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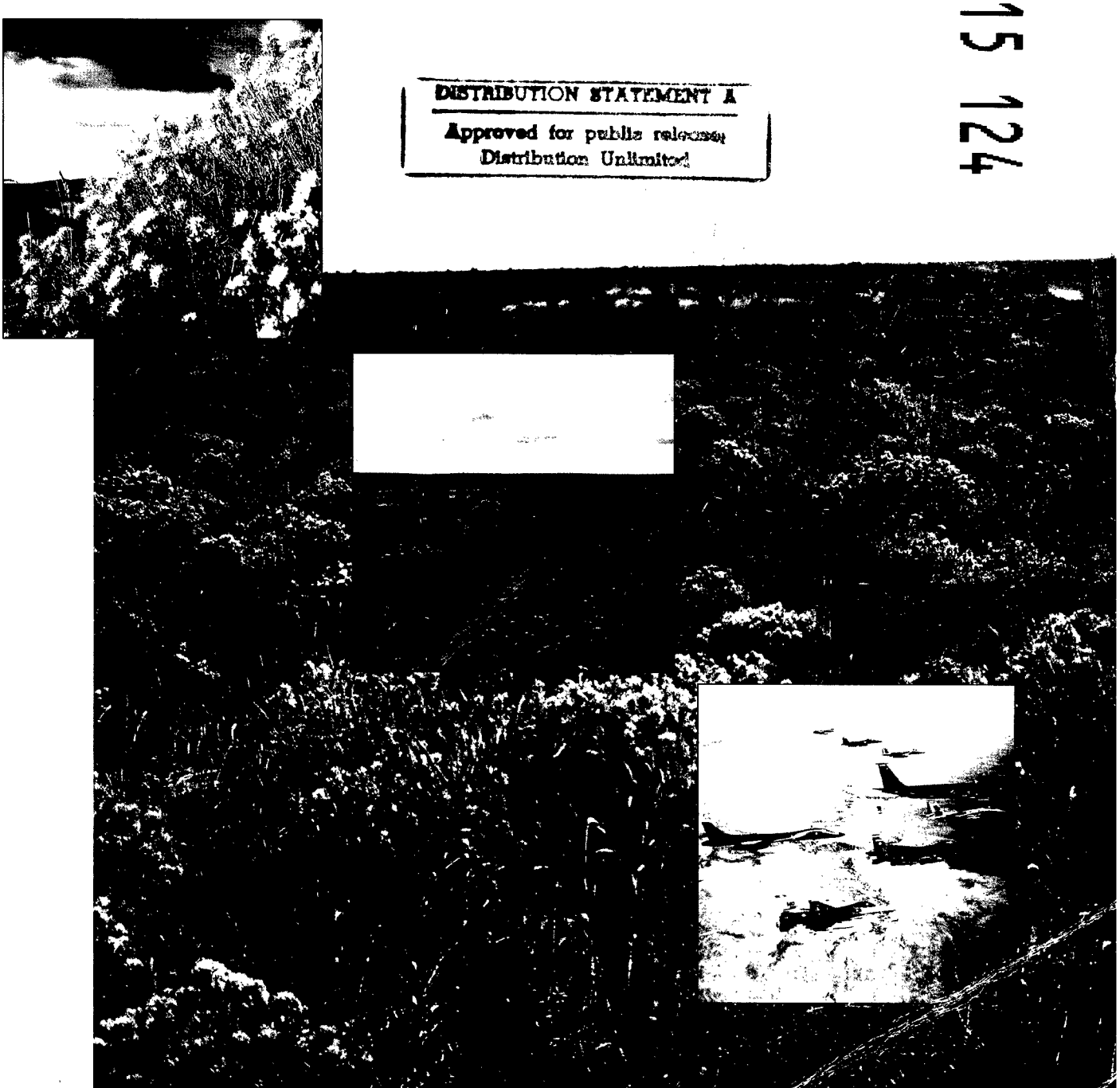
# ENHANCED TRAINING IN IDAHO

## ENVIRONMENTAL IMPACT STATEMENT

JANUARY 1998 • VOLUME 1

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# Summary of Contents by Volume

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**Preface Volume**

- Readers' Guide: Summarizes EIS changes resulting from public comments and agency inputs
- Executive Summary: Summarizes the ETI EIS results
- Recommendation of Preferred Alternative: Identifies the Air Force Preferred Alternative
- Mitigation Measures: Describes actions to reduce environmental consequences and/or public or agency concerns

**Volume 1**

- Chapter 1: Describes purpose and need of the proposal to Enhance Training in Idaho
- Chapter 2: Presents the alternatives including no-action and three training range alternatives
- Chapter 3: Delineates the baseline condition of the affected environment for each environmental resource
- Chapter 4: Addresses the environmental consequences of the four alternatives, including cumulative impacts
- Chapter 5: Presents irreversible and irretrievable commitment of resources if an action item were selected
- Chapter 6: Index

**Volume 2**

- Overview: Describes public review and comment response process
- Public and agency comments: Includes hearing testimony and written comments
- Response to comments: Responds to comments and/or identifies where responses can be found in the FEIS

**Volume 3 (originally Volume 2 of the DEIS)**

- Chapter 7: References
- Chapter 8: Persons and Agencies Contacted
- Chapter 9: List of Preparers
- Chapter 10: Consultation Information
- Chapter 11: List of Repositories
- Appendices A through N: Technical appendices and reports and information, in addition to that contained in the body of the FEIS, required for compliance with Federal Land Policy Management Act

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The ETI Final Environmental Impact Statement (EIS) evaluates four alternatives to enhance training for aircrews of the 366th Wing based at Mountain Home AFB, ID. The EIS was prepared in accordance with the National Environmental Policy Act (NEPA). It also has appendices to meet requirements of the Federal Land Policy and Management Act and its associated regulations for public land withdrawals. The Final EIS includes analyses of the potential environmental consequences of each alternative on airspace, noise, safety, hazardous materials, earth resources, water resources, air quality, biological resources, cultural resources, land use, recreation and visual resources and socioeconomics. The findings indicate that potential environmental impacts from any one of the range development alternatives include increased aircraft-related noise in the expanded portions of the MOAs, decreased aircraft-related noised in portions of existing MOAs, negligible to moderate impacts on habitat for wildlife and vegetation, disturbance to cultural resources eligible or potentially eligible to the National Register of Historic Places (National Register) and possible environmental effects of range alternatives combined with past, present and future projects or actions. The Juniper Butte Alternative was recommended as the Air Force's preferred alternative.

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# ENHANCED TRAINING IN IDAHO

## Final
## Environmental Impact Statement

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Volume 1
Chapters 1 through 6

January 1998

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# COVER SHEET
# FINAL ENVIRONMENTAL IMPACT STATEMENT
# COVERING THE PROPOSED ALTERNATIVES
# FOR ENHANCED TRAINING IN IDAHO

a. *Responsible Agency:* U.S. Air Force

b. *Cooperating Agencies:* Bureau of Land Management (BLM), State of Idaho, Federal Aviation Administration (FAA)

c. *Proposals and Actions:* This environmental impact statement (EIS) evaluates four alternatives (No-Action, Clover Butte, Grasmere, and Juniper Butte) to enhance training for aircrews of the 366th Wing based at Mountain Home Air Force Base (AFB). Under the No-Action Alternative, no additional range sites, emitter sites, or airspace would be developed. This alternative would not involve any changes in existing land management authorities or any modification to special use airspace. Aircrews would continue to perform the training activities they currently conduct including supersonic maneuvers, use of chaff and flares, composite wing training, and ordnance delivery at Saylor Creek Range (SCR) and remote ranges. The three action alternatives make use of the existing SCR and incorporate the following components: a 300-acre non-explosive training ordnance impact site within a 12,000-acre training range; 5 no-drop targets on which no training ordnance would be dropped; 20 one-quarter and 10 one-acre emitter sites for typical rotation of 5 to 8 trucks with electronic emitters; and modified military airspace to allow for greater dispersal of aircraft. All proposed range components would be located on federal lands and State of Idaho school endowment lands. For use of the federal lands, the Air Force proposes a military land withdrawal under the Engle Act for larger parcels, and rights-of-way from the BLM for smaller parcels. For use of State of Idaho school endowment lands, the Air Force proposes lease agreements. The three alternatives would involve modification of special use airspace, including establishment of restricted airspace over the tactical training range and expansion of existing Military Operations Areas (MOAs), under approval of the FAA. The three range alternatives vary in the locations of the tactical training ranges, the locations of the no-drop target areas, and the reconfiguration and expansion of the MOAs. Development of one of the range alternatives would substantially enhance the realism, quality, and flexibility of local training for the 366th Wing, a unique wing with an air expeditionary mission, stationed at Mountain Home AFB in Idaho.

d. *For Additional Information:* Lieutenant Shane Balken, Chief, 366th Wing Public Affairs, 366 Gunfighter Ave., Mountain Home AFB, Idaho 83648 (208) 828-6800 or Ms. Brenda Cook, EIS Project Manager, HQACC/CEVA, 11817 Canon Blvd., Crestar Bank Building, Suite 500, Newport News, VA 23606-2558 (757) 764-6197

e. *Designation:* Final Environmental Impact Statement

f. *Abstract:* This Final EIS has been prepared in accordance with the National Environmental Policy Act (NEPA). It also has appendices to meet requirements of the Federal Land Policy and Management Act (FLPMA) and its associated regulations for public land withdrawals. The Final EIS includes analyses of the potential environmental consequences of each alternative on airspace, noise, safety, hazardous materials, earth resources, water resources, air quality, biological resources, cultural resources, land use, recreation and visual resources, and socioeconomics. The findings indicate that potential environmental impacts from any one of the range development alternatives include increased aircraft-related noise in the expanded portions of the MOAs, decreased aircraft-related noise in portions of the existing MOAs, negligible to moderate impacts on habitat for wildlife and vegetation, disturbance to cultural resources eligible or potentially eligible to the National Register of Historic Places (National Register), and possible interference with traditional activities of Native Americans. This Final EIS also describes cumulative environmental effects of range alternatives combined with past, present, and future projects or actions. An analysis of the environmental information and public and agency input found that the Juniper Butte Alternative had the lowest potential for environmental impacts, followed closely by the Clover Butte Alternative. The Grasmere Alternative had the greatest potential for environmental impacts. All three alternatives met operational requirements. The Juniper Butte Alternative is recommended as the Air Force's preferred alternative.

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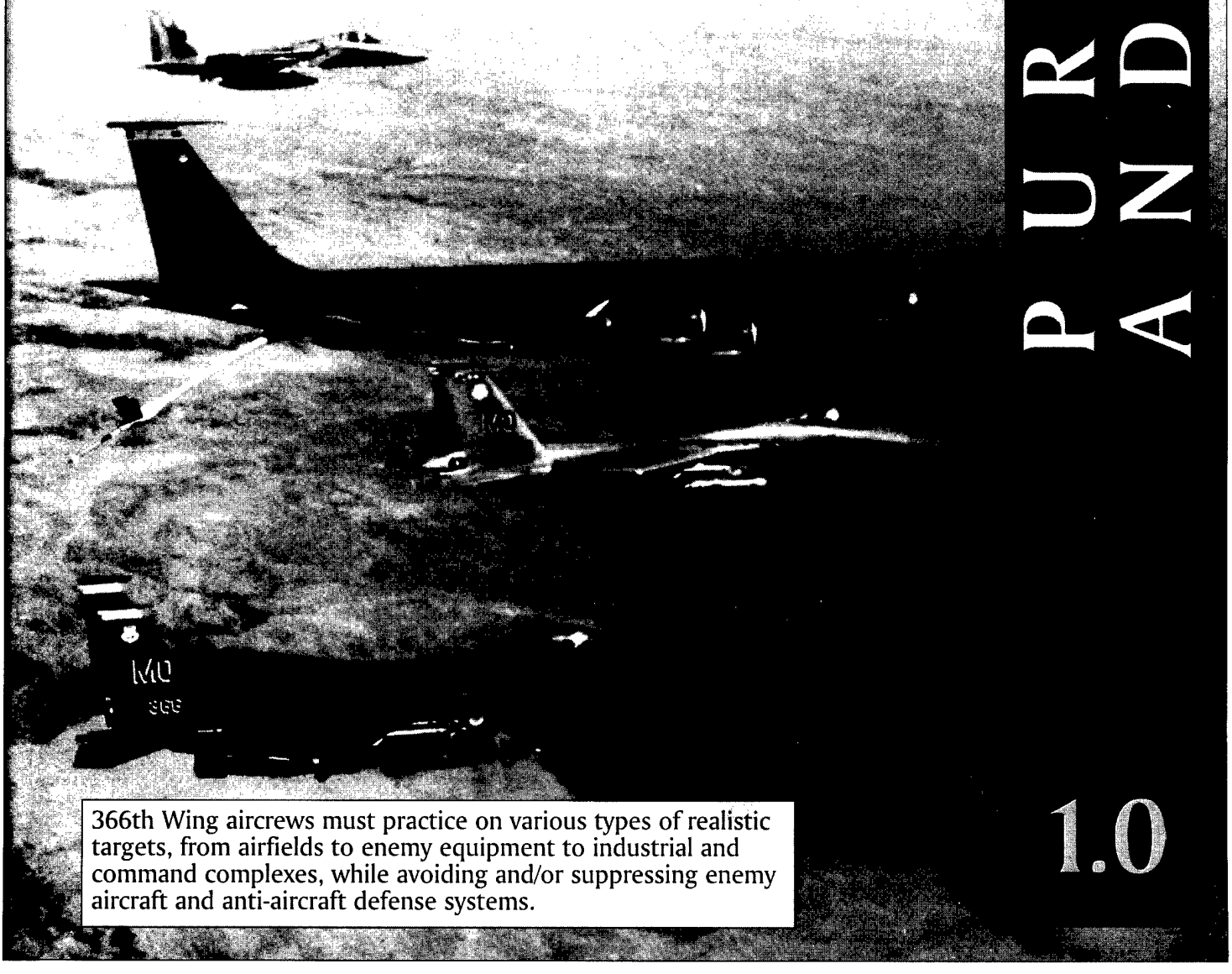
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# PURPOSE AND NEED

# 1.0

The Mountain Home AFB-based 366th Wing is a single integrated unit flying a mixture of different aircraft types. It is an air expeditionary force prepared to deploy worldwide to an area of potential or ongoing conflict. As one of the first units to deploy to a problem area, the 366th Wing has the responsibility to neutralize enemy forces.

Wing aircrews must be trained to perform any required action to stop or suppress enemy activity and avoid conflict escalation. The mission requires intensive individual training in all types of offensive and defensive weapons. The 366th Wing also requires coordinated training of the multiple aircraft types to ensure that a strike force penetrates both airborne and ground-based defenses to accomplish its mission. Because of these mission requirements, the 366th Wing must maintain peak readiness to respond rapidly and effectively to diverse situations and conflicts.



366th Wing aircrews must practice on various types of realistic targets, from airfields to enemy equipment to industrial and command complexes, while avoiding and/or suppressing enemy aircraft and anti-aircraft defense systems.

## Training Ranges and Airspace: What Exists Today

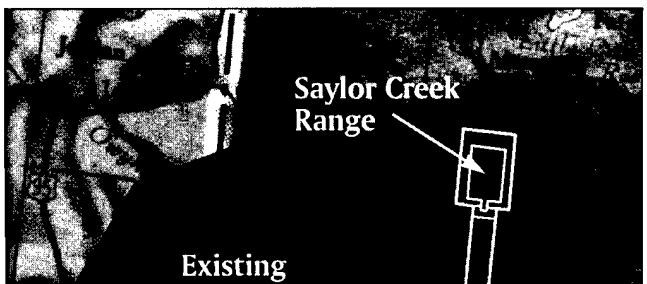
One of the questions raised at the public hearings was whether or not the existing SCR or remote ranges could provide the needed training.

### Local Range and Airspace

The local SCR consists of approximately 110,000 acres of land withdrawn by the Department of Defense for the purpose of weapons delivery training. The range extends 15 miles north-south and 11 miles east-west. The exclusive use area consists of approximately 12,200 acres located in a fenced area near the center of the range and includes all of the range's training targets. The highly visible conventional targets lack realism in terms of configuration, spacing, and separation required for tactical ordnance delivery.

The local airspace includes restricted airspace, military operations areas (MOAs), and military training routes (MTRs). Restricted airspace overlies SCR. MOAs support training activities that may or may not be directly associated with the range. MTRs provide access to restricted airspace and MOAs and offer low-altitude navigation training.

Aircraft from Mountain Home AFB use approximately 76 percent of the local airspace and range time. Aircraft from the Idaho Air National Guard use 19 percent and aircraft from units outside of Idaho (transient aircraft) constitute 5 percent.




The available airspace and SCR have certain restrictions that reduce opportunities for realistic training. SCR is located in the northeast corner of the airspace. This makes it difficult to realistically train on multiple targets and to attack the targets from multiple directions.

When limited to SCR, aircrews become accustomed to a standard attack approach, which lessens realistic training. In addition, the shape of the airspace concentrates aircraft into a "bottleneck" south of the northern airspace indentation and north of the Duck Valley Reservation. This existing concentration results in more frequent occurrences of noise in the corridor and less realistic training throughout the airspace.

### Remote Ranges and Airspace

The 366th Wing currently uses remote ranges and airspace that are more than 150 nautical miles from Mountain Home. Primary ranges are:

- The Utah Test and Training Range, Utah
- Fallon Training Range Complex, Nevada
- Nellis Air Force Range, Nevada

The 366th Wing uses these ranges to train for multiple aircraft coordinated attack and to meet the requirements for training with live ordnance.

Some multiple aircraft training and all live ordnance training will continue at these remote ranges under any of the enhanced training alternatives. Since other units manage these areas and represent the primary users, the 366th Wing must accept available times for use, which creates difficulties in scheduling and meeting training requirements.

Aircrews that fly to the remote ranges use valuable training time commuting. Aircrews and support personnel are often required to relocate from their homes at Mountain Home AFB in support of military operations throughout the world. Training at remote ranges requires additional deployment of aircrews and

# Guide to Frequently Identified Issues

The public involvement process produced many useful comments and input to this EIS. A number of specific issues were raised frequently. The following table lists those key issues and references them to the resource sections in the EIS that provide information relating to that issue.

| Frequently Identified Agency and Public Issues | |
|---|---|
| **Issue Raised** | **ETI EIS Sections** |
| Need for enhanced training range | 1.2, 1.3 |
| Noise effects | 3.2, 4.2, 4.8.4, 4.8.5, 4.8.6, 4.8.7, 4.8.8, 4.8.9, 4.8.10, 4.9.1, 4.9.3, 4.9.4, 4.9.5, 4.9.6, 4.9.7, 4.10.2, 4.10.3, 4.10.4, 4.11.2, 4.11.5, 4.11.4 |
| Biological resources | 3.8, 4.8 |
| Bighorn sheep | 3.8.11, 4.8.11 |
| Sage grouse | 3.8.11, 4.8.11 |
| Pronghorn antelope | 3.8.5, 4.8.5 |
| Raptors | 3.8.9, 4.8.9 |
| Native American concerns | 1.4.4.2, 3.0, 3.1.3, 3.2.3, 3.3.4, 3.6.6, 3.8.12, 3.9, 3.10.5, 3.11.3, 3.12.7, 4.0, 4.1.5, 4.2.7, 4.3.5, 4.6.6, 4.8.12, 4.9, 4.10.5, 4.11.5, 4.12.5, 4.12.6 |
| Recreation, aesthetics, and wilderness | 3.10.1, 3.10.3, 3.11, 4.10.2, 4.10.3, 4.10.4, 4.11 |
| Grazing and regional economics | 3.12.4, 4.12.4 |
| **Additional Agency Concerns** | |
| Fire risk | 2.3.2, 3.3.1, 3.8.1, 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.8.1, 4.8.5, 4.8.6, 4.8.7 |
| Slick spot peppergrass | 2.7, 3.8.3, 4.8.3, 5.0 |
| Road and bridge improvements | 3.8.2, 3.8.3, 3.8.8, 3.8.9, 3.8.10, 3.8.11, 4.6.2, 4.6.3, 4.6.4, 4.6.5, 4.7.2, 4.7.4, 4.8.1, 4.8.2, 4.8.5, 4.9.1, 4.9.2, 4.9.5, 4.9.6, 4.10.2, 4.10.3, 4.10.4 |

# 1.0 PURPOSE AND NEED FOR ENHANCED TRAINING IN IDAHO

The purpose of the proposals assessed in this Final Environmental Impact Statement (FEIS) is to provide an enhanced training capability in the State of Idaho for the 366th Wing at Mountain Home Air Force Base (AFB) (Figure 1.1-1). As the Air Force's rapid-response air expeditionary wing, the 366 Wing's mission is to deploy to a theater of operations and conduct combat operations. These operations include gaining air superiority, attacking ground targets, and providing support to those forces conducting air-to-air and air-to-ground activities. Preparing to effectively accomplish these complex demands requires training. The closer this training mirrors anticipated combat conditions, the better prepared the wing will be to fight when required. In addition to realism, which improves training quality, training should also incorporate flexibility, and be conducted efficiently to maximize training benefit from a given expenditure of resources. The activities collectively proposed for Enhanced Training in Idaho (ETI) satisfy these requirements.

The integration of a cohesive training complex comprised of conventional and tactical training ranges, threat emitters, and supporting military training airspace is needed to develop varying training scenarios that realistically reflect battlefield conditions. The location of the training complex in Idaho provides high-training efficiency since time available for training in combat tactics is maximized and travel time to the training complex is minimized.

The ETI proposals are designed to meet the need for enhanced training by providing high-quality training within available airspace with minimum impacts to the environment and traditional land uses in the region. The Air Force proposes a combination of ground and air assets that will, in conjunction with the existing Saylor Creek Range (SCR), provide a tailored training complex to enhance the training of the aircrews supporting the 366th Wing's unique mission.

These assets include the following:

- A 300-acre primary ordnance impact area within a 12,000-acre tactical training range. Non-explosive training ordnance would be dropped on targets on the 300-acre site.
- One 640-acre and four 5-acre no-drop target areas. Ordnance would not be used on the no-drop targets.
- Thirty emitter sites (20 consisting of one-quarter-acre and 10 consisting of one-acre) would be used, 6 to 8 at a time, during a typical training exercise to electronically simulate anti-aircraft artillery or surface-to-air missile radar emplacements.

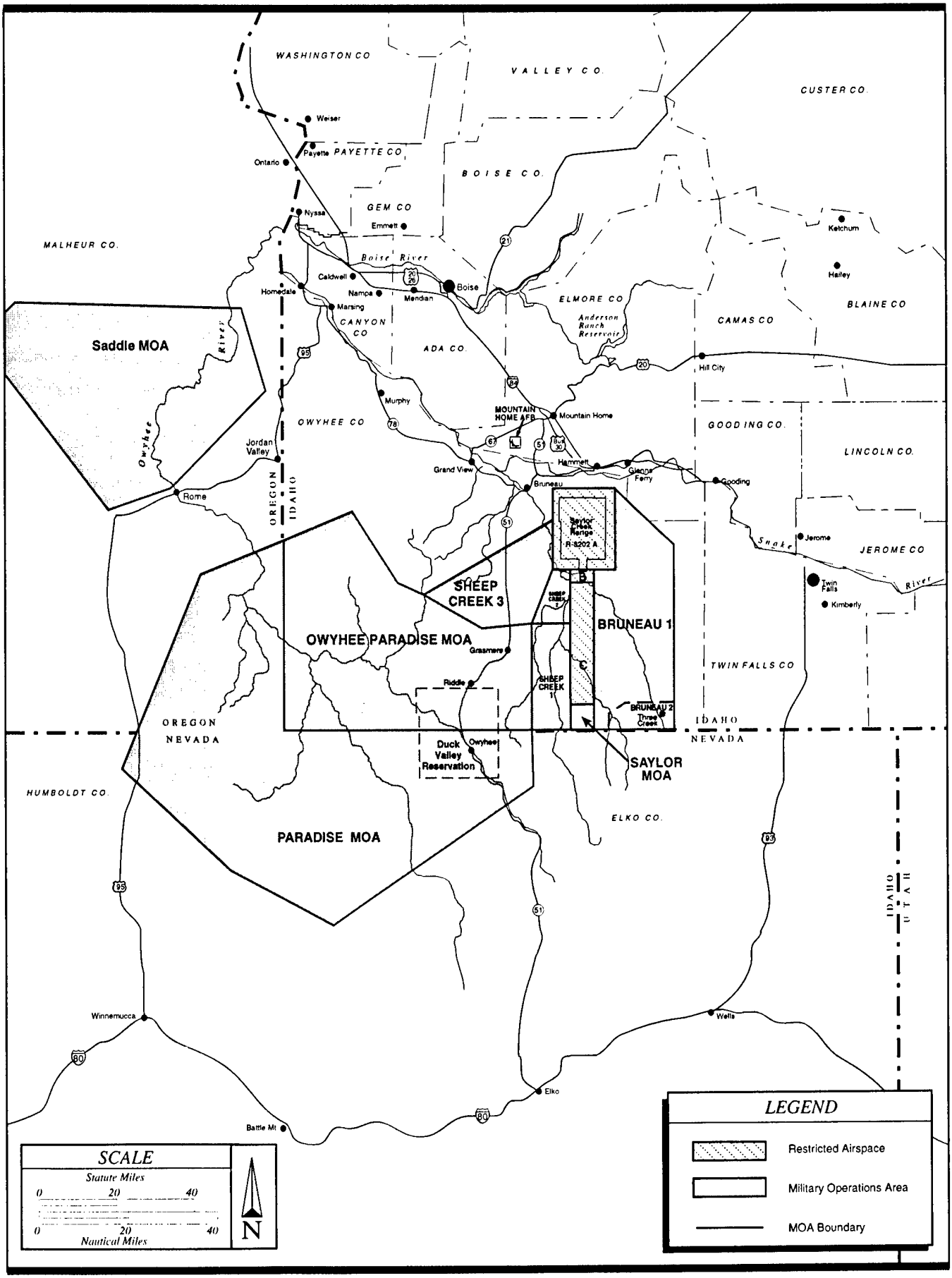



**Figure 1.1-1 Regional Location of Mountain Home AFB and Local Military Training Airspace**

- A modified airspace structure to support the full potential capabilities of the range and improve the flow of aircraft performing training through the airspace.

The following sections provide background on military aviation activities in Idaho, elaborate further on the purpose and need for ETI, and describe the various processes and coordination being conducted in support of the proposal.

# 1.1 BACKGROUND TO ENHANCED TRAINING IN IDAHO

## 1.1.1 History of Aircraft Training in Southwest Idaho

Military aircraft training and operations have been conducted over southwest Idaho since 1942. To train aircrews for combat in the Second World War, the U.S. Army Air Force established training airfields in Boise (now Gowen Field) and Mountain Home (now Mountain Home AFB). Flying B-29, B-24, and B-17 bombers, as well as P-38 and P-63 pursuit aircraft, the aircrews conducted training over much of southwest Idaho, but particularly in the 420,000-acre Saylor Creek Bombing Range and four other Precision Bombing Ranges (PBRs) (Figure 1.1-2). Training included a wide variety of activities such as aerial gunnery, bombing practice, low-altitude flight, and navigation.

As a Strategic Air Command (SAC) base in 1949, Mountain Home AFB supported B-29 bombers that continued to train over the lands in southwest Idaho. Between 1949 and 1960, the base and the training facilities were used by reconnaissance aircraft, transport wings, and bombers. Flight operations and training activities varied considerably during this period, depending upon the nature of the aircraft and the mission.

SAC added B-47 jet bombers to the aircraft inventory in 1960, using the base, Saylor Creek Bombing Range, and the airspace over southwest Idaho. Also, construction of three Titan missile complex sites in Owyhee and Elmore counties occurred at the same time. Although aircraft continued to fly over large portions of the high desert lands and canyons of southwest Idaho, new tactics, missions, and technology permitted the Air Force to return approximately 310,000 acres to the public lands inventory during the 1960s, including the four PBRs. The remaining 110,000 acres of SCR has remained essentially unchanged to the present.

Tactical Air Command (now Air Combat Command [ACC]) assumed control of the base and range in 1966, using SCR and southwest Idaho and its vicinity for low- and high-altitude reconnaissance and tactical fighter training. Thus, jet aircraft activities have had an influence on the environment of the region for more than 30 years. With the arrival of F-111 fighter-bomber aircraft at Mountain Home AFB in 1972, jet aircraft activities over southwest Idaho increased in frequency and duration. About a decade later, electronic combat EF-111 aircraft replaced one of the three F-111 fighter-bomber aircraft squadrons, and intense flying activities at the range and in the airspace continued.

During the period from 1972 through 1991, the F-111 and EF-111 aircraft operated intensely throughout the airspace above southwest Idaho, using SCR and the Military Operations Areas (MOAs) as they exist today. In addition, these and other transient aircraft used segments of two low-altitude (100 feet above ground level [AGL]) military training routes (MTRs) that crossed Owyhee County from west to east. These segments of MTRs visual route (VR)-1301 and VR-1302 were eliminated in 1993 to remove a source of concentrated noise over the Owyhee River canyon.

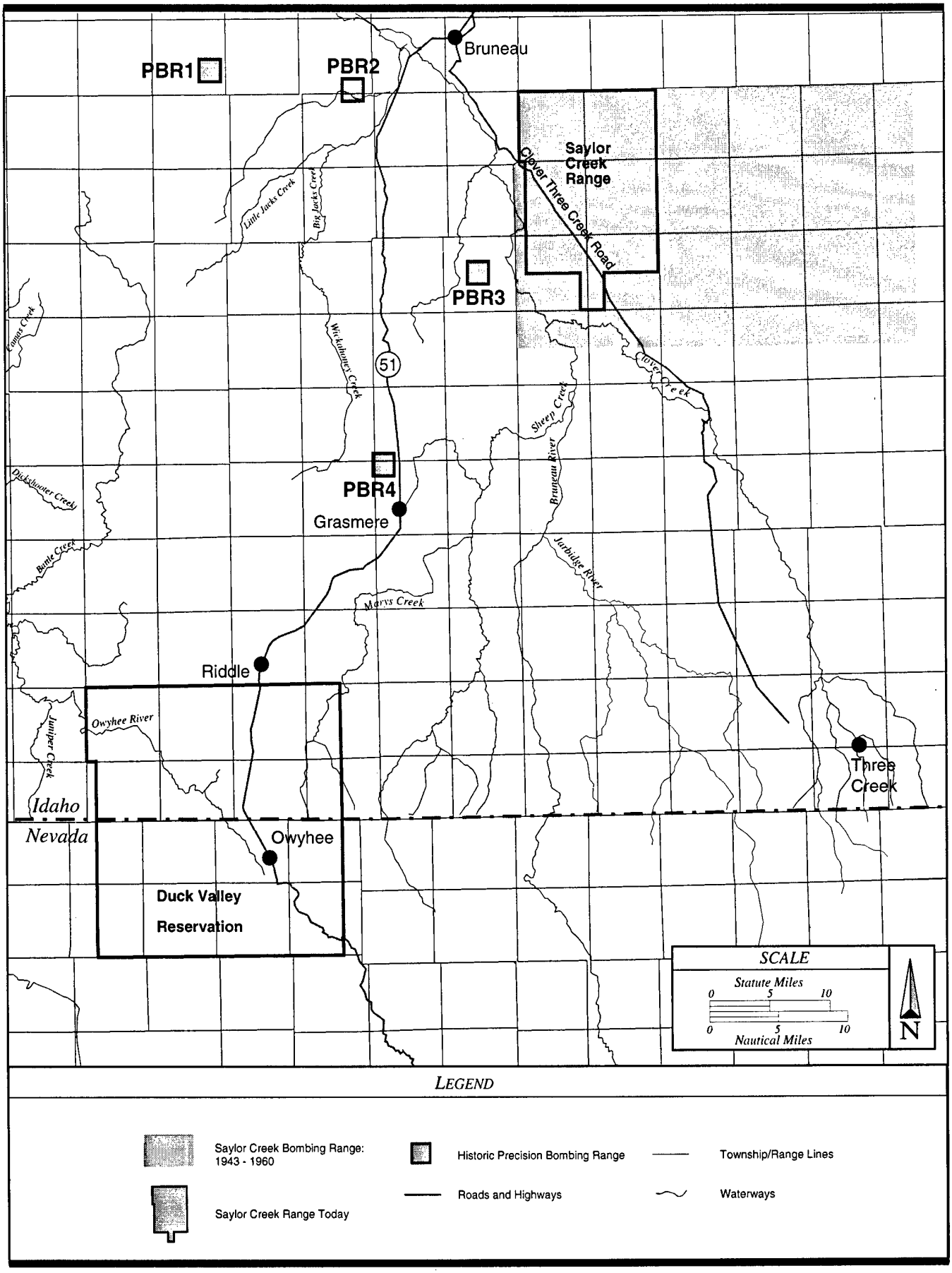



**Figure 1.1-2 Historic Precision Bombing Ranges and Saylor Creek Bombing Range: 1943-1960**

Potential enemy threats and mission training for F-111 and EF-111 aircraft focused on low-altitude flight tactics to evade detection by radar. To train for this tactic, F-111 and EF-111 aircrews commonly flew 1.6 to 1.8 hours in the MOA and range airspace at 300 to 500 feet AGL for the majority of their 3-hour sorties. From 1972 through 1986, use of the airspace including the Owyhee MOA averaged more than 7,000 sortie-operations per year; this equated roughly to 11,200 to 12,600 hours of low-altitude flight annually. At this time, RF-4C aircraft from the Idaho Air National Guard (IDANG) and transient aircraft from other bases and services also used the airspace and range assets in southwest Idaho. Given the tactics of the time, many of these other users also conducted longer duration sorties at low altitudes.

At the close of the 1980s and the start of the 1990s, changes in force structure, base closures, and realignments led to changes in the inventory of aircraft based at Mountain Home AFB. Transfer of F-111 aircraft from the base to other locations resulted in a reduction in the aircraft inventory, personnel, and amount of flying in the local airspace. By 1991, realignment recommendations approved by the President and adopted by Congress resulted in the transfer of the F-111s from Mountain Home AFB and the establishment at the base of a Composite Wing, the 366th Wing.

## 1.1.2 Establishment of the 366th Wing

By the early 1990s, the dramatically changed world situation and other factors prompted a reevaluation of the United States' policies and strategies, resulting in a revised defense orientation that emphasized a need for readiness to respond to at least two major regional conflicts simultaneously. These policies placed a substantially greater responsibility for readiness on forces based in the United States to respond to overseas threats. Achieving immediate effectiveness represents an important requirement for U.S.-based forces, no matter where they are deployed or the nature of their mission. One important way the Air Force achieved broad, flexible, effective response capabilities with fewer total forces was by establishing a Composite Wing at Mountain Home AFB.

Establishment of the Composite Wing began in 1992 and was essentially completed in 1994, and concluded with the basing of B-1B aircraft in 1996[1].

### 1.1.2.1 The 366th Wing and Airspace Use

Because a peace-time composite wing had no precedent, projections for training and airspace use analyzed in the Air Force in Idaho EIS proved to exceed those actually performed. Figure 1.1-3 compares the total number of local sorties conducted from Mountain Home AFB as projected in the Air Force in Idaho EIS to actual sorties flown by the 366th Wing since 1992. A sortie represents a flight of a single military aircraft from takeoff through landing. Figure 1.1-4

[1] Both the Air Force in Idaho EIS (1992) actions and the B-1B beddown environmental assessment (EA) (1996) are currently subject to litigation in the United States District Court for the District of Idaho.

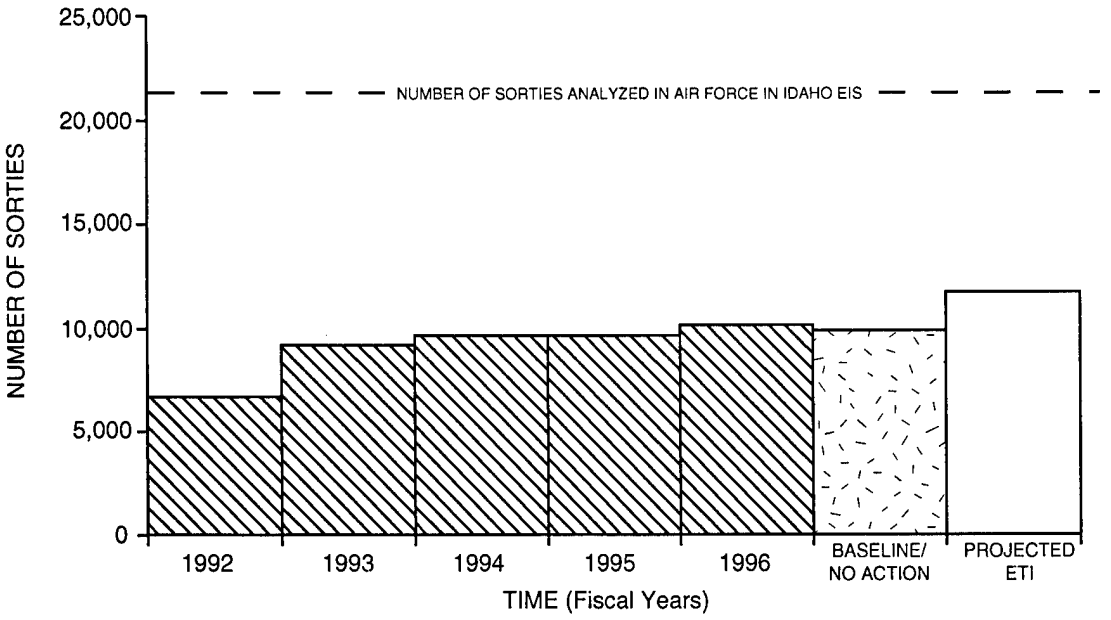



**Figure 1.1-3 Sorties Flown from Mountain Home AFB to Local Airspace**

**MAJOR EVENTS**

FY 1992

- Air Force in Idaho EIS ROD
- 389/391 Fighter Squardon Activated
- 34 Bomber Squardon Activated at Castle AFB

FY 1993

- 22 ARS/390 Activated
- F-111 Drawdown Complete

FY 1994

- 34 Bomber Squardon Transferred to Ellsworth AFB

FY 1995

- FONSI for Relocation of 34BS to Mountain Home, AFB
- FONSI for 124 Wing Conversion
- 34 Bomber Squardon Beddown at Mountain Home, AFB
- 124 Wing Conversion Begun

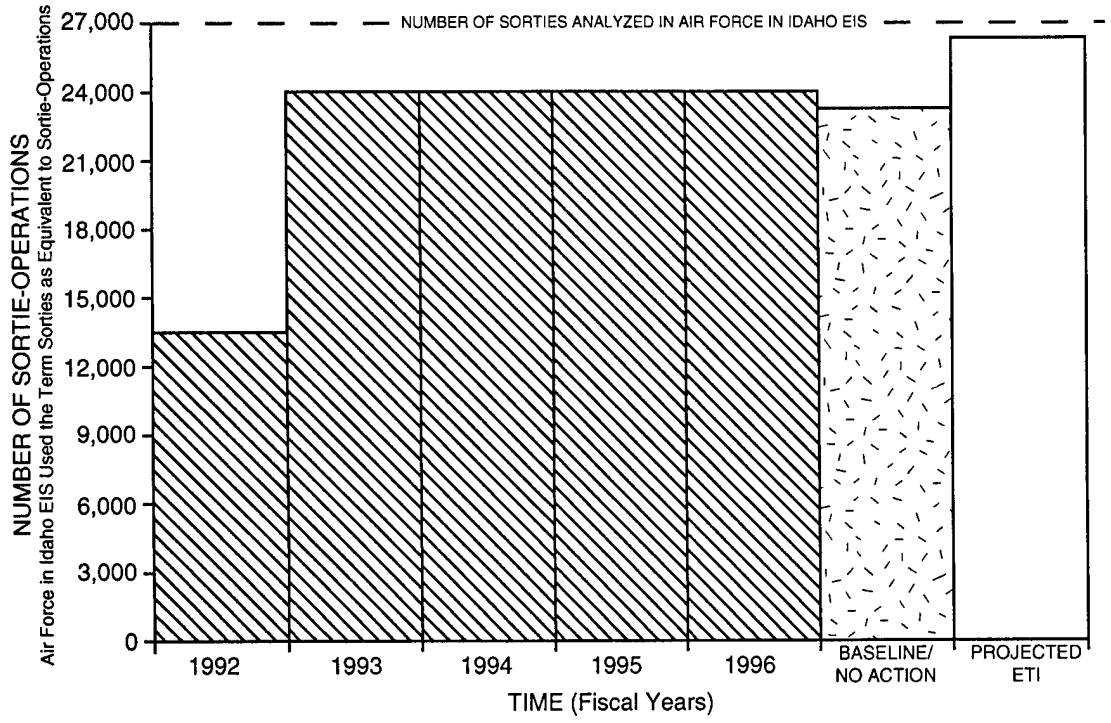



**Figure 1.1-4 Sortie-Operations by all Aircraft in Local Airspace**

provides a similar comparison of total sortie-operations in the local MOAs and restricted airspace. A sortie-operation is the use of one airspace area (e.g., MOA, MTR, restricted area) by one aircraft. As both of these figures demonstrate, actual sorties and total sortie-operations have remained well below the levels analyzed in the Air Force in Idaho EIS.

#### 1.1.2.2 BEDDOWN AND PRIOR ENVIRONMENTAL DOCUMENTATION

An EIS, Proposals for the Air Force in Idaho (Air Force 1992), analyzed the environmental consequences of establishment of a Composite Wing at Mountain Home AFB. A Record of Decision (ROD) implementing this action and associated airspace modifications was issued in March 1992. The decisions made in the ROD included the following:

1. Basing up to 76 aircraft at Mountain Home AFB to form a Composite Wing;

2. Raising the ceilings (upper limits) of the MOAs in southwest Idaho to a uniform 18,000 feet above mean sea level (MSL), and restructuring the internal boundaries of existing MOA airspace in Idaho;

3. Conducting supersonic operations above 10,000 feet AGL within the MOAs and restricted airspace in Idaho; and

4. Further studying a proposal by the State of Idaho to develop a new training range in southwest Idaho.

A separate and later Draft EIS (DEIS) and Plan Amendment, Idaho Training Range (ITR) (Air Force 1993), covered a proposed action near the Owyhee canyonlands, three alternatives, and a No-Action Alternative to develop a tactical training range for the Air Force in southwest Idaho. The proposal was abandoned by the Air Force prior to publishing a FEIS and Plan Amendment. Therefore, analysis and response to public comments were not completed. The ITR proposal was geographically and conceptually different from the proposal for ETI. Other than for historical purposes, the results of that DEIS have not been considered in this analysis. Although the Air Force did not proceed with the ITR proposal, issues raised by agencies, the public, and the Shoshone-Paiute Tribes during the ITR environmental process were reviewed and incorporated into the planning process for ETI. ETI has benefited from all public, agency, and Shoshone-Paiute Tribal comments that helped shape the proposal and identify mitigations to address concerns.

### 1.1.3 Current Air Force Mission in Idaho

The realignment of forces and facilities integral to the Air Force's implementation of national policies and strategies resulted in the establishment and evolution of the 366th Wing's mission, as described in this section. Also briefly described are other aircraft, particularly those from IDANG's 124th Wing at Gowen Field in Boise, that operate from and within Idaho and use the airspace and range to train for their missions.

### 1.1.3.1 366TH WING

The 366th Wing represents the Air Force's only operational composite wing with an air expeditionary mission, training as a single unit, and that lives, deploys, and fights together. In his 1991 report to Congress, the Secretary of the Air Force (SECAF) said, "one innovative initiative is the creation of composite wings that include — at one base, under one commander — all the resources needed to form composite force packages."

Shortly after the SECAF report, Maj. Gen. Robert Alexander, the Air Force Director of Plans, explained that "there is a convergence of factors that make composite wings more appropriate [than in previous years]: the change in the global environment; a corresponding new military strategy; technological advancements in command, control, communications, intelligence, and space; and improvements in maintainability and reliability. . . . The wing could have F-15Cs for air defense, F-16s for interdiction, KC 10s/135s for air refueling [and] could also have B-52s" (Schultz and Pfaltzgrass 1992).

The 366th Wing consists of a total of 66 primary assigned aircraft (PAA) including F-15Cs, F-15Es, F-16Cs, B-1Bs, and KC-135Rs. PAA are the number and type of aircraft that the Air Force assigns to the 366th Wing to perform its mission. The actual number of aircraft located at Mountain Home AFB may vary from the PAA, but any additional aircraft are only used as spares for the primary aircraft. The number of PAA determines the number of flying hours that are flown each year, the number of aircrews assigned, and many of the resources that are allocated to the wing. Throughout the remainder of this document, the description of baseline conditions and environmental consequences reflect the flight activities of the PAA. Table 1.1-1 presents the force structure and principal operational tasks of the 366th Wing aircraft. Aircrew assigned to each aircraft type must train not only to fulfill its specific operational tasks, but must also perform in an integrated and coordinated manner with all other aircraft in the wing. Today, the 366th Wing must be ready to respond to a wide variety of situations when deployed; it must maintain an exceptionally high level of training and coordination.

**Table 1.1-1. 366th Wing Primary Assigned Aircraft and Principal Operational Tasks**

| *Aircraft Type* | *PAA* | *Principal Operational Tasks* |
|---|---|---|
| F-15C | 18 | Air superiority fighter. Air-to-air combat and air intercept operations. No surface attack missions. |
| F-15E | 18 | Air-to-ground fighter and air-to-air. All-weather airstrike missions on ground targets. |
| F-16C | 18 | Multi-role fighter. Air-to-air combat, close air support, interdiction strikes, and suppression of enemy air defenses (SEAD). |
| B-1B | 6 | Long-range heavy bomber. High- and low-altitude bombing. |
| KC-135R | 6 | Air refueling, personnel, and equipment transport. |

Effective, high-quality training that provides the variation and realism expected in combat represents the foundation for maintaining readiness. The 366th Wing began training in the military airspace designated over southwest Idaho and at SCR in 1992. The wing also conducts required training at remote ranges such as Nellis Air Force Range (NAFR) and the Utah Test and Training Range (UTTR). Since establishment of a composite wing at a single base in a non-combat setting represented a new concept, both the training requirements and training activities have evolved from 1992 to the present. This evolution involved both increasing complexity and increasing sophistication in daily training activities, particularly with regard to composite wing training (CWT).

### 1.1.3.2 IDAHO AIR NATIONAL GUARD AND TRANSIENT AIRCRAFT

The 124th Wing of the IDANG, located at Gowen Field in Boise, fulfills a mission to provide close air support, forward air control, and airlift/airdrop. The wing in 1996 converted from the operation of 24 F-4G aircraft to 15 A-10 Thunderbolt II close air support aircraft and four C-130E Hercules transport aircraft. The A-10 aircraft are specifically designed for close air support missions with their ability to loiter over and protect ground troops and vehicles. These aircraft combine the long-loiter capability, a large and varied weapons load, and a wide combat radius to accomplish close air support. A large part of this mission focuses on anti-armor operations, although A-10s also have an air-to-air anti-helicopter capability as proven in the Gulf War. With their ability to stay over an area for a long period and with the protection of fuselage armor and redundant systems, the A-10 also performs a vital forward air control mission to assist other aircraft in attacking a target.

A-10 training involves air-to-ground weapons delivery (currently conducted at SCR and remote ranges), air-to-air combat training, joint mission training at SCR and remote ranges, and tactical navigation training. Remote ranges used by the A-10s include UTTR, NAFR, Yakima Firing Center, and Fort Lewis, Washington. Joint mission training often involves coordination with U.S. Army ground troops and helicopters.

For combat missions, the C-130 aircraft provide cargo and personnel airlift support, assault operations on unimproved airfields, equipment and personnel airdrops, and aero-medical support. As part of their State of Idaho mission, C-130 aircrews perform many of these functions in support of natural disaster relief. To train for these missions, the aircrews must conduct low-to-medium altitude (500-10,000 feet AGL) navigation, airdrop training, and assault strip landings. Currently, the IDANG C-130 aircraft perform this training both in the local airspace and in remote locations within and outside of the state.

Aircraft from other Air Force units, as well as from the U.S. Navy and Marine Corps, currently use the SCR, MOAs, and MTRs within southwest Idaho and the surrounding region. Known as transient users, these aircraft have a wide range of missions that roughly mirror those performed by the 366th Wing and the IDANG and account for approximately 5 percent of the training activity in southwest Idaho and its vicinity.

### 1.1.4 Airspace Use Since Establishment of the Composite Wing at Mountain Home AFB

Establishment of the Composite Wing (designated the 366th Wing) at Mountain Home AFB occurred in 1992. From that time to the present, many factors contributed to changes in airspace use relative to that projected by the Air Force in the Air Force in Idaho EIS (Air Force 1992). Appendix N presents a detailed chronology of those changes, the actions or factors resulting in the changes, and the coverage of action-specific or other applicable environmental analyses performed in compliance with the National Environmental Policy Act (NEPA). In summary, the chronology demonstrates that the changes in airspace use resulted from four primary categories of factors:

(1) Nonimplementation of proposed Air Force in Idaho airspace modifications designed to support training of the 366th Wing and the IDANG.

(2) Elimination of and modification to existing military airspace.

(3) Changes and additions to aircraft inventories.

(4) Evolution of training activities.

**Nonimplementation of airspace modifications.** In 1992, along with establishment of the 366th Wing, the Air Force decided to improve the utility of the MOAs over southwest Idaho through internal modifications of boundaries and upper altitude limits. These modifications were designed to maintain the existing total land area covered by the MOAs, and yet to provide more effective training airspace. The projected airspace use for the 366th Wing defined and analyzed in the Air Force in Idaho EIS (Air Force 1992) was predicated on this modified airspace structure. However, the Federal Aviation Administration (FAA) has failed to implement those modifications. Therefore, the 366th Wing, as well as other users of the airspace, have adapted airspace use and training activities to the existing, unmodified airspace. As an accommodation, the 366th Wing routinely submits temporary altitude reservation requests to the FAA to allow training above established restricted and MOA airspace associated with SCR.

This imposed constraint in flexibility and limitation to CWT has resulted in a portion (approximately 3 percent) of the 11 to 19 percent reduction in overall airspace use relative to the projections analyzed in the Air Force in Idaho EIS (Air Force 1992). The nonimplementation of airspace modifications also imposed a redistribution of airspace use among the MOAs and restricted airspace as compared to the Air Force in Idaho EIS projections. For all but one local MOA and restricted areas, adjusted airspace use levels have remained below those projected in the Air Force in Idaho EIS. In the Owyhee MOA, airspace use increased by about 1,600 sortie-operations as compared to the projections analyzed in the Air Force in Idaho EIS. This level of airspace use is comparable to that characteristic of the period from 1972 through 1986 when F-111 and EF-111 aircraft operated out of Mountain Home AFB.

**Elimination of and modifications to existing military airspace.** The first change of this type affecting airspace use occurred in 1993, with the elimination of segments of two low-altitude (100 feet AGL) MTRs (VR-1301, VR-1302) that crossed the Owyhee MOA. In the preceding years, these segments accounted for up to 3,900 flights within the airspace encompassed by the Owyhee MOA. This change reduced the number of overflights and noise over the Owyhee River canyonlands and provided for more effective, contiguous maneuvering airspace. Elimination of these MTR segments dispersed overflights throughout the MOA. On average, about 12 to 15 daily low-altitude overflights no longer occurred over the Owyhee River canyonlands.

The second change, effected in 1997, consisted of realignment of an MTR segment that crossed over the Duck Valley Reservation. Realignment of the MTR not only moved the route and overflights south of the Reservation, it also decreased the total amount of airspace affected by the MTR under the Paradise MOA (National Guard Bureau [NGB] 1996b).

The third change entailed use of restrictions on overflights of the Duck Valley Reservation. In 1994, the 366th Wing voluntarily imposed restrictions on overflight and use of chaff and flares over the reservation. Subsequently, the Air Force agreed in 1996 with the Shoshone-Paiute Tribes formally to implement these restrictions. Consequently, airspace use shifted northward. Section 1.4.4 provides additional detail on these restrictions.

**Changes and additions to aircraft inventories.** From its inception in 1992, the 366th Wing has included heavy bombers as part of the Composite Wing. Initially, B-52 aircraft of the 34th Bomb Squadron based at Castle AFB provided a remote element and trained as an integral part of the wing. In 1994, when the 34th Bomb Squadron moved to Ellsworth AFB and converted from B-52 to B-1B aircraft, it remained part of the 366th and continued to train with the wing. In order to permit the B-1B aircraft to become fully integrated into the 366th Wing, in 1996, the Air Force moved the 34th Bomb Squadron, consisting of six B-1B aircraft and approximately 500 personnel, to Mountain Home AFB. This change resulted in a 2.6 percent increase in flight activities at SCR and less than 0.4 percent overall increase in the MOAs. An environmental assessment (EA) and finding of no significant impact (FONSI) were completed for this action (Air Force 1996b).

Since 1975, the IDANG operated F-4 aircraft, flying RF-4C reconnaissance aircraft from 1975 through 1991, and F-4G "Wild Weasel" aircraft from 1991 to 1996. Due to force structure changes throughout the Air Force, in 1996 the IDANG converted from F-4Gs to A-10s and C-130s, resulting in a substantial mission change for the unit. This conversion included a slight change in personnel and reduction in total aircraft operations for the local MOAs and SCR. Moreover, replacement of the F-4Gs with the quieter A-10s and C-130s resulted in significant reductions in the noise levels for the lands underlying the existing airspace. An EA and FONSI (NGB 1996a) were completed for this action in mid 1996.

**Evolution of training activities.** The nature, amount, and duration of airspace use directly relates to the nature of required training activities for particular aircraft and groups of aircraft

such as the 366th Wing. In turn, training activities reflect the existing tactics and missions dictated by the strategies and defenses of potential adversaries. Because these adversary strategies and defenses change through time, the Air Force's training activities and the way military training airspaces are used must evolve too. Since its inception as a Composite Wing in 1992, the 366th Wing's training activities and airspace have evolved to respond to these changes. This evolution has resulted in the following:

- A portion (i.e., 8 to 16 percent) of the 11 to 19 percent reduction from projected overall use of the local MOAs and restricted airspace developed from initial composite wing training concepts.
- Total sorties and sortie-time remained at approximately one-half of the levels projected and analyzed in the Air Force in Idaho EIS.
- A greater (25 to 50 percent) emphasis was placed on use of higher altitudes (above 5,000 feet AGL) and decreased use of lower altitudes as a tactic to avoid ground-based enemy defenses.
- Adjacent airspace units (e.g., Owyhee and Paradise MOAs) are frequently used as combined airspace.
- Use of MTRs decreased substantially (more than 85 percent) below projections in Air Force in Idaho EIS, and a reduced requirement for low-altitude training was met by limited use of the MOA.

Overall, the factors described above have either reduced the number of low-altitude overflights and their associated noise or have not resulted in significant, adverse impacts to the environment when compared to those assessed when the 366th Wing was established (Air Force 1992). Appendix N presents greater detail on these factors and the environmental consequences.

## 1.2 PURPOSE OF ENHANCED TRAINING IN IDAHO

The purpose of the enhanced training range is to prepare combat-ready aircrews for real battlefield situations. The following section describes how the 366th Wing must train in order to survive in those situations.

The wing must maintain a constant state of combat readiness for its assigned missions. Such readiness to execute very short or even no-notice response results only from consistently receiving high-quality, effective training that incorporates all mission elements and tasks and provides a high degree of realism. This realism requires aircrews to perform integrated training activities using high levels of skill and coordination. It must also result in efficient utilization of the finite number of annual flying hours allocated to the wing.

The ETI proposal would provide augmented, effective training, currently not available in the local area. In fact, because ETI is designed to permit a flexible response to threats facing the 366th Wing in the 21st century, some kinds of the training provided by ETI are not entirely available at remote ranges. This enhancement of training for the 366th Wing incorporates the use of existing SCR and airspace assets with a proposed set of newly integrated assets, including an additional drop target area, no-drop target areas, emitter sites, and reconfigured MOA airspace. Situated under existing special-use airspace (SUA) in southwest Idaho, these training assets would enhance the 366th Wing's ability to gain more effective high-quality training from every available flying hour.

The proposed training assets are designed specifically to support the 366th Wing. Aircraft from other units, including the IDANG and those from other bases, would also conduct training using the ETI assets. While these units would continue to conduct the same type and level of training as today, no increase in flight activities are planned or anticipated. Implementation of enhanced training would substantially reinforce the 366th Wing's level of readiness to perform its assigned mission.

The proposal to enhance training in Idaho would meet four key objectives for the Air Force:

- Provide combat-effective training and maximize use of a fixed number of available training hours.
- Support the unique missions of the Air Force's rapid-response air expeditionary wing, and augment the realism, quality, and flexibility of training available either at SCR or remote ranges.
- Accommodate competing demands on airspace and land while increasing 366th Wing training capability.
- Ensure the Air Force's continued ability to balance protection of environmental and cultural resources with training needs.

## 1.3 NEED FOR ENHANCED TRAINING IN IDAHO

The reduction of forces worldwide, which increases the burden of readiness on the remaining forces, magnifies the importance of quality training. Combat readiness requires that the 366th Wing train the way it expects to fight, under realistic conditions that mirror the battlefield. Realistic training exposes aircrews to a wide variety of potential adversary targets, tactics, weapons, defense systems, and combat support elements before they are encountered in combat. Because the wing must be ready to respond rapidly to any one of innumerable situations, it seeks to use its available flying hours conducting realistic, quality training, rather than flying to and from a distant range.

The 366th Wing needs enhanced training to maintain a constant state of combat readiness. To provide enhanced training, local training ranges, airspace, and other assets should be capable of providing most of the types of training needed. Enhanced training requires the following elements:

- Although the wing does utilize the current best available assets on existing remote ranges, these facilities were designed and built before initiation of composite wing and air expeditionary force tactics and, therefore, were not designed to fully meet these training needs. While the best remote ranges are adequate to conduct limited CWT, ETI was specifically designed to optimize full-scale CWT training.

- Quality training requires adequate realism. The less realistic the training ranges and airspace, the less value is derived from the a finite number of annual flying hours. Training under unrealistic conditions prevents aircrews from understanding their capabilities under combat conditions and does not sufficiently prepare them for the pace and confusion of an actual battlefield. The objective of quality training is to replicate those conditions and tax the capabilities of military personnel as they would be in battle, so they learn to cope with the challenge before they are placed in a life-threatening situation; this need is addressed by a range specifically designed for CWT.

- Flexible training enhances both realism and quality. The flexibility of the ETI design will provide greater potential to keep pace with the evolution of future combat tactics, driven by technological change, than any of the remote ranges currently used by the 366th Wing. By altering all or part of the training scenario and training environment to give aircrews a range of experiences, they must respond to and overcome changes in potential enemy tactics. The flexibility to alter this training environment daily or even hourly, as in actual combat, also limits aircrews ability to memorize target approaches, defenses, routes, and tactics that reduce the effectiveness of the training.

- Integration of a training range, emitter sites, tactical targets, airspace, and other assets within an area that provides ready access for training offers an enhanced

method to achieve combat training. By configuring airspace, targets, and emitters within such an area, aircrews can conduct realistic training and maximize training value.

- The specific design and location of ETI offers the efficiency to ensure maximum time spent training by minimizing transit time to and from training locations. Closer ranges and airspace provide scheduling efficiency. Several remote ranges currently used by the wing are primarily test facilities that only allow training during non-test periods. The 366th Wing priority to get on these ranges is low, and even wing-wide CWT missions can be canceled on short notice if test missions have priority. The existing remote ranges cannot ensure this desired efficiency of schedule.

- Under the ETI proposal, the 366th Wing would reduce its use of remote ranges from 24 percent to less than 10 percent. Some remote range sorties would still be required since training events such as live ordnance and stand-off weapons deliveries are excluded from ETI. The remaining 90 percent of sorties flown by the wing would be able to take full advantage of the efficiency offered by an ETI specific design. This would allow for training events, such as simultaneous use of multiple targets and 360-degree axis of attack missions, that are now unavailable.

## Combat Situations and Training Requirements

The purpose of a training range, training airspace, and other assets is to prepare aircrews for battlefield situations. The following discussion compares the need for particular training assets with real battlefield situations.

**Air-to-Air and Air-to-Ground Maneuvers**. Were the 366th Wing to be assigned to attack enemy targets, it must temporarily seize complete control of the airspace and accomplish the following:

- destroy the targets (achieved by air-to-ground fighters and bombers — F-15Es, F-16Cs, and B-1Bs);

- protect the attacking forces (achieved by air superiority fighters and aircraft suppressing enemy air defenses — F-15Cs , F-15Es, and F-16Cs); and

- support the attacking forces (achieved by aircraft such as KC-135s, RC-135, and E-3 Airborne Warning and Control System [AWACS]).

Any enemy aircraft that enters combat airspace is targeted for immediate destruction by 366th Wing aircraft. For example, during the first days of hostilities during the Gulf War, numerous enemy aircraft attempted to prevent coalition aircrews from completing their missions. Many of these enemy aircraft were engaged at distances up to 100 miles. Based on this and other combat experience, sufficient training airspace is required to realistically simulate the air

combat environment leading to and from targets, and to accommodate the wide variety of training requirements associated with the 366th Wing.

Airspace used in combat situations starts at the target on the surface, and extends upward to the highest altitudes required to accomplish the mission. During past actual conflicts, ground attack aircraft have flown as low as 100 feet or lower, while the air superiority fighters have flown as high as 50,000 feet. Some combat missions require support aircraft to fly even higher. A realistic training environment allows aircrews to practice combat skills in much the same situations that would be required in future conflicts. However, some training policies preclude complete correspondence to certain activities such as flying below 500 feet AGL or firing missiles at manned aircraft. Many training tactics require rapid changes in altitude for air superiority or to evade enemy air defenses. Other training tactics require the aircrew to position the aircraft at a specific altitude above the ground to accomplish the assigned combat mission. Often during training, the aircrew must use their sophisticated weapon systems at an altitude that is optimum for the ordnance being simulated.

Realistic training requires a large expanse of airspace. The training environment must be physically large and flexible enough to simulate the following:

- the actual distances between enemy targets
- the distances and tactics that the enemy would use to protect the targets
- the tactics that combat aircrews would use to attack the targets
- the tactics used accomplishing the air superiority mission
- the tactics used accomplishing various support missions

**Supersonic speeds.** During combat, aircrews fly at speeds required to minimize exposure to enemy air defenses and to optimize the tactical use of sophisticated weapon systems. These speeds vary depending upon the type of aircraft, the tactics being used, and the threat conditions that are encountered during the mission. During the Gulf War, aircraft like the A-10 flew very slowly, as dictated by design and mission. Other aircraft like the F-15 and F-16 occasionally flew faster than the speed of sound when required to avoid destruction by enemy air defense systems or to use weapons of their own.

**Ordnance Delivery.** During combat operations, aircrews are required to deliver ordnance on targets at a very specific location, at a very precise moment in time, and must meet many other difficult delivery conditions. An example would be the requirement to release a particular ordnance at exactly 4 miles from the target, from at least 10,000 feet of altitude, using a climb angle of at least 30 degrees, with a true airspeed of at least 550 nautical miles (NM) per hour. Releasing the ordnance with 480 NM per hour true airspeed would result in mission failure due to the ordnance falling short of the target. A realistic training environment must allow the aircrews to use the same airspeeds that would be used during future conflicts.

Aircrews must meet these precise operational requirements in order to ensure that the target is damaged to the degree desired, and that the mission is successful. In addition to meeting all of the delivery requirements, the aircrew must simultaneously maintain their proper place in the formation, navigate to and from the target area, and must defend themselves from numerous enemy defensive systems that are attempting to destroy their aircraft. For example, during the Gulf War, large numbers of aircraft would attack an enemy airfield in rapid succession. Some aircrews would be tasked to attack airfield runways and taxiways, aircraft parked in protective structures, and related support facilities. Those aircrews would develop a coordinated plan to schedule each aircraft through the target area in a manner such that they attacked the targets in the desired sequence and protected the lives of the aircrew. In such situations, the aircrew must be concerned with avoiding impact with the ground, avoiding a mid-air collision with other aircraft, avoiding enemy defensive systems, and avoiding the effects of ordnance dropped from other aircraft.

During battle, each target is thoroughly analyzed to determine the appropriate method required to achieve the degree of damage desired. Each target is attacked according to a master plan, using different ordnance and different delivery requirements for each objective. Mission planners and the aircrew select the type of ordnance required, the type of fuse mechanism and function time, and the delivery conditions. The aircrew must then deliver the ordnance onto the target at the precise location where the ordnance will function as desired and, therefore, inflict damage to the target. Failure to meet any of the delivery requirements could result in mission failure due to inadequate target damage or, in some cases, no damage at all. An example would be the desired destruction of a hardened command and control bunker constructed of reinforced concrete. Mission planners would use documents that would dictate that a particular weapon must be delivered in such a way that it strikes the target at an entry angle of at least 50 degrees. If the aircrew causes the ordnance to have an entry angle of only 45 degrees, the mission could fail due to the ordnance skipping off the top of the target. The target could be missed entirely if the ordnance was released at an incorrect altitude, airspeed, or dive angle.

The skills that aircrews must possess to deliver ordnance under combat conditions are extremely difficult to learn. These skills must be maintained at a high degree of competency through frequent and realistic training. A training environment designed to develop and maintain combat skills is essential to the readiness of the 366th Wing. A realistic training environment includes the ability to practice a wide variety of training ordnance deliveries, and the capability for immediate feedback during training. This essential feedback is provided when an aircrew drops training ordnance at a tactical training range.

**Conventional Targets**. Training on simple targets known as conventional targets, such as those at SCR, provides the opportunity to practice basic skills under controlled conditions. These targets are typically attacked by one aircraft at a time. These targets are always easy to identify and are designed to provide a variety of visual indications about how the aircraft is oriented and where the aiming point is. Aircrews can concentrate on the requirements that are essential

to all munitions delivery events and can make repeated deliveries with feedback between each delivery. The feedback forms the basis for refinement of the skills being practiced, with improvements made on each subsequent delivery. Training ordnance must be dropped under these conditions in order to provide the aircrew with feedback that is immediate and precise. Current systems provide feedback that is accurate within one meter, and is reported to the aircrew within seconds of the training ordnance striking the ground.

**Tactical Targets.** A higher degree of training is available using tactical targets. These targets are much more difficult to locate, identify, and aim at than conventional targets. This higher degree of difficulty requires the aircrew to recognize and compensate for many near simultaneously occurring variables. The degree of difficulty associated with training against these targets also varies as the number of aircraft increase, and as the tactics used are varied. These more advanced training events provide immediate feedback from training ordnance delivery, and this feedback can be used to refine the aircrew skills before the next practice delivery.

The aircraft assigned to the 366th Wing are equipped with sophisticated equipment designed to increase the probability that training ordnance will impact the target as intended. This equipment consists of computers and other measuring devices that help the aircrew to determine when and where to release the ordnance. These devices must be checked to ensure that they are functioning properly so that the aircraft are ready to be deployed to a combat theater when required. Individual components of the systems can be checked using diagnostic equipment while the aircraft is on the ground. However, the integrity and functionality of the entire system can only be verified while in flight at the proper delivery conditions, and while actually delivering training ordnance.

Dropping training ordnance at a tactical training range provides aircrews with the expertise that they need to develop combat skills for future conflicts. Providing this training frequently and in a realistic setting maintains these skills at the level required. Aircraft systems' integrity and functionality are verified by dropping training ordnance. All of these factors are critical for the 366th Wing to be ready to deploy worldwide.

**No-Drop Targets.** The 366th Wing may be required to deploy to a variety of combat theaters throughout the world, where a wide range of targets may be encountered. A variety of targets needs to be included in a training environment to simulate the combat conditions that aircrews will face in future conflicts. Some enemy targets are closely spaced and very difficult to distinguish from other nearby structures. For example, in a row of warehouses at a chemical weapons manufacturing plant, the intended target may be a specific roof vent on a particular warehouse. Failure to target the exact intended point could result in mission failure or unintended consequences. Aircrews can practice many aspects of the training required to accomplish this mission by using sophisticated equipment in conjunction with no-drop targets.

No-drop targets offer a way to build targets that are matched to the sophisticated aircraft systems and demanding training requirements of the 366th Wing. Aircrews would use no-drop

targets to practice finding and aiming at a target without actually dropping training ordnance. To do this, aircrews would use a variety of means including visual acquisition, radar search methods, or other means such as detection of infrared emissions. No-drop targets provide an outstanding target even though they are built from ordinary materials using common building techniques. For example, a metal grain silo can be used to simulate fuel storage tanks. Training opportunities can be optimized by using several grain silos side by side and assigning an aircrew to target a specific silo. A higher level of training difficulty can be achieved by building a row of identical agricultural buildings with unique features on each building. Hundreds of individual targets could be simulated by varying the placement and number of doors, windows, and roof vents on ten agricultural buildings. No-drop targets can be designed and constructed with greater fidelity and lower maintenance cost than an equivalent drop target.

No-drop targets are a key component of a training environment that is designed to balance realistic training with the environment and traditional land uses. These facilities can be located in a manner that is environmentally suitable and operationally beneficial to aircrews due to the geographical separation from other no-drop targets and drop targets. No-drop targets located in a way that realistically simulate likely target areas are essential. This would allow aircrews to approach multiple targets at the same time, from many directions, using precise timing. The no-drop targets could be used individually, in groups, or in conjunction with drop targets. Targets that are geographically separated in a realistic manner are ideal candidates for practicing these essential combat skills. These no-drop targets would provide a necessary degree of realism to build skills and practice tactics that are required for combat missions.

The combination of no-drop targets geographically separated from drop targets on a tactical training range optimizes the amount of training that can take place simultaneously. Combat missions frequently utilize a mixture of aircraft types, each with a particular part of the overall mission. An example would be combining F-16s, F-15Es, and B-1 aircraft in one formation. The F-16s could drop training ordnance on a drop target at the tactical training range, the F-15Es could attack one no-drop target, while the B-1s could attack another no-drop target. The optimal mixture of no-drop targets and drop targets can be achieved by designing a training environment that encompasses the entire spectrum of training requirements for the 366th Wing. The tactics employed during training events would require a high degree of flexibility and the ability to simulate a wide variety of combat scenarios.

**Defensive Countermeasures.** During conflicts, the enemy can be expected to realize that U.S. forces will attempt to destroy certain key assets. The enemy forces will attempt to protect these assets from destruction by positioning defensive weapons that prevent our forces from completing their assigned missions. For example, before the Gulf War, Iraq deployed thousands of surface-to-air missiles (SAMs) and anti-aircraft artillery (AAA) to protect essential assets from destruction by coalition air forces. A realistic training environment must simulate such devices and tactics that combat aircrews will face in future conflicts. Radar-guided SAMs and AAA are simulated by electronic emitters positioned at emitter sites.

Defensive weapons designed to be used against combat aircrews are normally used in one of three general methods:

- Point defense of a high-value target
- An integral part of an armored ground force
- A component of a regional integrated air-defense system

A realistic training environment must allow the flexibility to replicate the manner that air-defense weapons may be used if future conflicts occur. Sufficient emitter sites meet training requirements by permitting variable simulated combat scenarios. Some scenarios may require the duplication of the point-defense method. Other emitter sites could be used to simulate air-defense systems used with a mobile ground force. All emitter sites could be used individually or as part of a larger integrated air-defense system. Some emitter sites would be positioned close to targets, while others would be optimized to protect selected geographical regions. It is, therefore, extremely important to locate emitters for combat training in a manner that best simulates the numerous defenses that are expected in future conflicts.

In the following section, the specific types of training and the airspace and range assets that would enhance the local capability to maintain mission readiness is described. It also examines the existing airspace and range assets in proximity to Mountain Home AFB according to their ability to provide enhanced training.

### 1.3.1 Elements of Training

Maintaining operational readiness and meeting Air Force requirements requires substantial, high-quality training. To achieve these goals, the 366th Wing conducts two major categories of training: continuation training (CT) and CWT. CT includes all the flying requirements levied on aircrew members by Air Force Training Instructions to meet their mission-ready status in their assigned aircraft. A CWT event is defined as a scenario employing multiple flights of the same or different types of aircraft, each under the direction of its own flight leader, performing the same or different roles. Much less frequently, the 366th Wing conducts Operational Readiness Exercises or Inspections (ORE/ORI), in response to higher headquarters direction.

The following is a list of training requirements documentation for 366th Wing aircrews derived from an Air Force Pamphlet (AFP), Air Combat Command Instruction (ACCI), Multi-Command Instructions (MCI), and 366 Operation Group Operating Instruction (OGOI) (Air Force 1994):

| | |
|---|---|
| AFP 36-2211 | Guide for Management of AF Training Systems, 1 Mar 97 |
| MCI 11-235 | C/KC-135 Operations, 1 Jan 96 |
| ACCI 11-B-1B | Aircrew Training--B-1, 10 May 96 |

| | |
|---|---|
| MCI 11-F16 | Pilot Training--F-16, 1 Oct 94 |
| MCI 11-F15 | Pilot Training--F-15, 1 Nov 94 |
| MCI 11-F15E | Aircrew Training--F15E, 5 Mar 95 |
| 366 OGOI 11-4 | Composite Wing Training Policy Planning Execution, 6 May 97 |

#### 1.3.1.1 CONTINUATION TRAINING

CT maintains and hones the proficiency of individual aircrew members in combat skills. Routinely performed by aircrews, CT is conducted throughout each aircrew member's assignment to a base. These requirements fall into three major categories of training: air-to-ground, air-to-air, and other training requirements. As summarized in Table 1.3-1, each of these categories includes many subcategories reflecting a broad variety of operational tasks. Appendix A provides additional definition of terms describing training activities. Typically conducted by a flight of one to four aircraft, CT utilizes the full range of available airspace, ranges and targets, and electronic threat systems.

*AIR-TO-GROUND TRAINING*

Air-to-ground training employs all the techniques and maneuvers associated with weapons use and includes low-, medium-, and high-altitude tactics, navigation, formation flying, surface attack tactics, targeting, weapons delivery, and defensive reaction. More than 60 percent (42 of 66) of the 366th Wing aircraft must perform all of these training requirements.

Surface attack tactics require training in which aircrews locate and destroy targets while avoiding or defeating defensive threats such as those simulated by electronic emitters. This training involves considerable vertical and horizontal maneuvering, requires sufficient airspace, and is enhanced by using realistic, changeable targets.

Weapons delivery involves the location, identification, and destruction of a variety of targets under different combat conditions. Weapons delivery training can involve a single pass or multiple passes on a target; aircrews must perform numerous different weapons delivery events (e.g., low-altitude level or dive or medium-to-high altitude release). For the 366th Wing, F-15E, F-16C, and B-1B aircrews currently conduct weapons delivery at SCR and remote ranges. At SCR, weapons delivery training involves the use of only training (nonexplosive) ordnance. More than 95 percent of this training ordnance consists of small (up to 25 pounds) steel training ordnance containing a spotting charge or marking device for determining how close the training ordnance comes to the target. Other ordnance on SCR consists of full-size, steel-encased concrete training ordnance weighing from 500 to 2,000 pounds. For the small amount (less than 5 percent) of live ordnance training conducted by the 366th Wing, aircrews use and will continue to use remote ranges approved for this activity.

**Table 1.3-1. Summary of Continuation Training Requirements for 366th Wing Fighter and Bomber Aircraft**

| *Training Requirement* | *F-15E* | *F-15C* | *F-16C* | *B-1B* |
|---|---|---|---|---|
| **Air-to-Ground Training** | X | | X | X |
| Surface Attack Tactics | X | | X | X |
| Conventional Weapons Delivery | X | | X | X |
| *Level Deliveries* | X | | X | X |
| *Diving Deliveries* | X | | X | |
| *Climbing Deliveries* | X | | X | |
| *Full-Size Ordnance Deliveries* | X | | X | X |
| *Strafing* | X | | X | |
| Tactical Weapons Delivery | X | | X | X |
| *Level Deliveries* | X | | X | X |
| *Diving Deliveries* | X | | X | |
| *Climbing Deliveries* | X | | X | |
| *Full-Size Ordnance Deliveries* | X | | X | X |
| *Strafing* | X | | X | |
| **Air-to-Air Training** | X | X | X | |
| Advanced Handling | X | X | X | |
| Air Combat | X | X | X | |
| Low-Altitude Air-to-Air | X | X | X | |
| Air Intercept | X | X | X | |
| Air-to-Air Defensive Maneuvering | X | X | X | X |
| **Other Training** | X | X | X | X |
| Low-Level Navigation | X | X | X | X |
| Electronic Combat | X | X | X | X |
| Aerial Refueling | X | X | X | X |

Conventional weapons delivery training involves training ordnance deliveries in a highly structured, repetitive learning environment. At ranges with conventional targets such as SCR, aircrews fly predetermined flight tracks against highly visible targets and receive immediate feedback from a range control officer. In contrast, tactical weapons delivery more closely matches the events that occur in actual combat. Aircrews must use a variety of maneuvers, avoid and react to defensive threats, minimize flight path predictability, and deliver the training ordnance on target. Tactical ranges provide an array of targets, configured and spaced to simulate conditions expected in combat and without obvious visual cues. By providing changing appearances or attack angles, tactical targets require aircrews to employ tactics and maneuvers that add variation and realism to the training.

### *AIR-TO-AIR TRAINING*

In fulfilling its mission, the 366th Wing must also contend with and defeat enemy aircraft to establish air superiority over a battlefield and permit other elements of the wing to carry out their mission assignments. In air-to-air training, participating aircraft employ a wide range of tactics and maneuvers requiring airspace with extensive lateral and vertical limits. Such training commonly occurs within the MOAs used by the 366th Wing. Air-to-air training involves advanced aircraft handling characteristics, air combat, low-altitude air-to-air training, and air intercepts. In this era of sophisticated targeting and tracking systems, as well as air-to-air missiles with long ranges, the "dogfights" no longer exclusively involve tightly clustered groups of aircraft chasing one another. Rather, air combat engagements may involve opposing aircraft separated by 70 miles or more. It is during high-altitude, air-to-air training maneuvers that supersonic events generally occur. Often, air-to-air training includes some aircraft playing the role of adversaries, or enemy aircraft. This training also requires the use of defensive countermeasures, such as chaff or flares. One-on-one engagements, or multiple aircraft training, can involve aircraft of different types performing complex, sophisticated activities in which positioning and strategy are as important as individual flying skills.

Although the F-15C is the primary air-to-air fighter, all fighter aircraft assigned to the 366th Wing conduct air-to-air training. These include F-16Cs and F-15Es, which along with the F-15Cs, account for 54 of the 66 aircraft assigned to the 366th Wing. The degree to which each aircraft type performs particular training events depends on the aircraft's mission.

### *NAVIGATION, THREAT AVOIDANCE, AND REFUELING TRAINING*

Low-altitude navigation training maintains aircrews' proficiency in using the terrain as a visual reference and point-to-point navigation. These skills are needed in combat situations to approach targets, avoid detection by certain defense systems, and reach other objectives. Conducted generally within MOAs and on MTRs, this training commonly occurs between 500 and 2,000 feet AGL.

In combat, weapons using electronic guidance systems pose substantial threats to aircraft. Aircrews, therefore, must train to interpret threats from these systems, implement countermeasures such as chaff and flares, and perform effective evasive maneuvering, sometimes at low altitude. To offer realism of threats and hone aircrew responses, ground-based electronic emitters are employed to simulate defensive systems. The 366th Wing conducts this training in MOAs and in the restricted airspace over SCR, where the existing sites for electronic emitters are located.

Aerial refueling sustains air operations during combat and serves two primary functions: it permits aircraft assigned to air-to-air and air-to-ground operations to remain "on-station" (i.e., assigned position in the operations arena) without returning to the airfield; and it provides aircraft the capability to conduct, when necessary, long-range flights to operations areas or targets. The 366th Wing requires both of these capabilities and all aircraft and aircrews in the 366th Wing must participate in aerial refueling training. Fighters and bombers need to efficiently and safely receive fuel, whereas the KC-135R tankers must train to dispense fuel to the variety of aircraft assigned to the 366th Wing. These operations are performed in assigned refueling tracks. 366th Wing tankers also support other Air Force-wide and Department of Defense (DoD) missions, including refueling routine, long-range transport missions, and fighters from other wings and Air National Guard (ANG). Approximately 80 percent of wing refueling operations are for training only, with only a few hundred pounds of fuel being transferred, and are not planned to extend the length of fighter training missions. Due to flying hour restrictions and limited availability of air refueling aircraft, air refueling training missions are normally flown locally to maximize air refueling opportunities. To routinely conduct more CWTs at remote ranges would make training less efficient, make less productive use of the limited number of annual flying hours, and be significantly expensive in terms of the wing's annual fuel budget.

#### 1.3.1.2 COMPOSITE WING TRAINING

CWT provides realistic, simulated battlefield conditions for training aircrews under circumstances similar to those occurring in actual combat. Before the establishment of a composite wing, joint exercises furnished the primary opportunity to conduct this type of training. Joint exercises such as Red Flag or Green Flag, which occur only two to four times a year at NAFR, temporarily integrate units that would fight together in the event of a conflict. Attendance at flag exercises is shared across each unit in the Air Force. A typical aircrew would only attend a flag exercise once every 18 months. Therefore, the frequency and variety offered by "flag" exercises alone are insufficient to ensure a high level of mission readiness for the 366th Wing. Rather, frequent and realistic CWT is also needed.

CWT is specifically designed to practice the unique mission of the 366th Wing – large force, integrated air power. To be effective, CWT must combine numerous aircraft and personnel to integrate different mission roles in one coordinated simulated combat exercise. Each CWT exercise is unique, but they typically involve employment of many or all of the specific operational tasks performed by the participating aircraft. Effective CWT also involves aircraft

that adopt roles and tactics of an adversary to provide realism in the exercise. These coordinated, integrated CWT exercises use extensive airspace and range assets including large MOAs and ranges. For the 366th Wing, aircrews are required to plan and fly an average of two CWT exercises per month for 11 months of the year. In a typical CWT exercise conducted at a remote range, 34 aircraft from the 366th Wing participate, and a variety of aircraft from other units often are involved. However, smaller numbers of aircraft can and do conduct CWT.

The 366th Wing conducts limited CWT in the local airspace defined by SCR and the 10 MOAs, but performs most (over 70 percent) exercises at remote ranges. In the local airspace, a CWT exercise involves a coordinated formation flying from the western side of the airspace (i.e., southeastern Oregon and western Owyhee County) and attacking targets at SCR. The formation may be spread over many miles or may be concentrated, depending on the tactics being employed. Adversary aircraft, simulated missile sites, and electronic emitters defend the targets. However, the variety, complexity, and realism of local CWT remains limited due to the lack of tactical targets, dispersed and changeable emitter sites, and restrictions on the airspace. Currently, of the 72 CWTs performed by the 366th Wing each year, an average of 51 occur at remote ranges. Many of these CWTs are conducted during ORE/ORIs.

#### 1.3.1.3 Operational Readiness Exercises and Operational Readiness Inspections

OREs and ORIs represent major exercises simulating all conditions associated with deployment and performance of a major combat mission. The wing must plan all aspects of the mission, from ensuring that maintenance personnel rapidly check, refuel, and re-arm aircraft to ensuring aircrews conduct multiple, coordinated attack missions, including CWT. OREs and ORIs involve most of the Wing, including maintenance and support personnel, and provide realistic simulated wartime taskings that must be performed effectively and successfully. An entire ORE/ORI could take up to 2 weeks with actual aircraft flight operations occurring over a 2- to 3-day period.

During this 2- to 3-day period, aircraft operations for OREs and ORIs involve three CWT missions each day, and each mission involves about 34 aircraft. Although the 366th Wing has conducted limited forms of these exercises using SCR and the local airspace, almost all are performed at remote ranges or deployed locations.

### 1.3.2 Required Training Capabilities

The 366th Wing currently conducts training in the military training airspace near Mountain Home AFB that overlies southwest Idaho, southeast Oregon, and northern Nevada, and at remote ranges. The special use airspace includes the airspace and range in the region surrounding Mountain Home AFB that the 366th Wing (and all previous units at Mountain Home AFB) has traditionally used. Figure 1.3-1 depicts the local range area and airspace used for training.

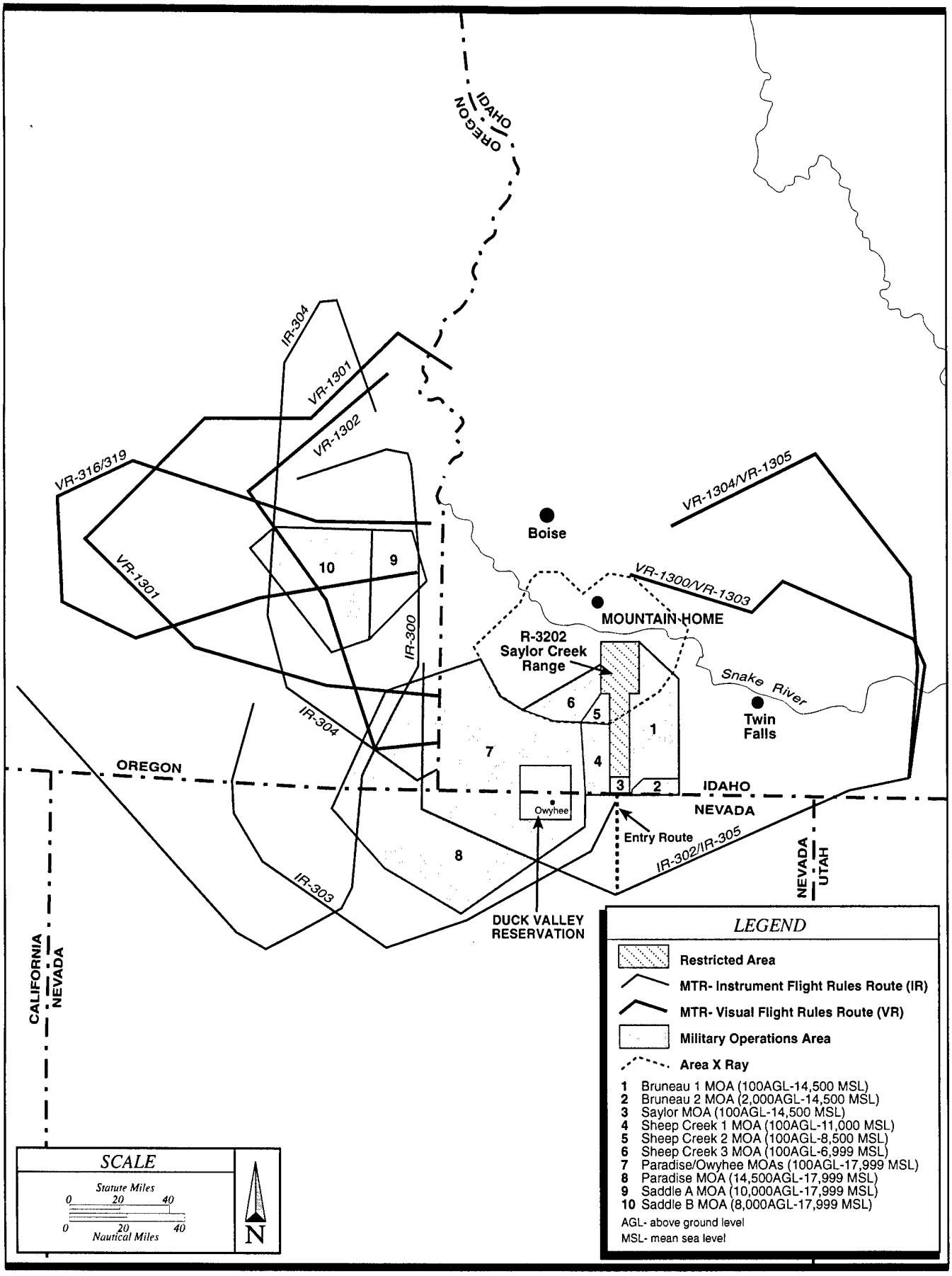



**Figure 1.3-1 Local MOAs, MTRs, and Restricted Airspace Used by the 366th Wing**

Remote ranges, as well as their associated airspace, consist of those located more than 150 NM from Mountain Home AFB and managed and scheduled by other units or services (Figure 1.3-2). The following describes the ranges and the airspace used by the 366th Wing.

### 1.3.2.1 RANGES, TARGETS, AND EMITTERS

The 366th Wing requires training capabilities that include three types of ground assets: conventional range and targets, tactical range and targets, and electronic emitters and sites. Table 1.3-2 presents the types of ranges, targets, emitters, and airspace required to meet training needs. A *conventional range and targets* provide training in weapons delivery in a highly structured learning environment that provides immediate feedback on performance and repetitive drilling. While needed to maintain accuracy and proficiency, the type and arrangement of targets on conventional ranges do not necessarily reflect realistic attributes that might be expected in a combat environment, nor do they provide for changeable configurations to increase training quality.

**Table 1.3-2. Requirements for Range, Target, Emitter, and Airspace According to Major Training Categories**

| *Required Training* | *Conventional Range and Targets* | *Tactical Range and Targets* | *Electronic Emitters and Sites* | *Restricted Areas* | *MOAs* |
|---|---|---|---|---|---|
| **CT** | | | | | |
| Air-to-Ground | Yes | Yes | Yes | Yes | Yes |
| Air-to-Air | No | No | Yes | No | Yes |
| Other Training (Low-Level Navigation, Electronic Combat, Aerial Refueling) | No | Yes | Yes | No | Yes |
| **CWT** | | | | | |
| Air Interdiction | No | Yes | Yes | Yes | Yes |
| Air Intercept | No | No | Yes | No | Yes |
| Suppression of Enemy Air Defenses | No | Yes | Yes | No | Yes |
| **ORE/ORI** | No | Yes | Yes | Yes | Yes |

Notes: Yes = Required
No = Not Required

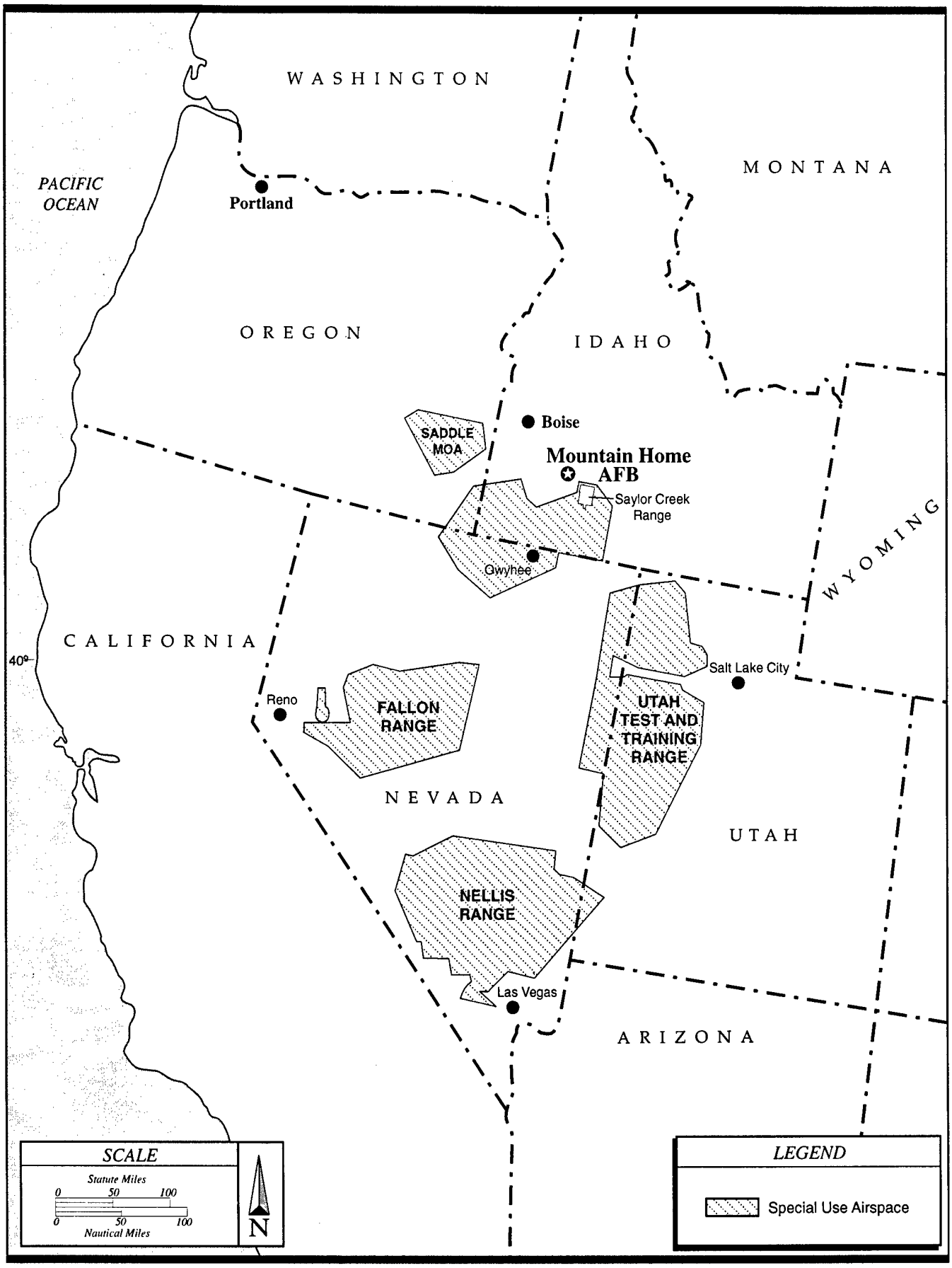



**Figure 1.3-2 Saylor Creek Range, Remote Training Ranges, and Special Use Airspace Used by the 366th Wing**

A *tactical range and targets* provide for an array of training activities required by the 366th Wing, especially tactical weapons delivery and CWT and ORE/ORI exercises. Of the aircraft included in the 366th Wing, more than half need to perform numerous types of primary training operations involving tactical targets. Tactical ranges provide a greater array of targets, configured and spaced to simulate realistic conditions and defenses like those expected in combat. For the 366th Wing, the general types of targets that the units would expect to encounter on their missions and, therefore, need to train on, include those listed below. Two of these target types are currently available at SCR; the other three types are not currently available in the local training area.

Target types currently available at SCR include the following:

- *Airfield*: Located on relatively flat terrain without terrain obstructions, an airfield target includes simulated runways, taxiways, alert pads, shelters, parking ramps, fuel depots, hangars, command bunkers, and radar, SAM, and AAA sites with roads interconnecting these elements.
- *Command Post*: Associated with an airfield or similar major defense facility, a command post target consists of a command bunker with communications arrays and associated air defenses.

Target types not available in the local training area include the following:

- *Industrial Complex*: An industrial complex target presents the elements and layout of a manufacturing or processing facility, and includes roads and air defenses (e.g., SAMs, AAA).
- *Railyard*: Composed of tracks, switching stations, communications facilities, marshaling yards, and rail cars, a railyard target represents a major transportation node providing transport of materials and personnel to and from the battlefield.
- *Forward Edge of Battle Area (FEBA)*: Commonly situated along or near a road, a FEBA target consists of a tank formation, artillery pieces, support or servicing convoys, and mobile AAA and SAM systems.

SCR, the existing training range for the 366th Wing, consists of approximately 110,000 acres of land withdrawn by the DoD for the purpose of weapons delivery training. The range, situated about 6 miles south of the Snake River in Owyhee County, extends 15 miles north-south and 11 miles east-west. The exclusive use area (EUA) consists of approximately 12,200 acres located in a fenced area near the center of the range and includes all of the range's training targets (Figure 1.3-3). A zone of about 97,800 acres surrounds the EUA; livestock grazing and hunting represent the primary land uses in this zone. The EUA contains five groups of scorable targets and two strafe pits used for conventional air-to-ground training. The targets include a conventional target circle, a small cluster of armored personnel vehicles, an airfield complex, a command post, and small air defense sites with a SAM and AAA battery. These highly visible

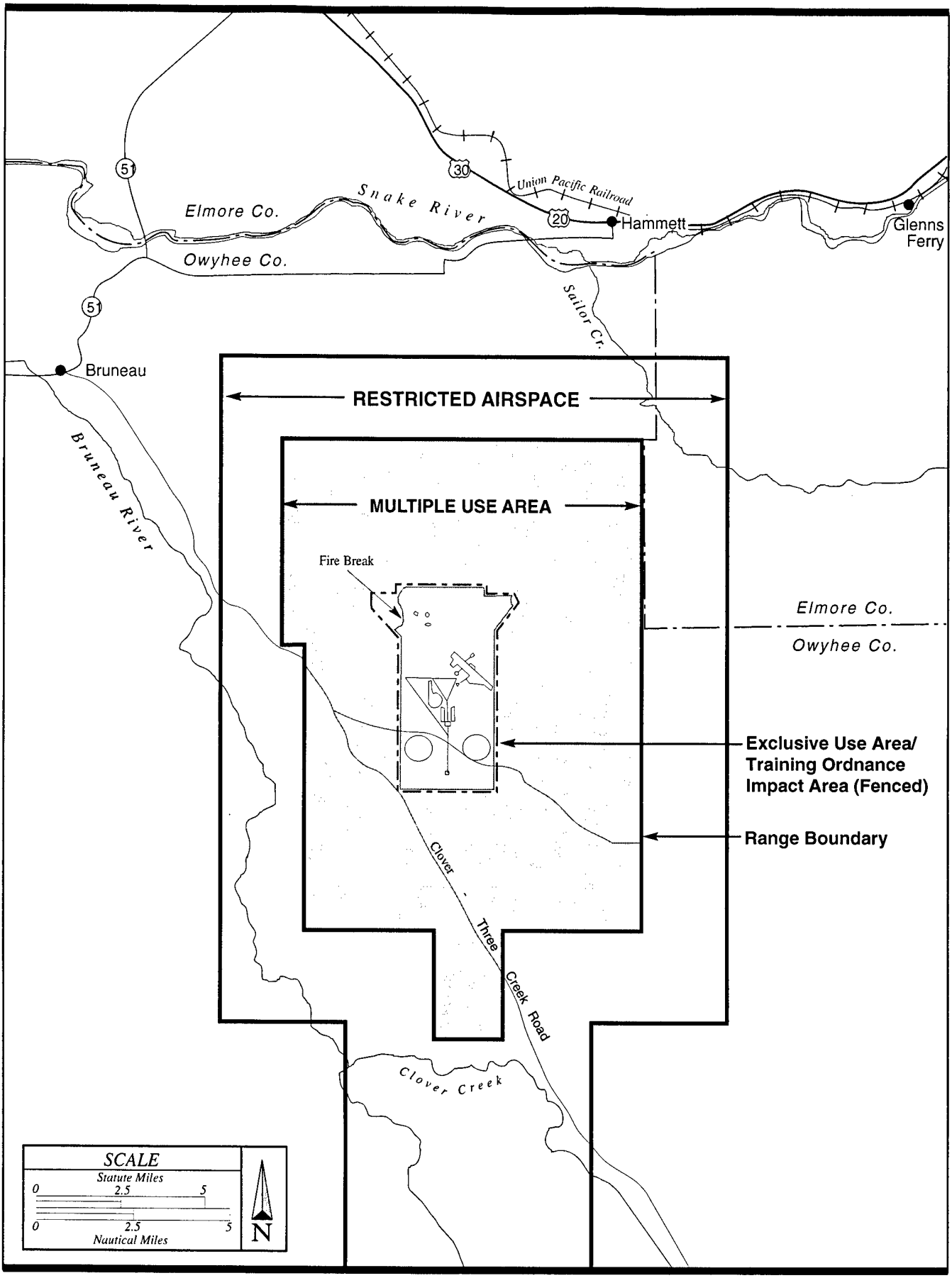



**Figure 1.3-3 Saylor Creek Range**

targets, which offer obvious visual clues such as devegetated run-in lines to guide aircraft approaches, provide none of the concealment expected under actual combat conditions. Furthermore, the targets lack realism in terms of the configuration, spacing, and separation required for tactical ordnance delivery training. Due to constraints on the airspace at SCR (see section 1.3.2.2), and the proximity of the targets to one another, this conventional range permits only limited attack angles and precludes simultaneous weapons delivery on multiple targets by different aircraft. Such limitations substantially reduce the range's usefulness for tactical weapons delivery and CWT.

*Electronic emitters and sites for locating electronic emitters* form an important and integral part of the ground assets required by the 366th Wing. Most required training operations, and especially CWT and ORE/ORI exercises, involve the use of electronic emitters to provide a realistic arena in which aircrews must detect and respond to simulated threats while completing mission objectives. To ensure realism, the number and location of electronic emitters need to vary to create different defense systems and to prevent aircrews from memorizing threat locations.

The 366th Wing currently has a total of four emitter sites. Of the four existing emitter sites, three lie within SCR and one is situated near Highway 51 south of the town of Grasmere. Because of their small number and clustered distribution, these emitter sites provide limited flexibility and capability to create a realistic and varied threat scenario for CT, CWT, or ORE/ORI.

### 1.3.2.2 AIRSPACE ASSETS

Training for the 366th Wing requires an integrated system of airspace, including restricted airspace and MOAs (refer to Table 1.3-2). MTRs, aerial refueling tracks, and Air Traffic Control Assigned Airspace (ATCAA) also form part of this system. This airspace must not only be of adequate size, it must also be configured appropriately to provide a realistic training scenario for both air-to-air and air-to-ground operations.

*Restricted airspace*, in accordance with FAA Handbook 7400.2, Procedures for Handling Airspace Matters, shall be designated when determined necessary to confine or segregate activities considered to be hazardous to nonparticipating (e.g., all civilian and any military aircraft not involved in the training activities) aircraft. Activities considered hazardous are unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, guided missiles, or training ordnance delivery. Flying into a restricted area without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants. In the case of SCR and the proposed tactical training range, the delivery of training ordnance requires adequate restricted airspace.

For either a conventional or tactical range, the restricted airspace must be of sufficient size to contain all flying activities associated with air-to-ground training. The restricted airspace needs to encompass the areas where weapons are released. For tactical ranges and targets, the

capability to deliver weapons from all potential directions forms another criterion defining the size and shape of the restricted airspace. The dimensions of restricted airspace, therefore, depend on the type of range (conventional or tactical) and target layout. Restricted airspace directly over target areas and their vicinities must extend down to the surface, whereas adjacent restricted airspace need not reach the surface.

Local airspace includes restricted area R-3202A, which overlies SCR, and R-3202B and C, which extend south of R-3202A. Under past training concepts, these narrow, linear restricted areas provided protected airspace for approaches to SCR. Under training concepts proposed for ETI, this airspace (R-3202B and C) no longer needs to be restricted. In addition, the size and procedural limits of the restricted airspace encompassing the range limits the ability to safely conduct simultaneous or closely sequential attacks by groups of aircraft. Expansion of the existing airspace to the north would alter this situation; however, existing federal airways and populated areas prevent such an expansion. These factors limit the utility of the SCR for realistic tactical training, and especially for CWT.

*MOAs* are special-use airspace designed to segregate certain military activities such as air combat maneuvers and air intercepts from nonparticipating air traffic operating under FAA control using instrument flight rules. Civilian aircraft flying under visual flight rules can operate within MOAs; all aircraft, military and civil, must employ see and avoid procedures. Every type of training and training operation conducted by the 366th Wing, with the exception of actual ordnance delivery, involves use of MOAs.

Air-to-air training requires sufficient MOA airspace to permit aircraft to maneuver and employ the full range of air-to-air combat tactics, including intermittent supersonic flight. In most air-to-air training activities, aircrews maneuver rapidly through turns, climbs, and dives, utilizing considerable airspace due to the speed of the aircraft. The vertical and horizontal dimension of the MOAs must also accommodate low-altitude, air-to-air training; air-to-ground training; electronic combat training; and the use of defensive countermeasures. MOAs commonly provide the airspace necessary to maneuver on approach to restricted airspace and targets, and accommodate the aircraft's departure maneuvers from the restricted airspace. On both the approach to and departure from the restricted airspace, aircrews must identify and respond to electronic combat threats, using evasive tactics and defensive countermeasures. If an air-to-ground range or target areas and their associated restricted airspace are geographically separated, MOA airspace of appropriate dimensions is needed to connect them to allow their use in a multi-target tactical or CWT operation.

By providing for all these individual training needs, MOA airspace is essential to CWT where numerous aircraft conduct their specific operational tasks simultaneously. As such, the 366th Wing requires adequately sized and properly configured MOA airspace to concurrently accommodate aircraft performing air-to-ground, air-to-air, low-altitude, and SEAD training.

Ten MOAs exist within the local airspace traditionally used by units from Mountain Home AFB. Six MOAs are directly associated with SCR; these MOAs are scheduled and used along with the range. The MOAs include Bruneau 1 and 2; Sheep Creek 1, 2, and 3; and Saylor. The 366th Wing also conducts training in the Owyhee, Paradise, and Saddle (A and B) MOAs. Refer to Figure 1.3-1 for the locations and operating altitudes of these MOAs.

This airspace has been in use by military aircraft since World War II, with official designation of the MOAs by the FAA occurring in 1972 (Paradise MOA) and 1975 (all other MOAs except Sheep Creek 3-1989). The six MOAs associated with SCR provide maneuvering airspace and airspace for air-to-ground activities at the range. Other air-to-ground training that involves no ordnance delivery also occurs in these MOAs. Air-to-air training activities are conducted in these six MOAs, although to a far lesser degree than air-to-ground training. This situation is due, in part, to the inconsistent ceiling altitudes for these MOAs (Figure 1.3-4). Of the six MOAs, four different ceiling altitudes are represented: 6,999 feet MSL, 8,500 feet MSL, 11,000 feet MSL, and 14,500 feet MSL. All of these differ from R-3202 with subarea ceiling altitudes of 18,000 feet MSL (R-3202A), 14,000 feet MSL (R-3202B) and 11,000 feet MSL (R-3202C). These differences limit both air-to-ground and air-to-air training, creating a "maze" through which aircrews must navigate. However, this maze provides no particular training value since it offers artificial, unchanging boundaries for flying. As an impermanent means to address these non-uniform ceilings, the 366th Wing regularly requests the FAA for temporary altitude reservations above these MOAs and extending up to 50,000 feet MSL when included with ATCAA.

The Owyhee MOA provides opportunities for both low- and medium-altitude training, including air-to-air activities and some air-to-ground operations that do not involve ordnance delivery. The portion of the Paradise MOA in Idaho completely overlies the Owyhee MOA, extending from the Owyhee's upper limits of 14,500 feet MSL to 17,999 feet MSL. Since the ground underlying the Owyhee MOA generally ranges from 4,000 to 5,500 feet MSL in elevation, the upper limits of the Owyhee MOA lie at or below 10,000 feet AGL. Therefore, supersonic flight activity, which occurs only above 10,000 feet AGL, is extremely rare in this MOA. Rather, these activities occur in the portion of the Paradise MOA that overlies the Owyhee MOA.

Limitations of this airspace stem from its north and south horizontal extent. In the north, the Owyhee and overlying Paradise MOAs taper to form a V-shaped boundary that lies about 20 NM south of the MOA's northernmost limits. In the south, restrictions on the overflight of the Duck Valley Reservation effectively create a southern boundary to the MOAs that extends about 9 NM north of their southernmost boundary. These restrictions are based on the Air Force's Good Neighbor Policy and a formal agreement with the Shoshone-Paiute Tribes (see section 1.4.4.2 for a list of the restrictions). These constraints, in combination with the limitations on the northern edge of the MOAs, result in a relatively narrow (15 NM) block of airspace over the Owyhee canyonlands in which aircrews must operate. It also serves to

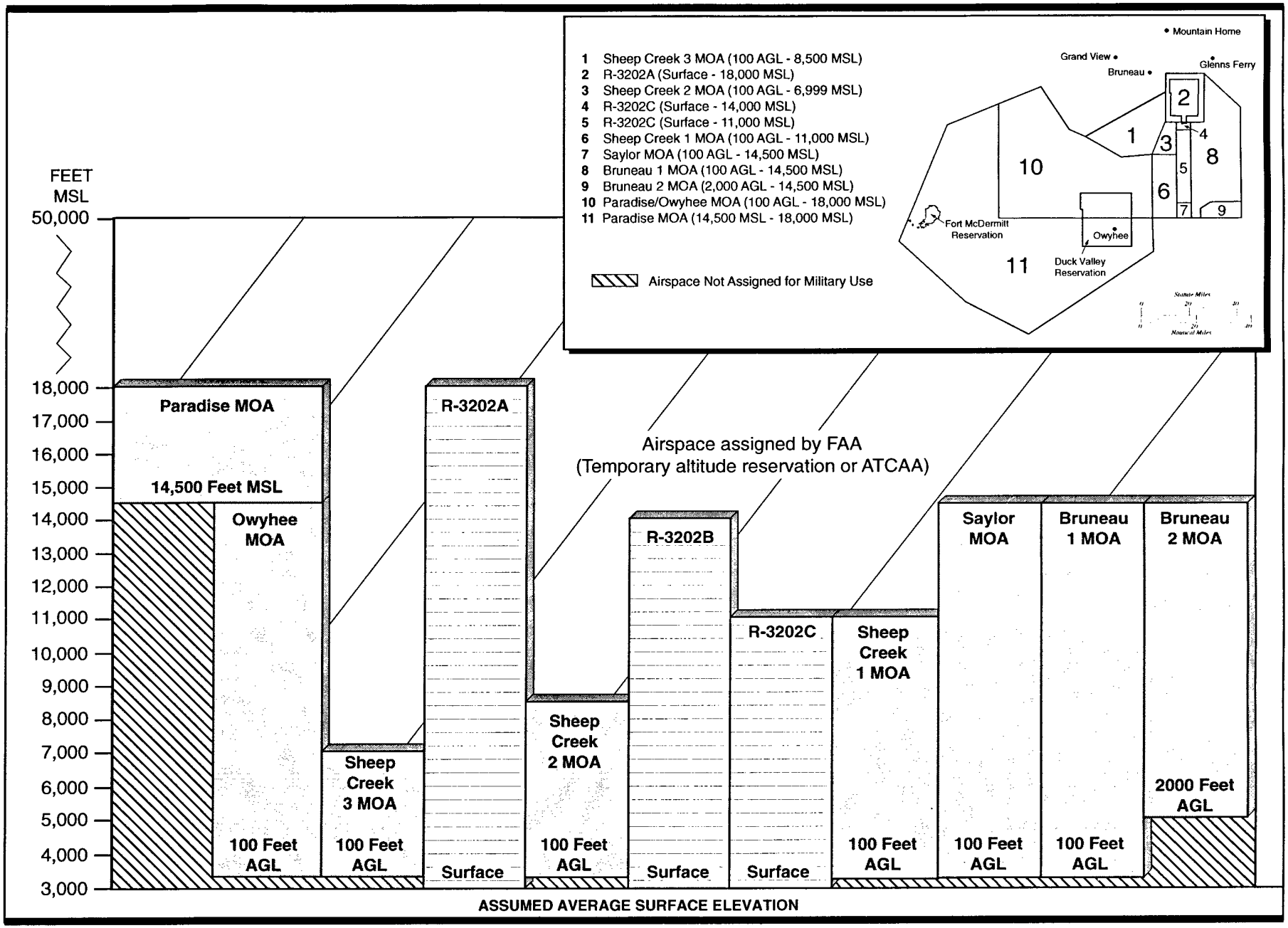



**Figure 1.3-4 Current Altitude Structure for R-3202 and Six Associated MOAs, and Owyhee and Paradise MOAs**

funnel aircraft through this area, restricting the size and configuration of aircraft formations and CWTs.

Both the Saddle and Paradise MOAs receive use for air-to-air training due to their higher floor altitudes. However, the restrictions on overflight of the Duck Valley Reservation (described above) also apply to the eastern portion of the Paradise MOA in Nevada. Implementation of these avoidance procedures creates a narrow, less useful block of MOA airspace between the eastern edge of the MOA and Reservation. The Saddle MOAs provide a collecting area for groups of aircraft prior to CWT or other exercises at SCR.

#### *MTRs, ATCAA, AND AERIAL REFUELING FLIGHT TRACKS*

The 366th Wing also trains in a set of 13 MTRs, ATCAA, and aerial refueling flight tracks.

*MTRs*, which consist of airspace corridors with narrow vertical and horizontal limits, provide navigation routes and access to MOAs and restricted airspace. MTRs are needed primarily for access and low-level navigation training. To support these training needs, a sufficient number of MTRs providing numerous points of access are required. Aircraft commonly operate at altitudes from 500 to 1,000 feet AGL on MTRs. Most MTRs are established with segments between 100 and 500 feet AGL, but ACC policy restricts low-level flight below 500 feet AGL.

*Refueling tracks* are also necessary. Because the aircrews in the 366th Wing need to be proficient in aerial refueling, the airspace assets available to these units must include adequate permanent air refueling anchors/tracks. The local refueling tracks should be available on a daily basis to permit simultaneous refueling of different aircraft.

*ATCAA* is airspace above 18,000 feet MSL designed to accommodate non-hazardous, military flight training activities. This airspace remains in the control of the FAA and, when not in use by military aircraft, may be used to support other aviation activities. Extending up from 18,000 feet MSL above the MOAs, the ATCAA permits military aircraft to conduct high-altitude, air-to-air combat training; practice evasion maneuvers; perform air refueling; and initiate some attacks on targets.

### 1.3.2.3 ACCESSIBILITY OF TRAINING ASSETS

Accessibility of training ranges and airspace consists of two major components: (1) proximity of range and airspace assets; and (2) availability of ranges and airspace. Range and airspace assets located near a base provide aircrews with the opportunity to maximize the training value of their finite flying hours. Through the annual budgetary process, the President, Congress, and Pentagon officials determine the funds available to use for fuel and flying hours. These allocations are then divided among the major commands within the Air Force, and the headquarters for each command allocates finite flying hours to each base, with specific allocations for each type of aircraft. Then, the base correlates the training and operational requirements necessary to its defined mission(s) with these finite flying hour allocations, and

determines the number, duration, and nature of the sorties for the aircrews and aircraft. Just like any budget, flying hour allocations must be used carefully to ensure the base meets its requirements with finite resources.

Maximizing the value of training for each flying hour expended represents a fundamental challenge for the 366th Wing. Existing local range and airspace assets, as described above, fail to provide all the realism, quality, and flexibility needed to enhance the 366th Wing's training. However, the proximity of these assets to Mountain Home AFB means that the aircraft sortie-operations involve minimal transit time and maximized training time. In contrast, the remote ranges and airspace at NAFR, Fallon Training Range Complex (FTRC), and UTTR offer more training opportunities than currently exist in local airspace. While these remote ranges offer CWT opportunities that vary from adequate to excellent, they do not operate to support the daily training needs of the 366th Wing. Transit to and from these remote locations yields almost no training value relative to the large expenditure of flying hours. Table 1.3-3 illustrates the ratio of combat training time to total flying time for representative fighter training sorties in Owyhee MOA and South UTTR. South UTTR offers training airspace with appropriate altitude limits similar to those in the Owyhee MOA. In contrast, the North UTTR does not offer appropriate airspace even though it is closer to Mountain Home AFB. The computer program "F-Plan" optimized fuel flow for transit. Each aircraft type had similar training configurations and used representative airspeeds and altitude profiles.

Ranges and airspace located farther than UTTR, such as NAFR and FTRC, would yield less combat training time relative to total flying time. Since fighter aircraft represent 54 of the 66 aircraft in the 366th Wing, diminishment of combat training time would reduce the overall effectiveness of training of the wing.

NAFR and UTTR, although managed and operated by the Air Force, directly support the missions and training of the units based at Nellis AFB and Hill AFB, respectively. In addition, NAFR also supports numerous flag (e.g., Red Flag) exercises throughout the year, as well as testing of next generation aircraft and weapons systems. With all of these demands, the NAFR receives considerable use, about 64,000 sorties per year. At UTTR, nearly 16,000 sorties are conducted each year, and it also serves as a weapons and aircraft testing venue. FTRC, which is managed, operated, and predominantly used by U.S. Navy aircrews for daily training, as well as the Top Gun school, supports over 30,000 sorties annually within its relatively small airspace.

Since the managing and operating units schedule use of these ranges and airspace areas, their associated aircrews receive first priority for training. Other users, such as the 366th Wing, receive only the remainder of the available training time. Such availability may not coincide with the date or time needed by the 366th Wing for specific training activities, or the portion of the range or airspace available at the time may not meet the particular requirements for that training mission. Occasionally, changes in availability can occur while aircraft are en route, causing either an aborted training mission or a modification to the training activity which results in less, or sometimes none of the training than originally scheduled. Users of these

**Table 1.3-3. Comparison of Average Transit Time Expended by 366th Wing Aircraft in Accessing Local and Remote Ranges and Airspace**

| *Airborne Refueling* | *Location* | *Time* | AIRCRAFT | | |
|---|---|---|---|---|---|
| | | | *F-15C* | *F-16C* | *F-15E* |
| Without | Owyhee MOA | Total Time | 55 min | 1 hr 4 min | 1 hr |
| | | Combat Training Time | 21 min | 26 min | 24 min |
| | | % Combat Training Time | 38% | 40% | 40% |
| | South UTTR | Total Time | 1 hr 39 min | 1 hr 40 min | 1 hr 32 min |
| | | Combat Training Time | 14 min | 15 min | 15 min |
| | | % Combat Training Time | 15% | 15% | 16% |
| With | Owyhee MOA | Total Time | 1 hr 41 min | 1 hr 53 min | 1 hr 47 min |
| | | Combat Training Time | 30 min | 38 min | 35 min |
| | | % Combat Training Time | 30% | 34% | 33% |
| | South UTTR | Total Time | 2 hr 14 min | 2 hr 28 min | 2 hr 20 min |
| | | Combat Training Time | 24 min | 27 min | 26 min |
| | | % Combat Training Time | 18% | 18% | 19% |

ranges not affiliated with the managing units have, therefore, only limited opportunities for quality realistic training, and must expend substantial portions of their allocated flying hours to accomplish it. While the 366th Wing has conducted and can continue to conduct its training using a combination of local and remote range and airspace assets, that training would be enhanced through establishing more realistic, flexible airspace and range assets in proximity to and under the control of Mountain Home AFB.

#### 1.3.2.4 LIMITATIONS OF AVAILABLE ASSETS

The 366th Wing seeks to enhance the flexibility, efficiency, and realism of local training to support and maintain operational readiness. The current local range, target, emitter, and airspace assets have deficiencies in four key areas that detract from their ability to meet these needs.

*Configuration and Location of SCR and Its Restricted Airspace.* SCR offers limited tactical target arrays, and does not provide a realistic battlefield complex that allows for variation in training attacks. While the ground area would allow for establishment of tactical targets to meet these needs, such targets would not be useful due to the limitations of the restricted airspace (R-3202A). To accommodate the appropriate number, dispersal, and configuration of targets necessary to enhanced training, the restricted airspace would need to be expanded to the north, northwest, and northeast. However, the presence of established federal airways, jet routes, and population centers within the additional required area prevent expansion of the restricted airspace. Therefore, without changes to the current restricted airspace, any new target arrays at SCR would not offer enhanced training. The existing restricted airspace for SCR limits the approach to targets to only south to north; precludes multidirectional (360 degrees) approaches needed for realistic, quality training; prevents simultaneous attack of different targets by different aircraft; and offers insufficient maneuvering room for Composite Wing tactics. All of these limitations diminish the quality of training available to the 366th Wing.

*MOA Airspace Size and Structure.* The current vertical and horizontal size and configuration of the MOA airspace in southwest Idaho and its vicinity restrict air-to-air training, force size, CWT, and more effective use of the airspace. For the six MOAs used and scheduled with SCR, numerous different ceiling altitudes create an unrealistic maze that artificially limits both attack and evasion maneuvers and tactics. Such limitations force aircrews into patterns of flying that do not enhance mission accomplishment or survival in actual combat. Differences in ceiling altitudes among these six MOAs also degrade the effective use of the airspace, since all of the airspace must currently be used for one set of training activities at a time. With higher, equal ceiling altitudes, the airspace could be divided vertically, allowing for more than one training activity to occur while ensuring safe separation between aircraft.

As described previously, the current configuration of the Owyhee MOA, in combination with the flight restrictions over the Duck Valley Reservation, creates limited operating and maneuvering room in the eastern portion of the MOA. This narrowing not only increases air

traffic density in the area, it severely restricts the size and configuration of CWT force formations, limits the variation available for approaches to and escapes from target areas on SCR, and confines air-to-air engagements. All of these factors result in less realistic training, causing aircrews to conduct operations that offer limited flexibility.

The flight restrictions associated with the Duck Valley Reservation also affect the utility of the eastern portion of the Paradise MOA. With only a narrow gap between the Reservation and the edge of the MOA, the airspace can be effectively used only for transit from one MOA to another. To ensure adherence to the flight restrictions, aircrews limit maneuvering and air-to-air combat training in this narrow area. As such, the capacity of this portion of the Paradise MOA to support training for the 366th Wing is restricted.

These limitations on the airspace also reduce the Air Force's ability to implement seasonal and locational avoidance of specific locales in response to public and agency concerns without further degrading training.

*Emitter Sites.* Realistic, quality training requires aircrews to react to and successfully defeat an array of enemy threats, either aircraft or ground based. To provide effective training, the locations of such threats must be unexpected to the aircrews for each training mission. Existing ground-based electronic emitters cannot provide this needed variation. At present, only four sites exist, and three of the four lie within SCR at consistent locations. Although outside of the range, the fourth also is situated at the same site consistently. Consistent siting of electronic emitters provides none of the realism needed to challenge aircrews and ready them for combat. In contrast, numerous dispersed sites for electronic emitters would permit considerable variation, challenging aircrews on a daily basis and enhancing training.

*CWT Support Capacity.* Although the 366th Wing conducts some CWT using the local MOAs, restricted airspace, and SCR, the factors outlined above limit both the nature and effectiveness of that training. The 366th Wing predominantly must use remote ranges to accomplish this training, expending finite flying hours in transit and scheduling CWT at the convenience of the managing and operating units. Enhancement of training would allow the 366th Wing to conduct a greater proportion of its CWTs within the local airspace, achieving higher quality, and more realistic training for the expenditure of each flying hour.

### 1.3.3 Additional Assets to Enhance Training

The Air Force and Bureau of Land Management (BLM) have worked with other interested parties to identify alternatives that enhance training while addressing both operational and environmental considerations consistent with the philosophy of balancing mission readiness with the environment. Refer to section 2.1.1 for a description of these considerations and how they apply to the alternative identification process.

Based on the Air Force's and BLM's efforts, as well as input from public scoping, three range development alternatives were identified (refer to section 2.3) to meet the needs for flexible,

high-quality training. These alternatives contain provisions for the establishment of integrated capabilities consisting of a tactical range that permits non-explosive training ordnance delivery, no-drop targets, and emitter sites, and reconfigured airspace.

#### 1.3.3.1 ESTABLISHMENT OF A TACTICAL RANGE

To meet enhanced training objectives, the training range needs to have an array of four targets that, in total, encompasses approximately 70 acres. These targets would lie within a 300-acre primary training ordnance impact area. The 300 acres would be in a relatively square tract of land covering about 12,000 acres. The configuration and size of the proposed range would permit aircrews to safely perform a number of ordnance delivery events using only small (up to 25 pounds), non-explosive training ordnance. However, some ordnance delivery events could not be performed at this range, nor could larger inert ordnance be used. While limiting some ordnance delivery events, the range size and shape would accommodate a broad variety of events sufficient to enhance training. This size and configuration for the range would also achieve quality training while affecting the smallest amount of land practicable.

#### 1.3.3.2 ESTABLISHMENT OF NO-DROP TARGETS

To enhance realism and the variability needed to challenge aircrews, five no-drop (no ordnance used) targets would be included as part of the improved training assets. The targets would consist of one 640-acre no-drop target and four, five-acre no-drop targets. The fenced, no-drop targets would include real or life-sized plastic replicas of battle tanks and trucks, a simulated surface-to-air missile complex, early warning radar sites, and buildings that represent two, small industrial complexes. The variety and dispersal of targets would allow the planning and practicing of complex missions similar to actual combat, while minimizing ground disturbance and effects on the environment. All no-drop targets would be located under existing MOA airspace.

#### 1.3.3.3 ESTABLISHMENT OF ELECTRONIC COMBAT EMITTER SITES

An electronic emitter site is a gravel pad for parking a truck. Establishment of 10, one-acre electronic emitter sites and 20, one-quarter-acre electronic emitter sites on BLM land in southwest Idaho would provide the opportunity to vary simulated threats and their locations. These emitter sites would serve as operating locations for mobile electronic emitters that simulate anti-aircraft defensive systems. Five to eight sites would be used during a normal workday, and up to 15 sites could be used for a 2- to 3-day period during exercises. The number of sites would allow emitters to be moved frequently providing a realistic, constantly changing threat and target combination.

#### 1.3.3.4 MODIFICATIONS TO AIRSPACE

To accommodate a tactical range, training activities, multiple dispersed emitter sites, and to disperse present aircraft activity, the existing airspace would need to be modified. The airspace

modifications would accommodate the alterations and further enhance the utility and value of the airspace as a training asset. Modifications and additions of airspace give aircrews additional room to maneuver toward the targets from many directions and angles, disperse air traffic throughout the MOAs, and provide for greater realism in air-to-air training without artificial limits. Proposed modifications and additions include (1) modifying airspace to establish restricted airspace over and in the vicinity of a proposed tactical range; (2) modifying the internal boundaries of existing MOAs; (3) additions of MOA airspace; and (4) modifications to existing restricted airspace.

## 1.4 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

This EIS provides fundamental information for separate decisions to be made by the Air Force, State of Idaho, BLM, FAA, and Congress.

The ***Air Force*** intends to make the following decision:

- Select one of the four alternatives evaluated in the EIS. The four alternatives are the No-Action Alternative, in which the 366th Wing would continue to use existing local and remote ranges and airspace assets, and three operationally equal range development alternatives that enhance the effectiveness and quality of training for the 366th Wing. Each of the three range development alternatives consists of four major integrated components:
  - A 12,000-acre tactical training range site where non-explosive training ordnance would be dropped on targets within a 300-acre primary ordnance impact area.
  - One 640-acre and four five-acre no-drop target areas, where training ordnance would not be used.
  - Thirty emitter sites (20 one-quarter-acre and 10 one-acre) that would be used intermittently to simulate anti-aircraft and surface-to-air missile radar emplacements.
  - A modified airspace structure to improve the flow of training aircraft.

If the Air Force selects one of the range development alternatives, this EIS will be used by the following agencies or government bodies:

The ***Department of Interior (DOI), BLM*** to make decisions regarding

- Withdrawal of public lands for the purposes of implementing the selected alternative; and
- Granting of rights-of-way for use, improvement, or construction of roads, emitter sites, and a power transmission line.

The ***State of Idaho*** to make decisions concerning the

- Lease of those State of Idaho lands within the selected alternative.

The ***FAA*** to make decisions concerning the

- Approval of airspace modifications associated with the selected alternative, including modifications to MOAs and rulemaking actions to establish restricted airspace over the 12,000-acre training range.

*Congress* to make decisions concerning

- The content and enactment of legislation withdrawing those specific public lands associated with the selected alternative.

The environmental impact analysis process (EIAP) for the proposal to enhance training in Idaho described in section 1.3.3 addresses three separate but related requirements. The requirements are outlined below, and the section discussing each in detail is denoted in parentheses:

- NEPA requires federal agencies to consider environmental consequences of their proposals in deciding whether to proceed with those proposals (section 1.4.1).
- Federal Land Policy Management Act (FLPMA) governs administration of public lands by the BLM, including land withdrawals (section 1.4.2) as specified under the Engle Act (refer to Appendix I).
- The FAA's process and procedures that govern establishment of special use airspace (section 1.4.3).

This EIS has been prepared to meet the requirements of NEPA and meets the requirements of FLPMA with respect to documenting the environmental consequences associated with the proposed land withdrawal. It also fulfills FAA requirements with respect to documenting environmental consequences of airspace modifications.

## 1.4.1 Environmental Impact Analysis Process

### 1.4.1.1 Requirements of NEPA

NEPA (Public Law [PL] 91-190, 42 United States Code [USC] 4321-4347, as amended) was enacted to establish a national policy for the protection of the environment. It also established the Council on Environmental Quality (CEQ) to implement the provisions of NEPA and review and appraise federal programs and activities in light of NEPA policy. CEQ promulgated regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508). These regulations outline the responsibilities of federal agencies under NEPA and provide specific procedures for preparing EISs to comply with NEPA. Air Force Instruction (AFI) 32-7061, which implements the CEQ regulations with regard to Air Force actions, defines the steps and milestones in the EIAP. Part 2300 of 43 CFR

1600 (Department of Interior's NEPA implementing regulations) specifies requirements for land withdrawal, as well as the requirement for environmental analysis.

The major milestones in this EIAP include the following:

- publication of a Notice of Intent (NOI) to prepare an EIS;
- publication of a NOI for Proposed Withdrawal and Opportunity for Public Meeting;
- scoping by inviting public and agency input to determine and define the significant issues to be addressed in the EIS;
- collecting information on the existing environment, including field studies, to provide a baseline for analyzing the effects of the alternatives;
- assessing the potential impacts of the proposed action and alternatives on the environment;
- preparation and distribution of a DEIS for public review and comment;
- a public review period (90 days for FLPMA), including public hearings to solicit comments on the analysis presented in the DEIS;
- preparation and distribution of an FEIS incorporating all comments received on the DEIS and responding to the substantive issues raised during the public review period; and
- publication of a ROD, no sooner than 30 days after the availability of the FEIS, outlining the Air Force's decision.

#### 1.4.1.2 COOPERATING AGENCIES

The Air Force is the proponent for the proposal to enhance training in Idaho and is the lead agency for the preparation of the EIS, as well as for the FLPMA documentation.

As defined in 40 CFR §1508.5, a cooperating agency

> means any Federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment . . . . A State or local agency of similar qualification . . . may by agreement with the lead agency become a cooperating agency.

The following agencies are identified as cooperating agencies in this project:

*Bureau of Land Management.* The BLM administers all of the public lands comprising most of the proposed range alternatives and associated sites for no-drop targets and emitters. The BLM is responsible for processing the land withdrawal application and prepares a case file for the DOI to submit to Congress under the Engle Act of 1958 and the FLPMA of 1976.

*Federal Aviation Administration.* Congress has charged the FAA with administering all navigable airspace in the public interest as necessary to ensure the safety of aircraft and the efficient use of such airspace. The portion of the proposal to change the configuration of the airspace leads to the FAA's participation as a cooperating agency.

*State of Idaho.* State school endowment lands governed by the Idaho Land Board and administered through the Department of Lands occur within the proposed training range alternatives, as well as within some of the proposed no-drop targets and emitter sites. All state coordination regarding the proposal for ETI will be coordinated through the Governor's office.

#### 1.4.1.3 PUBLIC INVOLVEMENT PROCESS

AFI 32-7061 and CEQ regulations require an early and open process for identifying significant issues related to a proposed action and obtaining input from the affected public prior to making a decision that could significantly affect the environment. These regulations specify public involvement at various junctures in the development of an EIS, including public scoping prior to the preparation of a DEIS, and public review of the DEIS prior to finalizing the document and making a decision.

Extensive public scoping was held throughout southwest Idaho and in Oregon and Nevada from June 4 through July 2, 1996. Scoping comments and perspectives were incorporated into the DEIS, including preparing an additional alternative proposed by scoping comments.

Public review of the DEIS included public hearings at various locations throughout southern Idaho and the Duck Valley Reservation. The purpose of the public hearings was to solicit comments relevant to the adequacy of the DEIS from government agencies, private organizations, and the public. The objective was to receive the comments and address them in the EIS. The public hearings were part of a 123-days public review process that began with the publication of the Notice of Availability in the Federal Register and public distribution on May 9, 1997. However, filing of the DEIS with the Environmental Protection Agency and Congressional distribution occurred on April 28, 1997. The comment period was originally scheduled to close on August 6, 1997, but was extended for 33 days to end the comment period on September 8, 1997. News releases were prepared to announce the extension of the comment period. Postcards were also distributed announcing the extension.

Public notification for the hearings was accomplished through newspapers, radio, and television stations. A news release for the public hearings appeared in the Federal Register on

May 2, 1997, and the DEIS Notice of Availability appeared in the Federal Register on May 9, 1997. A display ad advertising the public hearings was published in several local newspapers.

Seven public hearings were held at the six locations shown in Table 1.4-1. Four hundred and sixty-two people attended the seven hearings. One hundred and forty-two people provided verbal comments, 59 turned in written comments at the hearings, and 83 input their comments on computers that were available at the hearings. By the close of the comment period on September 8, 1997, a total of 1,372 written comments were received.

**Table 1.4-1. Public Hearing Schedule and Locations**

| *City* | *Date* | *Facility* |
|---|---|---|
| Mountain Home, ID | Tuesday, June 3 | Mountain Home Auxiliary Gym and Foyer |
| Grand View, ID | Wednesday, June 4 | Grand View Elementary School Gym and Foyer |
| Twin Falls, ID | Thursday, June 5 | College of Southern Idaho, Shields Bldg, Rooms 117/118 and Room 106 for displays |
| Three Creek, ID | Friday, June 6 | Three Creek School House |
| Owyhee, NV | Monday, June 9 | Human Development Center |
| Boise, ID | Thursday, June 12 | Boise State University, Jordan Ballrooms B and C |
| Boise, ID | Friday, June 13 | Same as June 12 |

#### 1.4.1.4 SUMMARY OF ISSUES IDENTIFIED DURING THE PUBLIC INVOLVEMENT PROCESS

Many commentors expressed interest in the proposal during the public hearing process. Individuals indicated their support of Air Force activities and the proposed enhanced training activities. Others indicated concerns about the proposal to enhance training in Idaho. Specific issues and concerns focused on the following:

*Airspace Expansion.* Concerns were expressed regarding expanding the airspace north of the current Owyhee and Sheep Creek Three MOA boundaries. Concerns were expressed that Little Jacks Creek WSA and bighorn sheep populations under the expanded airspace would be adversely impacted.

*Biological Resources.* Concerns centered upon the effects of noise and overflights on wildlife. Comments addressed the need to understand the effects on bighorn sheep, sage grouse, pronghorn antelope, smaller mammals, raptors, and other wildlife. Impacts upon native, threatened, and endangered plant communities as a result of fire, increased human presence, and improved roads were also of concern.

*Noise Effects.* Concerns regarding aircraft noise measurement and annoyance from noise were expressed in relation to humans and wildlife. Articles were cited dealing with helicopter overflight impacts. Commentors expressed concern that noise could cause annoyance to humans and abandonment of habitat or direct mortality through stress to wildlife. Commentors raised concerns that increased noise would adversely affect recreation by degrading solitude or the wilderness experience.

*Quality of Training.* Commentors, especially those with family members in the military, expressed concerns with the rapid pace of technological change and the wing's ability to keep training in step with that change. They recognized that the quality, realism, and flexibility of training is critical to success during combat or contingency operations and that good quality training, based on sound military technical principles saves lives and valuable assets purchased with taxpayer dollars.

*Need for the Proposed Range.* Commentors indicated that they did not believe there was a need for enhanced training. The comments also proposed use of remote ranges, such as the UTTR, as alternatives to enhanced training capabilities in Idaho. Some commentors expressed the opinion that existing overflights and the No-Action Alternative were unacceptable.

*National Defense.* Commentors acknowledged the importance of the 366thWing and voiced support for a strong National Defense. The unique mission of the Composite Wing was noted to be a critical element to the National Defense objectives.

*Recreation/Aesthetics.* Commentors expressed concern that the proposed training range would interfere with recreational boating, hiking, and hunting, or that military presence impacted the solitude and beauty of the canyons and desert. Concern was expressed that road improvements would increase access and lead to recreational overuse of the area.

*Native American Traditional Resources.* Commentors expressed concern that current airspace use, additional activities, or new training facilities could contribute to degradation of traditional environmental and cultural resources highly valued by the Shoshone-Paiute Tribes.

*Importance of Mountain Home AFB.* Commentors noted the continued presence of Mountain Home AFB is important to people and economy of the State of Idaho. As one of the state's largest employers, Mountain Home AFB contributes over $250 million annually to the region's economy.

*Economics and Overflights.* Concerns were expressed regarding the effect of the proposed range upon permittee ranch operations. Concerns were expressed that the proposal could impact the recreational economics of game species such as pronghorn antelope, mule deer, sage grouse, special bighorn sheep hunts, and rafting outfitters.

#### 1.4.1.5 ISSUES RAISED THAT ARE BEYOND THE SCOPE OF THIS ENVIRONMENTAL IMPACT STATEMENT

The public scoping process resulted in comments on policy and comments on previous decisions that are outside the scope of this EIS. These concerns include the following:

*National Needs Assessment.* A national needs assessment for training ranges and associated airspace was requested. A national needs assessment itself is beyond the scope of this EIS.

*Basing of the Composite Wing at Mountain Home AFB.* The decision to base the Composite Wing at Mountain Home AFB was required by law as a result of the recommendations of the 1991 Defense Base Closure and Realignment Commission and the Defense Base Closure and Realignment Act of 1990. The President approved and Congress accepted the recommendations. The effects of this realignment action were analyzed in the EIS on *Proposals for the Air Force in Idaho* (Air Force 1992), and the ROD was signed in March of 1992.

*Helicopter Activities.* Concerns were expressed regarding private, agency, commercial, and military helicopter operations in southwest Idaho. The proposal for ETI does not include helicopter training. Helicopter activities in southwest Idaho are conducted by the Idaho Department of Fish and Game, BLM, Idaho Army National Guard (IDARNG), and emergency or life flight operations. The IDARNG performs low-altitude (100-200 feet AGL) helicopter operations in the Triangle Training Area, located over the southwest portion of the Owyhee Mountains, and at SCR. Military helicopter activity over southwest Idaho is not expected to change. Ongoing IDARNG helicopter activities in the region are incorporated into cumulative analysis as part of the baseline conditions and, thereby, carried into all alternatives including the No-Action Alternative. Since there are no proposed changes to current incidental helicopter activity as a result of ETI, there is no separate analysis of the environmental consequences of existing helicopter activities.

*Authorization for Supersonic Flight.* Air-to-air flight activity can result in sonic booms. Training that involves supersonic flight has been authorized above 10,000 feet AGL in the military airspace over Idaho since 1992. The environmental consequences of authorizing supersonic flight were analyzed in the EIS on *Proposals for the Air Force in Idaho.* This EIS analyzes the effects of changes to training resulting from ETI that would alter supersonic flight activities above 10,000 feet AGL and its potential impacts.

### 1.4.2 Land Withdrawal Process

The Air Force proposes to assume management responsibilities of approximately 12,000 acres of public land currently managed by the BLM. Under the Engle Act of 1958, the approval of Congress is required for withdrawal of lands over 5,000 acres for a DoD project or facility. In order to withdraw lands, DoD submits an application to the appropriate BLM state office. The procedures for processing withdrawal applications are set forth in the land withdrawal regulations (43 CFR 2300). Withdrawal procedures include the following:

- application (March 29, 1996)
- notice of the proposed withdrawal in the *Federal Register* (April 8, 1996)
- public comment period (90 days) (concurrent with the ETI DEIS public comment period)
- conducting DoD/BLM public meetings (concurrent with the ETI DEIS public meeting)
- conducting environmental analysis necessary for the application (included in the ETI EIS and appendices)
- management plan for the use of the withdrawn public land
- land report summarizing issues transmitted to BLM headquarters with findings of recommendation transmitted to the BLM Washington office
- Congressional consideration and approval of withdrawal legislation prepared by the BLM Washington office

This environmental impact analysis process fulfills the central requirement of the land withdrawal process — conducting the studies necessary for the application and providing documentation for the case file. Under FLPMA, several studies and associated documentation, including a NEPA analysis and document, are required. For the ETI proposal, Table 1.4-2 lists the studies and documentation performed and provided in compliance with FLPMA regulations. The Air Force and BLM consulted on the organization and format of the FLPMA documents, and determined that many of the required studies would best be included as appendices to this EIS. Furthermore, this consultive effort determined that (1) a report on water requirements within the withdrawal is unnecessary since the Air Force proposes no use of water from those lands; and (2) the Contamination Report, which is required under the Engle Act, would follow the protocols and format of the Air Force's more rigorous Environmental Baseline Survey.

The body of this EIS presents the information on and analysis of all the resource categories required under FLPMA documentation. Baseline information and impact analyses within the EIS cover all areas and resources within the potentially affected environment. In contrast and as required by FLPMA, the other FLPMA documents included as appendices or elsewhere focus only on those lands and resources within the lands proposed for withdrawal under the range development alternatives. As outlined above, this EIS and the associated FLPMA documentation will comprise a substantial portion of the withdrawal package submitted by the DOI to Congress, should a decision to proceed with a withdrawal result from this process.

**Table 1.4-2. FLPMA Requirements and Documentation**

| *FLPMA Requirement* | *Documentation Prepared for ETI* | *Location of Documentation* |
|---|---|---|
| Preparation of an EIS or EA on the proposed withdrawal | ETI EIS | ETI EIS |
| A statement as to the extent and manner in which the public participated in the environmental review process | Statement of Public Participation | Appendix B |
| Study of the existing known and potential sources of contamination within the proposed withdrawn lands | Contamination Report [1] | Appendix C |
| Analysis of the known and estimated mineral potential and market demands for lands within the proposed withdrawal | Mineral Inventory | Appendix D |
| Determination if the proposed withdrawal includes floodplains or wetlands | Wetlands and Floodplains Report | Appendix E |
| A statement concerning the requirements for water use and the presence of water rights within the withdrawal | Water Rights Listing (no water use is proposed by the Air Force) | Appendix F |
| A Biological Assessment of threatened or endangered species and their critical habitat within the withdrawal or in its vicinity | Biological Assessment | Separate report |
| Identification of cultural resources within the withdrawal | Cultural Resources Report | Separate Report (due to sensitive and confidential nature of resource) |
| Identification of roadless areas or roadless islands within the withdrawal | Land Use Report | Appendix G |
| A report on present land uses and the effects of withdrawal on those uses | Land Use Report | Appendix G |
| Analysis of the economic impact of the proposed uses of the withdrawal | Economic Impact Report | Appendix H |
| Evidence of consultation with federal, state, and local agencies and nongovernmental groups and individuals | Persons and Agencies Contacted<br>Statement of Public Participation | Chapter 7.0, EIS<br>Appendix B and Chapter 8 |
| Prior to final action on the withdrawal, preparation of, with the coordination of the BLM, a plan and implementation program regarding the use and management of withdrawn lands and their related resources | Proposed outline of Resource Management Plan and implementation program | Appendix M |

Note: 1. Required under Engle Act of 1958.

### 1.4.3 Federal Aviation Administration Actions

Navigable airspace is a limited national resource. Congress has charged the FAA with administering navigable airspace in the public interest, as necessary, to ensure the safety of aircraft and the efficient utilization of such airspace.

FAA actions related to proposed changes in SUA discussed in this EIS fall into two categories. The first consists of rulemaking actions to review, assign, or modify restricted areas proposed in conjunction with establishment of a training range. The second category consists of nonrulemaking actions and includes modifications to MOAs where the FAA has the authority to make the final decision without issuing a rule, regulation, or order. FAA Handbook 7400.2, Procedures for Handling Airspace Matters, outlines specific procedures for each type of airspace action.

The main steps in the FAA airspace modification process are as follows:

- *Identify Airspace/Aviation Impacts.* In this initial step, the FAA considers the baseline conditions and characteristics of the airspace environment in the location of modifications proposed by the Air Force. This assessment would identify potential conflicts and issues relating to the proposed modifications.

- *Analyze Alternative Airspace Actions.* The FAA analyzes the potential consequences of the proposed modifications and alternatives on the environment and airspace. To reduce duplication of effort and documentation, the FAA will use the analysis in this EIS as the basis for this step.

- *Define Preferred Airspace Plan.* Based on the analysis, the FAA identifies a preferred plan for the airspace modifications. Again, this EIS forms the documentation for that plan.

- *Review Public Comment.* The FAA reviews the public comments regarding the DEIS in accordance with NEPA.

- *Publish Notice of Proposed Rulemaking.* Based on the public comments and any changes to the airspace plan it may engender, the FAA publishes a Notice of Proposed Rulemaking for the restricted airspace proposals in the *Federal Register.*

- *Issue Rulemaking Decision.* Subsequent to the ROD for this EIS, the FAA issues a rulemaking decision or a determination for approval of the airspace proposals. If the proposed modifications to the airspace are approved, charting revisions would be made in appropriate aeronautical publications.

## 1.4.4 Government-to-Government Relations

To fulfill its responsibilities under various laws, regulations, and agreements, the Air Force has paid special attention in this EIS to Native American interests and concerns. The United States government has a unique legal relationship with Native American tribal governments. The Shoshone-Paiute Tribes at Duck Valley and the Shoshone and Paiute Tribes at Fort McDermitt each act as a sovereign entity in its relationship with the federal government, and the federal government has various trust responsibilities concerning tribal interests. In recognition of this relationship, the Air Force has conducted discussions with the Shoshone-Paiute Tribes of the Duck Valley Reservation and corresponded with the Shoshone and Paiute Tribes at Fort McDermitt regarding various aspects of the ETI proposal.

### 1.4.4.1 Legal Mandates Pertaining to Native American Issues

Several laws and regulations address the requirement of federal agencies to notify or consult with Native American groups or otherwise consider their interests when planning and implementing federal undertakings.

In particular, on April 29, 1994, the President issued the *Memorandum on Government-to-Government Relations with Native American Tribal Governments*, which specifies a commitment to developing more effective day-to-day working relationships with sovereign tribal governments. Among the provisions of this memorandum are the following requirements:

- The head of each executive department and agency shall be responsible for ensuring that the department or agency operates within a government-to-government relationship with federally recognized tribal governments.
- Each executive department and agency shall consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments. All such consultations are to be open and candid, so that all interested parties may evaluate for themselves the potential impact of relevant proposals.
- Each executive department and agency shall assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and assure that tribal government rights and concerns are considered during their development of such plans, projects, and activities.
- Each executive department and agency shall take appropriate steps to remove any procedural impediments to working directly and effectively with tribal governments on activities that affect the trust property and/or governmental rights of the tribes.

Other legal mandates requiring consideration of Native American interests include:

- *National Historic Preservation Act (NHPA) of 1966.* The NHPA requires agencies to consult with Native American tribes if a proposed federal action may affect historic properties to which they attach religious and cultural significance.

- *American Indian Religious Freedom Act (AIRFA) of 1978.* AIRFA sets the policy of the United States to "protect and preserve for Native Americans their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian . . . including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship though ceremonies and traditional rites."

- *Archaeological Resources Protection Act (ARPA) of 1979.* ARPA addresses archaeological resources, which may or may not be on the National Register of Historic Places. ARPA requires issuance of a permit to conduct archaeological excavation or collection on federal land. ARPA states, "If a permit issued under this section may result in harm to, or destruction of, any religious or cultural site, as determined by the Federal land manager, before issuing such permit, the Federal land manager shall notify any Indian tribe which may consider the site as having religious or cultural importance."

- *Native American Graves Protection and Repatriation Act (NAGPRA) of 1990.* Among other things, NAGPRA requires federal agencies to consult with tribes concerning the discovery and disposition of Native American human remains and cultural items, which may or may not be archaeological resources or historic properties, on federal land.

- *Executive Order (E.O.) 13007, Indian Sacred Sites.* E.O. 13007, issued on May 24, 1996, requires that in managing federal lands, agencies must accommodate access and ceremonial use of sacred sites, which may or may not be protected by other laws or regulations, and must avoid adversely affecting the physical integrity of these sites.

- *Federal Land Policy and Management Act:* FLPMA (discussed in more detail in section 1.4.2) requires BLM to manage public land in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archaeological values. These resources may or may not be sacred sites, cultural items, archaeological resources, or historic properties.

#### 1.4.4.2 GOOD NEIGHBOR POLICY

The location of the Duck Valley Reservation under the local MOA airspace for Mountain Home AFB has been a point of concern throughout the base's history. The 366th Wing's Good Neighbor Policy evolved from the early 1980s and attempted to lessen the impact on the Duck Valley Reservation by restricting overflights of the Reservation to 750 feet AGL. In 1993, the

wing raised the restriction to 1,500 feet AGL. In 1994, the 366th Wing Commander expanded the policy to avoid overflights of the Reservation, except for emergencies, below 15,000 feet AGL, and to avoid the use of chaff and flares and supersonic activity at any altitude over the Reservation. To formalize this policy, on August 7, 1996, the Air Force agreed, absent compelling national security circumstances, military contingencies, or hostilities, to the following:

- The Air Force will not use supersonic airspeeds for training operations over the present boundaries of the Duck Valley Reservation.
- The Air Force will not use flares at night at any altitude, or use flares during the day below 20,000 feet AGL, for training operations over the present boundaries of the Duck Valley Reservation.
- The Air Force will not use chaff for training operations over the present boundaries of the Duck Valley Reservation.
- The Air Force will not fly at any altitude within 5 NM of the town of Owyhee (defined as a point located at the coordinates N41°58'.0", W116°10'.0") except during emergencies, such as aircraft mechanical problems or the avoidance of adverse weather.
- The Air Force will not fly below 10,000 feet AGL, and the Air Force will voluntarily not fly below 15,000 feet AGL, for training operations over the present boundaries of the Duck Valley Reservation except during emergencies, such as aircraft mechanical problems or the avoidance of adverse weather.
- To the greatest extent practicable, the Air Force will temporarily reschedule or relocate aircraft operations outside the present boundaries of the Duck Valley Reservation so as to avoid disturbance to ceremonies or other special traditional activities, upon reasonable notification by the Shoshone-Paiute Tribes.

#### 1.4.4.3 TREATIES

Three treaties, one ratified and two unratified by the U.S. Government, form the basis for claims by the Shoshone-Paiute Tribes for lands in southwest Idaho:

*Treaty of Ruby Valley.* This treaty was negotiated on October 1, 1863 with the Western Shoshone by a special commission appointed by President Lincoln, ratified by the U.S. Senate on June 26, 1866, and proclaimed on October 21, 1869.

*Boise River Treaty.* This treaty was negotiated on October 10, 1864 between the governor and superintendent of Indian Affairs for Idaho and the Boise Shoshone. It was never ratified by the U.S. Senate.

*Bruneau Treaty.* On April 12, 1866, the Bruneau Treaty was negotiated between the Bruneau Shoshone Nation and the governor and superintendent of Indian Affairs for Idaho. This treaty was also never ratified by the United States.

Each of these treaties is discussed in more detail in section 3.9.1.

#### 1.4.4.4 OUTREACH PROCESS

Since 1991, the Air Force has solicited information from the Tribal Council of the Shoshone-Paiute Tribes about the Air Force's various on-going activities and proposed actions. These initial efforts have evolved into an outreach program in which there are now frequent meetings and communication between the Shoshone-Paiute Tribes and the Air Force. As a result of the outreach program, the Air Force now has a better understanding of the concerns of the Shoshone-Paiute, the reasons for these concerns, and possible ways to address them.

The Air Force first met with the Shoshone-Paiute Tribes in 1995 while developing the initial proposal and alternatives for ETI. Since that time and throughout the ETI EIAP, additional consultation has been conducted to further refine the alternatives in response to information gathered during field studies and literature reviews. The proposal was modified whenever possible. Briefings, site visits, and meetings between the Air Force and the Shoshone-Paiute Tribes or Tribal representatives since May 1995 are listed in Table 1.4-3.

During these meetings and briefings, the Shoshone-Paiute raised concerns about a variety of environmental issues. These are discussed in appropriate parts of Chapters 3 and 4, and particularly in sections 3.9 and 4.9. Also, in February 1994, E.O. 12898, entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* directed federal agencies to identify disproportionately high and adverse environmental effects of their programs, policies, and activities on minority and low-income populations. Impacts related to Native American concerns are addressed throughout Chapter 4; section 4.12.6 specifically discusses environmental justice.

### 1.4.5 Other Regulatory and Permit Requirements

Other federal laws, regulations, policies, and permits that may apply to the alternatives are listed in Appendix I.

**Table 1.4-3. Meetings Between the Air Force or Its Representatives and the Shoshone-Paiute Tribes (page 1 of 3)**

| *Date* | *Format* | *Location* | *Summary/Participants* |
|---|---|---|---|
| 20 May 1995 | Visit | Duck Valley Reservation, Owyhee, NV | Air Force (366WG/CC, 366WG/DS) and Tribal Chairman discuss ETI proposal and relations between 366th Wing and DVR. |
| 20 September 1995 | Briefing | Duck Valley Reservation, Owyhee, NV | Air Force gives briefing to DVR on the ETI proposal. |
| 6 December 1995 | Conference | Duck Valley Reservation, Owyhee, NV | Air Force (366WG/DS, SAF/GC, 366WG/MDG) attends DVR's First Health, Economic, Education and Tribal Government Summit. |
| 21 February 1996 | Visit | Mountain Home AFB, ID | Tribal Council tours Mountain Home AFB and attends briefings. Includes overview of ETI proposal. |
| 21 May 1996 | Site Visit | Clover Butte area, ID | Air Force (366WG/DS), BLM, Air Force contractor, and DVR representatives visit Clover Butte 12,000-acre training range (Alternative B). |
| 22 May 1996 | Site Visit | Grasmere area, ID | Air Force, BLM, Air Force contractor, and DVR representatives visit Grasmere 12,000-acre training range (Alternative C). |
| 23 May 1996 | Briefing | Grasmere EC site, ID | Air Force meets with ranchers and DVR representatives to give update on ETI. |
| 28 May 1996 | Meeting | Boise, ID | Air Force, DVR, BLM, ISHS, and Air Force contractor discuss cultural resources surveys for ETI. |
| 20 June 1996 | Meeting | Duck Valley Reservation, NV | Meeting with Tribal members summarizing the scope of the ETI proposal and soliciting comments from Tribal members. Attended by BLM and Air Force (366WG/DS, 366RANS/CC, AF/XOOR) |
| 11 July 1996 | Briefing | Duck Valley Reservation, Owyhee, NV | Air Force gives briefing to DVR representatives on the ETI proposal. |
| 7 August 1996 | Site visit | Grasmere area, ID | DVR representatives and Air Force contractor visit Grasmere 12,000-acre training range (Alternative C). |
| 22 August 1996 | Site visit | Grasmere area, ID | DVR representatives and Air Force contractor visit Grasmere 12,000-acre training range (Alternative C). |
| 19 September 1996 | Meeting | Boise, ID | Air Force, BLM, ISHS, IDFG, Air Force contractors, and DVR representatives attend ETI Environmental Review Meeting. |

**Table 1.4-3. Meetings Between the Air Force or Its Representatives and the Shoshone-Paiute Tribes (page 2 of 3)**

| *Date* | *Format* | *Location* | *Summary/Participants* |
|---|---|---|---|
| 20 September 1996 | Meeting | Duck Valley Reservation, Owyhee, NV | Air Force (366WG/DS, 366RANS/CC, 366 OSS) and Air Force contractor give presentation to Tribal Chairman and Tribal Council on ETI, including Juniper Butte alternative (Alternative D). |
| 24 September 1996 | Site Visit | Juniper Butte area, ID | Air Force (366WG/DS, 366RANS/CC), Air Force contractor, ISHS, IDFG, BLM, and DVR representatives visit Juniper Butte area (Alternative D). |
| 8 November 1996 | Site visit | Grasmere area, ID | Air Force (366RANS/CC), Air Force contractor, and DVR representatives visit proposed emitter sites and no-drop target areas west of Highway 51. |
| 9 December 1996 | Meeting | Duck Valley Reservation, Owyhee, NV | Air Force (AF/XOO, AF/XOOR, and 366WG/DS) meets with Tribal Chairman and Tribal Council to review ETI and associated studies. |
| 9 January 1997 | Meeting | Grasmere EC site, ID | Air Force (366RANS/CC) and Air Force contractor meet with DVR representatives to discuss proposed emitter sites and no-drop target areas. |
| 22 January 1997 | Meeting | Duck Valley Reservation, Owyhee, NV | Air Force (AF/XOOR, ACC/DOR, 366WG/DS) and Air Force contractor review ETI proposal and cultural resource studies with Tribal Chairman, Tribal Council, and other DVR representatives. |
| 14 March 1997 | Meeting | Mountain Home AFB, ID | Tribal Chairman from DVR meets with 366 WG/CC and 366 WG/DS. |
| 9 June 1997 | Public Hearing | Duck Valley Reservation, Owyhee, NV | ETI Public Hearing held on DVR. |
| 29 July 1997 | Meeting | Mountain Home AFB, ID | Tribal Chairman and Council Member from DVR meet with 366 WG/DS and 366th ETI Team to discuss ETI DEIS. |
| 5 December 1997 | Meeting | Duck Valley Reservation, Owyhee, NV | Air Force (366 WG/DS, AF/XOOR) and BLM representatives meet with Tribal Chairman and Council Members at DVR to discuss ETI and other issues. |
| 10 December 1997 | Meeting | Duck Valley Reservation, Owyhee, NV | Air Force ( 366 WG/CC, 366 WG/DS, 366 OSS) and IDANG (266 RANS/CC) meet with Tribal representatives to discuss government-to-government relationship with the Tribes. |

**Table 1.4-3. Meetings Between the Air Force or Its Representatives and the Shoshone-Paiute Tribes (page 3 of 3)**

| *Date* | *Format* | *Location* | *Summary/Participants* |
|---|---|---|---|
| 9 January 1998 | Meeting | Duck Valley Reservation, Owyhee, NV | Air Force (366 WG/DS, AF/XOOR, SAF/MIQ) and BLM meet with Tribal representatives to discuss ETI EIS. |
| 13 January 1998 | Meeting | Duck Valley Reservation, Owyhee, NV | Air Force (366 WG/DS) delivers Confidential Review Copy of ETI EIS to Tribal representatives. |

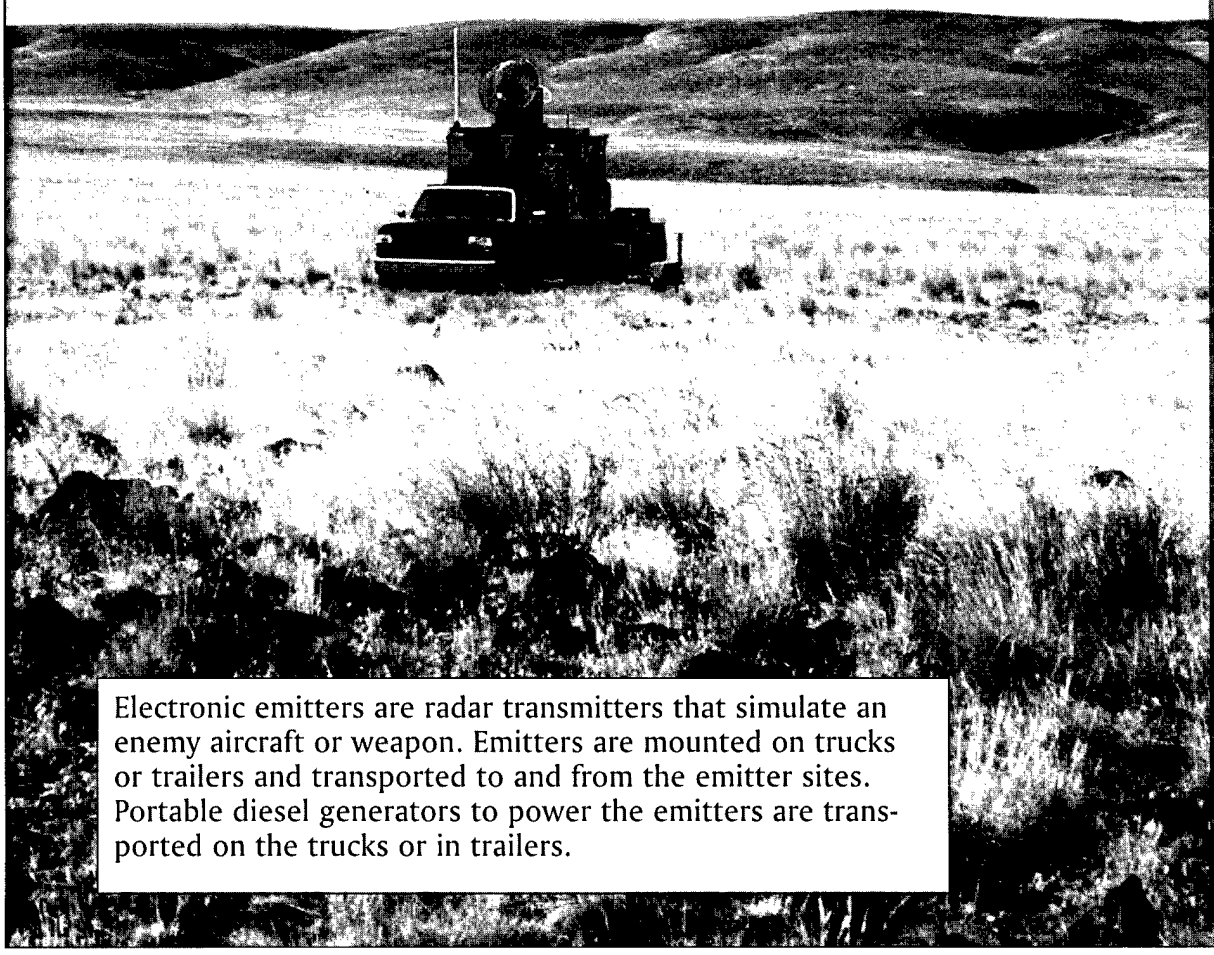
Notes: 366WG/CC = 366th Wing Commander
366WG/DS = 366th Wing Director of Staff
366RANS/CC = 366th Wing Range Squadron Commander
AF/XOO = Headquarters Air Force, Director of Operations and Training
AF/XOOR = Headquarters Air Force, Range and Airspace Division
ACC/DOR = Air Combat Command Airspace and Range Office
366WG/MDG = 366th Wing Medical Group
366 OSS = 366th Wing, Operational Support Squadron
DVR = Duck Valley Reservation
SAF/GC = Secretary of the Air Force/General Counsel
BLM = Bureau of Land Management
ISHS = Idaho State Historical Society
IDANG = Idaho Air National Guard
266 RANS/CC = 266th Range Squadron Commander
SAF/MIQ = Secretary of the Air Force, Environment, Safety, and Occupational Health

# 2.0 DESCRIPTION OF THE ALTERNATIVES

The Air Force examined lands under existing Military Operations Areas (MOAs) and restricted airspace within southwest Idaho to identify possible alternatives for enhanced training. This area was close enough to Mountain Home AFB to allow aircrews to use more of their time training instead of flying to a remote range.

The Air Force reviewed previous range proposals and decided that training could be enhanced with a small range that offered different types of targets, even though it meant that some tactics and larger practice ordnance could not be used. Air Force operational personnel determined the number, size, and distribution of drop and no-drop targets and emitter sites that would provide numerous and varied realistic training threats. The Air Force also identified changes to the airspace that would both reduce noise concentrations and enhance training.

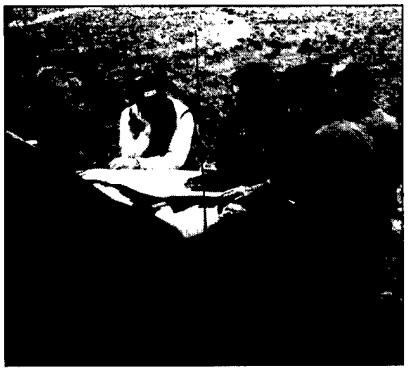
The Air Force sought the assistance and consultation of the BLM, the Shoshone-Paiute Tribes, the State of Idaho, other agencies, and the public to further define appropriate land and airspace characteristics.



Electronic emitters are radar transmitters that simulate an enemy aircraft or weapon. Emitters are mounted on trucks or trailers and transported to and from the emitter sites. Portable diesel generators to power the emitters are transported on the trucks or in trailers.

## Finding a Location for Range Facilities

Interagency and intergovernmental discussions identified alternative locations to meet the 366th Wing's enhanced training needs. Potential range sites, sizes, and configurations were considered. The operational and environmental considerations in this process are highlighted below.



Interagency and intergovernmental discussions helped the Air Force implement mitigation by avoidance in siting proposed facilities to avoid sensitive resources whenever possible.

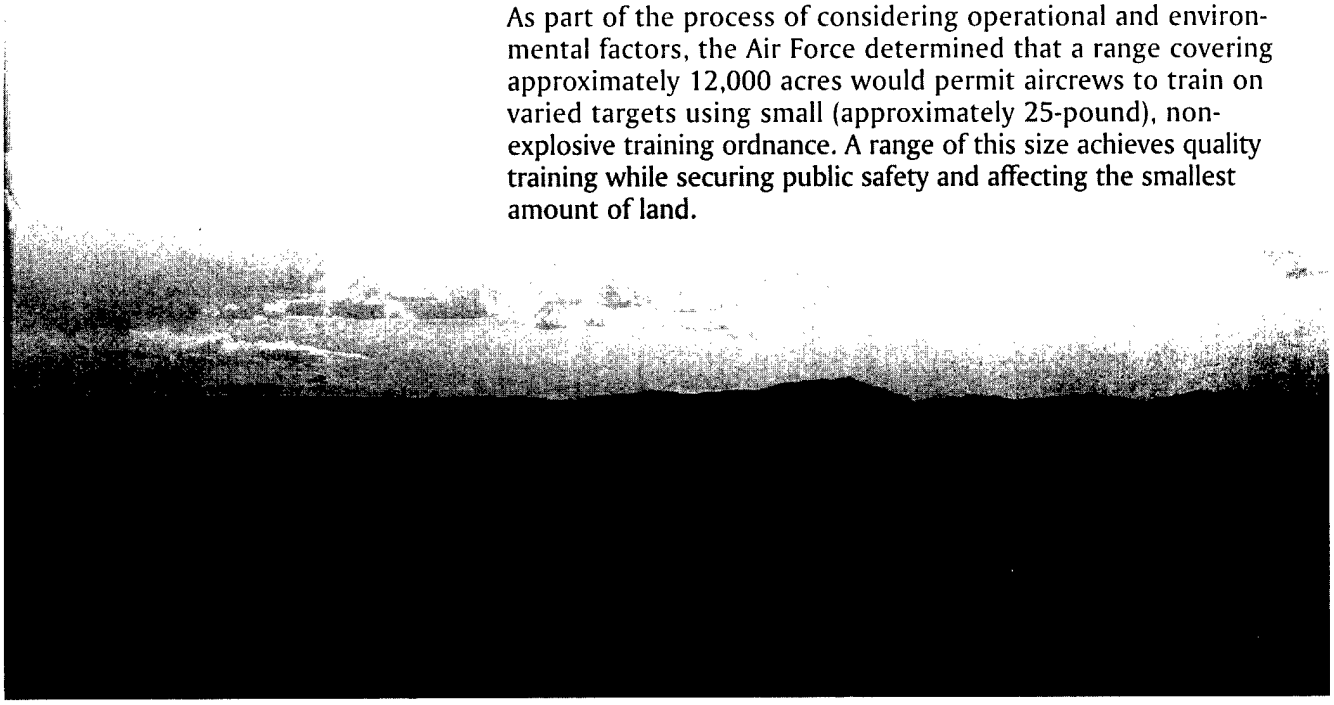
## Operational Considerations

- Permit aircraft to approach targets from any direction
- Accommodate establishment of restricted airspace over a range where training ordnance would be used
- Ensure flexibility and realism in target configuration, location, and appearance
- Permit simultaneous use of geographically dispersed targets on a new tactical range and Saylor Creek Range
- Site on relatively flat terrain with reasonable year-round access

## Environmental Considerations

- Site range locations and facilities to avoid BLM Wilderness Study Areas and related special use land management areas
- Consider concerns of Native Americans regarding specific locations of training sites through consultation with the Shoshone-Paiute Tribes
- Avoid areas with documented (at the time of alternative development) critical habitat for plants and wildlife, particularly threatened, endangered, or other special status species

As part of the process of considering operational and environmental factors, the Air Force determined that a range covering approximately 12,000 acres would permit aircrews to train on varied targets using small (approximately 25-pound), non-explosive training ordnance. A range of this size achieves quality training while securing public safety and affecting the smallest amount of land.



## The 12,000-Acre Tactical Training Range

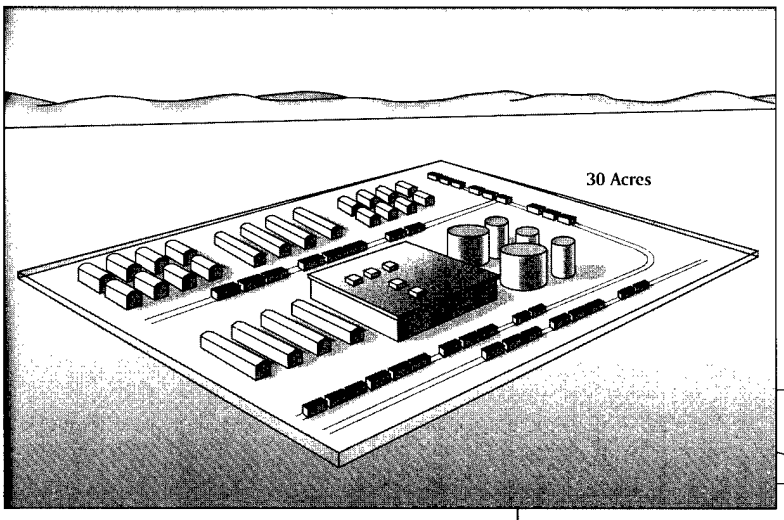
The entire 12,000-acre tactical range would be fenced for safety. Four target complexes would be built on a total of 70 acres within a 300-acre primary ordnance impact area. One would be a simulated industrial target constructed to look like a factory from the air but from the ground to appear like agricultural buildings in the local area. Two would be simulated surface-to-air missile targets. The fourth target would consist of plastic replicas of tanks or obsolete battle tanks and vehicles.

Small, non-explosive training ordnance would be dropped on the targets within the 300 fenced acres. On a recurring basis, all dropped training ordnance would be picked up and recycled, leaving the area clean of debris. Training ordnance would contain "cold spot" marking devices that produce no fire or flash.

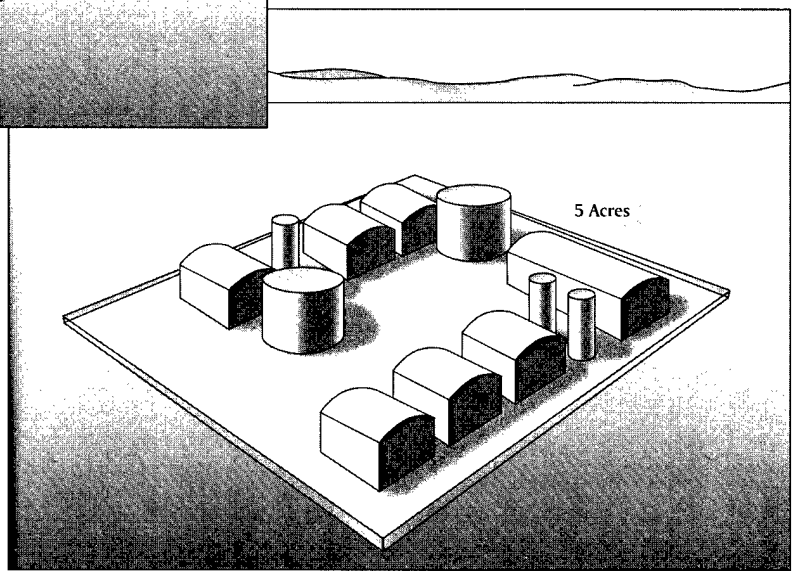
A three-acre maintenance facility would also be located within the 12,000-acre tactical range. Livestock would continue to graze on the remaining acreage.



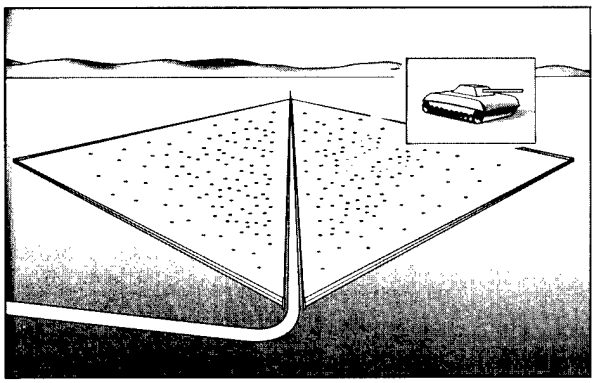
The BDU-33 is typical of the training ordnance to be used on the 300-acre primary impact area. The 25-pound training ordnance would have a "cold spot" marking device that produces a small marking plume rather than a fire or flash to see where the training ordnance hits.



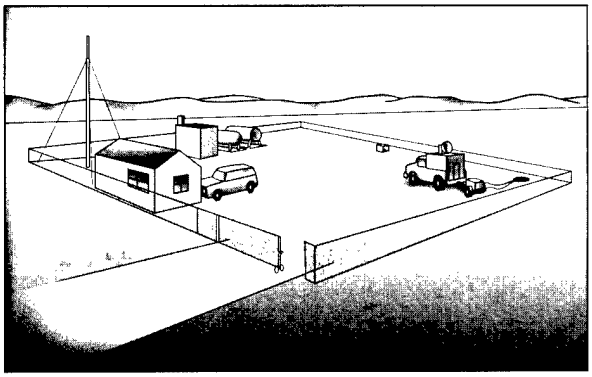

The simulated industrial target within the 12,000-acre tactical range would include structures that, from the air, look like an industrial area with a rail yard.



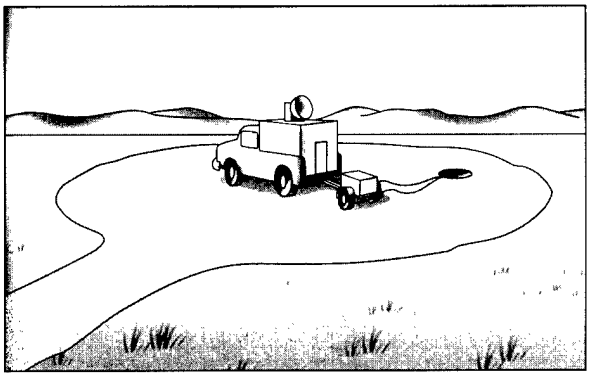

This illustration is representative of a five-acre no-drop industrial target.



The 640-acre no-drop site would contain approximately 200 life-sized tank and vehicle targets surrounded by a wildlife fence that would permit wildlife to access the site.



The ten one-acre mobile emitter sites include a small building, a fuel storage tank, and a 40-foot communications antenna.



The 20 unfenced one-quarter-acre mobile emitter sites would be gravelled and would have a grounding rod.

## No-Drop Targets

Five fenced no-drop targets are proposed on sites separated from the tactical range to provide more flexible and realistic training opportunities. Aircrews would approach targets and simulate ordnance delivery but no ordnance of any kind would be used. Most aircraft would not directly overfly the targets during simulated delivery of ordnance. However, a small number of aircraft would practice tactics that result in flying across the target areas.

The four five-acre no-drop targets consist of simulated surface-to-air missiles, simulated early warning radars, and two small simulated industrial complexes.

The largest no-drop target covers 640 acres and would contain approximately 200 life-size battle tanks and other vehicles. The vehicles would be rearranged periodically within the 640-acre area to provide varied target configurations for realistic aircrew training. Since no ordnance would be used, livestock would be able to graze within the 640-acre site.

## Electronic Emitter Sites

Mobile electronic emitters simulate enemy threats and provide realistic scenarios while maintaining a balance with the environment and traditional land use. The emitters can be moved just as an enemy would move. The simulated battle takes place electronically between the emitter and the aircrews. Electronic emitters may be overflown as part of the training against simulated threats.

The amount of land required for each emitter is small. The ten one-acre and twenty one-quarter-acre electronic emitter sites are geographically separated. An average of five to eight emitter sites would be used daily. During exercises, emitters could occupy approximately 15 of the sites over a 2- to 3-day period.

Ten of the emitter sites would be fenced areas of one acre each. Included within each acre would be an above-ground, double-walled diesel fuel storage tank for powering the emitter, a 400-square foot building, and a 40-foot communication antenna. This antenna would be used for communicating with personnel who oversee range training.

The other 20 sites would each be one-quarter-acre in size. These sites would contain a gravel-surfaced parking spot and a gravel driveway that runs from the existing road to the site.

# Description of the Proposed Action and Alternatives

The proposed action is to provide enhanced training in Idaho for the 366th Wing based at Mountain Home AFB. Eight candidate alternative sites were initially identified to implement enhanced training. Three more candidate alternative sites were presented by agencies and the public during scoping. Eight of the 11 sites did not meet operational and environmental considerations.

Section 2.1-1 of this Environmental Impact Statement (EIS) discusses these alternatives and the environmental and operational considerations used in the identification process.

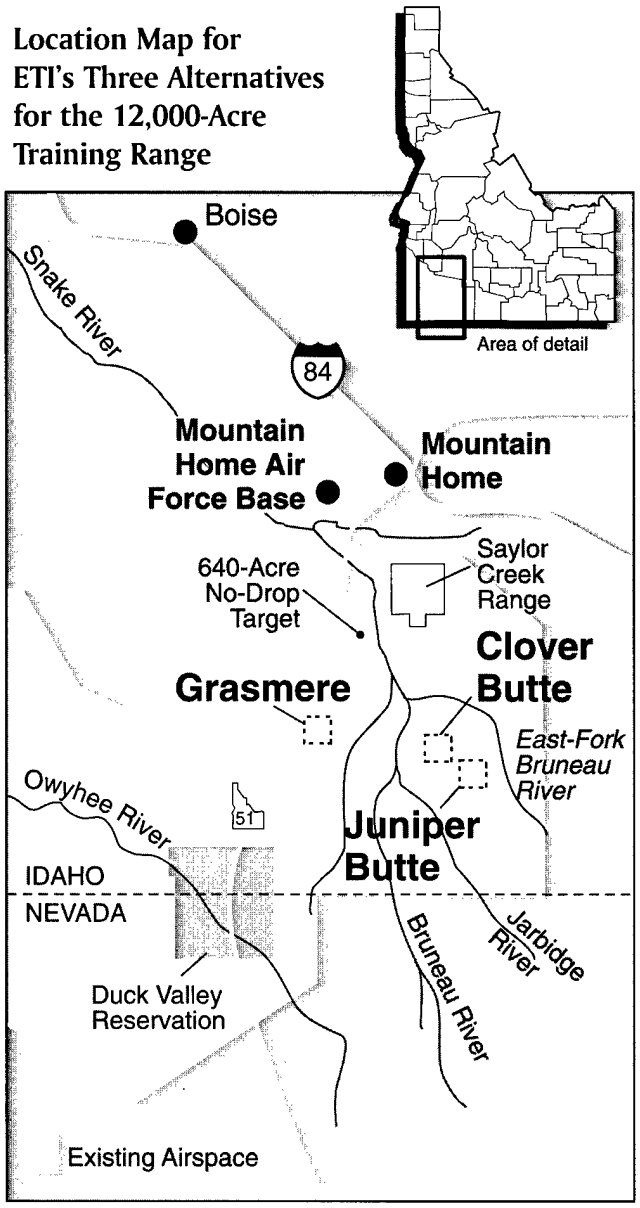
The adjacent figure presents all three training range development alternatives and the Mountain Home AFB airspace. Only one of the three alternatives would be chosen if a new training range were selected.

The two original alternative sites for enhanced training are Clover Butte (Alternative B) and Grasmere (Alternative C). Public and agency scoping produced Juniper Butte, which became Alternative D.

The National Environmental Policy Act also requires federal decisionmakers to consider the alternative of not taking an action (Alternative A - No-Action). Each of the four alternatives is discussed on the following pages.

The Air Force believes any one of the three range development alternatives would enhance training in Idaho. The Air Force has applied public and agency input as part of the environmental process to recommend Juniper Butte as the preferred alternative.

**Location Map for ETI's Three Alternatives for the 12,000-Acre Training Range**






The proposal is to integrate targets, such as the simulated tank at Saylor Creek Range (left), with a new 300-acre primary ordnance impact area, no-drop targets, and emitter sites to substantially enhance quality training for the 366th Wing.

## Alternative A: No-Action

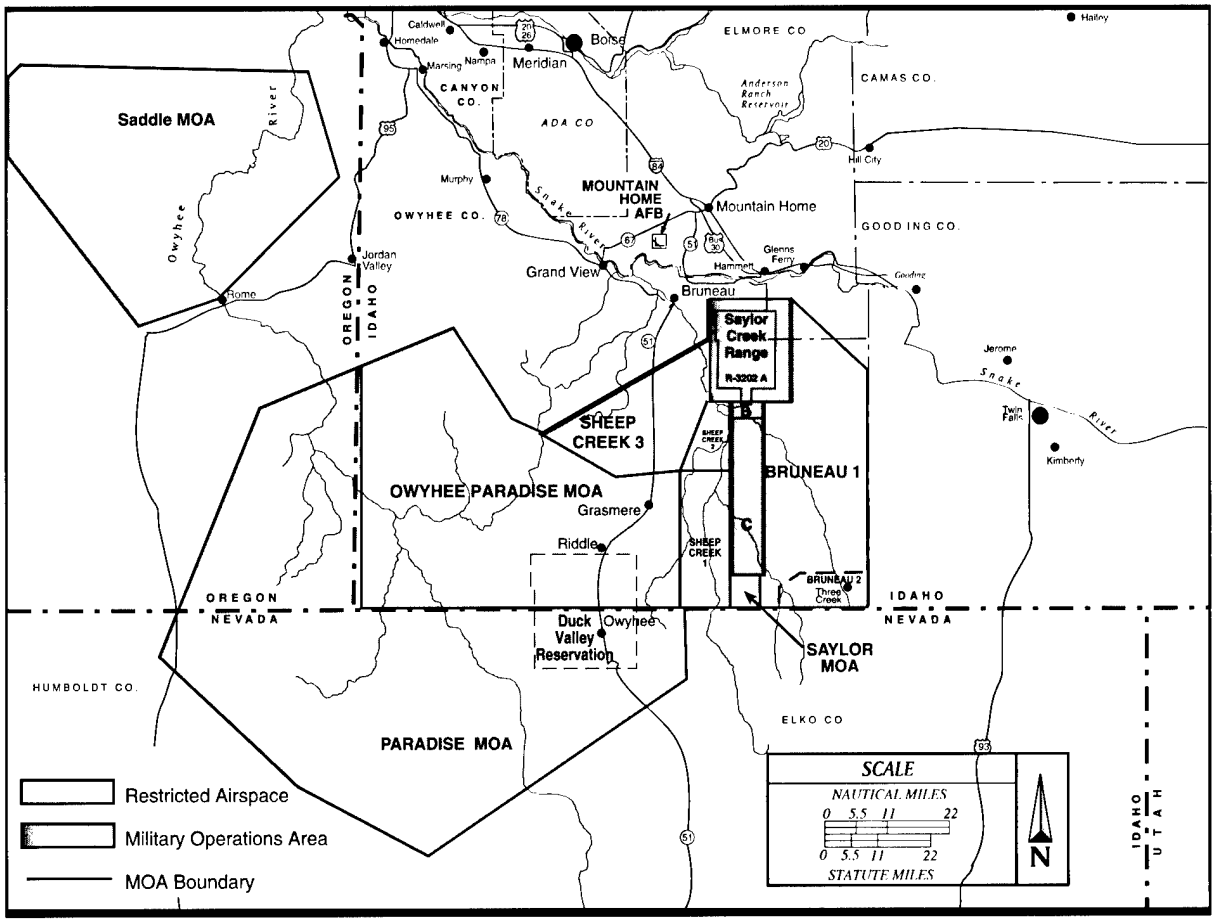
Under Alternative A, the Air Force would not be permitted to enhance training. No additional range, emitter sites, or airspace would be developed. The 366th Wing would continue to use Saylor Creek Range and the current airspace configuration, as well as remote ranges. Saylor Creek Range, the MOAs, and MTRs would continue as primary areas in which the 366th Wing would conduct training.

Training ordnance delivery at Saylor Creek Range and training use of defensive chaff and flares in the restricted area and MOAs would continue. Approximately 10 percent of the ongoing air-to-air training flights could result in brief supersonic events above 10,000 feet above ground level (AGL).

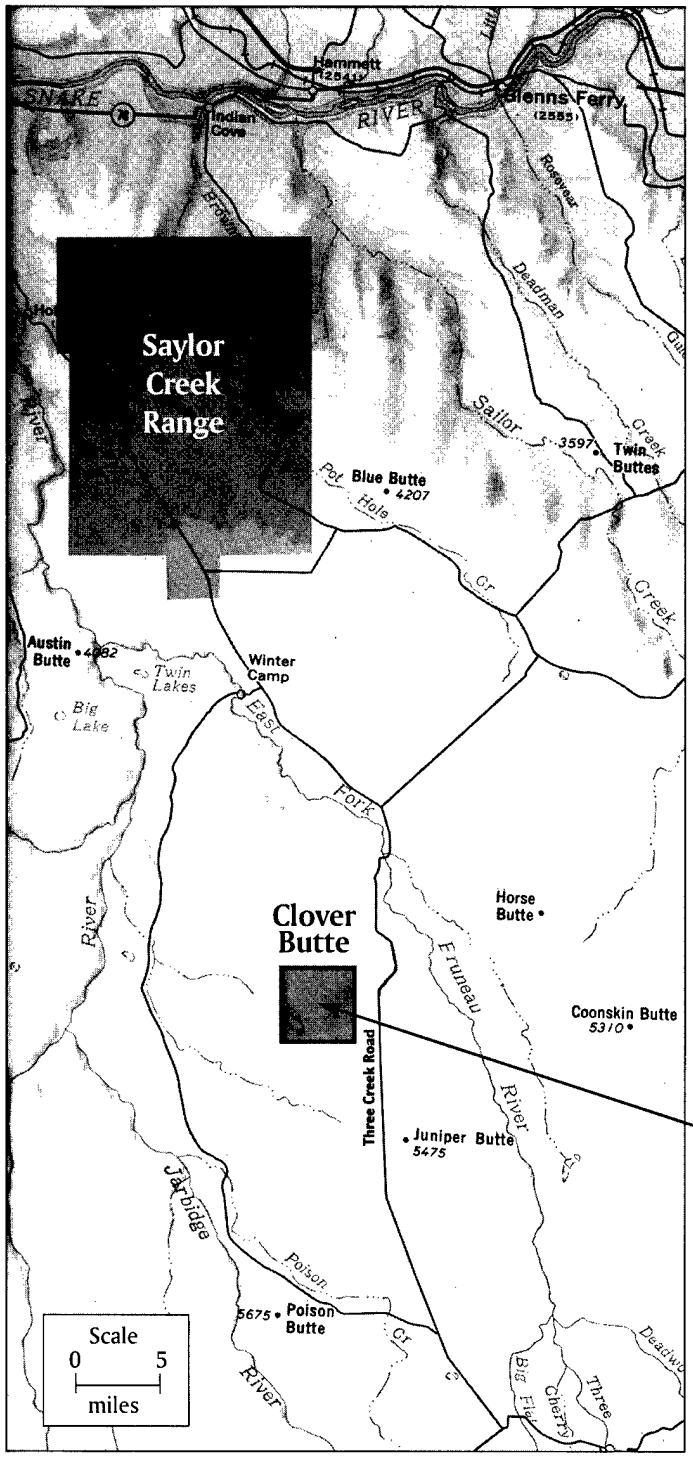
Wing training exercises would continue as at present in local airspace and at remote ranges. The nature of the existing local range and constricted airspace would continue to limit the type and realism of training. The 366th Wing would continue to train and to conduct operational readiness exercises using both local and remote ranges.

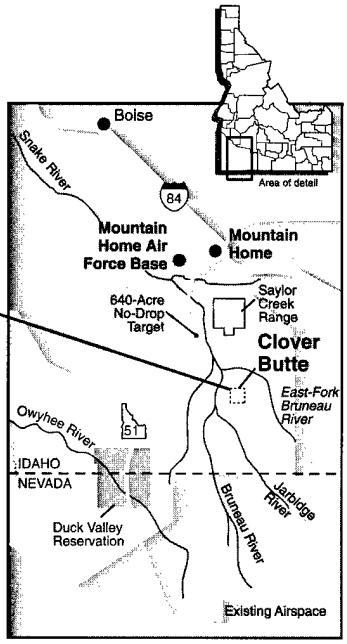


This specially staged formation includes all the different types of aircraft assigned to the 366th Wing. During training, aircraft normally fly in two to four ship formations with aircraft separated by one or more miles.



**Land sources and utilities for the three proposed training range alternatives are given on this and the following two pages.**




## Alternative B, Clover Butte

If this alternative were selected, the Air Force proposes to withdraw approximately 11,864 acres of public land, as follows:

- approximately 11,200 acres for the Clover Butte Alternative
- the 640-acre no-drop target area
- three five-acre no-drop target areas
- nine one-acre emitter sites

Eighteen one-quarter-acre emitter sites and the associated access routes are on public lands. The Air Force proposes to obtain rights-of-way from the BLM to use these lands.

State of Idaho land that would be leased by the Air Force from the State of Idaho Department of Lands includes:

- 640 acres within the Clover Butte training range
- one five-acre no-drop target area
- one one-acre and two one-quarter-acre emitter sites

Some roads or sections of roads for access to target and emitter sites would need to be improved or constructed. The types of improvements vary according to proposed vehicle traffic. Clover Butte would have 59 miles of gravel road improvements and 19 miles of new gravel roads.

Electricity would come from a 208-volt, three-phase transmission line linked to the main transmission line, which is located roughly 17 miles to the southeast of Clover Butte.

## Alternative C, Grasmere

If this alternative were selected, the Air Force proposes to withdraw approximately 9,264 acres of public land, as follows:

- approximately 8,600 acres for the Grasmere Alternative
- the 640-acre no-drop target area
- three five-acre no-drop target areas
- nine one-acre emitter sites

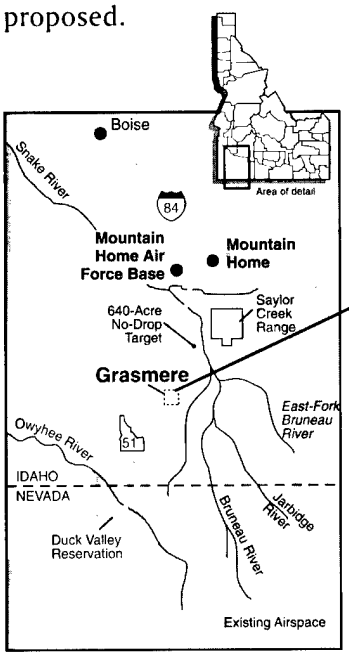
In addition, 18 one-quarter-acre emitter sites and access roads are on public lands managed by the BLM. The right to use these would be obtained through rights-of-way.

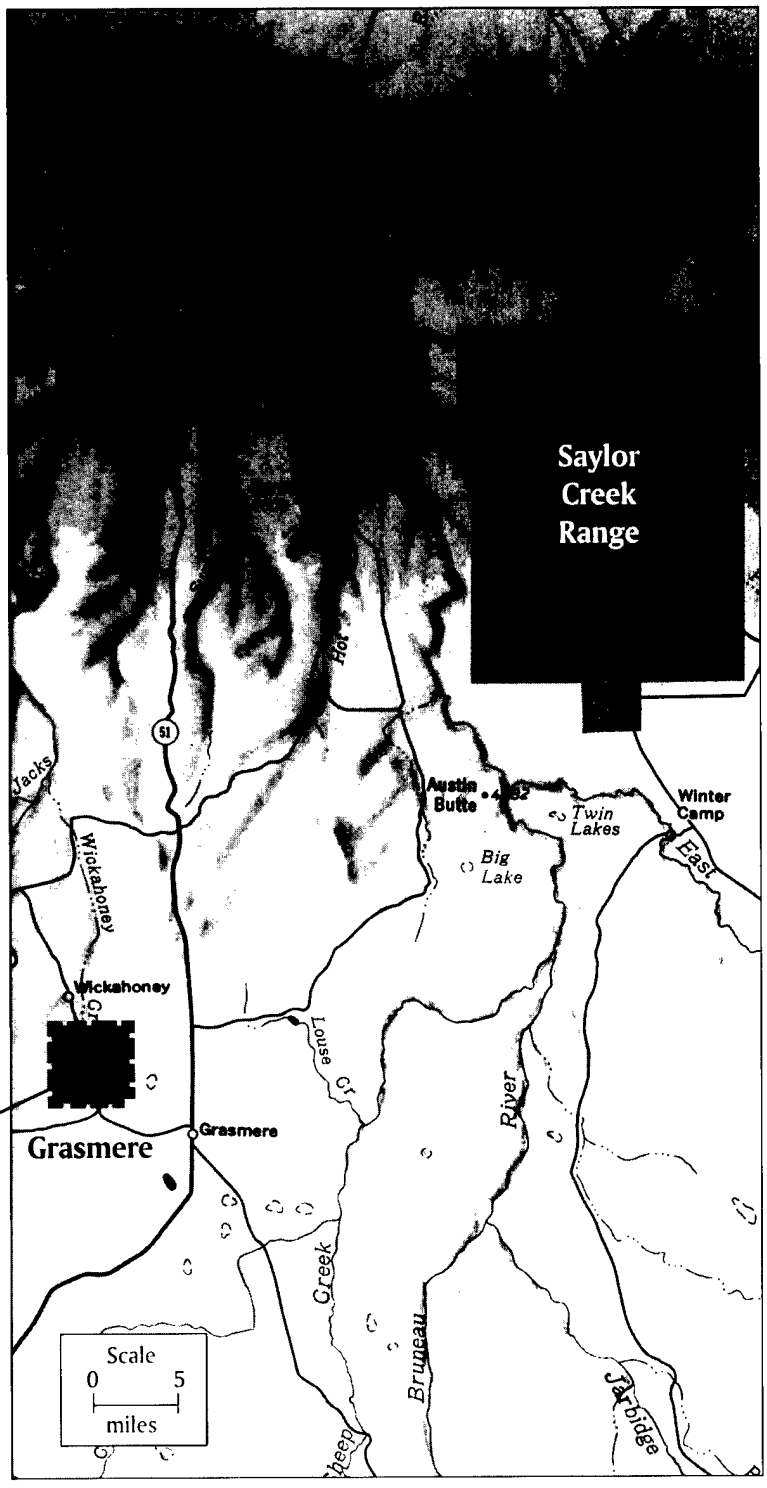
State of Idaho land that would be leased by the Air Force from the Department of Lands includes:

- 2,400 acres within the Grasmere training range
- one five-acre no-drop target area
- one one-acre and two one-quarter-acre emitter sites

Grasmere would have 61 miles of gravel road improvements and 19 miles of new gravel roads.

Propane-powered generators would provide all electrical power on the training range. No transmission line is proposed.



## Alternative D, Juniper Butte

If this alternative were selected, the Air Force proposes to withdraw approximately 11,269 acres of public land, as follows:

- 10,600 acres for the Juniper Butte Alternative
- the 640-acre no-drop target area
- four five-acre no-drop target areas
- nine one-acre emitter sites

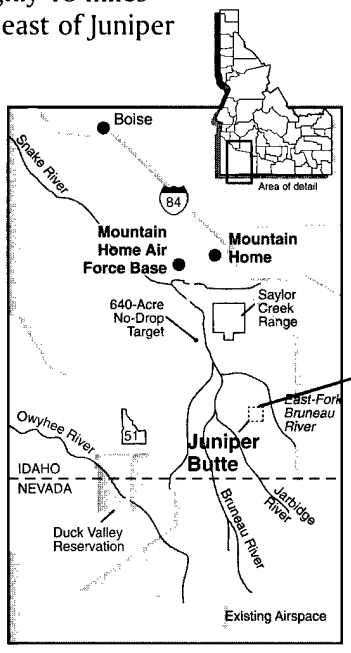
In addition, 18 one-quarter-acre emitter sites and access roads are on public lands managed by the BLM. The right to use these would be obtained through rights-of-way.

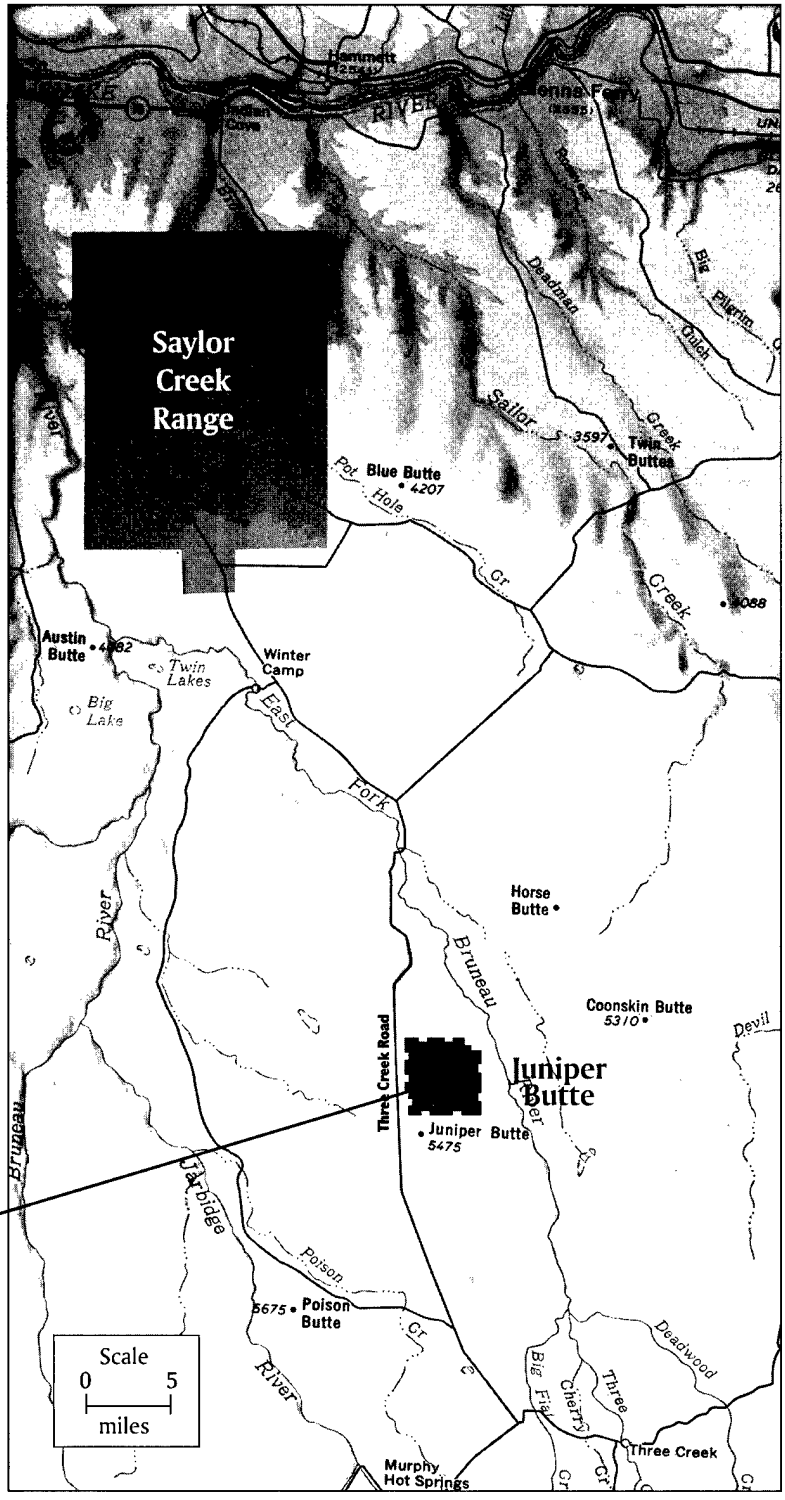
State of Idaho land that would be leased by the Air Force from the Department of Lands includes:

- 960 acres within the Juniper Butte training range
- one one-acre and two one-quarter-acre emitter sites

Juniper Butte would have 62 miles of gravel road improvements and 20 miles of new gravel roads.

Electricity would come from a 208-volt, three-phase transmission line linked to the main transmission line, which is located roughly 16 miles to the southeast of Juniper Butte.



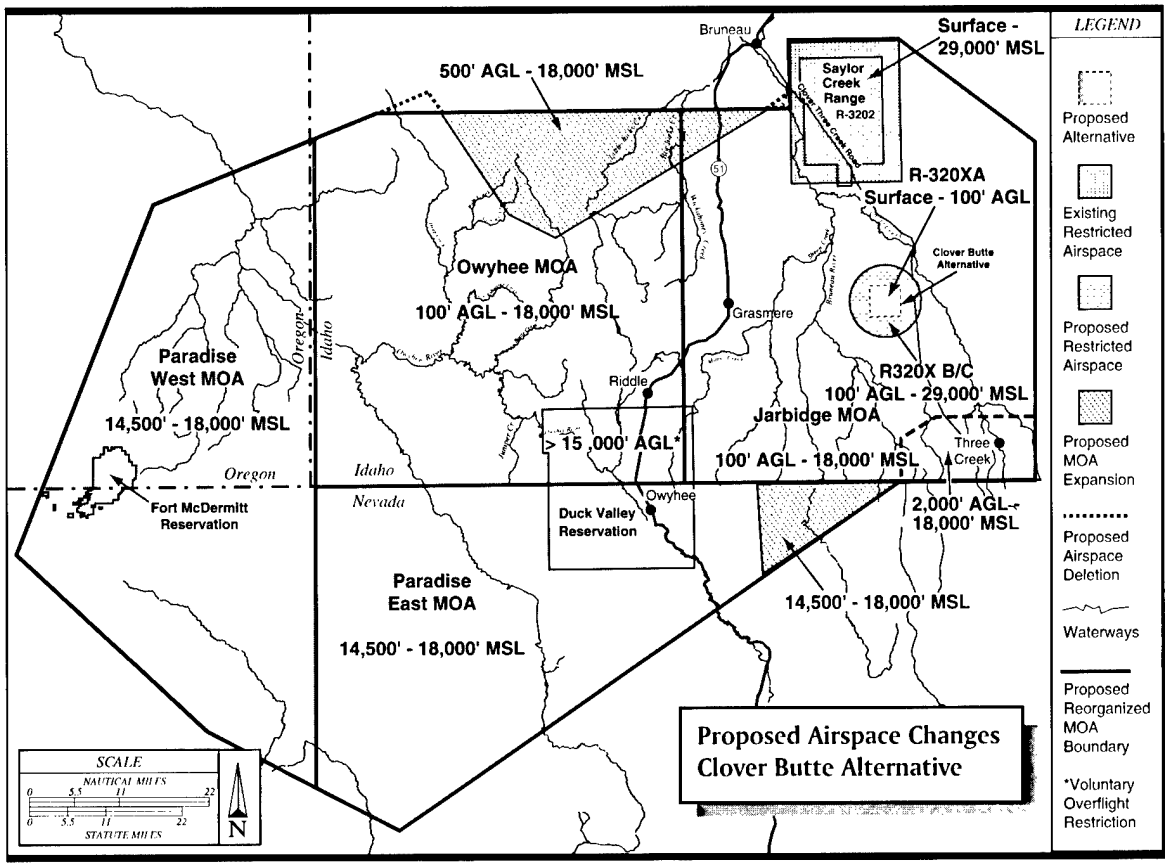
## Proposed Airspace Changes

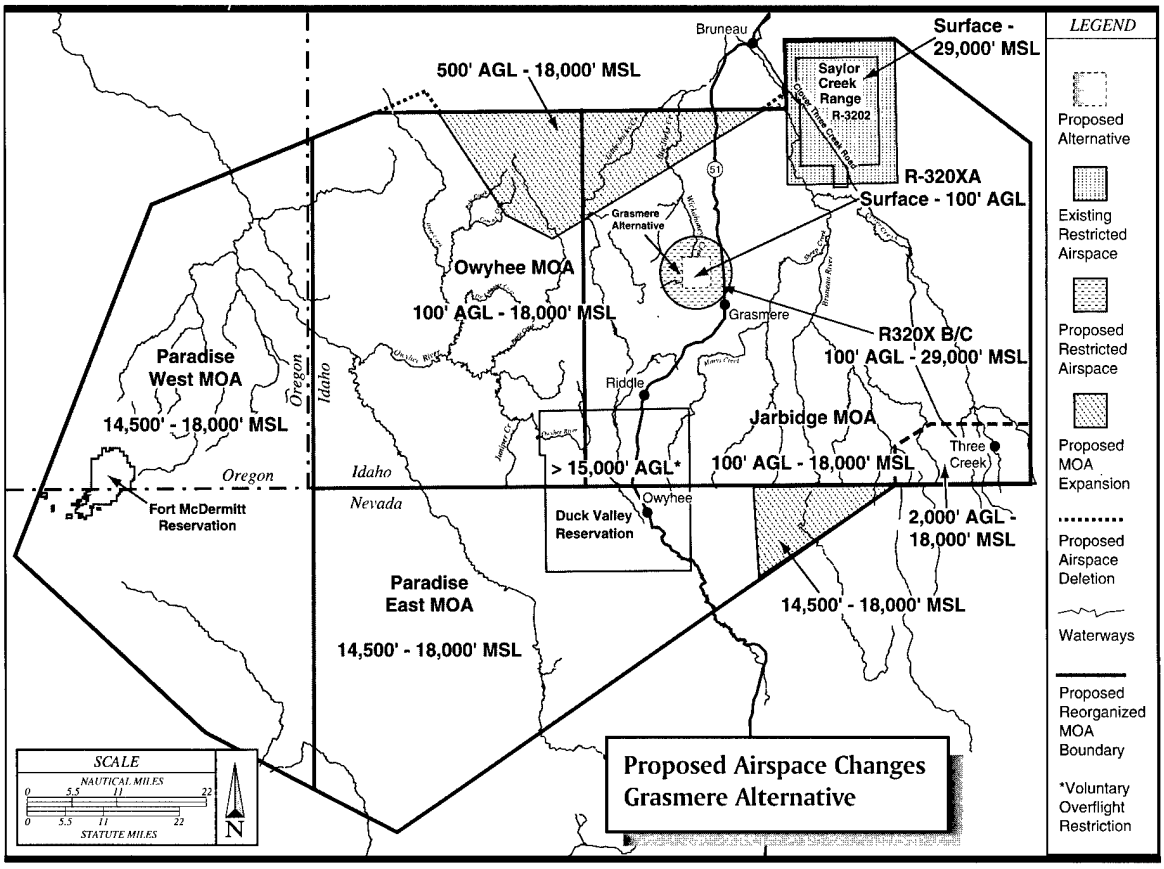
The Air Force proposes to change airspace for each range development alternative to the airspace configuration depicted below and on the following page. AGL means elevation above ground level. MSL means elevation above mean sea level. R-320X A, B, and C refer to the restricted airspace over a selected range development alternative. Paradise, Owyhee, and Jarbidge are names assigned to each MOA.

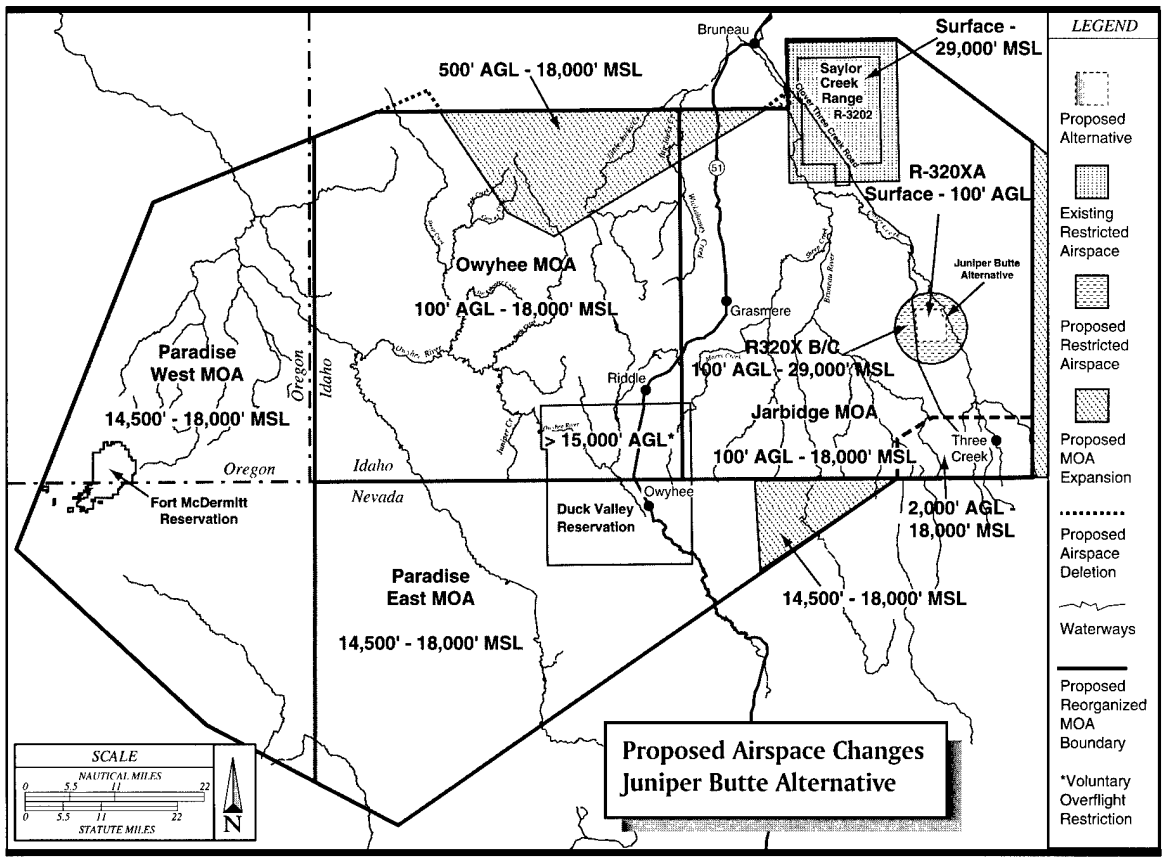
The proposed airspace changes include raising the ceiling over the range support MOAs to 18,000 feet MSL and expanding the airspace to the north and southeast.

These changes in airspace would balance realistic training with the environment and traditional land uses through the following:

- Aircraft noise would be dispersed. The current shape of the airspace creates a "bottleneck" (narrowing in the middle) between the town of Grasmere, Idaho and the Duck Valley Reservation. This concentrates flying activities over the Owyhee canyonlands. Additions to airspace would give aircrews more room to maneuver their aircraft. The effects of flying activities would no longer be concentrated.
- Operations would be enhanced. The proposed airspace changes would allow for better air-to-air and air-to-ground training, because the current shapes of the MOAs do not allow full use of the airspace. Aircrews presently must limit the directions they approach and exit Saylor Creek Range. The airspace changes provide realism, including the ability to approach targets from multiple directions. The proposal also allows aircrews to train on realistic targets using all the capabilities of modern aircraft.
- Flexibility would be increased both operationally and in balancing competing demands. Additional airspace would permit full use of the airspace for training activities and allow operations to avoid areas of seasonal concern.
- Restricted airspace would be restructured and reduced. The current restricted airspace south of Saylor Creek Range (not shown) would be replaced with restricted airspace circle around a selected alternative.




Bruneau
Surface - 29,000' MSL
500' AGL - 18,000' MSL
Saylor Creek Range R-3202
R-320XA
Surface - 100' AGL
Grasmere Alternative
Owyhee MOA
100' AGL - 18,000' MSL
Grasmere
R320X B/C
100' AGL - 29,000' MSL
Paradise West MOA
14,500' - 18,000' MSL
Oregon
Idaho
Riddle
Jarbidge MOA
100' AGL - 18,000' MSL
Three Creek
> 15,000' AGL*
Nevada
Owyhee
Duck Valley Reservation
Fort McDermitt Reservation
2,000' AGL - 18,000' MSL
Paradise East MOA
14,500' - 18,000' MSL
14,500' - 18,000' MSL
Proposed Airspace Changes
Grasmere Alternative
SCALE
NAUTICAL MILES
STATUTE MILES
N
LEGEND
Proposed Alternative
Existing Restricted Airspace
Proposed Restricted Airspace
Proposed MOA Expansion
Proposed Airspace Deletion
Waterways
Proposed Reorganized MOA Boundary
*Voluntary Overflight Restriction


Bruneau
Surface - 29,000' MSL
500' AGL - 18,000' MSL
Saylor Creek Range R-3202
R-320XA
Surface - 100' AGL
Juniper Butte Alternative
Owyhee MOA
100' AGL - 18,000' MSL
Grasmere
R320X B/C
100' AGL - 29,000' MSL
Paradise West MOA
14,500' - 18,000' MSL
Oregon
Idaho
Riddle
Jarbidge MOA
100' AGL - 18,000' MSL
Three Creek
> 15,000' AGL*
Nevada
Owyhee
Duck Valley Reservation
Fort McDermitt Reservation
2,000' AGL - 18,000' MSL
Paradise East MOA
14,500' - 18,000' MSL
14,500' - 18,000' MSL
Proposed Airspace Changes
Juniper Butte Alternative
SCALE
NAUTICAL MILES
STATUTE MILES
N
LEGEND
Proposed Alternative
Existing Restricted Airspace
Proposed Restricted Airspace
Proposed MOA Expansion
Proposed Airspace Deletion
Waterways
Proposed Reorganized MOA Boundary
*Voluntary Overflight Restriction

# 2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section presents a detailed description of four alternatives. Three alternatives, all of which involve development of a training range and other facilities, support the proposed action of Enhanced Training in Idaho (ETI). The No-Action Alternative provides for no development of new facilities and no enhanced training. This section includes a discussion of the characteristics used to identify and screen candidate alternatives for providing quality, combat-effective training. It also discusses alternatives considered but not carried forward for further analysis. Finally, the chapter summarizes and compares the environmental impacts of the four alternatives.

## 2.1 IDENTIFICATION OF ALTERNATIVES

Identification and analysis of alternatives is one of the core elements of the environmental process under the National Environmental Policy Act (NEPA) and Air Force Instruction (AFI) 32-7061. For this proposal to enhance training, the Air Force worked with the Bureau of Land Management (BLM), consulted with the Shoshone-Paiute Tribes, the State of Idaho, and other agencies, and listened to the public to help identify potential alternatives. This effort also involved seeking input from these groups on the characteristics of alternative sites that would make them suitable or unsuitable to contain training facilities. The Air Force considered these characteristics and integrated them into the identification of the alternatives.

### 2.1.1 Alternative Identification Process

As discussed in Chapter 1, this proposal seeks to provide the 366th Wing with enhanced training opportunities that offer quality, realism, and flexibility. Existing local training ranges, airspace, and emitter sites used by the 366th Wing offer limited realism, flexibility, and quality. Training at remote ranges requires transit time that expends finite flying hours and funding, yet yields minimal training value. An integrated set of training facilities would achieve the goal of enhanced training if it incorporates Saylor Creek Range (SCR) and the existing military operations areas (MOAs); provides the flexibility to vary attacks and tactics; presents aircrews with challenging, realistic battlefield situations; and allows for ready access on a day-to-day basis. The Air Force also recognized that, to the extent possible, these facilities should be compatible with the surrounding environment and natural setting.

#### 2.1.1.1 Initial Interagency and Intergovernmental Discussions

Identification of alternatives seeking to enhance training for the 366th Wing involved extensive interagency and intergovernmental discussions. Representatives from Headquarters Air Force, the Department of Interior, State of Idaho, and the Shoshone-Paiute Tribes reviewed Air Force concepts for a tactical training range based on 366th Wing training activities. In addition, the Air Force identified that no-drop targets, emitter sites, and airspace would be required in this

area to enhance training. The interagency and intergovernmental discussions resulted in the identification of possible land areas that would provide opportunities for this enhanced training. These initial search areas were located in eastern Owyhee County, south and southwest of SCR, and provided the basis for preliminary identification of six candidate range alternatives. The Air Force identified two additional candidate range alternatives with similar characteristics to those found in the initial search areas.

Discussions of this type have continued throughout the environmental impact statement (EIS) process, especially with the BLM. These have led to the refinement of information, analysis, and explanation, as well as to the definition of the preferred alternative.

#### 2.1.1.2 OPERATIONAL CONSIDERATIONS

To provide a more precise evaluation of potential candidate range alternatives, the 366th Wing further refined the operational considerations. As presented in Chapter 1, the training range, no-drop targets, emitter sites and airspace required to enhance training must offer operational attributes that provide for flexibility, realism, and quality. The operational considerations used are presented below.

**Provide 360-degree axis of attacks on targets**. To enhance realism and avoid unnecessary repetition in training, target areas and a range site should allow aircrews to approach from all axes and angles. By offering 360-degree access, aircrews could vary their training missions on a daily basis, creating a multitude of opportunities to simulate actual combat conditions. This type of access would also enhance the ability to conduct simultaneous and precision-timing training attacks by multiple aircraft at a single target area, thereby supporting Composite Wing Training (CWT) and Operational Readiness Exercise/Inspections (ORE/ORIs). The Air Force determined, based on the tactics required of aircraft in the 366th Wing, that the site for the targets should be at least 15 miles from the edge of a MOA to ensure 360 degrees of access.

**Accommodate establishment of restricted airspace over a range where non-explosive training ordnance would be used**. Air Force and Federal Aviation Administration (FAA) requirements dictate the need to establish restricted airspace over training ranges where potentially hazardous activities (e.g., training ordnance delivery) occur. Therefore, such a training range would lie in an area where restricted airspace could be established without conflicting with FAA-charted airspace. Such airspace should extend at least 5 nautical miles (NM) in all directions from the center of the target area within the range.

**Offer approximately 12,000 acres of land within which specific targets could be used to drop non-explosive training ordnance**. As described in Chapter 1, the Air Force established that realistic training requires a variety of targets that allow training ordnance delivery. The delivery of training ordnance and the rapid return in scoring information provide the aircrew with essential information on the quality of performance that cannot be obtained through a no-drop target. To provide the 366th Wing an effective tactical range that allows training ordnance delivery and includes a variety of targets, it is necessary to have a relatively square tract of land

covering about 12,000 acres. To determine this size, the Air Force identified all of the training ordnance delivery events (e.g., high-angle dive bomb) that each aircrew needs to conduct during training. Then it considered the weapons safety footprints (i.e., the distance within which a 99.99 percent probability exists that training ordnance would impact or come to rest) for each aircraft and event in order to determine the area that would be needed to accommodate all events. Using this information, the Air Force identified those primary training ordnance delivery events that would maximize training while using the least amount of land. By eliminating all events that involved use of training ordnance larger than 25 pounds, and even eliminating some events using small training ordnance, the Air Force defined an area of approximately 12,000 acres within which all weapons safety footprints for proposed events would be contained.

**Ensure flexibility and realism in target and emitter site configuration, location, and appearance.** At SCR, the targets lie unrealistically close to each other, and these targets offer abundant visual cues. These situations can be used effectively for mastering conventional training ordnance delivery that involves repeated actions under controlled conditions. However, realistic, quality tactical training for the 366th Wing requires that targets

- have an appearance similar to real combat targets;
- are widely distributed, consistent with battlefield conditions; and
- offer aircrews a wide variety of appearances when approaching from different angles.

In addition, these targets would be defended by electronic emitters that simulate an enemy defensive line to protect targets and attack incoming aircraft. Many possible locations at which emitters could be situated provide the element of surprise and variation for aircrews. On average, five to eight emitter sites would be in use each weekday. During CWT exercises, emitters could occupy approximately 15 of the sites over a 2-to 3-day period.

To provide a variety of targets with their emitters, yet use the smallest amount of land possible, the Air Force recognized that areas other than the 12,000-acre site would be necessary. However, to minimize the amount of affected land, the Air Force decided that these additional no-drop targets would not be used for any training ordnance delivery. Whereas aircrews would fly the same as if they were delivering training ordnance, they would not release any training ordnance at these no-drop targets. Without training ordnance delivery and its associated safety requirements, these no-drop target areas only require land area sufficient to accommodate the actual targets.

By using no-drop targets and expanding the emitter capabilities associated with the range, the 366th Wing could obtain access to a larger number of dispersed, variable targets with a number of associated emitters, while minimizing the amount of lands needed. Therefore, the Air Force examined the area for possible no-drop target sites and emitter locations, ensuring adequate separation from one another, SCR, and any proposed range sites.

**Permit simultaneous use of SCR and a new tactical range.** To enhance daily training and especially CWT, the site for a 12,000-acre range needed to be separated sufficiently from SCR. In this way, aircraft could attack both areas simultaneously, replicating tactics used in actual combat. In addition, the deliveries of larger, inert training ordnance and strafing could be conducted at SCR in conjunction with smaller (up to 25 pounds) training ordnance delivery at targets on the 12,000-acre range, providing a variety of deliveries. A minimum distance of 15 miles from the limits of SCR's target area would allow simultaneous approaches and departures of multiple aircraft at each site, thus enhancing CWT.

**Offer relatively flat terrain.** To facilitate construction and reduce the potential for erosion, the Air Force determined that the sites for the 12,000-acre range and the no-drop targets should consist of relatively flat terrain. Flat terrain is also conducive to cleaning and maintaining the target area.

**Provide reasonable, year-round access.** To increase their utility and reduce potential effects from construction and maintenance, the sites for the 12,000-acre range, the no-drop targets, and the emitters would need to lie near an established road system. For the 12,000-acre range, the system must also provide a high probability of access throughout most of the year.

#### 2.1.1.3 ENVIRONMENTAL CONSIDERATIONS

In addition to operational considerations, the Air Force identified environmental considerations for location of ground-based elements of ETI. The Air Force considered the ability of a candidate range alternative to address competing demands for land uses while avoiding ground disturbance to or protecting environmental and cultural resources. The following describes those considerations.

**Avoid special use land management areas.** Wilderness Study Areas (WSAs), Areas of Critical Environmental Concern (ACECs), and other special use land management areas all contain lands and resources for which certain protections have been established regarding on-the-ground development and use. In southwest Idaho, many of these areas correlate to river and creek canyons. The Air Force recognized the special status of these lands and considered them in the siting of possible alternative sites for a training range, no-drop targets, and emitter sites.

**Consider concerns of Native Americans regarding specific training sites.** Through discussions with the Shoshone-Paiute Tribes, the Air Force learned of their concerns regarding the locations of possible sites for a training range, no-drop targets, and emitter sites (refer to section 1.4.4). The Air Force considered these concerns when identifying alternatives. As a result of these discussions, the Air Force eliminated the western half of Owyhee County from consideration early in the identification process.

**Avoid areas containing known (and documented) critical or crucial habitat for wildlife, particularly threatened, endangered, or other special status species.** The Air Force used this consideration to screen out locations (including prospective emitter and no-drop target sites) in

order to reduce the potential for impacts. For example, Air Force and BLM biologists re-sited several potential emitter sites to avoid sage grouse habitat and leks.

While the Air Force used these three main environmental considerations to assist in eliminating locations, it also considered other concerns in its screening process for identifying potential sites for on-the-ground facilities. Chief among these concerns was reducing the potential to impede road access to ranchers, recreationists, and others.

#### 2.1.1.4 USING THE ENVIRONMENTAL AND OPERATIONAL CONSIDERATIONS TO EVALUATE CANDIDATE RANGE ALTERNATIVES AND OTHER PROJECT COMPONENTS

Candidate range alternatives were evaluated using all the considerations presented above. Application of these operational and environmental considerations to the eight candidate range alternatives identified through interagency/intergovernmental discussions and by the Air Force yielded

- Two candidate alternatives that conformed to the considerations and were carried forward for analysis in the draft environmental impact statement (DEIS); and
- Six candidate alternatives eliminated from further analysis due to nonconformance with the considerations.

For other project components, no-drop targets and emitter sites, the Air Force identified potential sites based on operational and environmental factors. Due to the size and limited impacts of no-drop targets and emitter sites, the Air Force had more flexibility to site these project components.

The Air Force identified an initial set of 20 one-quarter-acre and 10 one-acre locations for emitter sites, based on operational and environmental considerations. Through consultation with the BLM, research of existing information, and field studies, the Air Force chose to replace 14 of these locations with different sites that still met operational requirements, but offered a lower potential for environmental impacts. Some of the reasons for eliminating the original locations included evidence of a current sage grouse lek, the presence of even a small archaeological site, and sensitivity of viewpoints encompassing the site. Replacement sites were screened using field studies (i.e., biological surveys, archaeological surveys) to avoid potential impacts.

Similarly, a possible site for a five-acre no-drop target was eliminated due to both environmental and operational considerations. Its replacement better met operational considerations and offered no documented environmental concerns.

### 2.1.2 Candidate Alternatives

Two types of alternatives were considered in the identification process: candidate range development alternatives and the No-Action Alternative. Although representative of an array

of locations, all range development alternatives lie within the portion of eastern Owyhee County encompassed by the initial search area defined using the operational and environmental considerations from sections 2.1.1.2 and 2.1.1.3. In contrast, the No-Action Alternative includes the existing training assets in southwest Idaho, as well as existing ranges and airspace in Nevada and Utah.

### 2.1.2.1 CANDIDATE RANGE DEVELOPMENT ALTERNATIVES

Figure 2.1-1 shows the locations of the candidate range development alternatives. Table 2.1-1 lists these candidates and their conformance to the environmental and operational considerations used in the identification process.

#### *CANDIDATE ALTERNATIVES IDENTIFIED BY THE AIR FORCE*

##### *1. Table Butte*

Located about 11 miles southwest of SCR, this candidate alternative would allow the establishment of restricted airspace, acquisition of 12,000 acres, and flexibility of target use but would not allow a 360-degree approach. Since it lies less than 15 miles from SCR, it cannot be used simultaneously with SCR. It also lacks flat terrain and proximity to an established road system, which would require extensive road building that would have economic and environmental costs. Although not overlapping any WSA or canyon, it abuts a WSA associated with Bruneau Canyon. For these reasons, the alternative was not carried forward for detailed analysis.

##### *2. Jacks Creek*

This candidate alternative is located about 26 miles west of SCR. Although a 360-degree approach would not be possible, it would allow target flexibility. The site is dominated by rough terrain, making access and construction difficult. It also contains potential habitat for California bighorn sheep, a special status species. This candidate also abuts the Big Jacks Creek WSA. For these reasons, the alternative was not carried forward for detailed analysis.

##### *3. Rattlesnake*

This candidate alternative is located approximately 28 miles southwest of SCR. It was not carried forward due to its proximity to the Duck Valley Reservation, potential conflicts with cultural resources, and its location near a special land use management area.

##### *4. Saylor 1*

This candidate alternative, located just outside of the southeastern boundary of SCR, is 6 miles from the existing range. It was not carried forward due to its proximity to SCR, which would not allow a simultaneous use of both ranges, a lack of existing roads and access, and presence of steep, rocky terrain, making access and training ordnance cleanup activities very difficult.

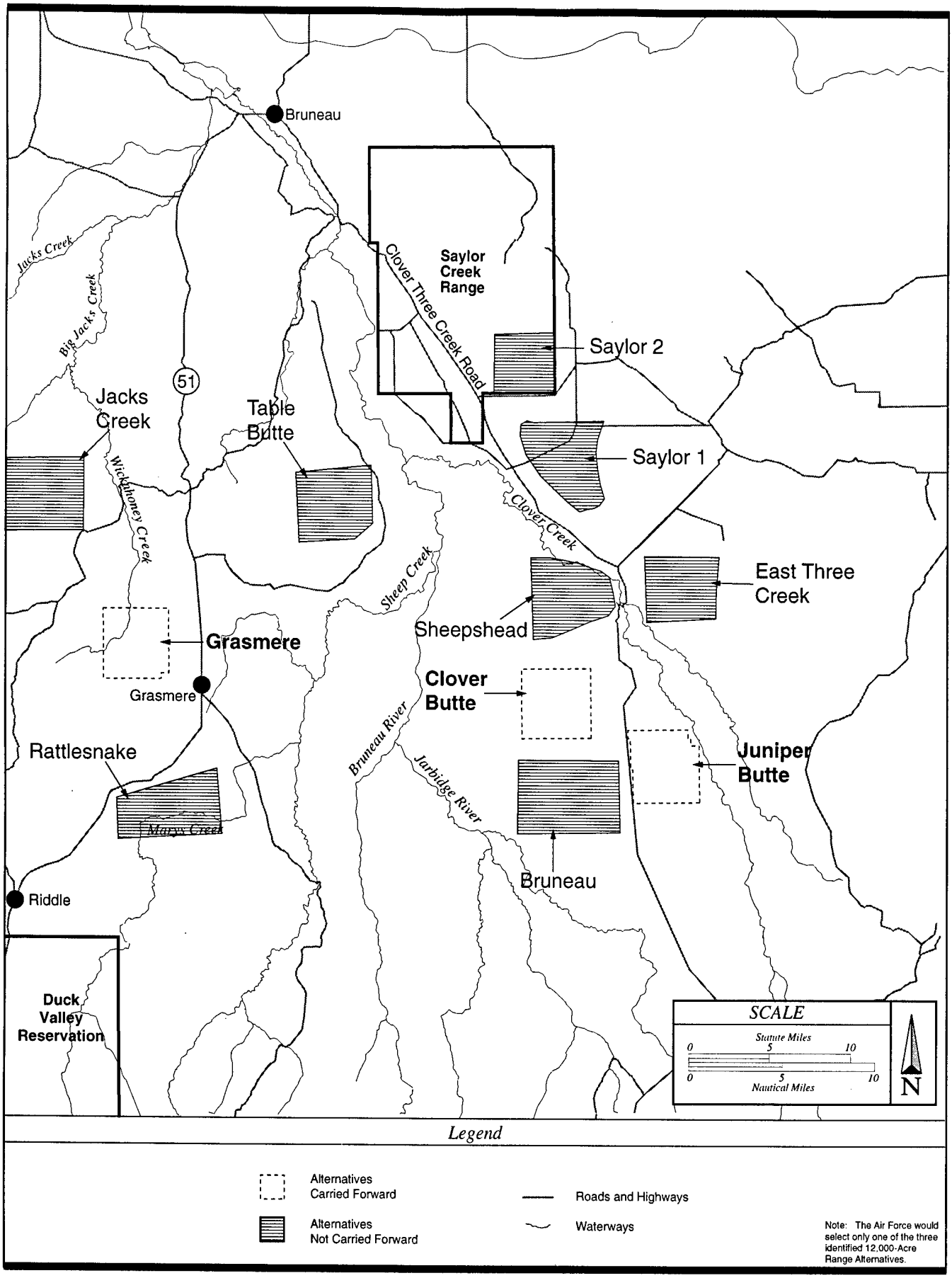



**Figure 2.1-1 Candidate Range Development Alternatives**

**Table 2.1-1. Candidate Range Development Alternatives and Environmental and Operational Considerations[1]**

| *Candidate Alternatives* | *360 Degree Approach* | *Establish Restricted Airspace* | *12,000 Acres Available* | *Flexibility* | *Simultaneous SCR Use* | *Flat Terrain* | *Access* | *Special Use Lands* | *Known Special Status Species/Habitat* | *Carried Forward for Detailed Analysis* |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Table Butte | no | yes | yes | yes | no | no | no | yes | yes | no |
| 2. Jacks Creek | no | yes | yes | yes | yes | no | no | yes | yes | no |
| 3. Rattlesnake | yes | yes | yes | yes | yes | yes | yes | yes | yes | no |
| 4. Saylor 1 | yes | yes | yes | yes | no | no | no | no | yes | no |
| 5. Sheepshead | yes | yes | yes | yes | no | no | no | no | no | no |
| 6. Bruneau | yes | yes | yes | yes | yes | yes | yes | yes | yes | no |
| 7. | yes | yes | yes | yes | yes | yes | yes | no | no | yes |
| 8. Grasmere | yes | yes | yes | yes | yes | yes | yes | no | no | yes |
| 9. Saylor 2 | no | yes | yes | yes | no | yes | yes | no | yes | no |
| 10. East Three Creek | yes[2] | yes | yes | yes | no | no | yes | no | no | no |
| 11. Juniper Butte | yes[2] | yes | yes | yes | yes | yes | yes | no | no | yes |

Notes: 1. Considerations were based on evaluation prior to field analysis
2. This consideration applies with a 2-mile extension on the eastern boundary of the MOA
Shading = Desirable attribute/conformance with consideration

*5. Sheepshead*

Located about 12 miles south of SCR, this candidate was not carried forward primarily because it would not allow a simultaneous use of the SCR. Portions of the site also contained steep and rocky terrain, making construction, access, and cleanup activities very difficult, as well as increasing the potential for erosion.

*6. Bruneau*

This candidate alternative, located about 26 miles south of SCR, conformed to the operational considerations, but also contained environmental concerns. It was not carried forward because it was near the Bruneau River-Sheep Creek WSA and because it contained three known rare plant species.

*7. Clover Butte*

This alternative conforms to all operational and environmental considerations. It lies a sufficient distance from the edge of the MOA and from SCR (about 19 miles), and it does not include or abut special use land management areas or habitat for protected species. Access from Clover-Three Creek Road is good, and relatively flat terrain dominates the site. Based on these considerations, this alternative warranted further environmental analysis and was designated Alternative B.

*8. Grasmere*

Located about 22 miles southwest from the target area on SCR, this candidate alternative offers predominantly flat terrain, excellent access from State Highway 51, a location that ensures 360 degrees of access by aircraft, and sufficient size to accommodate the required training activities. During the alternative identification process, no known habitat or cultural sites were noted based on existing information. This candidate alternative also conformed to the defined operational and environmental considerations. Therefore, this alternative warranted further environmental analysis in this EIS and was designated Alternative C.

### *CANDIDATE ALTERNATIVES IDENTIFIED THROUGH PUBLIC SCOPING*

The scoping process, in which the Air Force and BLM received input from the public and other agencies, offered the opportunity for the public to suggest different candidate alternatives and alternative sites. Scoping yielded three suggested alternatives: Saylor 2, located on the southeast corner of the existing SCR withdrawal; East Three Creek, located north of Clover Butte and east of Clover-Three Creek Road; and Juniper Butte, located south of Clover Butte and east of Clover-Three Creek Road. These candidate alternatives were then evaluated using the same process as discussed above.

*9. Saylor 2*

This candidate alternative was suggested because it would preclude the need for withdrawal of additional land for use by the Air Force. Saylor 2 lies within the existing boundaries of SCR, about 7 miles from the center of the target area. It also underlies R-3202. As such, this candidate alternative would be subject to all the airspace limitations associated with SCR. Moreover, it would not provide a 360-degree approach, nor would it provide sufficient geographic separation to permit simultaneous use of the tactical training range and existing SCR targets. Because of these limitations, this alternative was not carried forward in the analysis.

*10. East Three Creek*

This alternative is located about 15 miles southeast of SCR but approximately 13 miles from the eastern edge of the existing MOA, offering less than a 360-degree approach; with a two-mile extension of the MOA, the full 360-degree approach would be possible. Operationally, the location would provide the minimum distance from SCR. Environmentally, however, the steep and rugged terrain would hamper construction and cleanup of used training ordnance and could increase the possibility of erosion and sediment transport into the East Fork Bruneau Canyon (Clover Creek). Because of these limitations, this alternative was not carried forward in the analysis.

*11. Juniper Butte*

Juniper Butte, located about 25 miles southeast of SCR, offers relatively flat terrain, good access from Clover-Three Creek Road, and sufficient internal access. Similarly, it lies well away from special use land management areas and contains no known crucial or critical wildlife habitat, based on existing information. The East Fork of the Bruneau River lies adjacent to the northeast corner of the candidate site; this segment and nearby portions of this canyon do not contain any special use land management areas.

Operationally, the Juniper Butte candidate alternative lies 13 miles, not 15 miles from the eastern edge of the existing MOA. The alternative offered less than 360 degrees of access for aircraft without the eastward expansion of the MOA airspace; with expansion, the required full 360 degrees would be available to all aircraft. Since it conformed to all other environmental and operational considerations, the Air Force, in consultation with the BLM, determined it reasonable to propose a 2-mile expansion of the MOA to accommodate this candidate alternative. Therefore, Juniper Butte was carried forward for detailed environmental analysis and designated Alternative D.

### 2.1.2.2 NO-ACTION ALTERNATIVE

In the absence of developing a new local training range, no-drop targets, emitter sites, and associated airspace, the 366th Wing would continue to train using SCR, the MOAs, and Military

Training Routes (MTRs) and the existing remote ranges at Nellis Air Force Range (NAFR) and Fallon Training Range Complex (FTRC) in Nevada, and the Utah Test and Training Range (UTTR) in northwestern Utah. Continuation of training under the No-Action Alternative would not provide the enhancements needed by the 366th Wing, particularly because finite flying hours and funding would be expended in transit, not in training.

The No-Action Alternative was carried forward as Alternative A for detailed environmental analysis in this EIS. Section 2.2, below, describes this alternative.

#### 2.1.2.3 ALTERNATIVES CARRIED FORWARD FOR DETAILED ENVIRONMENTAL ANALYSIS

As a result of the alternative identification process, four alternatives were carried forward for detailed environmental analysis in this EIS:

- Alternative A – No Action
- Alternative B – Clover Butte (Range Development)
- Alternative C – Grasmere (Range Development)
- Alternative D – Juniper Butte (Range Development)

Each of these four alternatives is described in detail in sections 2.2 and 2.3.

## 2.2 ALTERNATIVE A — NO-ACTION

Under NEPA, "No Action" means that a proposed action (e.g., range development) would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward. Under the No-Action Alternative for ETI, no additional training range sites, emitter sites, or airspace would be developed. This alternative would not involve any land and realty actions, nor any modification to special use airspace. Aircrews would continue to perform the same training activities as they currently conduct, using existing local and remote ranges and airspace. However, cold spots or no spotting charges would be used at SCR. This would reduce the already low potential for non-explosive training ordnance-caused fires.

### 2.2.1 Range Use

Many comments were received from the public during the scoping process that expressed a desire for the Air Force to simplify the way it describes flights and aircraft operations in training airspace. In response, the following discussion provides a description of aircraft operations out of Mountain Home Air Force Base (AFB).

During the course of flight from takeoff through landing, military aircraft often use more than one defined airspace area. An airspace area may be a MOA, restricted area, or an MTR. For example, an aircrew in an F-15E would take off from Mountain Home AFB and fly in Paradise MOA, Owyhee MOA, SCR, then land at Mountain Home AFB. This results in one *sortie*, but would also account for three *sortie-operations*, one for each of the airspace areas. Sortie and sortie-operation (refer to section 1.1.2 and Appendix N for additional description) are used throughout this document to characterize aircraft operations.

This method of characterizing aircraft operations is used to differentiate between the flights conducted from takeoff to landing (sorties) and the use of airspace areas (sortie-operations). The number of sortie-operations is used to quantify the number of uses by aircraft and to accurately measure potential impacts, i.e., noise, air quality, and safety impacts. A sortie-operation is not a measure of time, nor does it indicate the number of aircraft in an airspace area during a given period.

Under the No-Action Alternative, the number and distribution of sorties and sortie-operations for ranges would remain the same as baseline. The 366th Wing would continue to train at SCR and the remote ranges – NAFR, FTRC, and UTTR.

### 2.2.1.1 BASELINE SORTIE-OPERATIONS AND NO-ACTION ALTERNATIVE SORTIE-OPERATIONS

Baseline and No-Action Alternative sortie-operations form the measure against which changes resulting from the different alternatives are evaluated. These sortie-operations account for the following:

- All annual aircraft sortie-operations conducted by the 366th Wing and other users of SCR and the MOAs within southwest Idaho and its vicinity;
- Annual sortie-operations for B-1B aircraft based at Mountain Home as part of the 366th Wing, projected according to the proposed action presented in the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Relocation of the 34th Bomb Squadron to Mountain Home AFB (Air Force 1996b); and
- Annual sortie-operations for A-10 and C-130 aircraft based at Gowen Field as replacements for the F-4G aircraft operated by the Idaho Air National Guard (IDANG), projected according to the proposed action presented in the EA and FONSI for the Aircraft Conversion for the 124th Wing (National Guard Bureau [NGB] 1996a).

The following discussion details the sources of the annual baseline and No-Action Alternative sorties for all users of SCR and the MOAs.

*366th Wing.* With the exception of the B-1B aircraft, the type, nature, and number of sorties and sortie-operations used in the baseline represent actual counts derived from scheduling and other information maintained by the managers of the airspace — the 366th Wing and 124th Wing. This information covers actual annual sorties by F-15E, F-16C, F-15C, and KC-135R aircraft from the 366th Wing, which account for 73 percent of the activity in the airspace. While sorties by these units may vary slightly (5-10 percent) from year to year due to deployments, utilization rates, weather conditions, and other factors, these totals represent the best available information on aircraft activities for baseline and the No-Action Alternative.

*B-1Bs as Part of the 366th Wing.* B-1B aircraft have operated in this airspace for several years, including as part of the 366th Wing while the B-1Bs were stationed at Ellsworth AFB. As noted in Chapter 1, this assigned B-1B squadron transferred to Mountain Home AFB in August of 1996. Since these aircraft have not been based at Mountain Home AFB for a year and were not based there for the period used to define the baseline for the remainder of the 366th Wing, projected numbers of sorties in each airspace unit were incorporated into baseline conditions and the No-Action Alternative. B-1Bs account for 3 percent of the sorties in the airspace. The projected annual sorties described in this EIS match those presented in the EA and FONSI (Air Force 1996b) addressing the relocation of the B-1Bs to Mountain Home AFB.

*124th Wing (IDANG).* Like the B-1Bs, the A-10 and C-130 aircraft were phased into the 124th Wing over a period of months (July-November) in 1996. The F-4G aircraft, which they replaced, had not been flown or had been removed very early in 1996. To consider the actual sorties performed by the 124th Wing during this period as baseline would yield an inaccurate description of the overall airspace use. Therefore, the projected number of sorties by A-10 and C-130 (19 percent of total sortie-operations in all local airspace) aircraft in each airspace unit were integrated with all other sorties for the baseline and No-Action Alternative. The projected annual sorties described in this EIS match those presented in the EA and FONSI (NGB 1996a) addressing the conversion of the 124th Wing from F-4Gs to A-10s and C-130s.

*Other Users.* Aircraft from other Air Force units and services (e.g., Navy) have regularly used SCR and the MOA airspace over the past three decades. Indeed, sorties by these other users, known as transients, accounted for a much larger proportion of the total activity in the past (i.e., 25 percent in 1991-1992). Currently, transients annually conduct less than 5 percent of the sortie-operations in each airspace unit. This would continue under the No-Action Alternative. The nature and number of sorties used in the baseline and No-Action Alternative reflecting transient activities consist of actual counts derived from scheduling and other information maintained by the 366th Wing and IDANG. The design of ETI to match the 366th Wing needs and the scheduling mitigations incorporated into range operations are expected to prevent any increased demand for airspace or range time by transient users.

### *Annual Variations in Sorties and Sortie-Operations*

Several factors influence annual variation in the number and distribution of sorties and sortie-operations for the 366th Wing:

- **Utilization rate.** The utilization rate essentially represents the number of sorties that a single aircraft will fly in a month. As such, it also influences the number of sortie-operations to a degree. The utilization rate is normally determined at the beginning of the fiscal year, and remains relatively constant during the year. Utilization rates vary from year to year due to changing Congressional appropriations and Air Force allocation of flying hours, which can cause variations to predicted use under any alternative, including the No-Action Alternative.

- **Evolution of training.** Baseline sortie-operations reflect the influence of the evolution of training for the 366th Wing. Changes in tactics associated with this evolution resulted in aircrews using higher altitudes for a greater proportion of training and conducting generally shorter duration sorties. Tactics will continue to evolve as the world geopolitical situation changes and as aircraft capabilities improve.

- **Weather.** Weather can influence where and when sortie-operations occur. It can also lead to concentrations of sortie-operations following periods of severe weather conditions. Weather conditions in the local flying area associated with Mountain

Home AFB are rarely severe enough to cause such problems. However, such conditions vary from year to year, and could cause variations to predicted use under any of the alternatives, including No-Action.

- **Deployments**. The 366th Wing is deployed to other bases throughout the year, usually for two periods of two weeks, to support a variety of training missions. National defense needs may require any portion of the Wing to deploy more frequently or for longer periods of time. For example, during 1996, the 366th Wing deployed parts of four squadrons to Turkey for Operation Provide Comfort, and part of one squadron to Jordan as part of an Air Expeditionary Force. Deployments vary from year to year, and can cause variations to predicted sortie-operations.

### *BASELINE AND NO-ACTION ALTERNATIVE TRAINING ACTIVITIES*

The 366th Wing represents the primary user of the existing airspace for SCR and the MOAs in southwest Idaho and its vicinity. As the primary user, scheduler, and manager of the airspace, the 366th Wing conducts a range of training activities, including continuation training (CT), limited CWT, and occasional OREs/ORIs. Section 1.3.1 of this EIS describes each of these sets of training activities in detail; Table 2.2-1 summarizes these activities and the general use of the airspace.

**Table 2.2-1. Baseline and No-Action Alternative Training Activities and Airspace Use by the 366th Wing at SCR and Local Airspace**

| *Training Activity* | *Primary Airspace Used* | *Frequency* |
|---|---|---|
| **CT** | | |
| Air-to-Ground | | |
| *Surface Attack Tactics* | SCR and associated MOAs, Owyhee MOA | Multiple times daily |
| *Conventional Weapons Delivery* | SCR and associated MOAs | Multiple times daily |
| *Tactical Weapons Delivery* | SCR and associated MOAs* | Multiple times daily* |
| Air-to-Air Training | | |
| *Advanced Handling* | Paradise and Owyhee MOAs | Multiple times daily |
| *Air Combat* | Paradise and Owyhee MOAs | Multiple times daily |
| *Low Altitude Air-to-Air* | Owyhee MOA | Multiple times daily |
| *Air Intercept* | Paradise and Owyhee MOAs | Multiple times daily |
| Other Training Requirements | | |
| *Low-Level Navigation* | MTRs and Owyhee MOA | Daily |
| *Electronic Combat* | SCR and associated MOAs, Owyhee MOA | Multiple times daily |
| *Aerial Refueling* | Aerial Refueling Tracks (above MOAs) | Daily |
| **CWT including ORE/ORI** | All* | 21 per year (51 performed at remote ranges) |

*Limitations of SCR and airspace restrict maneuvering and the number of aircraft that can participate.

The 366th Wing, as well as the other units using SCR and the existing MOAs, also dispense chaff and flares as part of training. Similarly, aircraft also conduct supersonic operations above 10,000 feet above ground level (AGL) in the MOAs over Idaho (excluding Duck Valley Reservation) as part of air-to-air training.

On average, the 366th Wing and other users conduct training at SCR and in the MOA airspace about 260 days per year. Normally, the 366th Wing conducts training Monday through Friday, including CT and CWT activities. About 85 percent of these sorties occur between 9 A.M. and 4 P.M., with some activity between 4 P.M. and 10 P.M. (9 to 11 percent) and after 10 P.M. (4 to 6 percent). A-10s and C-130s from the IDANG represent the primary users of the airspace during weekends, with some sorties occurring an average of two weekends per month. Transient use occurs primarily during the week.

The 366th Wing trains most of the year from Mountain Home AFB in the local airspace. Major elements of the Wing are deployed to other bases throughout the year, usually for two periods of two weeks, to support a variety of training missions. National defense needs may require any portion of the Wing to deploy more frequently or for longer periods of time.

### 2.2.1.2 SCR AND ASSOCIATED MOA USE

#### *SORTIE-OPERATIONS*

The 366th Wing represents the primary user of SCR and its six associated MOAs, accounting for 64 percent (4,965 of 7,737) of the sortie-operations. The IDANG accounts for about 32 percent (2,450 of 7,737 sortie-operations), whereas transients perform about 4 percent (322 of 7,737) of the annual sortie-operations.

SCR and its associated MOAs (Sheep Creek 1-3, Bruneau 1-2, Saylor) would continue to be scheduled together and receive use for CT (primarily air-to-ground training) and limited CWT. The 366th Wing would use the remote ranges for CT requirements that could not be fulfilled locally, a majority of CWT, especially that involving larger forces and more sophisticated tactical scenarios, and most OREs/ORIs. Table 2.2-2 presents a typical annual use of SCR and the remote ranges under the No-Action Alternative.

**Table 2.2-2. Use of SCR and Remote Ranges: Baseline and No-Action Alternative**

| | ANNUAL USE | |
|---|---|---|
| *Range* | *366th Wing* | *Total* |
| SCR and six associated MOAs: **Sortie-operations** | **4,965** | **7,737** |
| NAFR: *Sorties* | *1,492* | *64,333* |
| FTRC: *Sorties* | *267* | *31,147* |
| UTTR: *Sorties* | *669* | *15,797* |

Source: Mountain Home AFB 1996a

Under the No-Action Alternative, aircrews would continue to conduct the same type of training activities at SCR as occur now. Air-to-ground training would dominate the use of SCR and its associated restricted airspace. MOAs adjoining SCR would continue to be used and scheduled along with SCR, providing maneuvering and support airspace for range training activities.

SCR, along with the existing MOAs, would also continue to be used for limited CWT. Currently, the 366th Wing conducts approximately 72 CWT exercises per year, with 21 occurring in the airspace that includes SCR, its surrounding MOAs, the Owyhee, Paradise and Saddle MOAs, and MTRs. Under the No-Action Alternative, the 366th Wing would conduct the same number of CWT exercises as at present, although this CWT would continue to offer limited training value. The majority of CWT exercises would continue to be performed at remote ranges.

***TRAINING ORDNANCE USE***

At SCR and surrounding MOAs, the use of training ordnance would remain the same as baseline under the No-Action Alternative. Use of small (up to 25 pounds) training ordnance would be 22,725, whereas the use of larger (250 to 2,000 pounds) inert training ordnance would remain at approximately 1,049 annually.

The following lists the types of training ordnance that are currently used at SCR and would continue to be used under the No-Action Alternative.

- Bomb Dummy Unit (BDU)-33 or equivalent – Weighing 25 pounds, a BDU-33 is a small cast-iron and steel non-explosive training ordnance that can include a spotting charge to aid in visual scoring of weapons delivery. On impact, the spotting charge expels a plume of white smoke.

- BDU-50 – A BDU-50 consists of a concrete-filled steel shell weighing 531 pounds. This type of inert training ordnance includes a parachute-like device that deploys after release in order to slow its speed.

- Mk 82 Inert and 84 Inert – This type of inert training ordnance consists of a steel shell filled with concrete that weighs between 500 and 2,000 pounds.

- 20 millimeter (mm) and 30 mm steel cannon rounds (training rounds) used at approved strafe targets only.

Training ordnance is considered non-explosive since the training ordnance itself is not capable of exploding. Other than a spotting charge that creates smoke to aid in visual scoring and determine accuracy, the BDU-33 has no explosive material inside and does not explode into fragments on impact. A photograph of a used BDU-33 taken at SCR is on this section 2.0 divider page. BDU-33s or equivalent are referred to as non-explosive training ordnance, or just

as training ordnance, throughout this EIS. Inert ordnance, such as the BDU-50 and Mk82 and 84, contain no explosive material.

To reduce the effects of self-imposed restrictions on training ordnance delivery training, the Air Force will transition from the use of training ordnance with hot spot and cold spot spotting charges to training ordnance with cold spots or no marking devices. The spotting charges either consist of red phosphorous (hot spot) expelled by the explosive equivalent of two shotgun shells, or titanium tetrachloride (cold spot) expelled by about 2 grams of gunpowder. Upon impact, training ordnance containing hot spots discharge a narrow flame lasting a fraction of a second and is followed by smoke to aid in visual scoring. Cold spots discharge smoke, but no flame. Rather, the small amount of titanium tetrachloride mixes with moisture in the air to form, for a few seconds, a small marking plume. The cold spot ingredients become inert and dissipate upon contact with the air.

Since the potential for fire in the high desert represents a concern to all its users, elimination of training ordnance containing hot spots would remove one potential source of ignition. While current restrictions and precautions concerning the use of hot spots reduce this potential to negligible levels, the Air Force plans to eliminate use of training ordnance containing hot spots on SCR by about the year 2000.

Instead of training ordnance with hot spots, the Air Force will employ a combination of cold spots and training ordnance without spotting charges. Technological improvements in scoring systems cameras permit accurate scoring of non-explosive training ordnance deliveries (day or night) using only non-explosive training ordnance with cold spots or no spotting charges. The existing scoring system at SCR will be modified with the improved cameras, also by about the year 2000.

### *CHAFF USE*

Use of chaff has been approved and conducted at SCR, its associated MOAs, and throughout the Owyhee MOA for many years. Chaff is used by military aircraft as a defensive countermeasure to avoid detection by radar. It consists of fibers (called dipoles) coated with aluminum, about the thickness of fine human hair. This type of chaff has been used exclusively in the military training airspace over southwest Idaho and portions of Nevada and Oregon. When released in bundles from a dispenser in an aircraft, it spreads in the air to form an "electronic smoke screen" that reflects radar signals. In the air, the initial burst from a bundle forms a sphere about 300 feet in diameter, appearing on radar screens as an electronic cloud. The aircraft is obscured by the cloud, which confuses enemy radar. Two types of chaff are used by the Air Force: tactical chaff (RR-170) and training chaff (RR-188). Tactical chaff is primarily used during combat and consists of fibers with a variety of lengths cut to match radar radio frequencies. This type of chaff provides a false target to the radar. Usage of tactical chaff may obstruct radar used by commercial and civil aviation. To prevent this type of obstruction, any use of tactical chaff at SCR and the Owyhee and Paradise MOAs is coordinated with the FAA.

The 366th Wing enforces strict vertical and horizontal limits for the use of chaff to ensure non-interference with non-military traffic.

The preferred type of chaff used for aircraft training operations is RR-188 training chaff. Unlike tactical chaff, training chaff does not obstruct radar used by commercial and civil aviation. Specific chaff fiber lengths that may cause this type of obstruction, which is present in tactical chaff, are excluded during the manufacture of training chaff.

Chaff is dispensed in 4-ounce bundles composed of 500,000 to 3 million fibers, each with a diameter of 0.001 to 0.003 inches. Each fiber is coated with aluminum of 99 percent purity and a second coating of stearic acid. Fiber lengths vary from 0.375 to 2 inches for tactical chaff. The 2-inch length, which may obstruct air traffic control radars, is replaced with additional shorter length fibers in training chaff. Each chaff bundle is packaged in a plastic cartridge measuring 1 by 1 by 7 inches. The chaff is ejected from the plastic cartridge using a small, pyrotechnic device that remains on the aircraft, but chaff itself is not explosive. The chaff is dispensed into the atmosphere along with a small plastic end cap.

Currently, the 366th Wing and other users dispense almost 27,000 bundles of chaff per year over SCR and in its adjacent MOAs. Under the No-Action Alternative, chaff use would remain the same. Prohibitions against dispensing chaff over the Duck Valley Reservation and other communities would continue.

### *Flare Use*

The use of defensive countermeasure flares by aircraft forms a necessary part of realistic training; these defensive countermeasures provide false targets for adversary aircraft using thermal seekers or ground-based threats that simulate firing heat-seeking missiles. Flares consist of magnesium and teflon pellets that burn completely within 4 to 4.5 seconds after being dispensed. A flare begins burning immediately after it is expelled, reaching its highest temperature (1,000° Fahrenheit [F]) by the time it passes the tail of the aircraft.

As of March 1993, with the signing of the Interagency Agreement between the BLM and Mountain Home AFB, defensive countermeasure flares are approved for use within SCR and the Owyhee and Paradise MOAs, as well as those MOAs associated with SCR. Approximately 15,000 flares are dispensed over SCR and in its associated MOAs annually. A set of fire hazard and altitude restrictions (Mountain Home AFB Instruction 13-287 1995c) applied to all users of the airspace and supported by a fire management plan developed with the BLM, govern flare use in these areas. When operating over the SCR exclusive use area, aircrews may release flares as low as 700 feet AGL. Depending upon the fire index rating defined by the BLM with information from the National Weather Service, this minimum altitude can be raised to 2,000 feet AGL or prohibited completely. For activities over the remainder of the SCR and lands under all of the MOAs, minimum flare release altitude is 2,000 feet AGL. These minimum altitudes provide sufficient time for complete combustion and consumption of the flares before potential contact with the ground. The altitude restrictions provide a considerable buffer

against inadvertent low releases that might result in a burning material contacting the ground. In addition, the 366th Wing has dictated to all aircrews that flares will not be released over inhabited areas.

*ELECTRONIC EMITTERS*

A total of four electronic emitter sites provide locations for simulated ground-based threats against which aircrews from the 366th Wing and other units currently train. Three fixed electronic emitter sites lie within the exclusive use area of SCR, providing simulated threat signals out to a radius of about 10 NM. A fourth fixed emitter occurs within the existing Grasmere electronic combat site located along Highway 51, just south of the town of Grasmere. This emitter also provides coverage for a 10 NM-radius area.

### 2.2.1.3 REMOTE RANGES

For the No-Action Alternative, the 366th Wing would continue to use remote ranges and airspace at NAFR, FTRC, and UTTR. Training at these range complexes would include the following:

- Major exercises
- Live ordnance deliveries and missile firing
- Ordnance deliveries against tactical targets
- Simulated combat against dispersed electronic emitters

For the NAFR ranges and associated airspace, activities by the 366th Wing account for an estimated 5 percent of the cumulative total of sorties at the range complex. Like the local airspace, NAFR includes many ranges and MOAs, so a single aircraft can account for multiple sortie-operations during a single sortie, especially if it passes in and out of a specific airspace unit more than once. For FTRC, 366th Wing sorties represent less than 0.1 percent of the total; at UTTR they account for 4 percent. Under the No-Action Alternative, no change to this activity would occur. Given the low total number and proportion of sorties it conducts, the aircraft activities of the 366th Wing have negligible potential to influence overall environmental conditions at these ranges complexes. For this reason, discussion (see below) of NAFR, FTRC, and UTTR will be restricted to Chapter 2 of this EIS.

*NELLIS AIR FORCE RANGE*

NAFR is located in southern Nevada, 330 NM from Mountain Home AFB. NAFR includes approximately 3 million acres and consists of over 20 individual sub-ranges encompassed by five restricted areas and the adjacent Desert MOA. This complex is the largest in the Air Force inventory and provides Composite Force Training for strike forces that include nearly every type of combat and support aircraft. Approximately 64,000 sorties per year are conducted within this airspace. The North Range, which includes Restricted Areas R-4807 and R-4809,

provides a full tactical range capability that consists of simulated surface-to-air missile and anti-aircraft artillery sites, strategic electronic emitter systems, and appropriate acquisition and ground-controlled intercept radar. The South Range is included within Restricted Area R-4806 and consists of two manned and three unmanned weapons delivery sub-ranges that are used for testing, tactics development, and continuation training. These sub-ranges provide a variety of tactical and conventional weapons training capabilities that include target bombing circles, strafe pits, and a range of tactical type targets. The use of live ordnance, laser guided weapons, chaff, and flares is permitted within the designated range and target areas of both the North and South ranges.

The restricted airspace overlying the ranges extends from the ground surface to unlimited altitudes and is continuously active to support various Department of Defense (DoD) and Department of Energy missions and activities. The Desert MOA extends from 100 feet AGL up to but not including 18,000 feet above mean sea level (MSL) and has an overlying Air Traffic Control Assigned Airspace (ATCAA) up to 55,000 feet MSL. A range of air-to-air training missions is conducted in the MOA/ATCAA.

NAFR is used by the 57th Wing and the 99th Air Base Wing stationed at NAFR; other units from other bases and services also use NAFR. However, priority in scheduling of use is given to the primary users, those stationed at NAFR. During large group operations, range time is not available to non-participating or transient units. The primary users also have precedence for day-to-day training. Situations develop where aircrews from Mountain Home AFB or other bases are refused access to the range because of conflicts in schedules with primary users. Currently, the 366th Wing conducts about 1,500 sorties annually at the NAFR and associated MOAs; if the No-Action Alternative is selected, this level of activity would continue.

NAFR encompasses a large area that has been used for training for decades. Issues of environmental concern on the NAFR include access to geological deposits, relationship to DOE activities, effects of military operations on sensitive biological species, Air Force activities on Desert Wildlife Refuge, access to and protection of Native American sacred areas, and management of threatened and endangered species. The Air Force is preparing a draft EIS due in November 1998 for the renewal of the NAFR in accordance with Public Law (PL) 99-606.

### *UTAH TEST AND TRAINING RANGE*

The UTTR, located in northwestern Utah in the Great Salt Lake Desert, is a dedicated military reservation that provides the capabilities to support both conventional and tactical CT, CWT, and a multitude of weapons systems test programs. This range complex (scheduled and maintained by Hill AFB) encompasses five restricted areas and five MOAs that are divided to form the UTTR North and South Ranges. The North Range (350,000 acres) lies 175 NM from Mountain Home AFB. Segmented and small airspace units, along with a training range offering limited quality and realism, reduce the training value of the North Range to the 366th Wing. In contrast, the South Range, located about 200 NM from Mountain Home AFB, offers extensive MOA and restricted airspace opportunities to employ live ordnance and missiles, and

the capacity to perform supersonic operations in a broad range of altitudes. Given these differences, the 366th Wing attempts to primarily use the South Range. All of the restricted airspace overlying UTTR generally extends from the surface or 100 feet AGL to 58,000 feet MSL. The MOAs extend from 100 feet AGL to ceiling altitudes varying from 6,500 to 14,500 feet MSL, with the exception of the Gandy MOA, which extends to, but does not include, 18,000 feet MSL.

UTTR is currently used by the squadrons stationed at Hill AFB. It is a primary Air Force training and operation center, with an average of over 15,000 sorties per year. UTTR receives considerable use for weapons and aircraft testing, both of which can dominate use of the range to the exclusion of training activities. Similar to NAFR, scheduling use of the range is difficult for transient aircraft because of the priority given to primary users. The 366th Wing conducts about 700 sorties per year at UTTR, including CWT exercises. Under Alternative A, the number of CWT exercises and sortie-operations conducted at UTTR would remain the same.

Issues of environmental concern at the UTTR include the effects of noise on civilian populations in the area, noise over WSAs, management of sensitive species, and the proximity to Fish Springs National Wildlife Refuge, and historic trails.

#### *FALLON TRAINING RANGE COMPLEX*

The FTRC, located 240 NM from Mountain Home AFB in west-central Nevada, consists of five range areas and associated airspace infrastructure, including eight restricted areas and the Austin, Gabbs, Carson, and Ranch MOAs. This complex is used for both continuation and composite force training and is currently the only Navy-maintained facility where advanced integrated Carrier Air Wing strike training can take place. The FTRC impact area has four weapons delivery ranges and an electronic warfare range. Live and inert ordnance is used, where authorized, on the different weapons range target areas.

FTRC supports many priority missions including Top Gun, Top Dome, test and evaluation, and combat training. These Navy missions dominate range use, accounting for more than 90 percent of the sorties.

All restricted airspace, except R-4816, begins at the ground surface and extends to ceilings that currently vary from 8,000 to 18,000 feet MSL. The MOAs and their overlying ATCAA are used for air-to-air training and provide additional maneuvering airspace relative to the ranges. Out of a total of over 30,000 sorties performed at FTRC annually, the 366th Wing conducts less than 300, including CWT exercises. This level of use would not change under the No-Action Alternative. Such low amounts of use by the 366th Wing reflect the priority given to Navy Carrier Air Wing Training and associated uncertainties in scheduling operations at FTRC.

There are varied issues of environmental concern at FTRC, including the effects of military operations on Native American traditional use and sacred areas. More than 15 tribes are represented from the area and have an interest in the military use of the region by the federal government. The compatibility of high- and low-altitude, high-speed, aerial weapons training

with underlying land uses, wilderness areas, recreation sites, and wild horse herds is a major concern. The Navy is currently preparing an EIS for the withdrawal of 189,000 acres of public land in north-central Nevada. The U.S. Navy is also preparing a draft EIS due in November 1998 for the renewal of the Bravo-20 portion of the FRTC in accordance with P.L. 99-606.

## 2.2.2 MOAs

Under the No-Action Alternative, MOAs would continue to be used as in baseline. As presented previously, aircrews conduct a wide range of training activities in MOAs. Because of their vertical and horizontal dimensions, MOAs often offer the latitude to conduct air-to-air combat, air intercepts, and other training that requires maneuvering space. The 366th Wing primarily uses the six MOAs associated with SCR, and the Owyhee, Paradise, and Saddle MOAs; the latter three MOAs form the focus of this description. Use for the six MOAs associated with SCR was presented above in section 2.2.1.

Under No-Action, no modifications to the MOAs would occur. No MOA airspace would be established over the Little Jacks Creek area. However, this area would continue to form part of the FAA-approved Area X-Ray through which 366th Wing and other military aircraft would transit to and from the MOAs.

### 2.2.2.1 MOA Sortie-Operations

Table 2.2-3 presents the use of the MOAs under baseline and the No-Action Alternative.

**Table 2.2-3. MOA Use: Baseline and No-Action Alternative**

| | Annual Sortie-Operations | | |
|---|---|---|---|
| *Range* | *366th Wing* | *Others* | *Total* |
| Owyhee | 5,465 | 1,885 | 7,350 |
| Paradise | 4,604 | 487 | 5,091 |
| Saddle | 1,397 | 589 | 1,986 |

Source: Mountain Home AFB 1996a

Air-to-air training activities that could result in supersonic events would continue to be conducted above 10,000 feet AGL in the existing airspace over Idaho. This excludes airspace over the Duck Valley Reservation (refer to section 1.3.2.2 for details of these restrictions). Based on substantial field monitoring, analysis, and modeling (see section 3.2, Noise, for a detailed description), it has been established that, on average, 10 percent of sorties engaged in air combat maneuvering will perform activities that could involve brief supersonic flight. Currently, in the portion of the Paradise MOA overlying Idaho and portions of the MOAs associated with SCR, approximately 537 annual sortie-operations conduct the type of

maneuvering potentially resulting in supersonic flight. All of this activity occurs above 10,000 feet AGL, as required, and most of it is performed in the ATCAA above the MOAs that extends from 18,000 feet MSL (12,000-15,000 feet AGL) to 50,000 feet MSL. For the No-Action Alternative, sortie-operations with the potential to result in supersonic events would remain the same. The air combat maneuvering that potentially results in supersonic flight would remain brief (16 to 90 seconds) for an individual sortie-operation.

#### 2.2.2.2 CHAFF AND FLARE USE

Chaff has been used in the military training airspace associated with SCR for many years. Flares have been used in this same airspace for over five years. Neither chaff nor flares are used in the Saddle MOA. Table 2.2-4 presents chaff and flare use under baseline conditions and the No-Action Alternative.

**Table 2.2-4. Chaff and Flare Use in Owyhee and Paradise MOAs: Baseline and No-Action Alternative**

| *MOA* | *Annual Chaff Use (Bundles)* | *Annual Flare Use* |
|---|---|---|
| Owyhee | 12,142 | 6,053 |
| Paradise | 9,934 | 4,566 |

Note: Refer to Table 2.3-14 for chaff and flare use in SCR.
Source: Mountain Home AFB 1996a

Dispensing of chaff under any alternative would continue to follow current procedures. These include no releases over the Duck Valley Reservation or other communities under the airspace and adherence to altitude and locational restrictions for dispensing chaff so as to not cause interference with air traffic control radar and communications. Flare use would remain the same. As described for SCR and its associated MOAs, the 2,000-foot AGL restriction provides more than ample time for a flare to burn completely prior to contact with the ground.

### 2.2.3 MTRs

As described in Chapter 1, a set of 13 MTRs in the region provide for low-altitude navigation training and access to MOAs. Although MTRs are important assets for training, current levels of use (i.e., annual sortie-operations) provide sufficient training opportunities for the 366th Wing and other users. For this reason, no changes in the types or number of aircraft using these existing MTRs would occur under the No-Action Alternative or any other alternative.

Portions, also known as segments, of MTRs underlie the existing Saddle and Paradise MOAs. Segments also underlie areas slated for the proposed Paradise East MOA expansion. While these overlapping MOAs would not alter the use of the MTR segments, this EIS accounts for the potential combined effects of the use of overlapping MTR segments and MOA airspace.

## 2.3 RANGE DEVELOPMENT ALTERNATIVES

The proposed action consists of enhancing training in Idaho for the 366th Wing. Because each of the three equivalent range development alternatives could provide the necessary enhancement, none represents the proposed action, or even the preferred alternative. Rather, any of the range development alternatives would meet the 366th Wing's needs for training. The Air Force, in consultation with the BLM, has chosen to use the environmental analysis process and public and agency input to assist in identifying a preferred alternative to fulfill the proposed action.

In the Notice of Intent (NOI) published on 12 April 1996 in the *Federal Register*, the Air Force identified two alternatives (B and C) under which a range would be established, airspace modifications would occur, and emitter sites would be developed. Public scoping sessions yielded a third alternative (D) that conformed to the defined operational and environmental considerations. Either Alternative B (Clover Butte), Alternative C (Grasmere), or Alternative D (Juniper Butte) could be developed and used in identical fashion and each would include the same number and size of no-drop targets and emitter sites. The three alternatives are also very similar in the modifications to airspace; however, Alternative D includes a 2-mile extension of the eastern boundary to existing MOAs (Bruneau 1 and 2). As such, the components comprising each alternative that warrant analysis in the EIS and associated studies are the same, even though the locations of the proposed components differ. Table 2.3-1 lists the proposed components for these alternatives.

The following section describes the three range development alternatives currently under consideration: Clover Butte, Grasmere, and Juniper Butte. Under any of these alternatives, the Air Force would establish a tactical training range, along with other facilities. Figures 2.3-1, 2.3-2, and 2.3-3 depict the on-the-ground components of Alternative B, Alternative C, and Alternative D, respectively. The training range would be used with the existing and proposed training assets for the 366th Wing, Alternative B, C, or D would include the following:

- Construction, operation, and use of a tactical training range covering approximately 12,000 acres;
- Development and use of four five-acre and one 640-acre no-drop areas on which only simulated ordnance training (i.e., no training ordnance would be dropped) would occur;
- Establishment of 20 one-quarter-acre and 10 one-acre sites for use by electronic emitter units; and
- Modification of existing airspace, including expansion of MOA airspace and establishment of a restricted area over the tactical training range.

**Table 2.3-1. Components of Alternatives B, C, and D**

| *Alternative Component* | *Training Range* | *No-Drop Targets* | *Emitter Sites* | *Airspace Modification* |
|---|---|---|---|---|
| **Land and Realty Action** | | | | |
| Land Withdrawal – Federal Lands | x | x | x | |
| Rights of Way – Federal Lands[1] | x | x | x | |
| Lease – State School Endowment Lands | x | x | x | |
| **Construction/Maintenance** | | | | |
| Targets | x | x | | |
| Roads | x | x | x | |
| Maintenance Facility | x | | | |
| Generators/Fuel Storage | x | x | x[2] | |
| Electrical Lines | x[3] | | | |
| Fencing | x | x | x[4] | |
| Surfacing/Grading | x | x | x | |
| Communications | x | | x[6] | |
| Scoring System | x | | | |
| Fire Prevention/Suppression | x | x | x | |
| Waste Management | x | x | x | |
| Training Ordnance Clean-Up | x | | | |
| **Training Activities** | | | | |
| Training Ordnance Use | x | | | |
| Chaff/Flares[5] | x | x | x | x |
| Airspace Use | x | x | x | x |
| **Land Use Management** | | | | |
| Grazing/Grazing Privileges | x | x[7] | | |
| Access/Safety | x | x | x | x |
| Natural and Cultural Resources | x | x | x | x |

Notes:
1. Includes access rights to training range, no-drop targets, and emitter sites
2. Only one-acre emitter sites would include permanent fuel storage in double-walled above-ground tanks with secondary containment
3. Alternative B and D would involve construction of a 208-volt line from linking an existing transmission line to the maintenance facility; no line is proposed for Alternative C
4. Only one-acre emitter sites would be fenced; one quarter-acre emitter sites would not be fenced or include any features other than a gravel parking pad and a grounding rod
5. Use of chaff and flares throughout the airspace has been approved and conducted since 1992; for all alternatives this use would continue under existing restrictions
6. Communication monopole only at selected one-acre emitter sites
7. Only ND-1 (640-acre no-drop target)

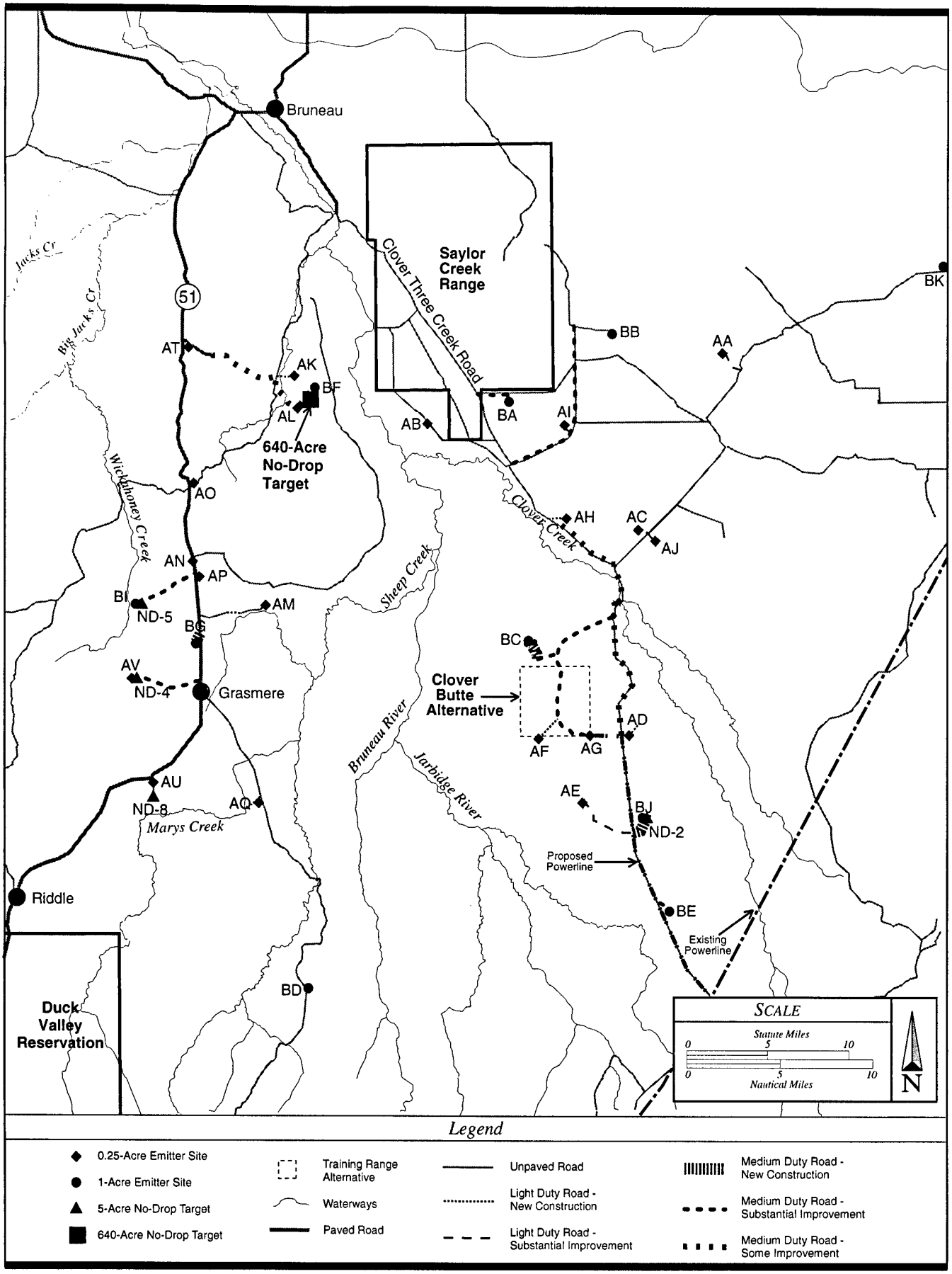



**Figure 2.3-1 Components for Alternative B - Clover Butte**

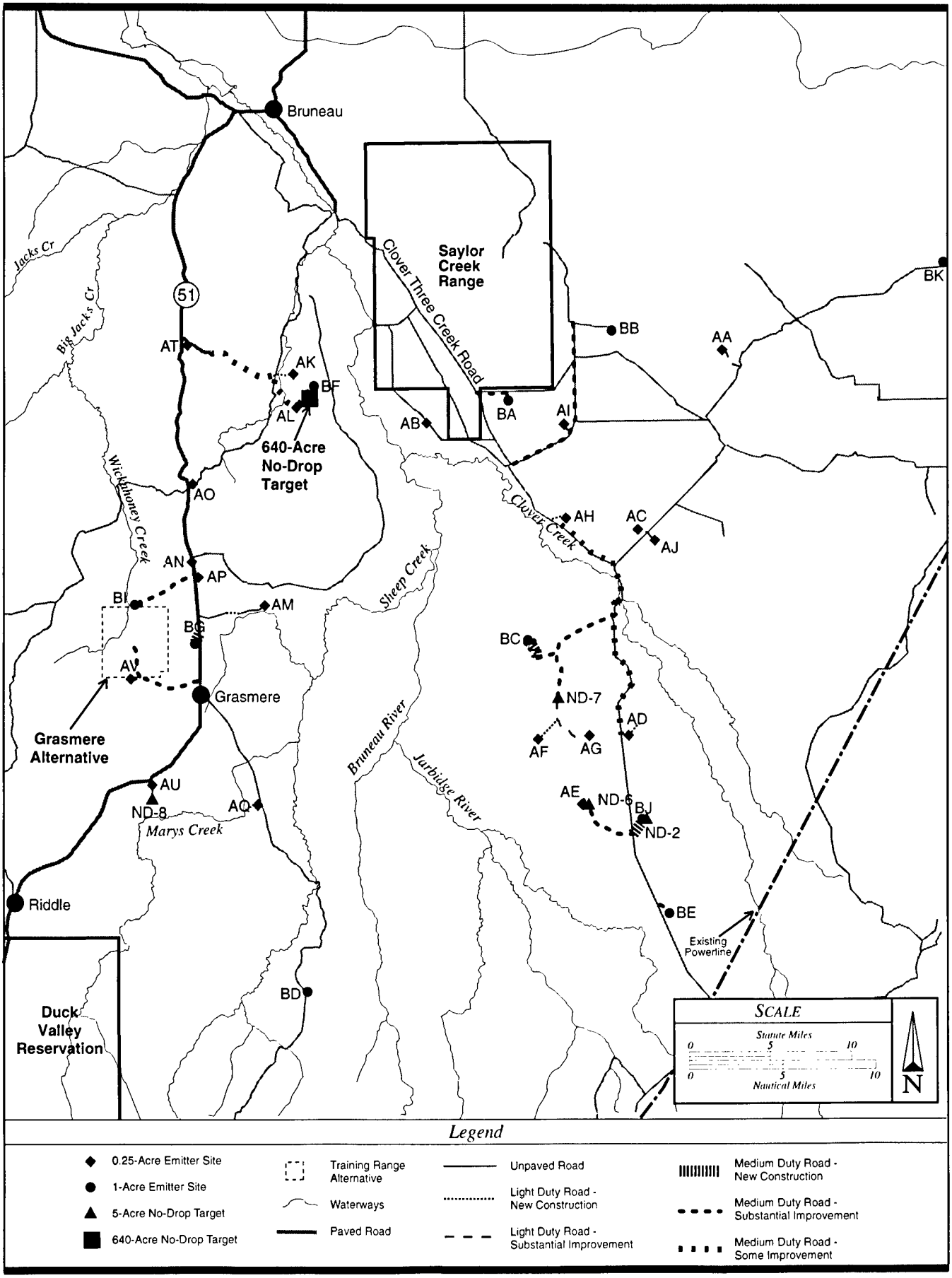



**Figure 2.3-2 Components for Alternative C - Grasmere**

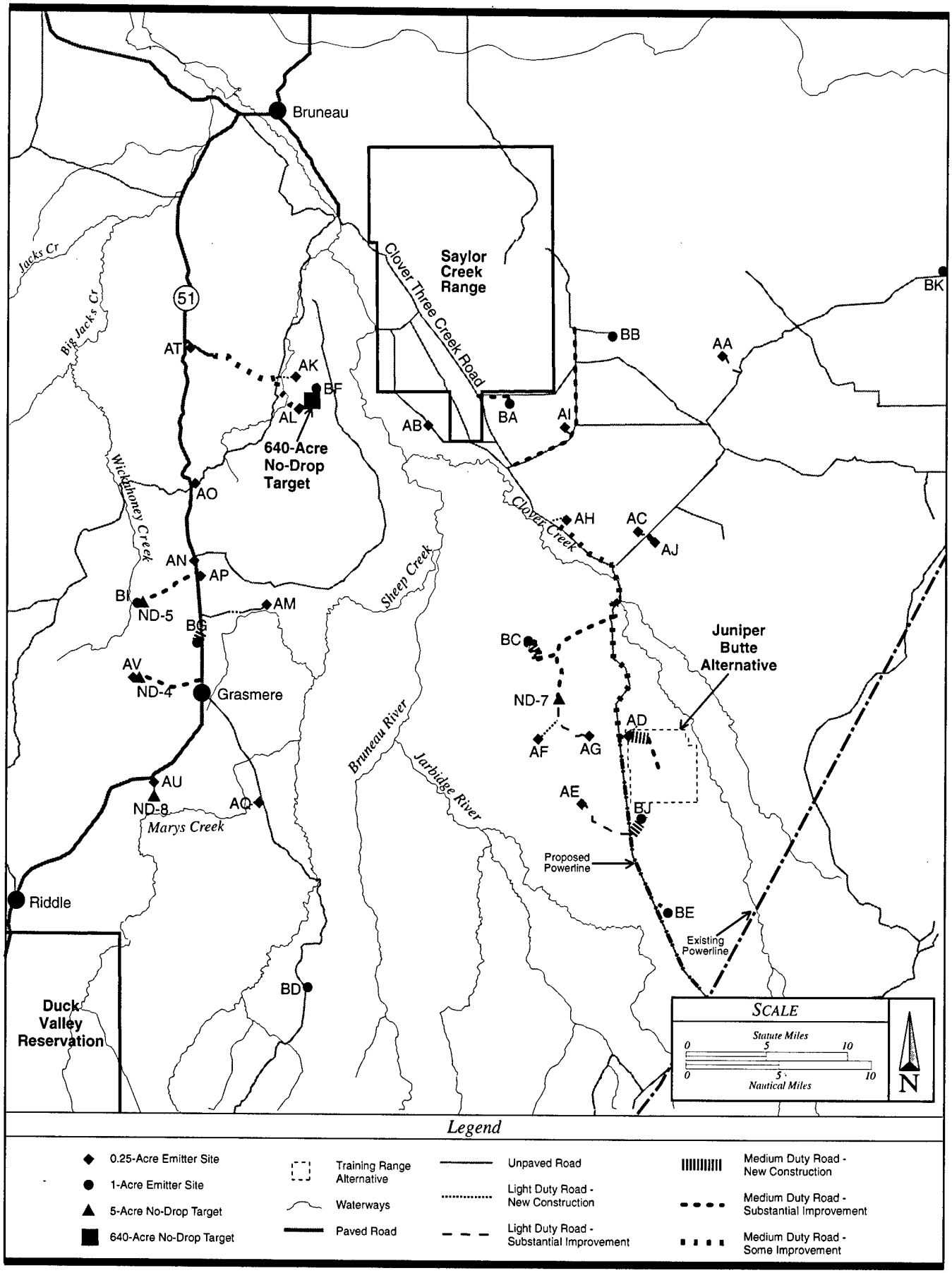



**Figure 2.3-3 Components for Alternative D - Juniper Butte**

The following section outlines the elements of these alternatives according to seven major categories: land and realty actions (2.3.1), construction and maintenance (2.3.2), proposed airspace modifications (2.3.3), training ordnance use (2.3.5), chaff and flares (2.3.6), other activities (2.3.7), and land use management (2.3.4).

### 2.3.1 LAND AND REALTY ACTIONS

Most of the lands within the proposed tactical range, no-drop targets, and emitter sites for these alternatives consist of public lands administered by the BLM. The remainder of the affected lands are owned by the State of Idaho. No private lands would be used for the training range, no-drop sites, emitters, or roads.

To assume management responsibility for the training range, targets, and emitter locations, the Air Force needs to accomplish several types of land and realty actions with BLM and the State of Idaho. These actions include withdrawal of land, real property leases, right-of-way agreements, and use agreements. Federal, state and local agencies hold relevant rights and authorities to these lands. Table 2.3-2 includes a summary of these processes and Table 2.3-3 identifies the current land status for the proposed tactical range, no-drop targets, and emitter sites.

#### 2.3.1.1 LAND WITHDRAWAL — FEDERAL LAND

The Air Force proposes to withdraw public lands for the tactical range, no-drop target sites, and the one-acre emitter locations. A withdrawal would allow for the transfer of all or part of the management responsibility from the BLM to the Air Force. Under the Engle Act of 1958, a military withdrawal of over 5,000 acres of public land must be approved by Congress. For Alternatives B, C, and D, the proposed withdrawal of public lands would exceed 5,000 acres.

**Alternative B — Clover Butte.** The Air Force proposes to withdraw 11,864 acres of public land in Owyhee County consisting of approximately 11,200 acres within the proposed Clover Butte site, the entire 640-acre target area, three five-acre no-drop target areas, and nine one-acre emitter sites (Table 2.3-4).

**Alternative C — Grasmere.** For Alternative C, the Air Force proposes to withdraw approximately 9,264 acres of public land in Owyhee County. This land consists of approximately 8,600 acres within the proposed Grasmere site, the 640-acre no-drop target area, three five-acre target areas, and the same nine, one-acre emitters described for Alternative B.

**Alternative D — Juniper Butte.** The Air Force proposes to withdraw approximately 11,269 acres of public land in Owyhee County. This land includes approximately 10,600 acres for the proposed Juniper Butte site, the entire 640-acre no-drop target area, four five-acre target areas, and the same set of one-acre emitter sites as listed for Alternative B.

**Table 2.3-2. Summary of Federal, State and Local Agency Lands and Realty Processes**

| *Jurisdiction* | *Project Component* | *Process* | *Elements* | *Decisionmaker* | *Permit Type* |
|---|---|---|---|---|---|
| BLM | Portions of 12,000-acre range, 640-acre no-drop, five-acre no drop targets, one-acre emitter sites | Withdrawal of Lands | • Application Interagency Consultation<br>• NEPA documentation and studies<br>• Withdrawal Resource Management Plan<br>• State and national review<br>• Congressional action | Congress | Act of Congress |
| BLM | One-quarter- acre emitters sites, roads, powerline, access to emitter sites, no-drop targets, and training range<br><br>Water pipeline relocation | Right-of-way | • Application<br>• Environmental information<br>• District level review and decision<br>• NEPA documentation and studies | Area manager | Right-of-way |
| State of Idaho | Portions of 12,000-acre range, one-quarter-acre and one-acre emitter sites, five-acre no-drop targets | Lease | • Application<br>• Management Plan preparation<br>• Agency and State Land Board review<br>• Board decision | State Land Board | Lease |
| State of Idaho | Access to emitter sites and no-drop targets | Lease or easement | • Application<br>• Management Plan preparation (lease application only)<br>• Agency and State Land Board review<br>Board decision | State Land Board | Lease |
| Owyhee County | Access to emitter sites and no-drop targets | Use agreement | • Acknowledgment of use | Owyhee County Commissioners | Use agreement |
| Local Highway District | Access to emitter sites and no-drop targets | Use agreement | • Acknowledgment of use | Local highway district | Use agreement |

**Table 2.3-3. Land Status for Alternative Components**

| *Component* | LAND STATUS | | |
|---|---|---|---|
| | *Alternative B Clover Butte* | *Alternative C Grasmere* | *Alternative D Juniper Butte* |
| Tactical Training Range | BLM, State of Idaho | BLM, State of Idaho | BLM, State of Idaho |
| 640-acre No-Drop Target (ND-1) | BLM | BLM | BLM |
| Five-acre ND-2* | State | State | NA |
| Five-acre ND-4 | BLM | NA | BLM |
| Five-acre ND-5 | BLM | NA | BLM |
| Five-acre ND-6 | NA | BLM | NA |
| Five-acre ND-7 | NA | BLM | BLM |
| Five-acre ND-8 | BLM | BLM | BLM |
| **One-acre Emitter Sites*** | | | |
| BA, BB, BC, BD, BE, BF, BG, BI, BK | BLM | BLM | BLM |
| BJ | State | State | State |
| **One-quarter-acre Emitter Sites*** | | | |
| AA, AB, AD, AE, AF, AG, AH, AI, AK, AL, AM, AN, AO, AP, AQ, AT, AU, AV | BLM | BLM | BLM |
| AC, AJ, | State | State | State |

*Note: ND-3, BH, AR, and AS were eliminated due to environmental and operational considerations.

**Table 2.3-4. Acreages[1] of Proposed Land and Realty Actions for Proposed Training Range, No-Drop Targets, and Emitter Sites**

| *Land Status* | *Action* | *Alternative B* | *Alternative C* | *Alternative D* |
|---|---|---|---|---|
| Public Land | Withdrawal | 11,864 | 9,264 | 11,269 |
| | Right of Way[2] | 4.50 | 4.50 | 4.50 |
| State Land | Lease | 646.50 | 2,406.50 | 961.50 |
| Total | | 12,515 | 11,675 | 12,235 |

Notes: 1. Acreage represents the legal land records recorded on the BLM's Master Title Plats; proposed acreage references have been rounded up for lands subject to withdrawal.
2. Includes only rights-of-way for emitter sites; road rights-of-way are discussed in section 2.3.2.4.

The final withdrawn acreage may vary slightly (1-2 percent) in a legal survey of the site. For the purposes of this EIS, 12,000-acre areas are used to describe the tactical training range.

### 2.3.1.2 Rights-of-Way — Federal Land

For all range alternatives, a total of 18 one-quarter-acre emitter sites are located on public lands. To use these lands, the Air Force proposes to obtain rights-of-way from the BLM. Similarly, roads crossing public lands would require rights-of-way (see section 2.3.2.3).

One or more stock water pipelines may cross a 12,000-acre tactical range site in such a fashion that the Air Force may need to relocate these pipelines for protection against damage from training activities. Relocating a water pipeline on BLM land would require obtaining either a range improvement permit or an amended or new BLM right-of-way. A stock water pipeline may also be relocated through Air Force withdrawn lands, if necessary, to ensure in-kind compensation for ranching operations. If a pipeline is relocated, the Air Force would work with the BLM and owner of the pipeline using the appropriate process. The Air Force's normal practice involves the local owner relocating the pipe with the Air Force paying the local owner for the cost of relocation.

### 2.3.1.3 Lease — State Land

Use of State of Idaho school endowment lands would be permitted through a lease agreement with the State of Idaho, Department of Lands.

**Alternative B — Clover Butte.** State school endowment lands would comprise approximately 646.50 acres, with 640 acres within the proposed range site and the remainder consisting of one five-acre target area, one one-acre emitter site, and two one-quarter-acre emitter sites.

**Alternative C — Grasmere.** State school endowment lands would account for 2,406.50 acres, most of which lie within the Grasmere tactical range site. State school endowment lands would also include one five-acre no-drop target area, and the same set of emitter sites as in Alternative B. Roads and other rights-of-way would remain the same as in Alternative B.

**Alternative D – Juniper Butte.** A total of 961.50 acres of state school endowment lands would be leased. About 960 of these acres would lie within the proposed training range site, with the remainder consisting of lands for emitter sites.

#### 2.3.1.4 OTHER PARTY AGREEMENTS

Use of some access roads may also require authorization from Owyhee County or the Three Creek Good Roads Highway District. The Air Force would enter into appropriate agreements with these entities.

#### 2.3.1.5 NON-PROJECT LANDS

No private land will be acquired or used for any project components. To the extent that livestock grazing operations are disrupted, the Air Force proposes to compensate the permittee through monetary or in-kind compensation. In-kind compensation could include fencing, moving pipelines, extending pipelines, and constructing above-ground water reservoirs as required to meet permittee requirements and to comply with accepted grazing management practices. In-kind compensation could involve acquisition of private lands for in-kind livestock grazing operations. The lands would consist of those already used for livestock grazing. No in-kind compensation land could be used for any training range facilities including no-drop targets or emitters.

### 2.3.2 Construction/Maintenance

#### 2.3.2.1 TRAINING RANGE AND NO-DROP TARGETS

Under any of the three training range development alternatives, the tactical training range would be surrounded by a fence (see Fencing below for more details) and contain four targets consisting of a simulated industrial complex, two surface-to-air missile targets, and a forward edge of battle area array. Target type and construction would remain the same for all alternatives. Limited grading would be required since the targets would be constructed atop the ground surface. The targets would be situated within fenced areas totaling 300 acres in the center of the range, known as the primary training ordnance impact area. The targets themselves, without the encompassing impact areas, cover roughly 70 acres. The primary training ordnance impact area, which encompasses the targets, represents the land area most subject to ground disturbance impacts from training ordnance. It is estimated that approximately 95 percent of training ordnance would impact in this zone. Observations at SCR concerning BDU-33 or equivalent training ordnance indicate that ordnance impacts predominantly occur within 300 feet of a target (Peter 1989). For the proposed target

configurations associated with Alternatives B, C, and D, the zone including the targets and 300 feet beyond their limits encompasses about 250 acres. Thus, the 300-acre primary training ordnance impact area defined for this analysis provides roughly 20 percent more area for which primary training ordnance impacts are assessed. A gravel road would provide access to these targets from the three-acre maintenance facility located at an edge of the 12,000-acre site.

**Alternative B — Clover Butte.** The 12,000-acre tactical range at the Clover Butte location would contain four targets as described above (Figure 2.3-4). A three-acre maintenance facility, linked to the targets by a gravel road, would lie in the southeast corner of the site. The Clover Butte alternative would include the 640-acre no-drop target (ND-1) and four five-acre no-drop targets (Table 2.3-5) located west and southeast of the range site. These dispersed no-drop targets would consist of a Forward Edge of Battle Area (FEBA) array (ND-1), two simulated industrial sites (ND-4 and 5), a surface-to-air missile (SAM) site (ND-8), and a simulated early warning radar site (ND-2). All of the targets would be painted in desert beige to reduce their contrast with the surrounding landscape.

**Table 2.3-5. No-Drop Target Areas under Alternatives B, C, and D[1]**

| *Alternative* | *ND-1* | *ND-2* | *ND-4* | *ND-5* | *ND-6* | *ND-7* | *ND-8* |
|---|---|---|---|---|---|---|---|
| B-Clover Butte | x | x | x | x | | | x |
| C-Grasmere | x | x | | | x | x | x |
| D-Juniper Butte | x | | x | x | | x | x |

Note: 1. The site considered for ND-3 was replaced by ND-8 and excluded from further analysis as part of the Air Force's efforts to mitigate by avoidance.

**Alternative C — Grasmere.** This alternative would consist of a tactical training range with four targets (Figure 2.3-5), a 640-acre no-drop target (ND-1), and four five-acre no-drop targets (see Table 2.3-5). The types, structures, and arrangement of targets would be the same as in Alternative B. Located at the southern edge of the 12,000-acre training range site, the three-acre maintenance facility would connect to the targets via a gravel road.

**Alternative D — Juniper Butte.** The 12,000-acre tactical range at the fenced Juniper Butte location would include the same four targets and maintenance facility as described above (Figure 2.3-6). The maintenance facility would be located in the northeast corner of the site. Under this alternative, the 640-acre no-drop site (ND-1) and three of the five-acre sites (ND-4, 5, and 8) would remain the same as in Alternative B. Due to the location of the 12,000-acre training range in Alternative D, one of the five-acre sites (ND-7) would shift location.

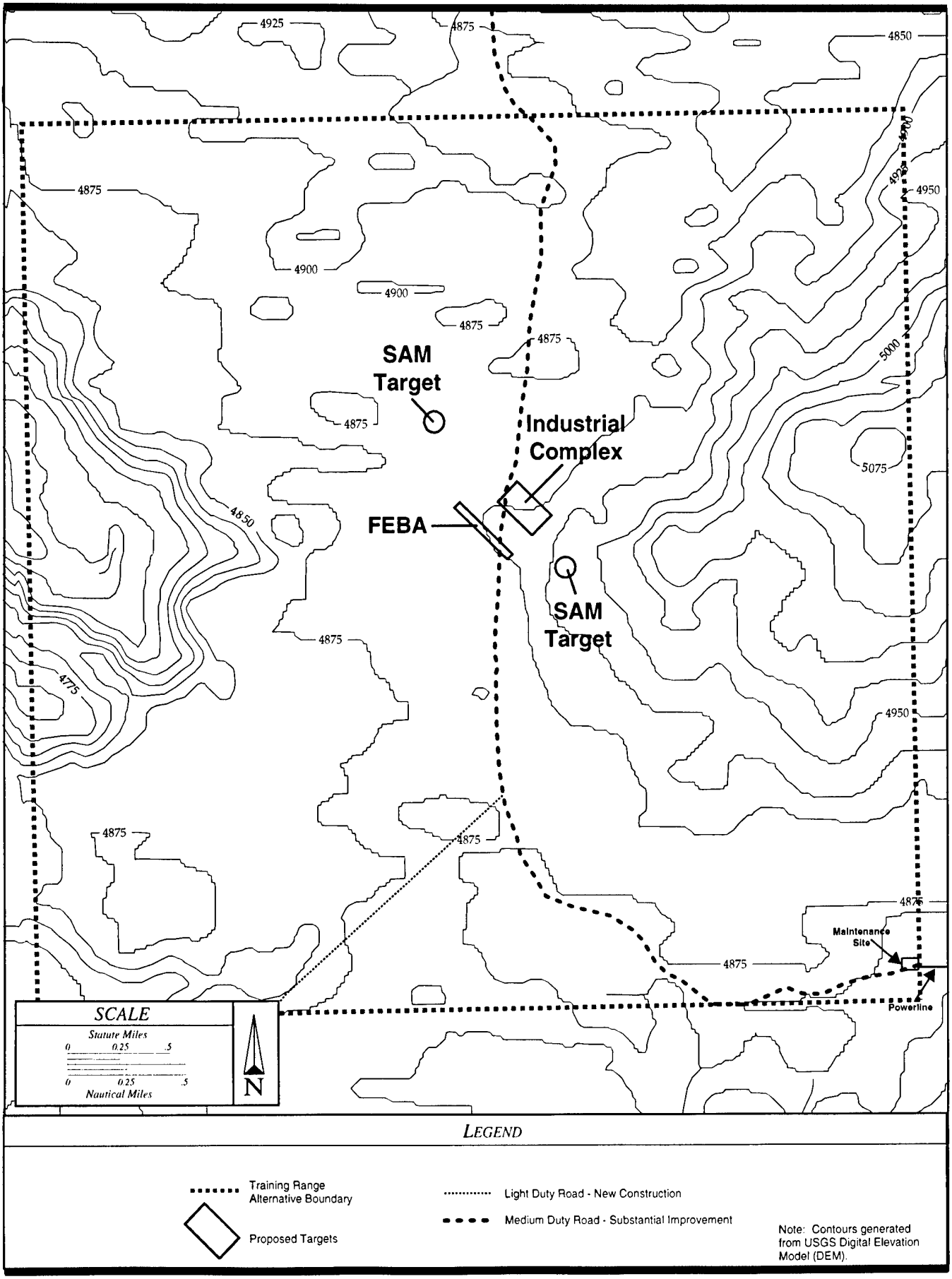



**Figure 2.3-4 Target Areas in Alternative B: Clover Butte**

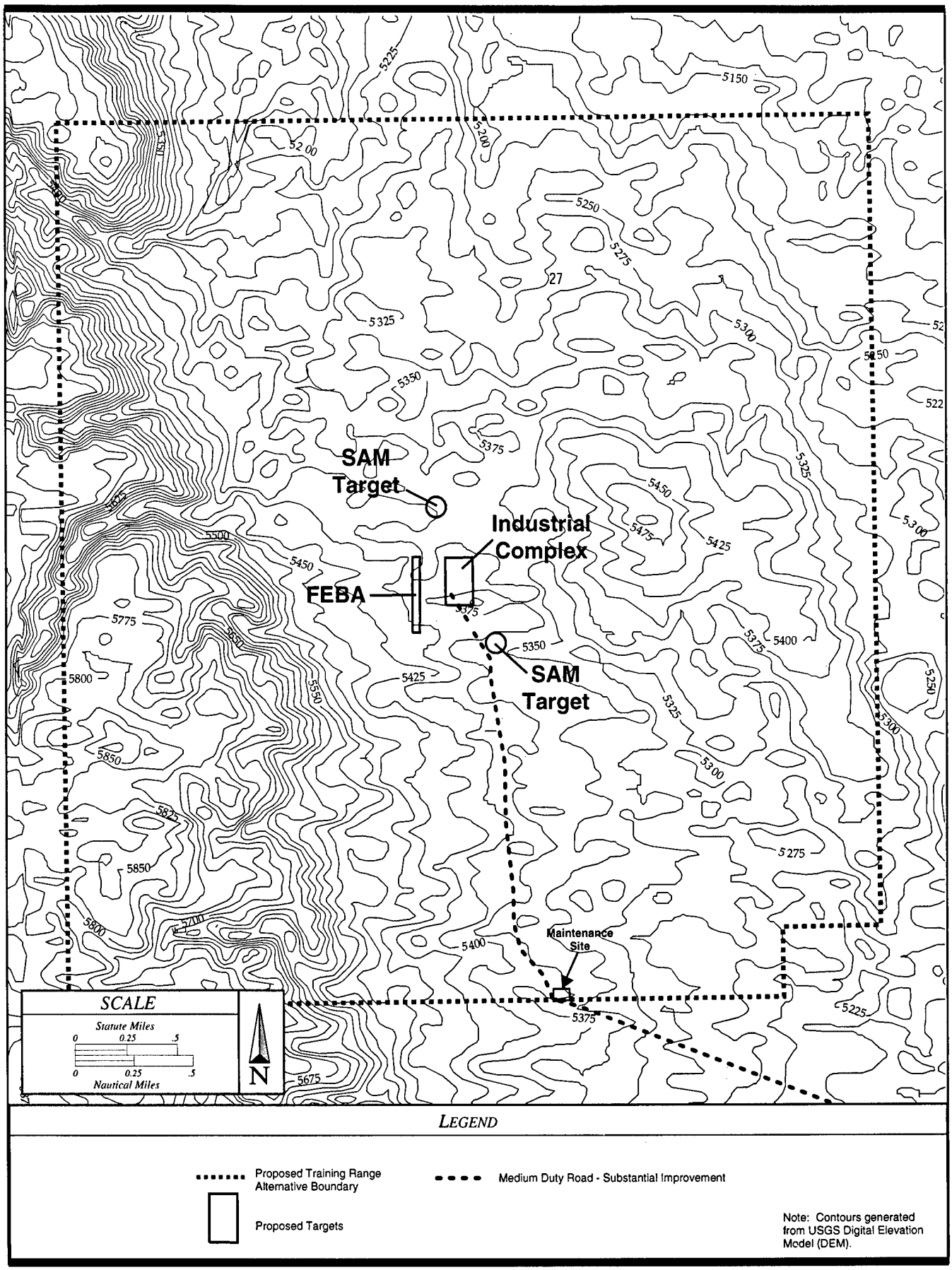



**Figure 2.3-5 Target Areas in Alternative C: Grasmere**

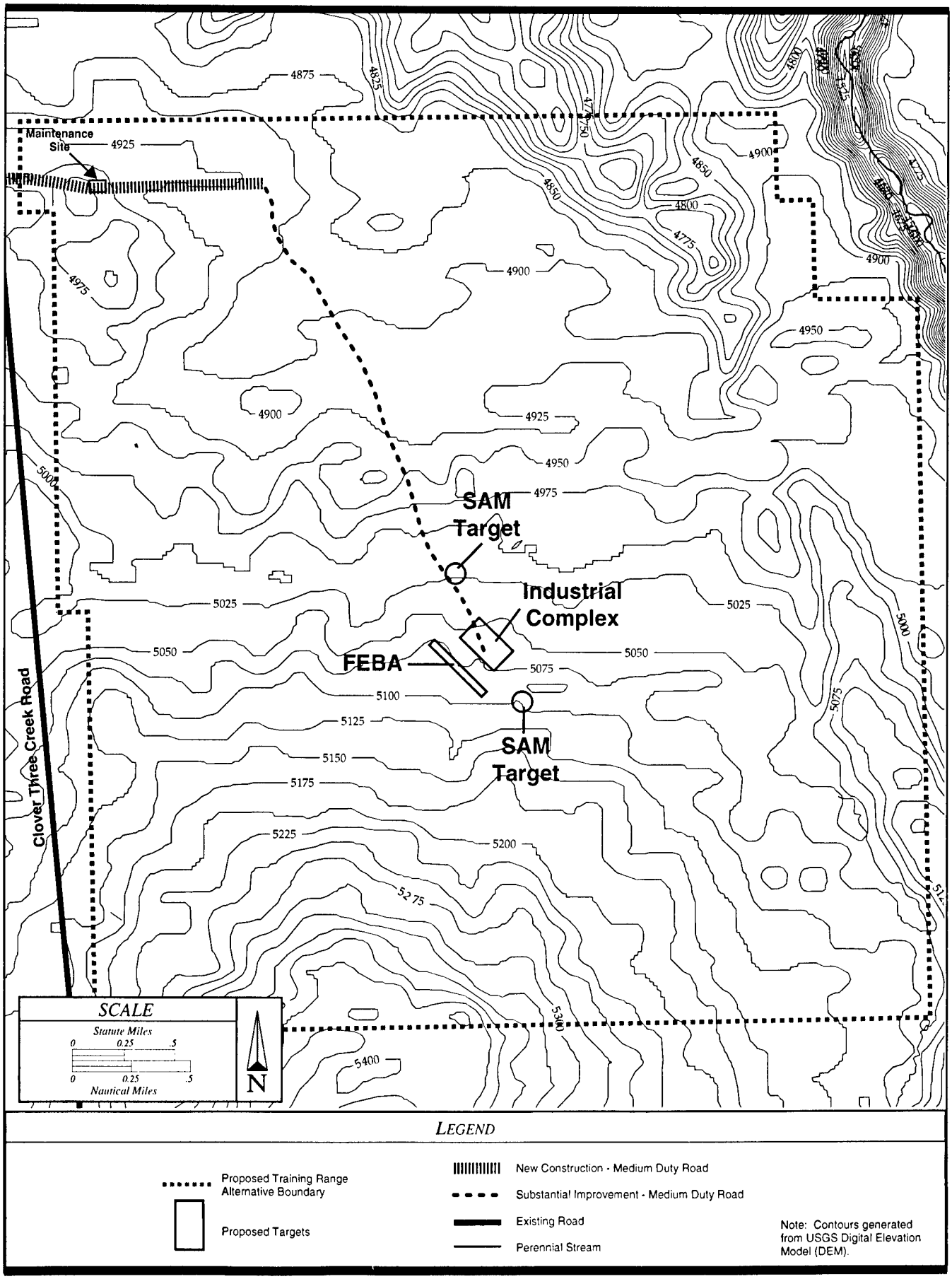



**Figure 2.3-6 Target Areas in Alternative D: Juniper Butte**

### *TACTICAL TRAINING RANGE TARGETS*

As depicted on Figure 2.3-7, at the tactical training range, the industrial complex target would consist of various buildings and storage tanks located on about a 30-acre area surrounded by a fence that could permit wildlife passage (BLM 1989e). Within the 30-acre area, the industrial target would be arranged into six "city blocks" of buildings. These blocks of buildings would vary from four to eight structures and be dispersed over five acres. The buildings would consist of agricultural style structures similar to the ones used by ranchers. The height of four of the blocks is about 25 feet. The other two blocks are about 60 feet and 40 feet, respectively.

One of the blocks consists of five round, simulated storage tanks. The industrial target would also include a simulated railyard area. The railyard would consist of 24 rail cars located on two parallel tracks approximately 0.75 mile in length.

Two of the targets would represent SAM sites with simulated vehicles and plastic piping for missiles. The fenced SAM targets consist of six missiles arranged in a circle within a five-acre area. The missiles would be about 30 feet long and 4 feet in diameter. They would be placed at an angle with the base on the ground and the end of the missile about 12 feet up from the ground. Revetments (berms) built from gravel piles would enclose the individual simulated missile targets.

The fourth target on the tactical range would represent the array of vehicles and tanks commonly associated with a battlefront. The FEBA array would consist of 25 plastic, fiberglass, or obsolete Army tanks on a 1,000 by 3,000-foot site. The tanks, which are approximately 7 to 10 feet in height, would physically cover about 30 acres and be arranged to simulate an actual enemy formation. If obsolete Army tanks were used, all hazardous materials would be removed prior to emplacement. Development of this target area would not require grading or excavation, although transport and placement of the vehicles could result in surface disturbance.

Some of these targets would include propane-powered or electric heaters to provide infrared training opportunities. These heaters would be protected from training ordnance damage by placing them in vaults or surrounding them with concrete barriers.

### *NO-DROP TARGETS*

Five no-drop targets would be developed on sites separated from the tactical range to provide more flexible and realistic training opportunities. No training ordnance would be released on to these targets, although aircrews would approach them and simulate ordnance delivery. Metal structures simulating industrial targets would be constructed on two of the five-acre sites, whereas the other five-acre sites would contain structures simulating a SAM installation and a radar site, respectively. The industrial target would consist of about 15 buildings and storage tanks similar to the one described for the 12,000-acre training range (Figure 2.3-8). Four 2,000-gallon propane above-ground storage tanks (ASTs) would also be located on site. The SAM site located at ND-8 would be similar to that described for the 12,000-acre training range

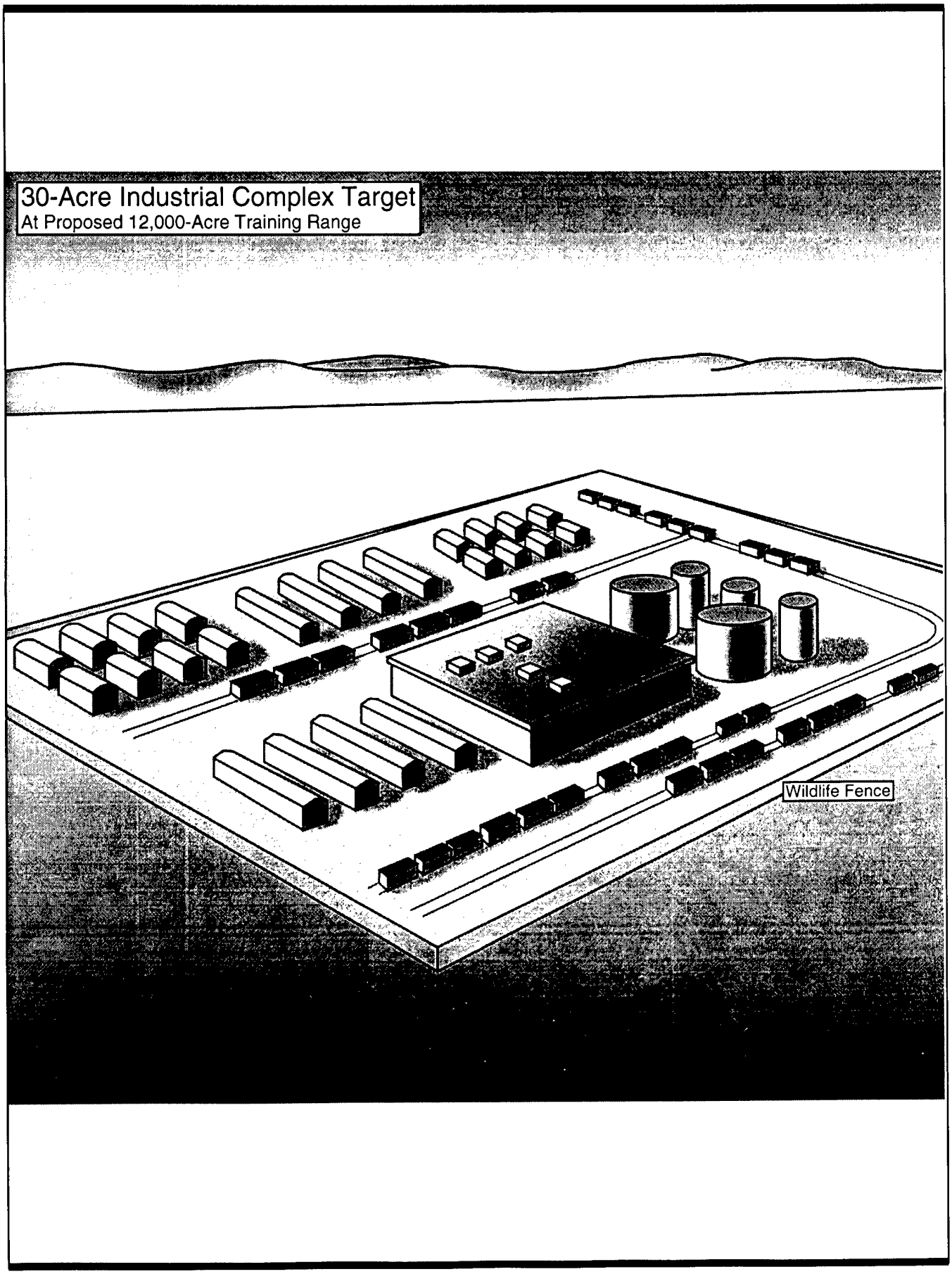



**Figure 2.3-7 Industrial Complex Target**

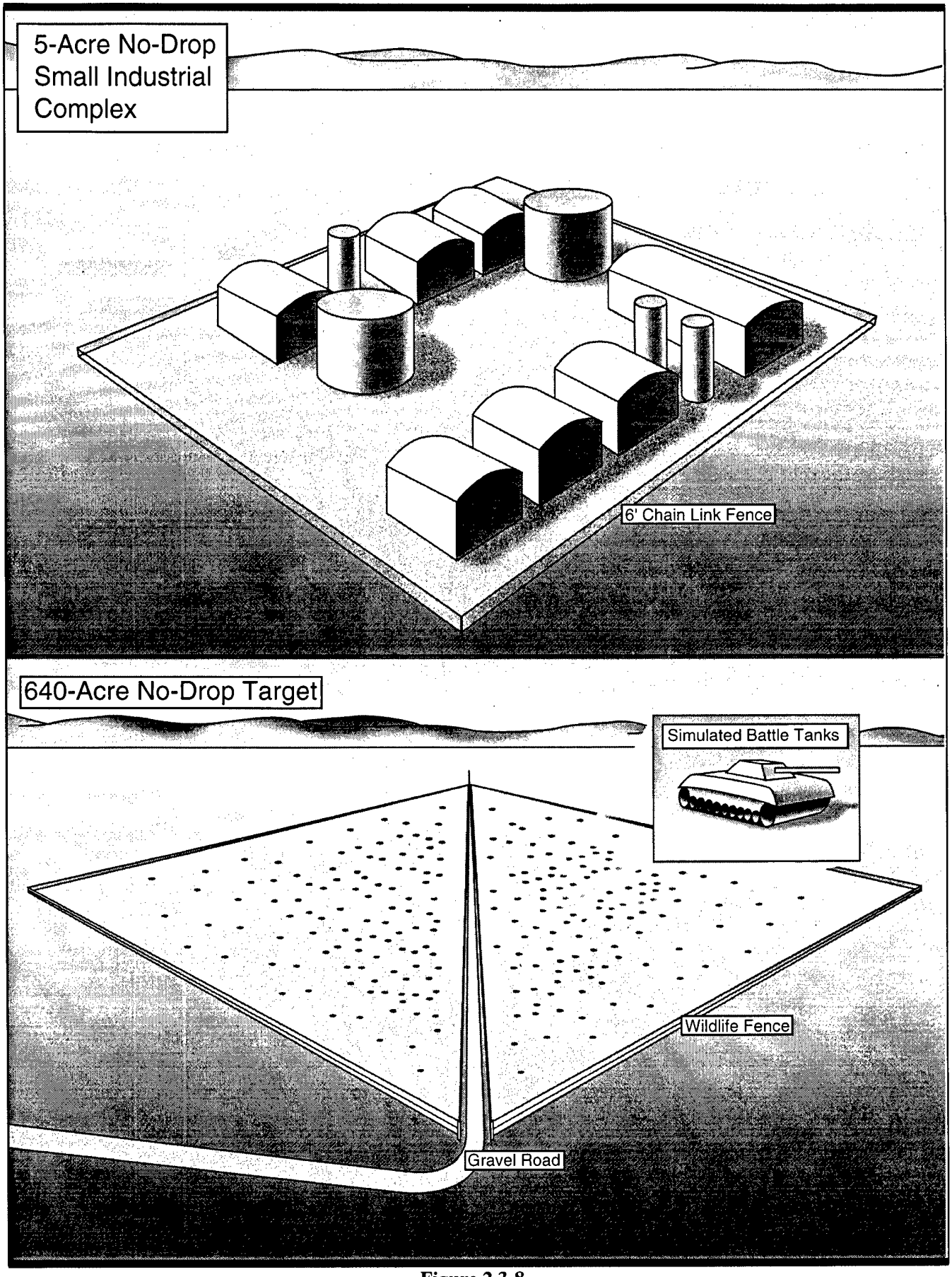



**Figure 2.3-8**
**5-Acre No-Drop Small Industrial Complex and 640-Acre No-Drop Target**

except the missile sites would be completely enclosed by a 12-foot cedar fence. ND-8 is also slightly larger (5.85 acres vs. 5 acres) than the other no-drop targets[1]. The early warning radar installation would consist of four 20-foot radar dishes mounted on earthen berms approximately 6 feet in height. One 2,000-gallon propane tank would also be located on this site. Construction for these targets would mirror that used on the tactical range. Propane heaters fueled by protected propane tanks would be employed at several no-drop targets. Located along an existing road, the 640-acre site would contain roughly 200 real (non-functioning and with hazardous material removed) or simulated (fabricated from plastic or fiberglass) military vehicles and tanks (Figure 2.3-8). As with some of the targets at the 12,000-acre tactical range, a portion of these tank and vehicle targets would include propane heaters to provide infrared signatures for aircraft.

Table 2.3-6 presents the attributes of the no-drop target sites. As this information shows, seven of the eight sites consist of locations characterized by seeding (ND-1, 5, 6, and 7), non-native vegetation (ND-2), or previous development (ND-8). ND-8, a five-acre no-drop target site represents a location developed for the Pershing II missile program in 1980. Although never used for the program, development resulted in widespread ground disturbance. An EA and environmental baseline survey (EBS) (Mountain Home AFB 1995a) were completed for this and five other former Pershing II missile sites as possible locations for emitters. These studies found no evidence of hazardous waste contamination and no environmental issues at these sites. ND-4 (five acres) includes sagebrush habitat, yet has received disturbance through grazing and fire.

**Table 2.3-6. Attributes of Proposed No-Drop Targets**

| *Site* | *Acres* | *Propane Gas Tank (2,000 gallons)* | *Road Type* | *Site Characteristics* |
|---|---|---|---|---|
| ND-1 | 640 | 4 | MDG | Seeded |
| ND-2 | 5 | 1 | MDG | Non-Native |
| ND-4 | 5 | 4 | MDG | Native |
| ND-5 | 5 | 4 | MDG | Seeded |
| ND-6 | 5 | 4 | MDG | Seeded |
| ND-7 | 5 | 4 | MDG | Seeded |
| ND-8 | 5 | 0 | MDG | Developed |

MDG = Medium Duty Gravel
Seeded = Seeded with Crested Wheatgrass
Non-Native = Introduced Cheatgrass or other invasive species
Native = Native Vegetation
Developed = Former Pershing II Missile Site

[1] For the remainder of this document, ND-8 is referred to as a five-acre no-drop target site.

### *MAINTENANCE FACILITY*

The maintenance facility for the tactical range would consist of one building situated on a three-acre site (Figure 2.3-9). The site would include a 7,000-square-foot building that houses range maintenance activities, a maintenance garage, and emitter maintenance. This structure would house facilities to repair and construct individual targets or portions thereof, provide storage for range vehicles and fire suppression equipment, and support communications. The entire area within the three acres would be graveled and graded. The roads to the maintenance facility would not be plowed in winter, unless required under emergency conditions.

Approximately 8 to 12 people would work on site during days when flying occurs. Target maintenance would occur regularly throughout the year. For about one week during the year (typically in the period from May through October), the range would be closed to training ordnance delivery and approximately 20 people would work on site conducting a comprehensive training ordnance cleanup. Although no personnel would live on site, the facility would include sleeping and cooking accommodations for use on a temporary, as-needed basis. A wastewater septic system would be installed. Solid waste would be removed by Mountain Home AFB to an approved disposal facility.

### *FUELS, STORAGE TANKS, AND ELECTRICAL POWER*

Diesel fuel for range maintenance vehicles would be stored at the maintenance facility under Alternative B, C, or D using four double-walled 250-gallon ASTs with approved secondary containment features such as a catchment and berm system to prevent any spills from contacting the ground. The maintenance facility would employ federally approved practices when using petroleum products, paints, and lubricants. Any waste of this type, as well as solid waste, would be stored temporarily and removed to an approved disposal site at regular intervals. In addition, any of the three range development alternatives would support six 2,000-gallon propane tanks used for either power or to fuel heaters within targets.

The range maintenance facility would also contain a 50,000-gallon water tank to support fire suppression and for maintenance activities. Water to fill this tank would be trucked from Mountain Home AFB or supplied by a contractor.

Many concerns were expressed in public and agency comments on the DEIS regarding the possibility of range fires or disruption to ranching operations from increased human presence. In response to these concerns, the Air Force proposes to develop a less than one-acre above-ground reservoir within a corner of the 12,000-acre training range for Alternative B or D. This reservoir is not required at Alternative C since alternate sources of water are available. This less than one-acre above-ground reservoir would be linked to existing pipelines and be available for ranching operations. At all times, the proposed reservoir would have 50,000 gallons of water reserved to support fire suppression. Within the proposed withdrawal area, the water from the joint-use reservoir would be accessible from both outside and inside the perimeter fence.

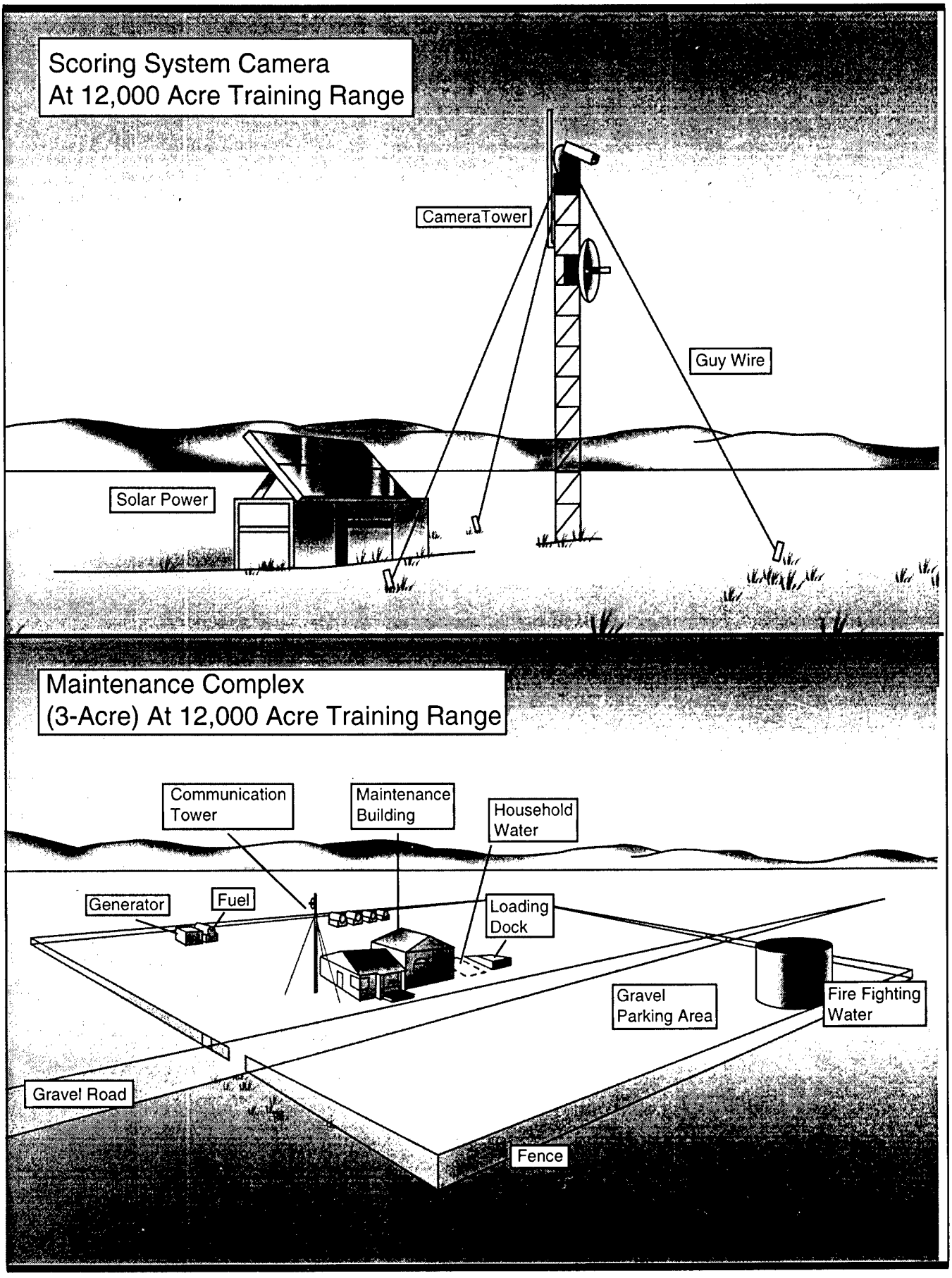



**Figure 2.3-9 Scoring System and 3-Acre Maintenance Complex**

**Alternative B — Clover Butte.** Fuel and water storage tanks for Clover Butte would be as described above. This alternative would include the less than one-acre above-ground reservoir. For Alternative B, electrical power would be derived from a 208-volt, three-phase transmission line linked to the main transmission line located roughly 15 miles to the southeast. To provide this source of electricity, the Air Force proposes to construct an above-ground, eagle-safe line (40-foot high wooden poles with cross-bars) extending along Clover-Three Creek Road (Idaho Power 1994). As depicted in Figure 2.3-10, the proposed transmission line would leave Clover-Three Creek Road, extend westward for about 0.45 mile until it intersects the road into the Clover Butte site. At this point, the proposed line would connect to the range maintenance facility.

**Alternative C — Grasmere.** Fuels and storage tanks would be the same as Alternative B, except no above-ground reservoir would be needed. For Alternative C, propane-powered generators using two additional fuel storage tanks would provide all electrical power to the site. No transmission line is proposed.

**Alternative D — Juniper Butte.** Fuels and storage tanks would be the same as Alternative B, including the above-ground reservoir. For Alternative D, electrical power would be derived from a 208-volt, three-phase transmission line linked to the main transmission line, as proposed for Alternative B. For this alternative, however, the proposed line would diverge eastward from its northernmost extent along Clover-Three Creek road for about 0.5 mile to the maintenance facility.

*FENCING*

The perimeter of the 12,000-acre tactical training range would be surrounded by a wildlife (BLM 1989e) wire fence. This fence would have three wires; a smooth wire 18 inches above ground and two barbed wires for a total height of 36 inches. Up to four gates would be constructed to allow for livestock access and exit. Contained within the training range would be four separate targets. Each of these targets would be fenced to prevent livestock entry but still allow for wildlife passage. Around ND-1, the 640-acre no-drop target site, the wildlife fencing would extend along both sides of the existing road that crosses through the proposed site, allowing for continued access of all users of this road. Gates would be installed at strategic locations to permit livestock entry and exit.

To prevent theft and vandalism, other types of fencing would be used at the five-acre no-drop targets. At the five-acre no-drop target sites, a six-foot chainlink fence would be utilized.

At all of the facilities, signs would be posted describing their use and access. This would be done in compliance to Air Force instructions and policies. Further discussion of access is provided in section 2.3.8.2.

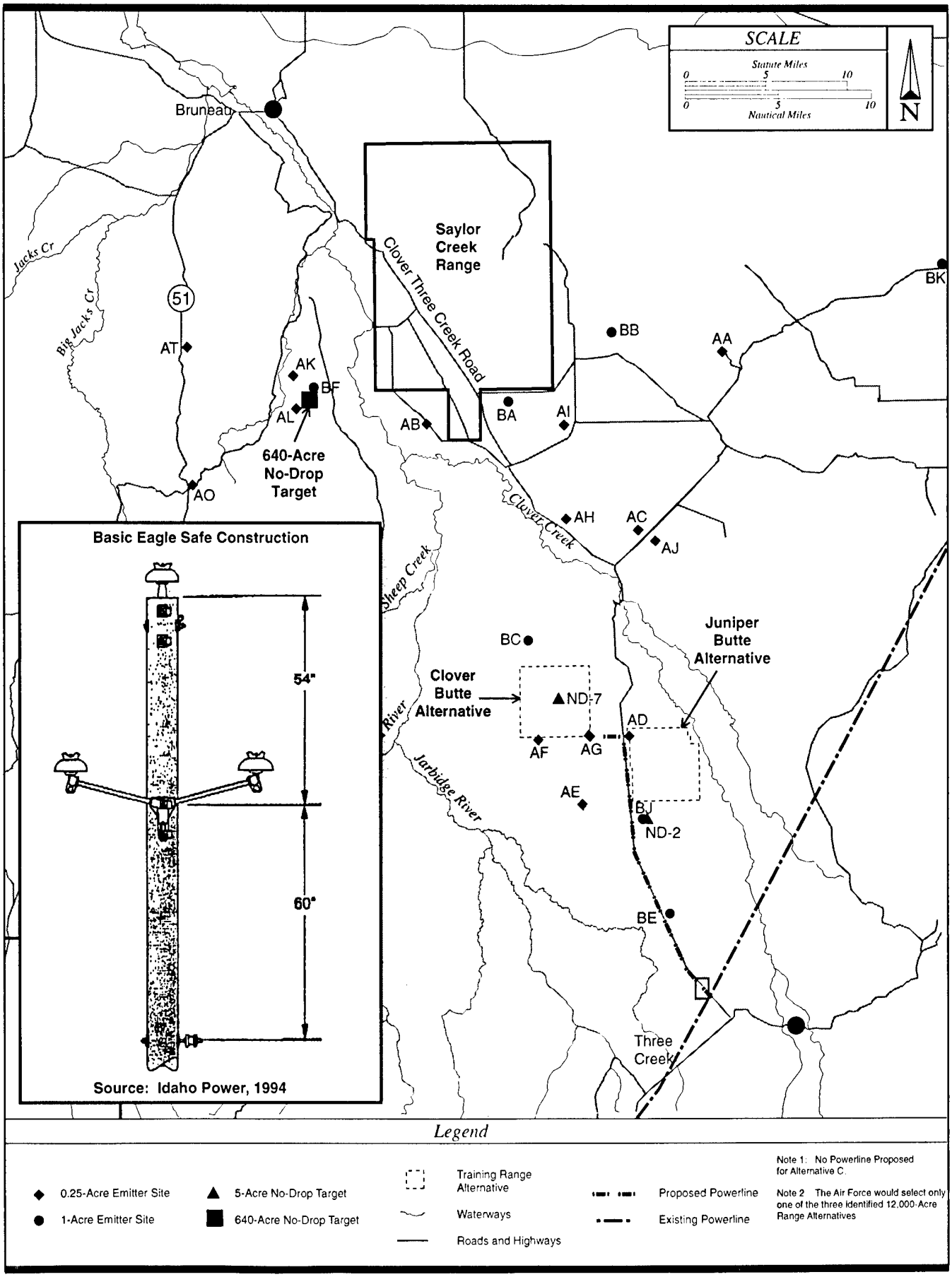



**Figure 2.3-10 Proposed Powerline for Alternatives B and D**

### *COMMUNICATIONS*

A variety of communications equipment would be used under any of the range development alternatives.

The training range maintenance facility would be equipped with

- Telephones (via a microwave communications system) for communicating with other government agencies, emergency services, and for normal administrative purposes
- Permanently installed and mobile radios for communicating between the training range, emitter sites, en route personnel, and Mountain Home AFB
- Permanently installed and mobile radios for communicating with aircraft

One-acre emitter sites would be equipped with

- Permanently installed and mobile radios for communicating between the training range, other emitter sites, en route personnel, and Mountain Home AFB
- Mobile telephones for communicating with other government agencies, emergency services, and for normal administrative purposes

When manned for operations or maintenance, one-quarter-acre emitter sites and no-drop targets would be equipped with

- Mobile radios for communicating between the training range, other emitter sites, en route personnel, and Mountain Home AFB
- Mobile telephones for communicating with other government agencies, emergency services, and for normal administrative purposes

### *SCORING SYSTEM*

A set of scoring system cameras would be installed to provide scoring of training ordnance delivery events. Low-light television or infrared cameras would be used, enabling scoring at night. The cameras would be powered by solar cells and batteries, and would be mounted on towers ranging in height from 10 to 40 feet (refer to Figure 2.3-9). Each of these towers and associated equipment covers a 50-by-50-foot area, with some components enclosed within a six-foot-high chain link fence, where required. The cameras would be linked to an existing control facility on Mountain Home AFB via a microwave communications system. Due to variable terrain, a solar powered microwave repeater station would be required at one emitter site. For Alternative B and D, this would be emitter site BC. For Alternative C, emitter site BG would be

used. Maintenance of the equipment would occur quarterly, unless system malfunctions require more frequent visits. Roads to the cameras would not be necessary.

### *MAINTENANCE ACTIVITIES*

#### *Fire Prevention and Suppression*

The Air Force proposes to restrict the use of defensive countermeasure flares and training ordnance. All training ordnance will either contain cold-spotting charges or lack spotting charges. Under extreme fire risk conditions, determined from the same information and criteria used by the BLM, no training ordnance would be used, and maintenance activities would be carefully monitored. Flare use may also be eliminated during extreme fire risk conditions. During other times, flares would be released only above 2,000 feet AGL, under the same restrictions that apply today for this area. Therefore, no firebreaks are proposed on the 12,000-acre training range. Nevertheless, equipment supporting fire suppression will be located at the maintenance facility during range operations as required by prevailing fire conditions. This equipment would include a 1,200-gallon fire truck, two pickup trucks equipped with 200-gallon "slip-ons," and a tank truck capable of transporting approximately 5,000 gallons of water that would be available to refill the pumpers away from the maintenance facility. Maintenance personnel would be qualified and available for priority assignment to fire suppression duty. Backup fire-fighting personnel are available at SCR, Mountain Home AFB, and BLM. A 50,000-gallon water storage tank (non-potable) would be located at the maintenance facility within the 12,000-acre range. This tank would be filled throughout the fire season, and would be available for interagency use for fire suppression. In response to public and agency concerns expressed during the DEIS public hearings and comment period, the Air Force will construct a pipeline-supplied, less than one-acre above-ground reservoir capable of storing sufficient water to provide 50,000 gallons for fire suppression on the proposed Clover Butte or Juniper Butte location. This additional storage capacity is not required at the proposed Grasmere location since alternate sources of water supply are available.

#### *Waste Management*

Waste management procedures would include the disposal of hazardous waste using approved practices currently followed at SCR and removal of solid waste to an approved landfill or recycling facility. All solid and hazardous waste collection, transport, recycling, and disposal practices would be in accordance with approved Air Force instructions and policies.

#### *Training Ordnance Clean-up*

Weapons delivery training required by the 366th Wing would involve delivery of small (up to 25 pounds) non-explosive training ordnance on the target areas of the training range. The training ordnance debris, cast iron and steel, would be collected and recycled. For about one week per year (typically in the period from May through October), the range would be closed to training ordnance delivery and approximately 20 people would work on site conducting a comprehensive training ordnance cleanup. Other smaller scale training ordnance cleanup

activities would be conducted periodically throughout the year, depending upon weather and operational constraints.

*Personnel*

Between 8 and 12 full- and part-time personnel would perform maintenance on targets, vehicles, facilities, and equipment, as well as operate communications equipment. Personnel would commonly be at the range on weekdays. None of the personnel assigned would live on site, although temporary living quarters (for emergency use only) would be available at the maintenance site. Personnel would routinely commute in groups to the site on a daily basis during weekdays, or as needed.

### 2.3.2.2 EMITTERS AND EMITTER SITES

Electronic emitter units simulate enemy surface-to-air threats to which aircrews must respond effectively. By constantly changing the arrangement, number, and location of emitter units, aircrews are required to adapt and respond to a variety of realistic threats. To provide this capability, 30 emitter sites would be established in eastern Owyhee County. Figure 2.3-11 shows the 30 emitter sites under evaluation and Table 2.3-7 presents their attributes. Twenty sites would cover one-quarter acre each, consisting of a gravel, unfenced parking area designed to support temporary use. Measuring one acre each, the other 10 sites would contain one 400-square-foot building approximately 15 feet in height. Building material would be either concrete block or painted metal. A 40-foot monopole supporting communications would also be located on these sites, if required. A one-acre site would also contain a generator building, a 2,000-gallon propane tank, and a 250-gallon fuel AST. The emitters, mounted on trucks, would be 17 feet tall. Under Alternatives B and D, emitter site BC would include a 50-foot radio tower instead of the monopole. For Alternative C, the communications relay tower would be established at emitter site BG. The radio tower would consist of a 40-foot tower topped with four 10-foot microwave dishes to provide communication relay from the range to the base. All one-acre sites would be surrounded by a 6-foot high chain link fence topped with an additional 2 feet of barbed wire.

The one-quarter-acre emitter sites would support a mobile emitter approximately 17 feet in height. Fencing would not be used to surround these smaller emitter sites. Figure 2.3-12 depicts the layout of typical one-acre and one-quarter-acre sites. When in operation, an emitter antenna would be pointed up toward the sky.

On average, five to eight emitter sites would be in use each weekday. During some exercises, approximately 16 times per year, emitters could occupy approximately 15 of the sites over a 2- to 3-day period. Due to changing training scenarios, weather, and road conditions, it is likely that some sites would receive more use than others. The number of days of use would range from about 50 to 260 for these various sites.

The emitter units would range in size from a pickup truck to a tractor-trailer combination. Use of the smaller units would be common, since not all roads to the sites would accommodate the

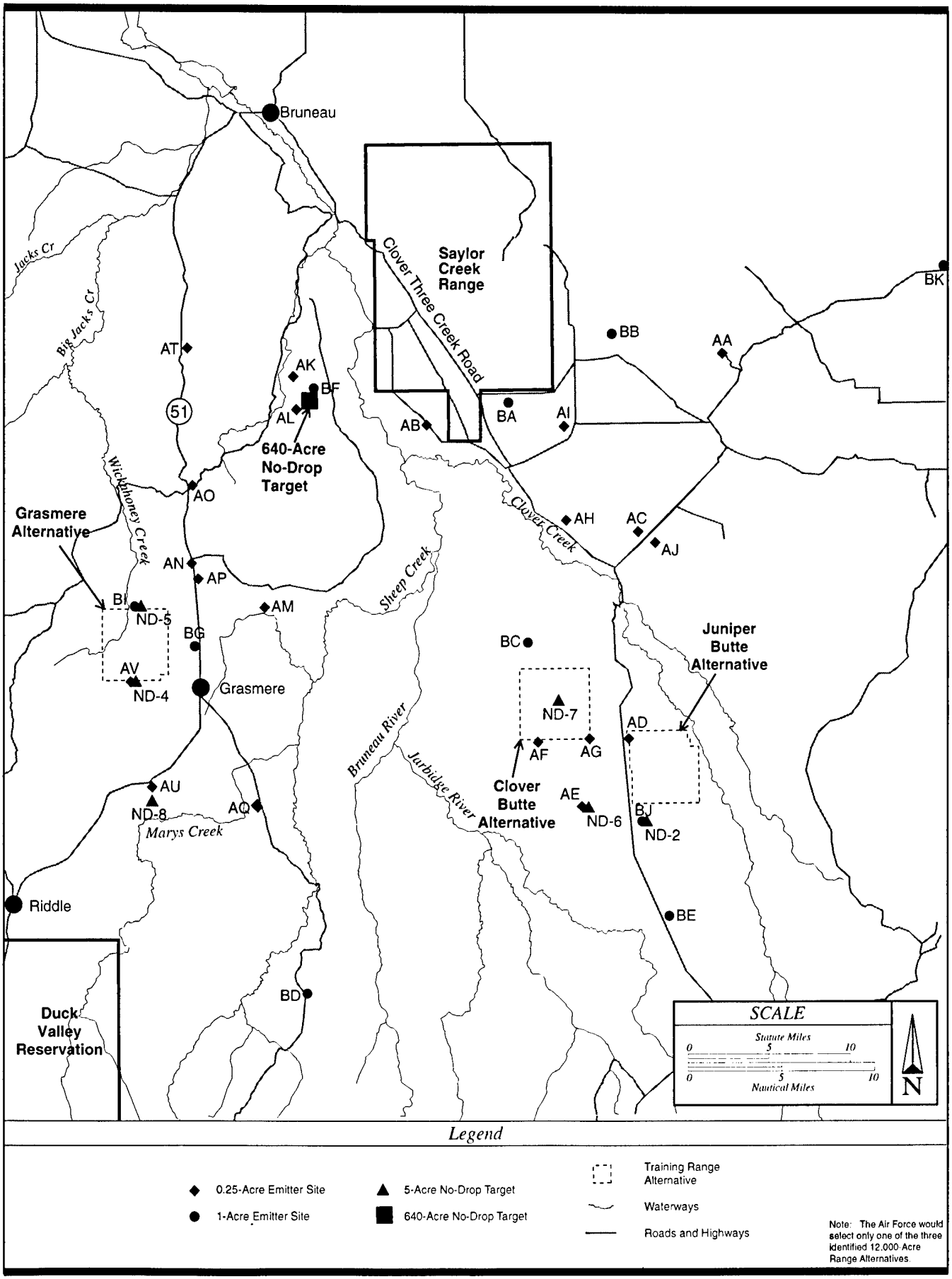



**Figure 2.3-11 Proposed Emitter Sites**

**Table 2.3-7. Attributes of Proposed Emitter Sites**

| *No Drop Targets/ Emitters* | *Size (acres)* | *Propane Gas Tank 2,000 Gallons* | *Diesel Fuel Tank 250 Gallons* | *Road Type* | *Site Vegetation Characteristics* |
|---|---|---|---|---|---|
| BA | 1 | 1 | 1 | MDG | Non-Native |
| BB | 1 | 1 | 1 | MDG | Seeded |
| BC | 1 | 1 | 1 | MDG | Seeded |
| BD | 1 | 1 | 1 | MDG | Native |
| BE | 1 | 1 | 1 | MDG | Seeded |
| BF | 1 | 1 | 1 | MDG | Seeded |
| BG | 1 | 1 | 1 | MDG | Native |
| BI | 1 | 1 | 1 | MDG | Seeded |
| BJ | 1 | 1 | 1 | MDG | Native |
| BK | 1 | 1 | 1 | MDG | Developed |
| AA | 0.25 | NA | NA | LDG | Seeded |
| AB | 0.25 | NA | NA | LDG | Non-Native |
| AC | 0.25 | NA | NA | LDG | Seeded |
| AD | 0.25 | NA | NA | LDG | Seeded |
| AE | 0.25 | NA | NA | LDG | Seeded |
| AF | 0.25 | NA | NA | LDG | Non-Native |
| AG | 0.25 | NA | NA | LDG | Seeded |
| AH | 0.25 | NA | NA | LDG | Non-Native |
| AI | 0.25 | NA | NA | LDG | Non-Native |
| AJ | 0.25 | NA | NA | LDG | Native |
| AK | 0.25 | NA | NA | LDG | Native |
| AL | 0.25 | NA | NA | LDG | Native |
| AM | 0.25 | NA | NA | LDG | Non-Native |
| AN | 0.25 | NA | NA | LDG | Non-Native |
| AO | 0.25 | NA | NA | LDG | Seeded |
| AP | 0.25 | NA | NA | LDG | Developed |
| AQ | 0.25 | NA | NA | LDG | Native |
| AT | 0.25 | NA | NA | LDG | Non-Native |
| AU | 0.25 | NA | NA | LDG | Developed |
| AV | 0.25 | NA | NA | LDG | Non-Native |

Notes: BA-BK = One-acre Emitter Sites; AB-AV = One-quarter-acre Emitter Sites
MDG = Medium Duty Gravel
LDG = Light Duty Gravel
Seeded = BLM-seeded crested wheatgrass
Non-Native = Introduced cheatgrass or invasive weeds such as tumble mustard
Native = Native vegetation such as Sandberg bluegrass, Wyoming big sagebrush, or low sagebrush
Developed = Site has been improved for specific use (gravel pit or Pershing missile site)

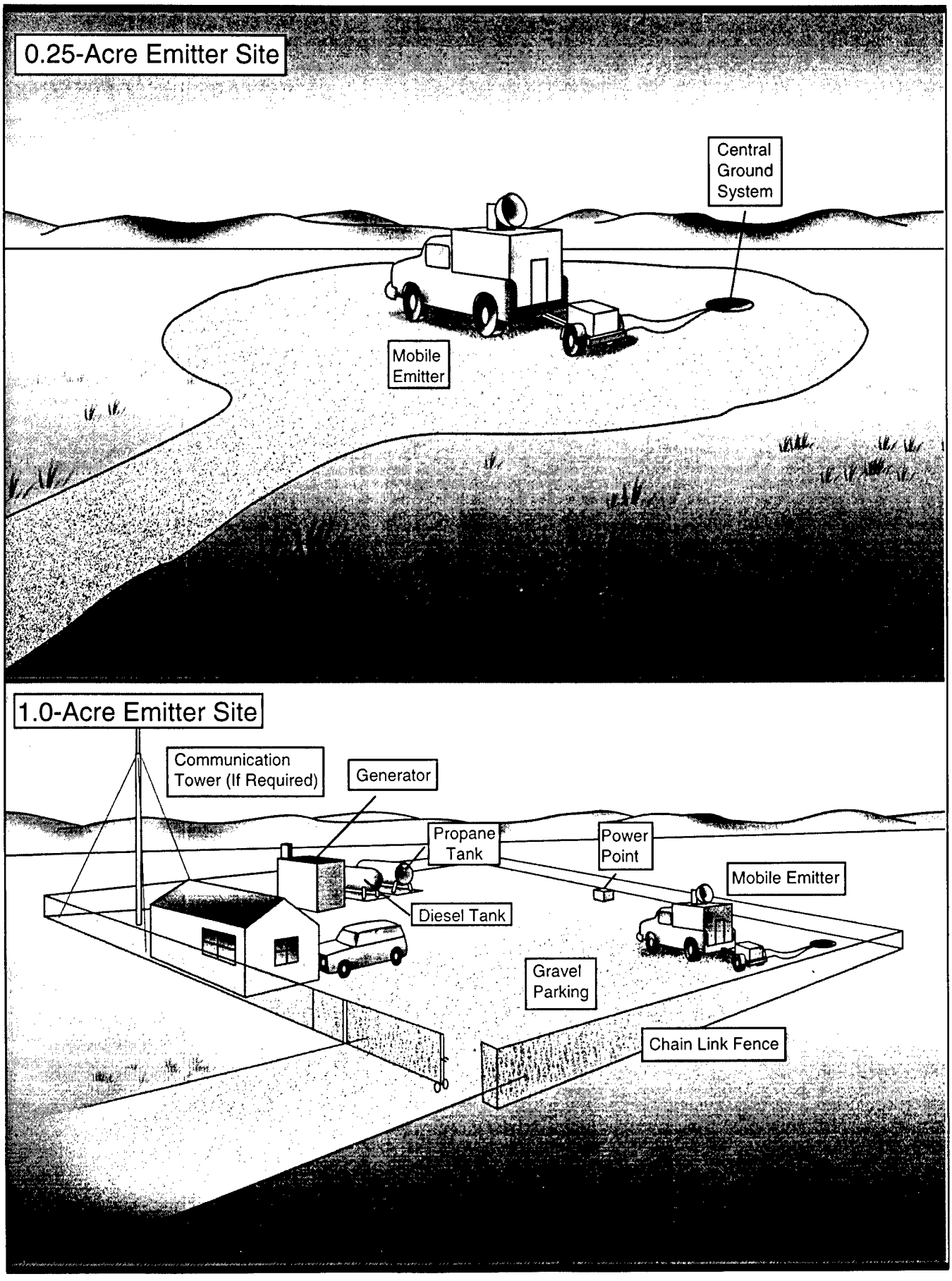



**Figure 2.3-12 Emitter Sites with Mobile Electronic Emitters in Place**

larger units during all seasons of the year. Personnel would always be present during emitter operations. Secured and nonoperating emitters would occasionally be left overnight at the one-acre sites.

For all alternatives, operation of the one-acre emitter sites would involve use of a small diesel (60 kilowatt) generator to power the units. Generators will run an estimated 6 to 8 hours a day when emitters are on an emitter site. These sites would contain 250-gallon above-ground fuel tanks with double walls and secondary containment such as a catchment and berm system to prevent accidental releases. The one-quarter-acre emitter sites would utilize mobile diesel generators.

As illustrated under site characteristics in Table 2.3-7, each candidate emitter site was evaluated to minimize effects from direct ground disturbance. Fourteen candidate emitter sites were deleted from consideration as part of the effort to mitigate by avoidance. Emitter site characteristics are divided into four categories: seeded (planted crested wheatgrass), non-native (introduced cheatgrass or invasive weeds), native (vegetation native to Idaho), or developed (gravel pit or former Pershing II missile site). At the ten one-acre emitter sites, five sites have been seeded, three sites contain native vegetation, one site has non-native vegetation, and one site is developed, consisting of a former Pershing II missile site. Of the 20 one-quarter-acre emitter sites, eight are covered with non-native vegetation, six have been seeded, four sites have native vegetation, and two sites are developed (AP is an active gravel pit; AU is a former Pershing II missile site).

The Air Force previously evaluated the former (and unused) Pershing II missile sites for use as locations for mobile emitters. An EBS and EA for this proposal established no significant impacts (Mountain Home AFB 1995a).

Distribution of the proposed emitter sites reflects a balance of operational requirements for dispersal and relationship to SCR, proposed training range sites, and no-drop targets, accessibility, and considerations of environmental and cultural resources (refer to Figure 2.3-12). With the exception of a single one-acre emitter site BK, all emitter sites occur under existing airspace. Site BK, a former Pershing II missile program facility, lies about 5 miles northeast of the current Bruneau 1 MOA and proposed Jarbidge MOA boundary. Since the emitter units project a simulated threat detectable by aircraft at distances greater than 5 miles, this site would provide useful training even though it lies outside MOA airspace.

#### 2.3.2.3 ROADS

Access to and within the area would be provided by a limited set of roads, primarily consisting of existing roads. To provide access to training range sites, the Air Force would need to improve or construct some roads or sections of roads. A series of short connecting roads and driveways would also be constructed to provide access to target and emitter sites. Based on the Air Force's proposal, two classes of roads are expected to be necessary: light duty and medium duty (Table 2.3-8).

**Table 2.3-8 Proposed Road Categories**

| *Road Category* | *Improvement Type* | *Training Range* | *No-Drop Target* | *One-Acre Emitter Sites* | *One-Quarter-Acre Emitter Sites* |
|---|---|---|---|---|---|
| Light duty gravel | No Improvements Needed | X | X | | X |
| | Substantial Improvements | X | X | | X |
| | New Construction | X | X | | X |
| Medium duty gravel | No Improvements Needed | X | X | X | |
| | Some Improvements | X | X | X | |
| | Substantial Improvements | X | X | X | |
| | New Construction | X | X | X | |

A *light duty road* would be designed to accommodate all types of vehicular traffic to serve the one-quarter-acre emitter sites during the approximate 260 days of training activity. As such, the typical use of the road would be for a small pickup truck with a trailer. User levels on these roads would range from one or two vehicles traveling each training day approximately 50 to 260 days per year. A light duty road would be approximately 10-feet wide, surfaced with approximately 3 inches of gravel base. Where required to prevent soil erosion, a shallow ditch, about 8 feet wide, would be constructed along the sides of the road. Culverts and water bars would also be installed where required to prevent effects on wetlands, waters of the U.S., and downstream habitats. The Air Force would meet the construction requirements established by the lead agency from whom they obtained the right-of-way.

A *medium duty road* would be designed to accommodate all types of vehicular traffic. However, use of the road would likely be limited to the 260 days of the year when training activity is anticipated. In some instances, they would also accommodate use from other roads that intersect them. The roads would be designed to serve the training range areas, no-drop target areas, and one-acre emitter sites. The medium duty road would be designed for the heavy duty trucks and equipment required during construction of these areas, as well as routine maintenance. Once the areas are constructed, use levels on these roads would range from zero vehicles per week for some emitter sites, to as many as 32 trips during the week of comprehensive training ordnance cleanup at the 12,000-acre training range. A medium duty road would be approximately 14 feet wide, surfaced with approximately 6 inches of gravel base. Where required to prevent soil erosion, a shallow ditch, about 8 feet wide, would be constructed along the sides of the road. Culverts and water bars would also be installed where required to prevent effects on wetlands, Waters of the U.S., and downstream habitats. The Air

Force would meet the construction requirements established by the lead agency from whom they obtained the right-of-way.

Some roads do not require improvements. A portion of these would be used by the Air Force based on seasonal limitations. Highway 51 and Clover-Three Creek Road would not require seasonal limitations; these roads are already able to accommodate light or medium duty travel most of the year. Access to some emitter sites would not be required at all times; therefore, during wet periods the Air Force would discontinue use of these sites.

In all cases, roads would not be used when weather conditions do not permit travel. The Air Force would not routinely plow or remove snow. Snowmobiles or helicopters could be used on rare occasions to ensure access for emergencies at the 12,000-acre training range site. The Air Force intends to develop interagency service agreements with the applicable jurisdiction for annual road maintenance.

Different road and improvement types apply to the various alternative components. Under the proposed Juniper Butte Alternative, the primitive two-track road along the East Fork of the Bruneau River (along the northeast corner of the proposed range site) would be re-routed to be outside the range's perimeter fencing, and thus be accessible to the public.

More than one improvement type can apply to different segments of the same road. The types of improvements also vary according to the nature of proposed vehicle traffic. Table 2.3-9 outlines the length in miles and type of improvements for light and medium duty roads.

**Table 2.3-9. Projected Improvements and Miles[1] of Roads**

| *Road Category* | *Improvement Type* | *Alternative B* | *Alternative C* | *Alternative D* |
|---|---|---|---|---|
| Light duty gravel | Substantial Improvements | 6 | 6 | 10 |
| | New Construction | 8 | 8 | 8 |
| | Subtotal | 14 | 14 | 18 |
| Medium duty gravel | Some Improvements | 25 | 25 | 25 |
| | Substantial Improvements | 28 | 30 | 27 |
| | New Construction | 11 | 11 | 12 |
| | Subtotal | 64 | 66 | 64 |
| | Total | 78 | 80 | 82 |

Note: 1. Mileage rounded to nearest mile.

As part of the road improvements, the Air Force proposes to replace the bridge at Clover Creek Crossing to accommodate heavier equipment use. The bridge, made from pre-stressed concrete, would have a 40-foot span and be 16-feet wide. A private dam exists a few yards downstream of the current bridge site. The bridge improvement would involve all best management practices to avoid sediment load, construction at a low-water season, and temporary re-routing of minimal flow from the dam and around the construction site. Using this EIS as a basis, the Air Force would develop the necessary documentation for a Section 404 permit, including a finding of no practicable alternative, and consult with the U.S. Army Corps of Engineers should a decision be made to proceed with the action. Safety measures would be implemented as necessary including use of safety markers and flags. Access during construction would be available through the existing bridge.

## 2.3.3 Proposed Airspace Modifications

Implementation of a range development alternative would not alter the basic types of training conducted by the 366th Wing in the local airspace. However, the presence of a tactical training range, dispersed no-drop targets, emitter sites, and reconfigured airspace would substantially enhance the quality, realism, and sophistication of the training activities that could be performed. To achieve these results, the Air Force and the FAA would need to modify the airspace to permit increased maneuvering area, allow realistic and varied approaches to targets, and accommodate larger simultaneous and sequential forces to conduct CT and CWT. These airspace modifications would alter how the 366th Wing currently uses each airspace unit, enhancing the training value of the airspace through the minimum changes and additions. It would also allow flight activity to be dispersed, thereby providing operational flexibility and reducing constriction of flight activity north of the Duck Valley Reservation.

Related sets of airspace modifications would result under Alternative B, C, or D. Figures 2.3-13, 2.3-14, and 2.3-15 show these proposed modifications for each alternative. The proposed modifications to the existing airspace fall into two categories: MOA expansion and deletions (non-rulemaking), and establishment and elimination of restricted airspace (rulemaking). Table 2.3-10 shows the differences in land areas underlying airspace by alternative.

For Alternatives B and C, the nature and total amount of airspace would be the same. Alternative D would require a slight increase in airspace to allow sufficient space for aircraft to maneuver near the eastern boundary of the airspace. Although the three alternatives would result in slightly different configurations of the internal boundaries of the airspace units, the distribution of sortie-operations would remain similar.

### 2.3.3.1 Proposed MOA Modifications

*Owyhee and Sheep Creek 3 MOA* (Figures 2.3-13 through 2.3-15). Under any of the three range development alternatives, the Air Force proposes to extend the northern edge of the existing

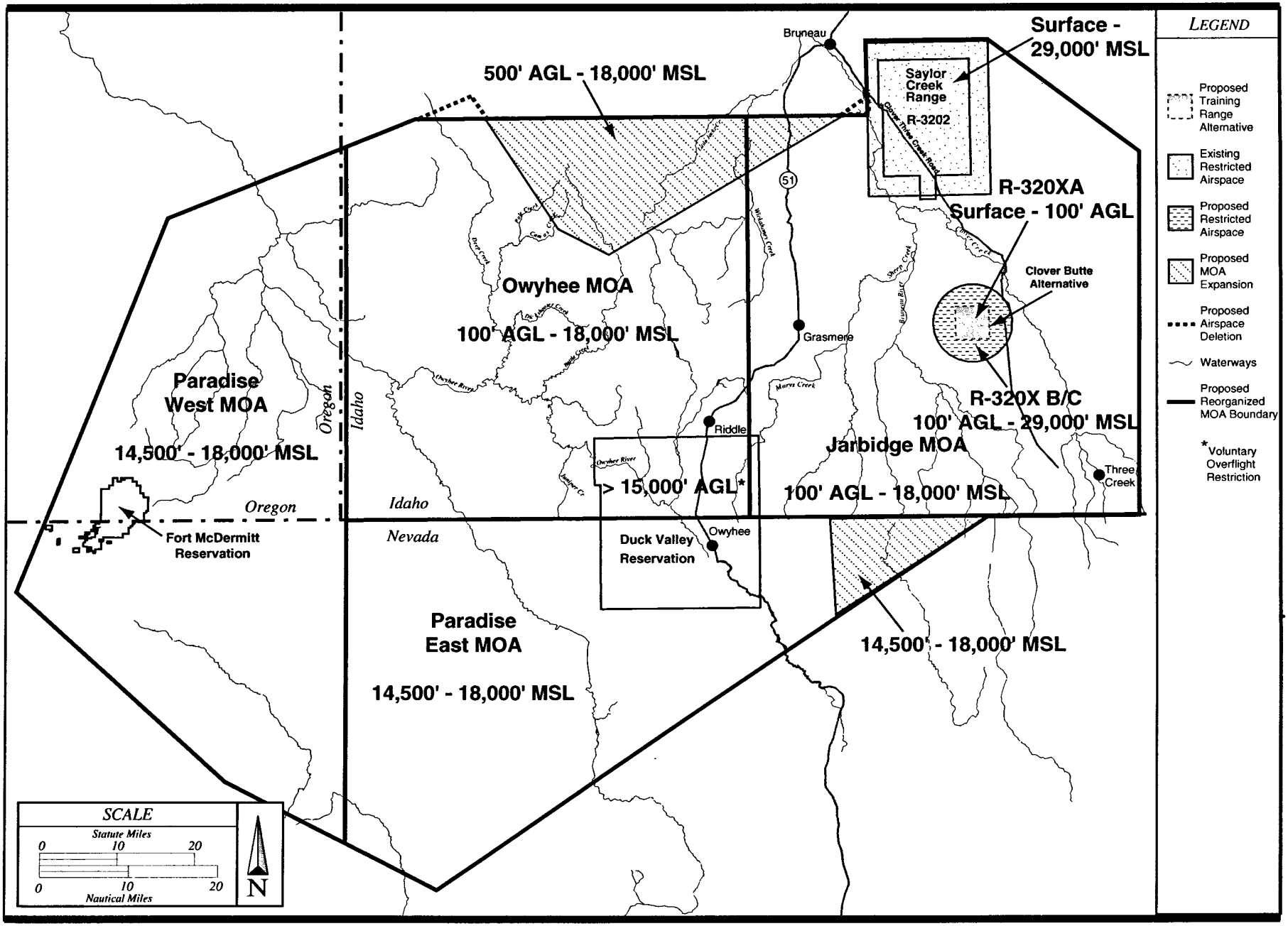



**Figure 2.3-13 Alternative B - Clover Butte Proposed Airspace Modifications**

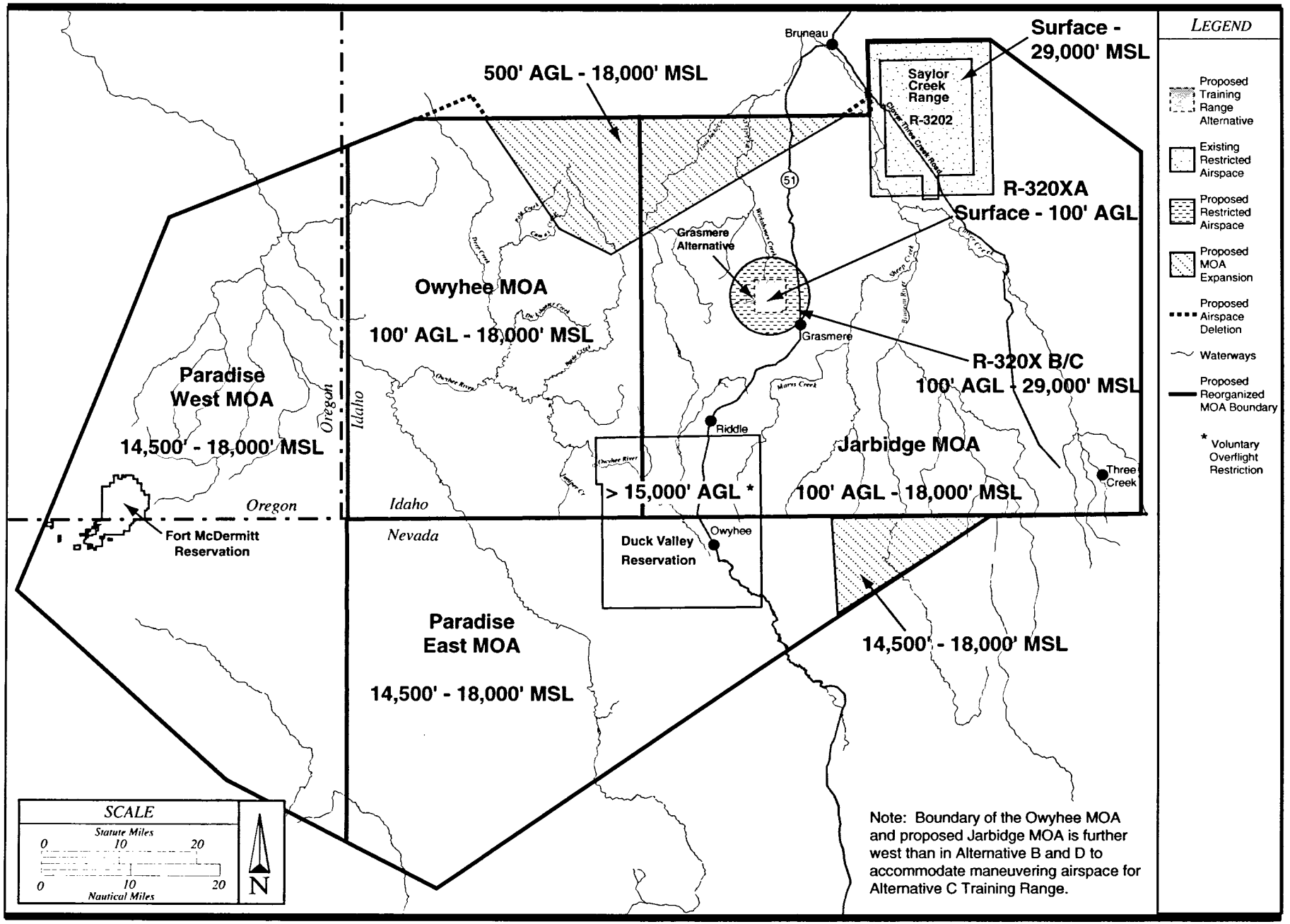



**Figure 2.3-14 Alternative C - Grasmere Proposed Airspace Modifications**

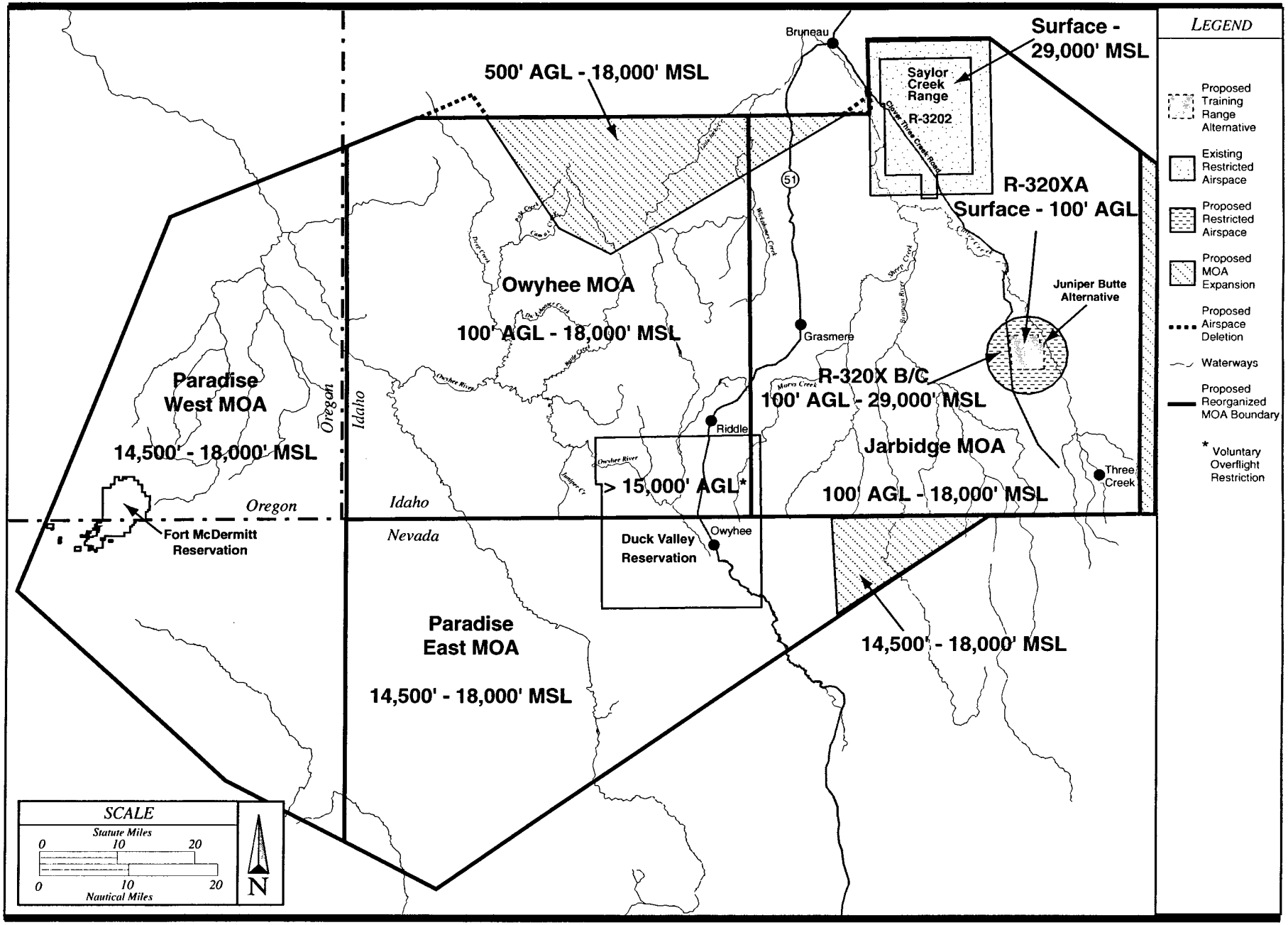



**Figure 2.3-15 Alternative D - Juniper Butte Proposed Airspace Modifications**

**Table 2.3-10. Comparison of Areas Underlying Airspace by Alternative**

| *Airspace Unit* | BASELINE/ NO-ACTION *Underlying Area (square miles)* | ALTERNATIVE B CLOVER BUTTE *Underlying Area (square miles)* | ALTERNATIVE C GRASMERE *Underlying Area (square miles)* | ALTERNATIVE D JUNIPER BUTTE *Underlying Area (square miles)* |
|---|---|---|---|---|
| Restricted Airspace | | | | |
| Airspace Associated with Saylor Creek Range | | | | |
| R-3202A | 299 | 299 | 299 | 299 |
| R-3202B | 20 | NA | NA | NA |
| R-3202C | 178 | NA | NA | NA |
| Proposed Range ETI 320XA/B/C | 0 | 79 | 79 | 79 |
| **Total** | 497 | 378 | 378 | 378 |
| MOAs | | | | |
| Bruneau 1 | 964 | 0 | 0 | 0 |
| Bruneau 2 | 136 | 0 | 0 | 0 |
| Sheep Creek 1 | 295 | 0 | 0 | 0 |
| Sheep Creek 2 | 109 | 0 | 0 | 0 |
| Sheep Creek 3 | 449 | 0[1] | 0[1] | 0[1] |
| Saylor | 48 | 0 | 0 | 0 |
| Jarbidge | 0 | 2,268 | 2,793 | 2,268 |
| Jarbidge North Expansion | 0 | 39[1] | 175[1] | 39[1] |
| Jarbidge East Expansion | 0 | 0 | 0 | 112 |
| Owyhee | 2,335 | 2,246 | 1,721 | 2,246 |
| Owyhee North Expansion | 0 | 374[1] | 238[1] | 374[1] |
| Paradise | 4,447 | 0 | 0 | 0 |
| Paradise East | 0 | 2,012 | 2,012 | 2,012 |
| Paradise East Expansion | 0 | 126 | 126 | 126 |
| Paradise West | 0 | 2,438 | 2,438 | 2,438 |
| Saddle A | 592 | 592 | 592 | 592 |
| Saddle B | 1,469 | 1,469 | 1,469 | 1,469 |
| **Total** | 10,844 | 11,564 | 11,564 | 11,676 |

Note: 1. Includes elimination of portions of MOA airspace due to proposed MOA reconfiguration.
Source: Mountain Home AFB 1996a

Owyhee and Sheep Creek 3[2] MOAs approximately 20 NM to the north. This northern airspace expansion would fill in the "V"-shaped gap in the northern portion of the MOA structure, overlying about 429 square miles. As proposed, this MOA expansion would extend vertically from 500 feet AGL to 18,000 feet MSL; the ceiling altitude would match all adjacent MOA altitudes (Figure 2.3-16). To simplify the borders of the airspace, the Air Force also proposes to eliminate the northernmost tips of the Owyhee MOA (about 13 square miles), and Sheep Creek 3 MOAs (about 3 square miles), aligning this northern edge with the northern limits of the proposed expansion. This set of modifications would enhance training by

- providing less constricted airspace north of the Duck Valley Reservation and its overflight restrictions;
- permitting greater variation in approaches to SCR, the 12,000-acre training range, and the no-drop targets;
- offering additional MOA airspace to accommodate realistic training particularly CWT; and
- creating more airspace in which to conduct air-to-air training.
- permitting flexible scheduling in response to agency and public environmental concerns.

This expanded MOA airspace would overlap with existing airspace associated with Mountain Home AFB. Designated as "Area X-Ray," this airspace has been delegated by the FAA to Mountain Home AFB for providing air traffic control services to aircraft arrivals, departures, and overflights. This airspace, which extends from the surface to 16,000 feet MSL, is returned to the FAA's Salt Lake Air Route Traffic Control Center (ARTCC) on a daily basis when no longer required for Mountain Home AFB operations. Area X-Ray also provides arrival and departure routes to the existing MOAs which transit the proposed MOA extensions. Refer to Figure 1.3-1 for more details on Area X-Ray.

*Paradise MOA* (refer to Figures 2.3-13 through 2.3-15). Alternatives B, C, and D would involve establishment of additional MOA airspace at the eastern limits of the Paradise MOA in Nevada (i.e., Paradise East MOA Expansion). As described in section 1.3.2.2, existing restrictions on overflight of the Duck Valley Reservation limit the utility of the narrow strip of Paradise MOA airspace east of the reservation. The proposed expansion would consist of a triangular-shaped piece of MOA covering about 126 square miles above Nevada. Vertical dimensions of this expansion would match those for the existing Paradise MOA: 14,500 to 18,000 feet MSL. Two MTR corridors (IR-303 and an exit route for other MTRs) cover roughly 35 percent of this area

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2 Within the airspace modifications, the existing Sheep Creek 3 MOA would be divided and redesignated as portions of the Owyhee and Jarbidge MOAs. For this analysis, they are referred to as the Jarbidge North MOA Expansion and Owyhee North MOA Expansion.

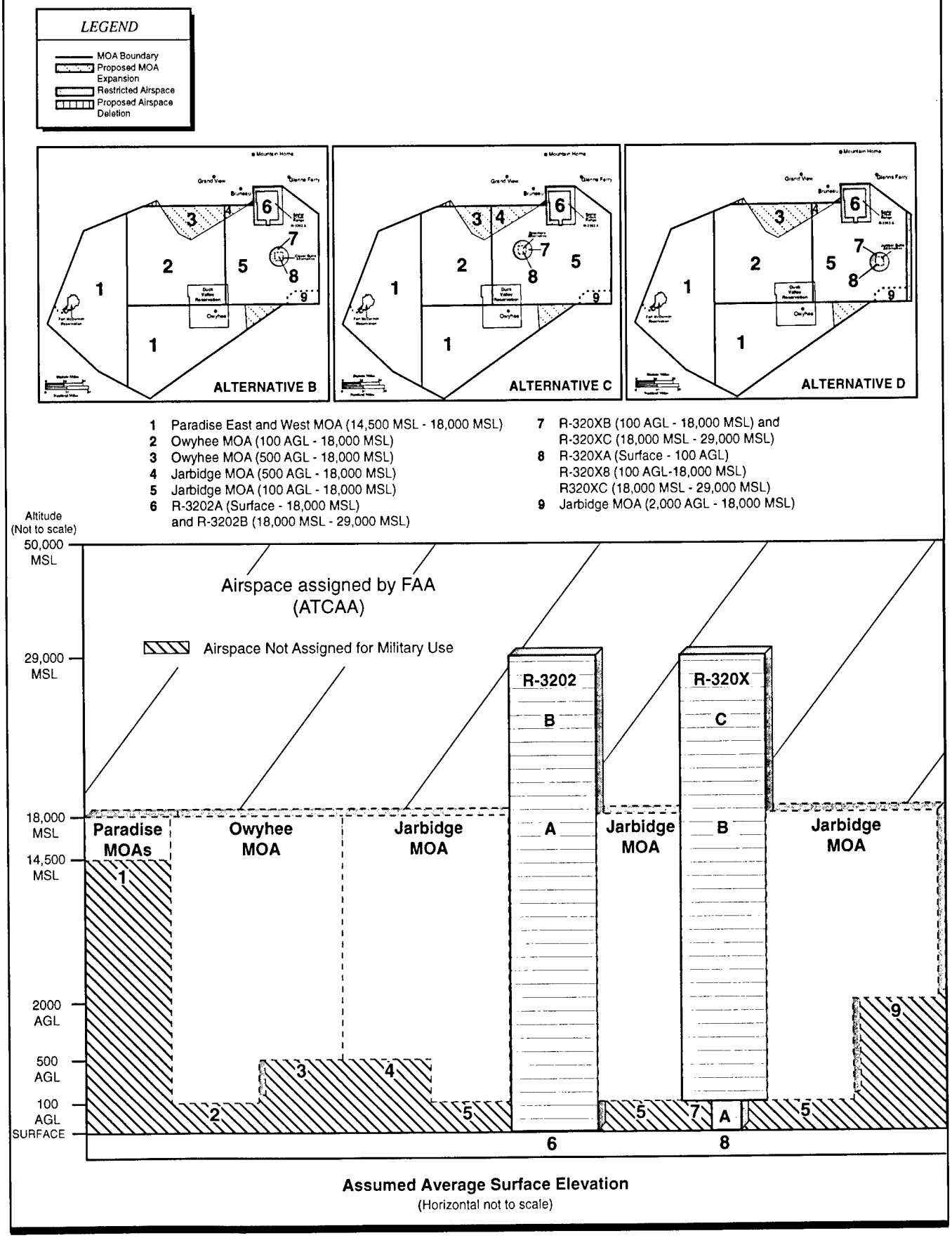



**Figure 2.3-16**
**Proposed Altitude Structure for R-3202 A/B, R-320X A/B/C, Paradise MOAs, Owyhee MOA, and Jarbidge MOA**

at altitudes ranging from 100 feet AGL to 14,000 feet MSL. The underlying lands have been exposed to low-level military jet overflights for a number of years.

Expansion of this portion of the Paradise MOA would enhance the utility of this airspace while simultaneously enabling aircrews to maintain required avoidance of the reservation. Use of this section of the MOA would consist of more than straightforward transit to and from the Idaho airspace. It would provide sufficient maneuvering space for aircrews to employ the variability needed for realistic, quality training.

*Eastward Expansion of Jarbidge MOA* (refer to Figure 2.3-15). Only under Alternative D, the MOA airspace east of SCR (currently the Bruneau 1 and 2 MOAs) would be expanded 2 miles to the east. This modification, as part of the proposed Jarbidge MOA, would permit full 360-degree access to the Juniper Butte training range.

### 2.3.3.2 Modifications to Restricted Airspace

*Restricted Areas R-3202A, B, and C.* Under a new training range alternative, as noted previously, R-3202B and C south of SCR would no longer be necessary. Under Alternatives B, C, and D, the Air Force proposes to eliminate R-3202 B and C and convert the airspace into MOA airspace. This element of the airspace modifications would eliminate restricted airspace and facilitate civil air traffic in airspace overlying 198 square miles, including portions of the Bruneau and Jarbidge rivers. A higher block of airspace (new R-3202B) would be established as a restricted area directly above R-3202A, extending the current SCR restricted airspace from 18,000 to 29,000 feet MSL. When in use, this upper block would accommodate tactics such as pop-up and high-altitude weapons deliveries.

Elimination of R-3202B and C, in combination with proposed restricted airspace over the 12,000-acre training range, would reduce the total area overlain by restricted airspace by almost 120 square miles.

*Proposed 12,000-acre Tactical Training Range.* FAA and Air Force regulations require restricted airspace above and around any range impact area, with the airspace extending to the surface over the actual lands containing the range. The restricted airspace must be of sufficient size to permit all planned aircraft and training ordnance delivery activities associated with the range, while precluding interaction with non-participating aircraft. Under Alternatives B, C, or D, three overlapping restricted areas would be established. Centered on the central point of the range, this circular restricted airspace would cover approximately 50,000 acres. One restricted area (R-320XA) would completely overlie the square 12,000-acre range, extending from the surface to 100 feet AGL (refer to Figure 2.3-16). Directly overlying R-320XA, but with a radius of 5 NM, the second restricted area (R-320XB) would extend from 100 feet AGL to 18,000 feet MSL. The third restricted area (R-320XC) lies directly on top of R-320XB and would extend from 18,000 feet MSL to 29,000 feet MSL. This upper block of restricted airspace would support high-altitude training ordnance deliveries and other tactics. Also, R-320X A and B could be

scheduled separately from the upper block (R-320X C), thereby providing usable airspace for different training activities.

With the exception of proposed site BK, all emitter sites and no-drop targets would occur under MOA airspace. No restricted airspace would be required over no-drop targets or emitter sites since no training ordnance delivery would occur at these locations. While aircraft would simulate training ordnance deliveries against no-drop targets, these activities would operate under standard "see and avoid" MOA procedures. Most aircraft would not overfly the targets during simulated delivery. However, a small number of aircraft would practice tactics that would result in crossing target areas in 6 seconds or less. Electronic emitters, which simulate threats to aircraft, are not commonly overflown as part of training against those simulated threats. Rather, aircrews focus on identifying these simulated threats and neutralizing them from a distance beyond the range of the simulated threats. For example, against an electronic emitter simulating a SAM with a 10-NM range, an aircrew would train to identify the threat signature and simulate deployment of a weapon to neutralize the threat from beyond 10 NM.

#### 2.3.3.3 RECONFIGURATION OF MOAS

*Jarbidge MOA* (refer to Figures 2.3-13 through 2.3-15). In addition to existing, charted airspace consisting of R-3202-A, B, C, Bruneau 1 and 2 MOAs, Sheep Creek 1, 2, and 3 MOAs, and Saylor MOA, the 366th Wing at times operates in airspace made available through the Salt Lake City ARTCC. The FAA assigns an altitude reservation, or block of defined airspace, to extend above the top of the charted airspace (ranging from 7,000 to 18,000 feet MSL) up to 50,000 feet MSL; this temporary airspace is activated on an "as needed" or real-time basis. When the altitude reservation is not active, the FAA directs other air traffic through the area. The majority of the airspace reconfiguration, as outlined below, would eliminate the ongoing need for a stationary altitude reservation in this area and standardize the airspace used for military training.

To provide a consistent, single airspace unit associated with the proposed tactical training range, SCR, the no-drop targets and emitter sites, the Air Force proposes to create the Jarbidge MOA by

- eliminating the designations and internal boundaries for the Sheep Creek 1, 2, and 3 MOAs, Saylor MOA, and Bruneau 1 and 2 MOAs (refer to Figure 2.3-16);
- converting restricted areas R-3202B and C to MOA airspace;
- including the eastern portion of the proposed northern MOA expansion in this new MOA;
- establishing a single north-south boundary line for the MOA that extends from the Idaho-Nevada border to the northern limits of the proposed MOA expansion; and
- extending the ceiling of the MOA from various current altitudes to a uniform altitude of 18,000 feet MSL.

This reconfiguration would serve two primary functions. First, it would create a single usable airspace unit that would provide sufficient maneuvering and approach space to conduct training activities associated with the ranges, no-drop targets, and emitters. By reconfiguring this airspace as proposed, the 366th Wing could better schedule different activities in the Jarbidge and Owyhee MOAs, thereby enhancing effective use of the airspace. For example, air-to-air training could be more readily accomplished in the Owyhee and Paradise MOAs at the same time as air-to-ground activity occurs in the Jarbidge MOA. The current airspace configuration does not readily permit such compartmentalization of the training activities.

Second, increasing the altitude and establishing a uniform altitude for this MOA would formalize the airspace currently used for simultaneous low- and high-altitude training activity. By extending from its current floor altitude of 100 feet AGL[3] to 18,000 feet MSL, the MOA would provide sufficient airspace to accommodate high- and low-altitude activities with sufficient vertical separation for safety.

*Owyhee MOA* (refer to Figures 2.3-13 through 2.3-15). Reconfiguration of the Owyhee MOA would entail the following:

- including the western portion of the proposed northern MOA expansion in this existing MOA;
- establishing a single north-south boundary (with the Jarbidge MOA) line for the MOA that extends from the Idaho-Nevada border to the northern limits of the proposed MOA expansion; and
- redesignating the overlying portion of the Paradise MOA that extends from 14,500 to 18,000 feet MSL as the Owyhee MOA (refer to Figure 2.3-16).

Such modifications to the Owyhee MOA would provide enhancements similar to those described for the proposed Jarbidge MOA. Particularly, these changes would permit more effective use of the airspace for more than one training activity and allow more realistic CWT.

*Paradise MOAs* (refer to Figures 2.3-13 through 2.3-15). With a goal of enhancing effective use of the airspace, the Air Force also proposes to modify the internal structure of the Paradise MOA. This administrative modification would involve dividing the current Paradise MOA into Paradise West and East MOAs. This configuration, which existed in the past, would permit aircrews to use each MOA separately or jointly, depending upon the nature of the training activities.

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[3] The existing Bruneau 2 MOA has a floor altitude of 2,000 feet AGL; although the airspace would be integrated into the proposed Jarbidge MOA, the floor altitude for this section of the MOA would remain at 2,000 feet AGL.

### 2.3.4 Sorties and Sortie-Operations

Table 2.3-11 compares the sorties conducted by the 366th Wing in the local airspace and at remote ranges under baseline conditions and alternatives B, C, and D. Table 2.3-12 presents the number of day and night sortie-operations at SCR, a proposed tactical training range, and the associated range support MOAs for the three range alternatives (B, C, and D) in comparison to the baseline/No-Action Alternative. Figures 2.3-17, 2.3-18, and 2.3-19 provide a comparison of sortie-operations in all airspace units for the baseline/No-Action Alternative and sortie-operations for Alternatives B, C, and D, respectively. Under any of the three range development alternatives, the following changes to airspace use would occur:

- Enhanced training opportunities in Idaho would increase total 366th Wing sorties from Mountain Home AFB to the local airspace by approximately 7 percent (653 sorties). A corresponding reduction in the use of remote ranges would occur under Alternatives B, C, or D.

- The Jarbidge MOA (formerly composed predominantly of Sheep Creek 1-3 MOAs, Bruneau 1-2 MOAs, Saylor MOA, and Restricted Airspace R-3202B and C) would receive use primarily in support of air-to-ground training activities and CWT at SCR, the 12,000-acre tactical range, and no-drop targets. Of the 8,273 sortie-operations proposed for the Jarbidge MOA, 7,561 would use SCR and 3,984 would use the 12,000-acre tactical range. Over 3,000 sortie-operations of the total (8,273) in the Jarbidge MOA would conduct activities at both SCR and the 12,000-acre tactical range during the same use of the airspace. About 32 sortie-operations would be conducted daily, an increase of about two sortie-operations above baseline conditions (based upon 260 flying days).

- The reconfigured Owyhee MOA would receive proportionately greater use (than baseline) for air-to-air training. About 30 sortie-operations would be conducted daily, an increase of about two sortie-operations above baseline conditions (based upon 260 flying days). Despite the annual increases (496 sortie-operations), all sortie-operations would involve roughly twice as much time at altitudes above 5,000 feet AGL than under this altitude as compared to baseline conditions.

- SCR and the proposed tactical range, no-drop targets, emitter sites, and the modified MOA airspace would be used for CWT. Approximately 41 CWT exercises, including those for ORE/ORIs (rather than 21 under baseline), would be performed in local airspace. These changes account for the increase in sortie-operations in many of the local airspace units. Eighteen CWTs by the 366th Wing would continue to be flown from Nellis AFB to NAFR.

**Table 2.3-11. Comparison of Annual 366th Wing Sorties: Local Airspace, Remote Ranges, and Deployed Locations**

| | *Baseline/Alternative A* | *Alternative B, C, or D* | *Change* |
|---|---|---|---|
| Local Airspace[1] | 9,883 | 10,536 | +653 |
| NAFR[2] | 1,492[3] | 808 | -684 |
| FTRC | 267 | 136 | -131 |
| UTTR | 669 | 280 | -389 |
| Deployed at Remote Locations | 93[3] | 871 | +778 |

Note: 1. IDANG and transient sorties to local airspace are not expected to change.
2. Most NAFR sorties are flown from Nellis AFB.
3. Represents FY95, when there were two deployments to Nellis AFB and no overseas deployments.
Source: Mountain Home AFB 1996a

**Table 2.3-12. Annual Sortie-Operations for Baseline and Alternatives: SCR and Range Support MOAs vs. SCR, Proposed Jarbidge MOA, and Proposed Training Range**

| | BASELINE/ALTERNATIVE A | | | ALTERNATIVE B, C, AND D | | | AMOUNT OF CHANGE | | |
|---|---|---|---|---|---|---|---|---|---|
| *Airspace Unit* | *Day* | *Night* | *Total* | *Day* | *Night* | *Total* | *Day* | *Night* | *Total* |
| Range Support MOAs (Sheep Creek 1-3, Bruneau 1-2, Saylor) | 7,254 | 483 | 7,737 | | | | | | |
| *SCR[1]* | (7,254) | (483) | (7,737) | | | | | | |
| Proposed Jarbidge MOA | | | | 7,733 | 540 | 8,273 | +479 | +57 | +536 |
| *SCR[2]* | | | | (7,071) | (490) | (7,561) | | | |
| *Proposed Training Range[2]* | | | | (3,741) | (243) | (3,984) | | | |

Notes: 1. The range support MOAs encompass SCR, so SCR sortie-operations are already included in range support MOA sortie-operations. Such inclusions are designated with "( )" and are not additive to sortie-operations for the MOAs.
2. The proposed Jarbidge MOA would encompass SCR and a proposed training range, so SCR and proposed training range sortie-operations are already included in the proposed Jarbidge MOA sortie-operations. Such inclusions are designated with "( )" and are not additive to sortie-operations for the proposed MOA.
Source: Mountain Home AFB 1996a

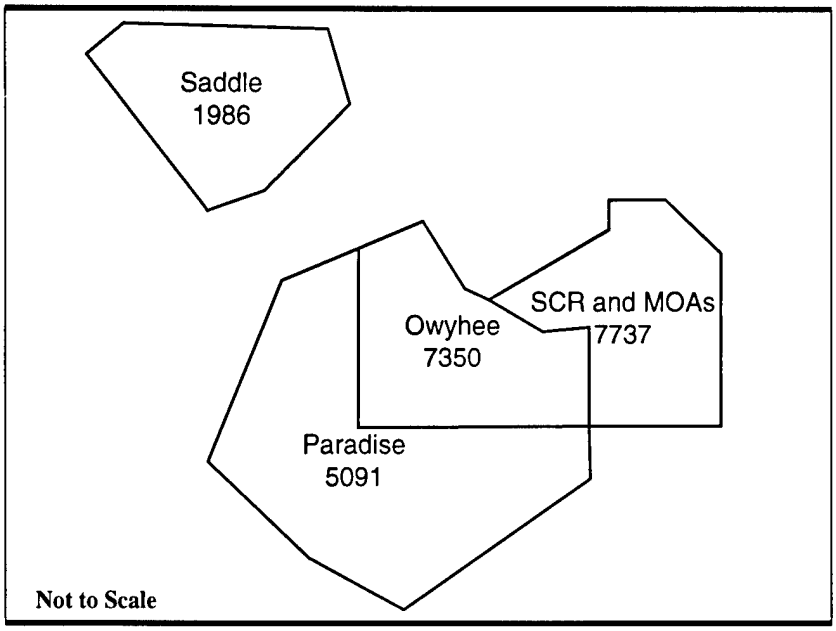



**Figure 2.3-17**

**Distribution of Annual Sortie-Operations Baseline/ No-Action Alternative**

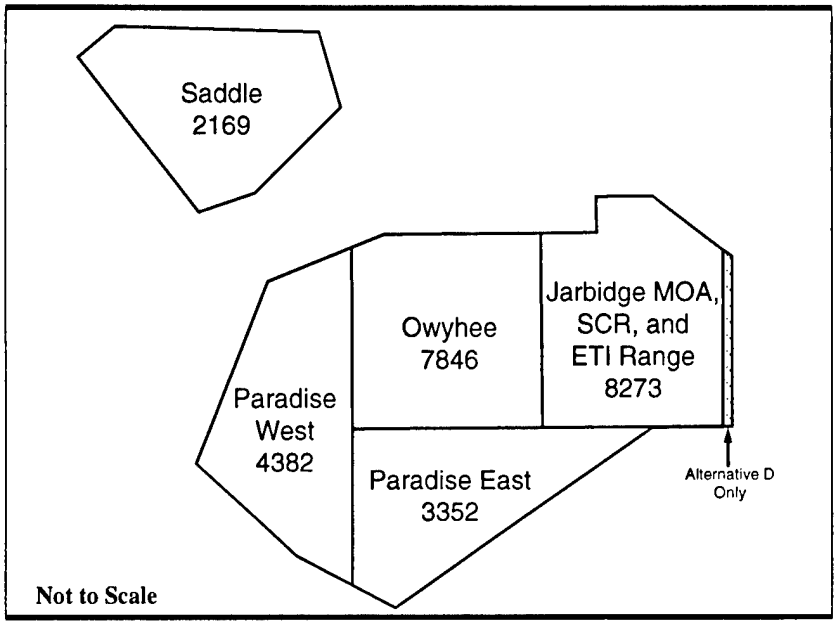



**Figure 2.3-18**

**Distribution of Proposed Annual Sortie-Operations Alternatives B and D**

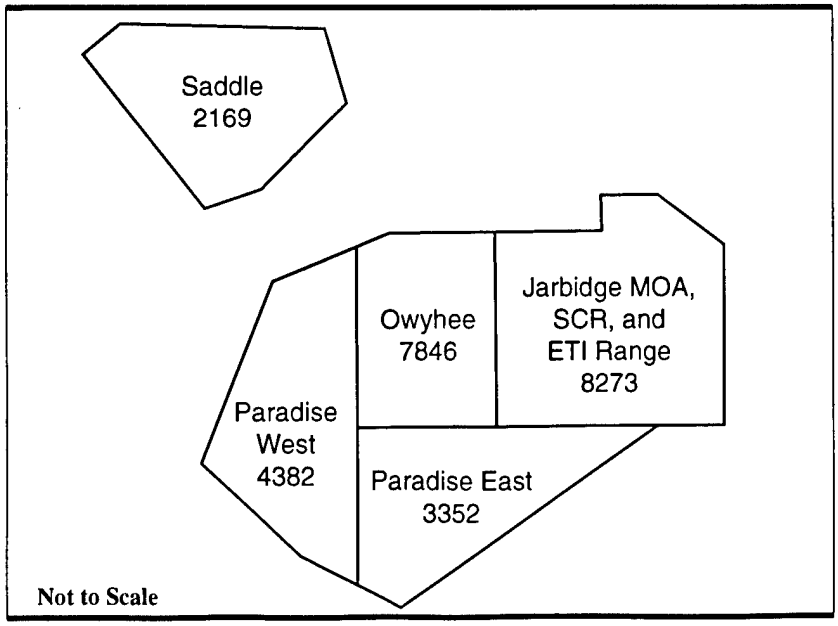



**Figure 2.3-19**

**Distribution of Proposed Annual Sortie-Operations Alternative C**

- Night (after 10 P.M.) sortie-operations would increase by 57 and 51 annually in the Jarbidge and Owyhee MOAs, respectively. For the Jarbidge and Owyhee MOAs, night sortie-operations would represent about 6 and 5 percent of total sortie-operations, respectively. This represents no perceptible change relative to baseline percentages.

- Division of the Paradise MOA into the Paradise East and West MOAs would result in compartmentalizing the airspace use. All of the increased use in these MOAs would occur above 14,500 feet MSL.

- Expansion of the Owyhee MOA and Sheep Creek 3 MOA (part of the proposed Jarbidge MOA) would result in aircraft training activities over lands not previously exposed to these types of aircraft operations. However, these lands have underlain Area X-Ray through which aircraft regularly transit to and from Mountain Home AFB and the Owyhee and Sheep Creek 3 MOAs (refer to Figure 1.3-1).

- 366th Wing sorties to NAFR, FTRC, and UTTR would decrease overall by 46 percent. Use of NAFR and UTTR would decrease by 684 sorties and 389 sorties, respectively. Sorties at FTRC would decrease by 131 sorties. The decrease in remote range sorties would result from increased training opportunities in Idaho.

- Although ETI would offer high-quality training opportunities, it is unlikely that other units would use it more than at present. The distance to the ETI from other bases, the costs in fuel and transit time, and proposed schedule restrictions of ETI would limit the value to other units.

- Under all alternatives, sortie-operations on MTRs would remain unchanged from baseline conditions.

Air-to-air training activities that could result in supersonic events would continue to be conducted above 10,000 feet AGL in the existing airspace over Idaho. This excludes airspace over the Duck Valley Reservation, as well as the Paradise East and West MOAs and Saddle MOAs. For the MOA and restricted airspace overlying Idaho, there would be a 10 percent increase in the number of sortie-operations that could result in supersonic events. This increase is due to more sortie-operations conducted in the local airspace. However, the frequency of occurrences per sortie-operation involving air combat maneuvering would remain the same (10 percent). Table 2.3-13 compares the annual air-to-air sortie-operations potentially resulting in supersonic events under baseline/No-Action to Alternatives B, C, and D.

**Table 2.3-13. Annual Air-to-Air Sortie-Operations Potentially Resulting in Supersonic Events**

| *Airspace Unit* | *Baseline/No-Action* Events | *Alternatives B, C, and D* Events | *Amount of Change* Events |
|---|---|---|---|
| SCR and Existing SCR MOAs/ SCR and Proposed Jarbidge MOA | 235 | 267 | +32 |
| Existing Paradise MOA Above Owyhee MOA/ Proposed Owyhee MOA | 302 | 326 | +24 |
| Total | 537 | 593 | +56 |

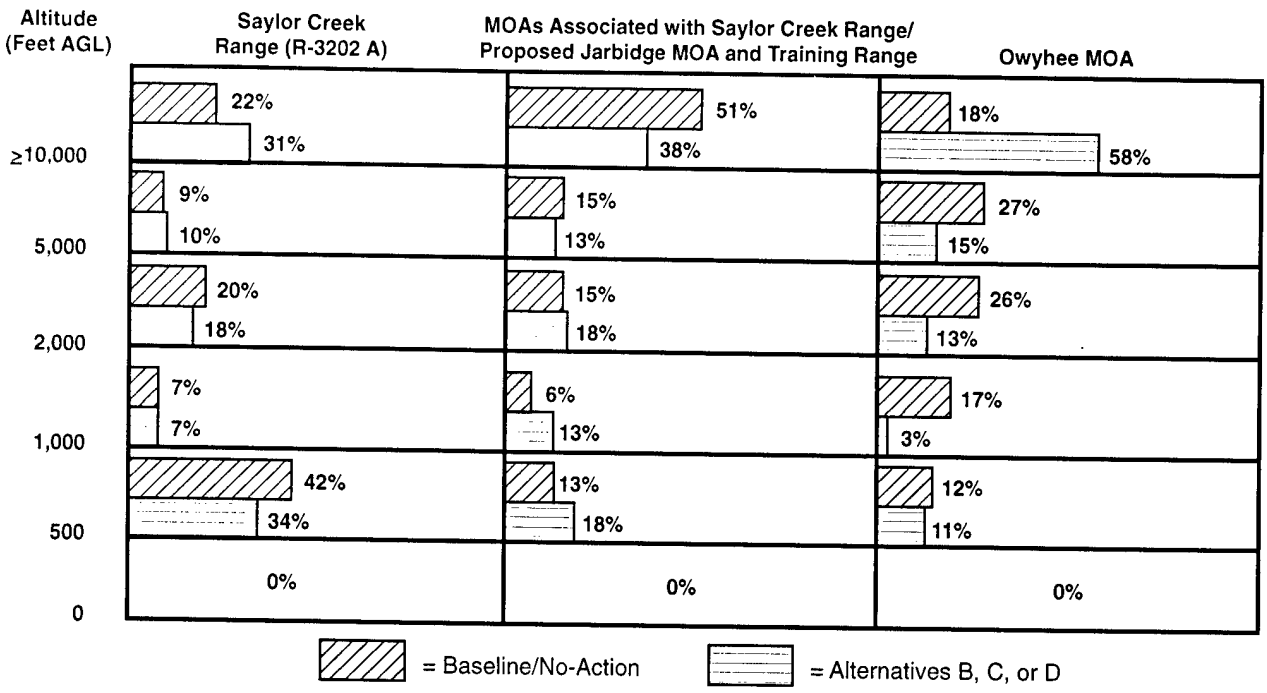
Note: No supersonic events currently take place or would take place in the Saddle MOAs, the portion of the Paradise MOA over Nevada and Oregon, or in the proposed Paradise East and West MOAs. Also, due to a ceiling that does not generally exceed 10,000 feet AGL, no supersonic events occur in the existing Owyhee MOA.

Source: Mountain Home AFB 1996a

Modifications to military training airspace under Alternatives B, C, and D would alter the estimated cumulative (i.e., for F-16, F-15C/D, F-15E, B-1B, and A-10 aircraft which account for 95 percent of the sorties) percentage of time spent at different altitudes. Figure 2.3-20 depicts the proposed changes in estimated percentage of time per altitude block for SCR (R-3202A); the six existing MOAs used and scheduled with SCR, the proposed Jarbidge MOA, including the proposed training range (R-320X) and no-drop targets; and the existing and proposed Owyhee MOA. Paradise MOA over Nevada and Oregon, and Saddle MOAs over Oregon, were not included in Figure 2.3-20 because their floors generally start at higher altitudes, and variation in the use of altitude blocks is limited in comparison to other local airspace units.

As this information shows, estimated cumulative use of altitudes above 10,000 feet in R-3202A (over SCR) would increase by 9 percent under Alternatives B, C, and D. From 1,000 to 10,000 feet AGL, estimated percentages of cumulative time spent would remain relatively the same. In contrast, an 8 percent decrease would occur for the altitude block between 500 and 1,000 feet AGL. For R-3202A, the capacity to use higher altitudes results from the proposal to extend the restricted airspace from 18,000 feet MSL to 29,000 feet MSL.

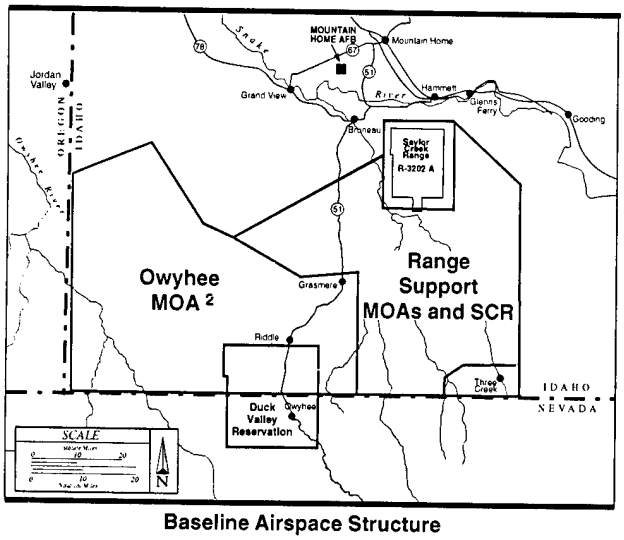
Similarly, the proposed extension of the ceiling of the Owyhee MOA from 14,500 feet MSL to 18,000 feet MSL would provide a single, contiguous block of airspace extending to higher altitudes. This factor, combined with the use of the proposed Jarbidge MOA to support range training sortie-operations, would increase the use of altitudes above 10,000 feet AGL in the Owyhee MOA by about 40 percent. The estimated percentage of time would decrease by more than half between 1,000 and 10,000 feet AGL, whereas it would remain relatively the same (11 to 12 percent) for the 500 to 1,000 feet AGL altitude block.



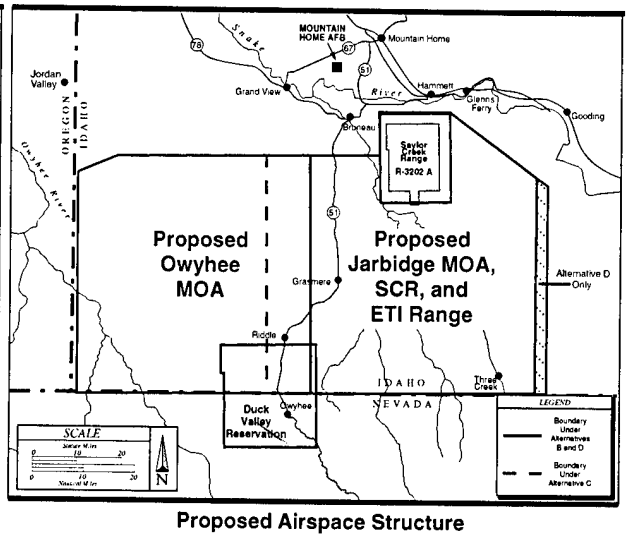

1. For Proposed Jarbidge MOA and Training Range, the estimated percentages include sortie-operations projected for SCR, the proposed Training Range and No-Drop Targets.

2. Under baseline/No-Action, the Owyhee MOA extends up to approximately 10,000 feet AGL (14,500 Feet MSL). The percentage shown here reflects a liberal estimate (50 percent) for those sortie-operations using the portion of the Paradise MOA that overlies the Owyhee MOA.

3. Saddle MOAs and Paradise MOAs, not presented. Saddle MOAs start at approximately 4,000 to 6,000 feet AGL and use of the altitude blocks is not expected to change. Paradise MOA starts at generally 8,000 to 10,000 feet AGL and is 3,500 feet thick, so no shift in use of altitude blocks is expected.




Baseline Airspace Structure




Proposed Airspace Structure

**Figure 2.3-20**
**Estimated Percentage of Cumulative Time of Sortie-Operations Per Altitude Block By Airspace Unit**

For the proposed Jarbidge MOA, which would predominantly support air-to-ground training activities, the estimated percentage of time would decrease above 10,000 feet AGL and increase 2 to 7 percent in the four lower altitude blocks.

### 2.3.5 Training Ordnance Use

Training ordnance use would involve delivery of a total of approximately 15,000 and 6,400 small (BDU-33s or equivalent) training ordnance on SCR and the proposed training range, respectively. Overall, training ordnance use would decrease by about 6 percent relative to baseline. This training ordnance would contain either cold spotting charges or no spotting charges. Cold spots discharge smoke, but no flame. Cold spot ingredients, primarily titanium tetrachloride, quickly become inert and dissipate. The training ordnance delivery events proposed for this area as discussed under Weapons Safety below are designed to ensure a 99.99 percent probability that training ordnance remains within the fenced 12,000 acre tactical training range.

#### *TYPES OF TRAINING ORDNANCE*

The proposed action would involve the use of only BDU-33s or equivalent training ordnance on the proposed tactical range (see Table 2.3-14). Approximately 6,400 small, non-explosive training ordnance are projected for use on the proposed tactical target areas in the 12,000-acre range. No training ordnance would be used at the no-drop targets and the emitter sites.

Under the range development alternatives, weapons delivery would continue to employ the same training ordnance types at SCR as are used presently. This would consist primarily of BDU-33s or equivalent training ordnance. Training ordnance used on SCR conventional targets would decrease to roughly 15,000 units per year. Strafing with 20-mm and 30-mm steel cannon rounds would continue only on SCR, which includes four strafe pits and approved strafe targets.

**Table 2.3-14. Training Ordnance Use under Each Alternative**

| *Alternative* | **BDU-33 or Equivalent* | **Mk 82 Inert* | **Mk 84 Inert* | **BDU-50* | **20 mm* | **30 mm* |
|---|---|---|---|---|---|---|
| Baseline/ Alternative A | | | | | | |
| Saylor Creek Range | 22,584 | 384 | 456 | 209 | 78,000 | 178,200 |
| Alternative B, C, and D | | | | | | |
| Saylor Creek Range | 14,804 | 288 | 168 | 209 | 60,000 | 178,200 |
| Proposed 12,000-Acre Training Range | 6,364 | 0 | 0 | 0 | 0 | 0 |
| Total | 21,168 | 288 | 168 | 209 | 60,000 | 178,200 |
| Percent change | -6% | -25% | -63% | 0% | -23% | 0% |

*Note: These are scheduled versus actual amounts of training ordnance; actual use of training ordnance depends upon availability and often falls below scheduled levels.

Source: Mountain Home AFB 1996c

*Weapons Safety*

Safety is of paramount importance in operating any air-to-ground weapons range. Safety standards, and required processes and procedures, are stipulated in AFI 13-212. Although not all-inclusive, the following safety procedures that have specific applicability to safeguarding the general public are highlighted.

- Flight routes to and from the range are designed to avoid populated areas when the aircraft are carrying external ordnance of any type.
- The range operating agency designates weapons delivery patterns that must be adhered to by all range users.
- All firing or release of weapons must be accomplished to ensure impact within the impact area.
- Positive identification of the target is mandatory before an aircrew expends any training ordnance.
- The range operating agency must ensure that the public is aware of hazards associated with the range, and that hazard notices are periodically brought to the attention of the public.
- Signs posting the area must convey the hazards of entering the range.
- All information given to the local news media about range operations must be reviewed to ensure it conveys to the public the danger of entering the range.

**Footprints.** The Air Force has defined the weapons delivery events and axes of attack for training ordnance delivery events to provide a 99.99 percent probability that training ordnance would be contained within the applicable weapons safety footprints which, through design, would be contained within the proposed 12,000-acre tactical range. To achieve this result, weapons safety "footprints" are used that, based on historical information, describe a geographic area within which training munitions will come to rest on the ground.

The weapons safety footprints applicable to proposed training ordnance delivery events were used to assess operations under the range development alternatives, in accordance with procedures detailed in AFI-13-212, "Weapons Ranges." For the range development alternatives, all proposed weapons footprints fall within the confines of the range boundaries, and approximately 95 percent of the training ordnance would impact and remain within 300 feet of the target. The primary training ordnance impact area defined in this EIS, includes all drop targets and the surrounding area that would be fenced. In total, this area would encompass about 300 acres in the center of the range.

Many of the footprints reflect a significant amount of information gathered from aircraft with older systems. However, newer and far more accurate systems are used in the aircraft of the

366th Wing. As sufficient information is collected and analyzed that apply specifically to newer, more modern aircraft with improved weapons delivery capability, footprints may become smaller and more contained. However, for some events, lacking newer data, even these aircraft systems had to be assessed using the older and much more conservative information. As updated information is received, each event will be analyzed as described above before it would be permitted to be performed on the range.

**Hung Training Ordnance.** Existing procedures for hung training ordnance would remain the same under all alternatives. If it is suspected that a 25-pound training ordnance has failed to release from an aircraft, another aircraft flies alongside during the daytime and provides visual inspection. When this inspection reveals unreleased training ordnance, aircrews then attempt to jettison the training ordnance on the jettison target within the impact area. If this fails, the aircraft commander notifies the Mountain Home AFB control tower, requesting a flight path for the straightest possible approach to avoid populated areas. If unreleased training ordnance were suspected at night, then the aircraft would proceed to Mountain Home AFB, while avoiding populated areas.

### 2.3.6 Chaff and Flares

Training with defensive countermeasures (chaff and flares) would continue to be an integral part of training for the 366th Wing. For all the local airspace, total chaff use would increase by about 12 percent (5,794 more bundles of chaff). However, chaff use at SCR and in the surrounding proposed Jarbidge MOA would decrease by 12 percent relative to baseline conditions (Table 2.3-15). Due to changes in the configuration of the airspace and increased sortie-operations, chaff use in the Owyhee MOA and Paradise East and West MOAs would increase by 30 and 55 percent, respectively.

For defensive countermeasure flares, total use in all the local airspace would decrease by about 17 percent (4,331 fewer flares) as a result of decreased allocations. Most of this decrease (by 34 and 6 percent respectively) would occur in the SCR airspace and proposed Jarbidge MOA, including the proposed 12,000-acre training range (Table 2.3-15). Because the Paradise MOA would be divided into the Paradise East and West MOAs and sortie-operations would increase, annual flare use would increase by almost 1,000.

The use of chaff and flares is currently approved at SCR and throughout the MOAs. Under the alternatives, chaff and flares would continue to be used in accordance with current procedures and agreements with the BLM. Over the proposed tactical training range or the associated no-drop targets, flares would not be dispensed under 2,000 feet AGL. This is the same altitude restriction that applies to the remainder of the MOA airspace in southwest Idaho. Correspondingly, chaff would not be dispensed over inhabited areas. Chaff and flare use would remain restricted over the Duck Valley Reservation (refer to section 1.3.2.2).

**Table 2.3-15. Chaff and Flare Use under All Alternatives**

| *Training Ordnance* | *Alternative* | *Saylor Creek Range and Associated MOAs*[2] | *Owyhee MOA* | *Paradise MOA/ Paradise East and West MOAs* | *Total* |
|---|---|---|---|---|---|
| Chaff (bundles)[1] | Baseline/ Alternative A | 26,820 | 12,142 | 9,934 | 48,896 |
| | Alternatives B, C, and D | 23,498 | 15,820 | 15,372[3] | 54,690 |
| | Percent change from baseline | -12% | +30% | +55%[3] | +12% |
| Flares (each) | Baseline/ Alternative A | 14,624 | 6,053 | 4,566 | 25,243 |
| | Alternatives B, C, and D | 9,640 | 5,708 | 5,564[3] | 20,912 |
| | Percent change from baseline | -34% | -6% | +22%[3] | -17% |

Notes:
1. In Saddle 1 and 2 MOAs, neither chaff nor flares will be used.
2. Chaff and flare use for baseline and No-Action (Alternative A) includes Saylor Creek Range, Bruneau 1 and 2; Sheep Creek 1, 2, and 3; and Saylor MOAs. For Alternatives B-D, this includes SCR, the proposed 12,000-acre training range, and the proposed Jarbidge MOA.
3. Totals for Paradise East and West MOAs were combined and compared to baseline of Paradise MOA.

Source: Mountain Home AFB 1996a

## 2.3.7 Other Activities

### *Radio Frequency Emissions*

Radio frequency (RF) emissions consist of the transmission of non-ionizing energy through space to receptive objects. The types of RF-emitting equipment presently used by the 366th Wing and those proposed for use at emitter sites include radio communications systems, electronic emitters, and scoring systems. DoD and Air Force safety instructions provide guidance for the safe operation of RF-emitting equipment and training requirements for personnel who operate the equipment. Unit personnel could be exposed to RF energy, but all RF emitters are considered nonhazardous as long as applicable safety precautions and calculated hazard distances are adhered to. For each piece of equipment producing RF, separation distances between the equipment and a receptor have been calculated so that a person beyond that distance will not receive RF energy that exceeds a permissible exposure limit (PEL). For the equipment proposed for use, these distances range from 2 to 221 feet. All RF-producing equipment will be oriented so that the RF energy is directed away from personnel and visitors, and safe separation distances will be maintained. Additionally, signs

indicating the presence of RF energy will be posted at each emitter location or on the fence at the proposed one-acre emitter sites.

*Laser Activity*

Laser targeting systems are an integral part of some modern aircraft. These laser systems are currently authorized for use on designated target areas within the SCR and are proposed for use on the training range for ETI. Combat mode of laser operations is proposed for use on the 12,000-acre target area, and the eye safe mode is proposed for use on the no-drop targets. Use of combat mode of laser operations is limited to those specific targets and target areas that have been specifically approved for those operations, like SCR. Laser guided training ordnance would not be used on the training range for ETI.

When the laser targeting system is used in the combat mode, it can be hazardous to the eyes under some conditions. Therefore, its use is restricted to DoD-controlled land, and under specific safety precautions. Procedures have been established to preclude any adverse impacts on the health and safety of either aircrew or observers during the use of lasers in designated target areas. These procedures require that a certification of the laser operations be completed by the Base Bioenvironmental Engineers with assistance from Armstrong Laboratories, Brooks AFB, Texas. This would determine what hazard control measures, if any, would be required for a target area based on the flight profile and resulting laser safety footprint for each target area. Such evaluations have been performed at SCR and would be for any target area selected under any of the range development alternatives. All safety procedures would be implemented prior to the use of lasers at the training range targets, including assurance that the laser safety footprints remain within the 12,000-acre range. Laser use at no-drop targets (an average of two times per month per target) would be limited to an eye safe mode of operation, and would also be certified to ensure safe operations (see section 4.3).

## 2.3.8 Land Use Management

### 2.3.8.1 GRAZING

The Air Force proposes to permit livestock grazing within the 12,000-acre range under any of the range development alternatives. Such grazing would occur outside of the fenced targets but within the range itself. Existing livestock grazing permits issued by the BLM and grazing leases issued by the State of Idaho would be terminated. The Air Force would manage grazing at levels compatible with training activities. Procedures for managing grazing, however, would be specified according to goals and objectives in the Resource Management Plan (RMP) for the range. Appendix M presents an approach for the proposed plan and implementation program. Grazing would be permitted on the 640-acre no-drop site under similar criteria. No grazing would occur on the five-acre no-drop sites, the one-acre emitter sites, or the graveled one-quarter-acre emitter sites.

#### 2.3.8.2 ACCESS/SAFETY

The proposed operations at the 12,000-acre training range are designed to ensure that all training ordnance remain within the fenced range boundaries. For safety reasons, access to sites by the public would not be permitted, although access by ranchers to grazing areas through a coordinated grazing plan is envisioned. The no-drop targets and the one-acre emitter sites would be fenced to prevent vandalism and would not be open to public access. When in use, personnel would be present at all emitter sites.

#### 2.3.8.3 NATURAL AND CULTURAL RESOURCES

The Air Force recognizes the need and value of management and stewardship of natural and cultural resources. The Air Force would act in accordance with AFI 32-7064 and AFI 32-7065, which provide guidelines for activities in relation to natural and cultural resources found on Air Force lands. It is also expected that the environmental impact analysis process (EIAP) may reveal the need for other management procedures. Management practices at the proposed training range would be described in detail in the RMP, consistent with the findings of the EIS should a range development alternative be selected. As outlined in Appendix M, this plan will include procedures for access, the protection of cultural and natural resources, management of grazing, fire, hazardous wastes, and training ordnance cleanup, in keeping with Air Force environmental guidelines.

### 2.3.9 Range Development and Use Schedule

A schedule for development and use of a new training range, no-drop targets, roads, and emitter sites would be subject to appropriations and military construction funding. For purposes of this analysis, a proposed sequence of construction activities is presented below. The development sequence would take place over a 3 to 4-year period and includes the following:

- Reconstruct existing bridge over Clover Creek
- Upgrade portions of Clover-Three Creek Road
- Build roads in the interior of the 12,000-acre training range
- Build road to scoring system relay site
- Construct scoring system relay site
- Construct targets within the 12,000-acre training range
- Construct maintenance facility within the 12,000-acre training range
- Develop all no-drop sites

- Develop majority of emitter sites
- Improve or build roads associated with no-drop and emitter sites
- Develop remaining emitter sites
- Improve or build roads associated with emitter sites

As described above, the first set of construction activities would likely include construction of a new bridge over Clover Creek adjacent to the current bridge on Clover-Three Creek Road. Clover-Three Creek Road would be graded and graveled. The training range maintenance facility, as well as all roads and targets within the 12,000-acre training range, would also be constructed. The road to the scoring system relay site and the site itself would be built.

Subsequent construction would include development of the four no-drop target sites. All roads associated with these sites would be improved or constructed. Emitter sites would be developed using equipment and personnel efficiently. This would necessitate building emitter sites and associated roads that are geographically near each other at the same time.

For all of the range development alternatives, the basic construction sequence would occur over a 3- to 4-year period. This sequence would ensure access to the target locations and a base of operations for development activities, monitoring of construction, and fire suppression equipment and personnel while range development is ongoing. The Air Force anticipates construction efforts to occur from April through October.

By adhering to the sequence as presented, initial training activity at the 12,000-acre training range could occur prior to completing all construction activities. Such activities would be limited by the development of the targets. Training activities would also be constrained by the construction activities, so use of the range would not be extensive. Once constructed, use of the 12,000-acre training range would occur year round.

# 2.4 COMPARISON OF ALTERNATIVES BY RESOURCE AND POTENTIAL IMPACTS

Table 2.4-1 summarizes the findings and environmental consequences of the No-Action Alternative and range development alternatives for each resource. This side-by-side comparison of the alternatives reveals the differences and similarities among the resources with regard to the impacts identified in this EIS.

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 1 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **AIRSPACE (Sections 3.1, 4.1)** | | | |
| **Restricted Airspace** | | | |
| No change from baseline | Nearly 50% overall reduction in restricted airspace<br><br>Elimination of R-3202B/C<br><br>Vertical extension of R-3202A<br><br>New restricted airspace over training range<br><br>Decrease of average daily sortie-operations at SCR by 1-2<br><br>No impacts to emergency medical flights traveling from Owyhee, NV, to Boise, ID | In addition to impacts discussed for Alternative B, potential impacts on Grasmere airport operations<br><br>Impact on general aviation using Highway 51 corridor and Grasmere airfield. These aircraft would be required to divert around the restricted airspace or obtain permission to transit through | Same as Alternative B |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 2 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **MOAs** | | | |
| No change from baseline | Internal boundary realignment<br><br>Northern expansion of Owyhee MOA by 430 sq. mi.<br><br>Southern expansion of Paradise MOA by 125 sq. mi.<br><br>Overall 6% increase in MOA airspace<br><br>Decrease of average daily sorties in Paradise East/West MOAs by 3-7 sortie-operations<br><br>Increase of average daily sortie-operations in Owyhee MOA by 1-2 sorties<br><br>No impacts on general aviation | All impacts would be the same as Alternative B, except internal boundary of Owyhee-Jarbidge would be farther west | All impacts would be the same as Alternative B with an additional 2 mile MOA expansion to east (totaling 112 sq. mi.) |
| **NOISE (Sections 3.2, 4.2)** | | | |
| Existing noise levels would continue throughout the airspace with aircraft operation concentrated along an east-west corridor north of Duck Valley Reservation. Continued annoyance, as expressed by commentors, with existing aircraft operations | General reduction of average noise levels throughout the airspace except in the airspace directly over the proposed training range (increase from 61 to 66 decibel [dB]) and in the northern airspace expansion (increase from 46 to 53 dB)<br><br>Reduction of average noise levels would result from reconfiguration of airspace. Levels would decrease from 69 to 59 dB in R-3202C due to aircraft operations being more uniformly distributed throughout the military airspace | All impacts would be the same as Alternative B except average noise levels would increase from 56 to 66 dB directly over the proposed training range and increase from 46 to 51 dB in the northern airspace expansion. Levels would decrease from 69 to 56 dB in R-3202C | All impacts would be the same as Alternative B except average noise levels would increase from 57 to 66 dB directly over the proposed training range and increase from 46 to 52 dB in the northern airspace expansion. Levels would decrease from 69 to 56 dB in R-3202C. |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 3 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **SAFETY (Sections 3.3, 4.3)** | | | |
| **Fire and Ground Safety** | | | |
| Current safety management would continue | Low increased fire risk during range construction and daily operations and maintenance activities<br><br>Low fire risk from cold spotting devices on 25-pound training ordnance<br><br>Minimal risk at emitter sites due to increased ground activities<br><br>Safe separation distances established for radio frequency energy associated with emitters<br><br>Target area surveys/clearance required for laser operations | Same as Alternative B, except somewhat higher fire risk for development of this site | Same as Alternative B |
| **Flight Safety** | | | |
| No change from baseline | Statistically predicted risk of F-16 accident every 11.1 years. Risk significantly less for all other aircraft. Past 11 years experience of no bird-aircraft strikes suggest low likelihood of bird-aircraft strikes | Same as Alternative B | Same as Alternative B |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 4 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **Munitions Safety** | | | |
| No change from baseline<br><br>Positive impact from use of cold spotting in place of hot spots for training ordnance | Positive impact from use of cold spotting in place of hot spotting for training ordnance<br><br>Reduction of total ordnance use<br><br>Reduction of chaff use on SCR (-12%); increase in Owyhee (+30%), Paradise East, and Paradise West MOAs (+55%), and selected range alternative<br><br>Reduction of flare use on SCR (-34%) and in Owyhee MOA (-6%); increase in Paradise East and West MOAs (+22%) and over selected range alternative<br><br>Continuation of Air Force's agreement to restrict use of chaff and flares over Duck Valley Reservation | Same as Alternative B | Same as Alternative B |
| **HAZARDOUS MATERIALS AND SOLID WASTE MANAGEMENT (Sections 3.4, 4.4)** | | | |
| **Hazardous Materials** | | | |
| No change from baseline | Increase in use of hazardous substances from maintenance activities for ground support equipment, infrastructure maintenance, and vehicle maintenance<br><br>Increased potential for minor spills and releases from construction/maintenance activities<br><br>Increased storage of herbicides and fire suppression chemicals | Same as Alternative B<br><br>In addition, use of propane powered generators for electricity would involve additional fuel storage and maintenance | Same as Alternative B |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 5 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **Solid Waste** | | | |
| No change from baseline | Increase in debris from training ordnance on specific range site; decrease at SCR<br><br>Increase in domestic solid waste generation at maintenance facility and emitter sites, consisting of small amounts of residue from minor maintenance activity and possible small quantities of domestic waste | Same as Alternative B | Same as Alternative B |
| **EARTH RESOURCES (Sections 3.5, 4.5)** | | | |
| No change from baseline | No impact on unique geologic/geomorphic features, mineral resources, or paleontological resources<br><br>Short-term increased potential for erosion of surface soils by wind and/or water and for soil expansion from construction and maintenance activities | Same as Alternative B except for increased potential of erosion for maintenance facility site | Same as Alternative B |
| **WATER RESOURCES (Sections 3.6, 4.6)** | | | |
| No change from baseline | No impact on ground water, floodplains, or claims to water rights at range<br><br>Short-term construction impacts to Clover Creek during bridge reconstruction<br><br>Direct impacts to 49 intermittent and 1 perennial stream from new and upgraded road construction<br><br>Potential indirect impacts to 1.2 acres of wetlands | Same as Alternative B<br><br>Direct impacts to 56 intermittent and 1 perennial stream from new and upgraded road construction<br><br>Potential indirect impacts to 33 acres of wetlands | Same as Alternative B<br><br>Direct impacts to 58 intermittent and 1 perennial stream from new and upgraded road construction<br><br>No direct or indirect impacts to wetlands |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 6 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **AIR QUALITY (Sections 3.7, 4.7)** | | | |
| No change from baseline | Fugitive dust emissions from construction and maintenance activities would total about 224 tons, less than 0.1% of federal and state standards<br><br>Average decrease in aircraft emissions of 47% from baseline due to greater use of higher altitudes | Fugitive dust emissions from construction and maintenance activities would total about 176 tons, less than 0.1% of federal and state standards<br><br>Average decrease in aircraft emissions of 47% from baseline due to greater use of higher altitudes | Same as Alternative B |
| **BIOLOGICAL RESOURCES (Sections 3.8, 4.8)** | | | |
| **Vegetation, Rare Plants, and Wetlands** | | | |
| No change in impacts to any vegetation | Direct impacts from ground disturbance associated with training ordnance impact areas, emitters, roads, and no-drop target areas would include a loss of 2,874 acres of plant communities, including 515 acres of native vegetation. No direct impacts would be associated with wetlands or rare plants<br><br>Direct impacts to 49 intermittent and 1 perennial stream from new and upgraded road construction<br><br>Potential indirect impacts to 4,197 acres of native vegetation and 1.2 acres of wetlands | Direct impacts from ground disturbance associated with training ordnance impact areas, emitters, roads, and no-drop target areas would include a loss of 2,861 acres of plant communities, including 511 acres of native vegetation, and 2.4 miles of waters of the U.S. No direct impacts would be associated with wetlands or rare plants<br><br>Direct impacts to 56 intermittent and 1 perennial stream from new and upgraded road construction<br><br>Potential indirect impacts to 7,609 acres of native vegetation and 33 acres of wetlands | Direct impacts from ground disturbance associated with training ordnance impact areas, emitters, roads, and no-drop target areas would include a loss of 2,929 acres of plant communities, including 522 acres of native vegetation, loss of as much as 7.3 acres of rare plant habitat, and 2.4 miles of waters of the U.S. No direct impacts would be associated with wetlands<br><br>Direct impacts to 58 intermittent and 1 perennial stream from new and upgraded road construction<br><br>Potential indirect impacts to 1,875 acres of native vegetation. No indirect impacts to wetlands |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

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| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **Wildlife** | | | |
| No changes from baseline impacts | Direct impacts from ground disturbance, wildfire, noise, and human presence would be negligible to low for most wildlife species<br><br>Human presence impacts would be negligible because few easily-disturbed species occur in ROI One for Alternative B<br><br>Potential indirect impacts could affect the diversity and abundance of wildlife species associated with the 4,200 acres of sagebrush habitat within the 12,000-acre training range | Direct impacts from ground disturbance, wildfire, noise, and human presence would be low for most wildlife species<br><br>Human presence may have a moderate impact to general wildlife species that are known to be easily disturbed (e.g., golden eagles, bats, etc.)<br><br>Potential indirect impacts could affect the diversity and abundance of wildlife species associated with the highly diverse habitats (e.g., canyons, riparian, and wetland areas, and contiguous stands of native vegetation) within the 12,000-acre training range | Direct impacts would be similar to those for Alternative B<br><br>Impacts from human presence would be similar to those for Alternative B<br><br>Potential indirect impacts could affect the diversity and abundance of wildlife species associated with Juniper Draw, which comprises seven percent of the 12,000-acre training range, and the adjacent canyon of the East Fork Bruneau Canyon |
| **Protected and Sensitive Wildlife Species** | | | |
| No changes from baseline impacts | Direct and indirect impacts for protected and sensitive wildlife would be similar to those for general wildlife (i.e., negligible to low)<br><br>Human presence may have a moderate impact to protected and sensitive wildlife species that are known to be easily disturbed (e.g., sage grouse, loggerhead shrikes, etc.) | Direct and indirect impacts for protected and sensitive wildlife would be similar to those for general wildlife (i.e., low)<br><br>Human presence may have a moderate impact to protected and sensitive wildlife species that are known to be easily disturbed (e.g., California bighorn sheep, sage grouse, ferruginous hawks, prairie falcons, bats, etc.) | Direct and indirect impacts for protected and sensitive wildlife would be similar to those for general wildlife (i.e., negligible to low)<br><br>Human presence may have a moderate impact to protected and sensitive wildlife species that are known to easily disturbed (e.g., bats, ferruginous hawks, etc.) |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

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| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **CULTURAL RESOURCES (Sections 3.9, 4.9)** | | | |
| **Archaeological Resources** | | | |
| No change from baseline | Ground disturbance could affect a small number of National Register-eligible archaeological sites in primary ordnance impact area. Very low potential to affect a moderate number of other National Register-eligible archaeological sites elsewhere in 12,000-acre training range<br><br>Minimal adverse impacts to setting of National Register-eligible archaeological resources from increased noise levels<br><br>No impacts to National Register-eligible archaeological sites in no-drop target areas or emitter sites<br><br>Potential impacts to archaeological resource along an access road | Ground disturbance could affect a few National Register-eligible archaeological sites in primary training ordnance impact area. Very low potential to affect a large number of other National Register-eligible archaeological sites elsewhere in 12,000-acre training range<br><br>Minimal adverse impacts to setting of National Register-eligible archaeological resources from increased noise levels<br><br>National Register-eligible archaeological resource would be impacted by proposed no-drop target areas<br><br>Potential impacts to archaeological resource along an access road | Ground disturbance would affect no National Register-eligible archaeological sites in primary training ordnance impact area. Would probably affect no National Register-eligible archaeological sites elsewhere in 12,000-acre training range<br><br>Minimal adverse impacts to setting of National Register-eligible archaeological resources from increased noise levels<br><br>National Register-eligible archaeological resource would be impacted by proposed no-drop target areas<br><br>Potential impacts to archaeological resource along an access road |
| **Architectural Resources** | | | |
| No change from baseline | One architectural resource would be impacted by a proposed bridge relocation<br><br>No adverse impacts to setting of known architectural resources from increased noise levels | Same as Alternative B | Same as Alternative B |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 9 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **Traditional Cultural Resources** | | | |
| The current level and frequency of noise intrusions at some traditional cultural resources would not be reduced | Ground disturbance could affect a few traditional cultural resources in primary training ordnance impact area. Very low potential to affect a moderately large number of other traditional cultural resources elsewhere in 12,000-acre training range<br><br>Potential ground disturbance at a few traditional cultural resources caused by a proposed access road realignment<br><br>Low or no impacts to traditional cultural resources from increased noise levels<br><br>Visual intrusions associated with some emitter sites and other facilities west of Highway 51 | Ground disturbance could affect several traditional cultural resources in primary training ordnance impact area. Very low potential to affect a large number of other traditional cultural resources elsewhere in 12,000-acre training range<br><br>Potential ground disturbance at a few traditional cultural resources caused by a proposed access road realignment<br><br>Low or no impacts to traditional cultural resources from increased noise levels<br><br>Visual intrusions associated with some emitter sites and other facilities west of Highway 51 | Ground disturbance would probably affect no traditional cultural resources in primary training ordnance impact area. Very low potential to affect a few traditional cultural resources elsewhere in 12,000-acre training range<br><br>Potential ground disturbance at a few traditional cultural resources caused by a proposed access road realignment<br><br>Low or no impacts to traditional cultural resources from increased noise levels<br><br>Visual intrusions associated with some emitter sites and other facilities west of Highway 51 |
| **LAND USE AND TRANSPORTATION (Sections 3.10, 4.10)** | | | |
| **Land Status** | | | |
| No change from baseline | Approximately 11,864 acres would shift from BLM to DoD management<br><br>Recreation would be prohibited in certain areas<br><br>Grazing would be restricted in certain areas<br><br>Military activities would be a new land use | All impacts would be the same as Alternative B except approximately 9,264 acres would shift from BLM to DoD management | All impacts would be the same as Alternative B except approximately 11,269 acres would shift from BLM to DoD management |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 10 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **Land Management** | | | |
| No change from baseline | On withdrawn lands, management by DoD would be in accordance with guidelines established in RMP (refer to Appendix M) | Same as Alternative B | Same as Alternative B |
| **Special Use Areas** | | | |
| No change from baseline impacts | No change in management of or activity in special use areas<br><br>Increased overflight activity and/or changes in noise levels should not preclude the designation of special use areas. Jacks Creek WSAs would be exposed to increased noise levels. Owyhee and Bruneau-Jarbidge canyonlands would have reduced noise levels | Same as Alternative B | Same as Alternative B |
| **Transportation Activity** | | | |
| No change from baseline<br><br>Roads would remain at current unimproved status | Some beneficial effect from construction of new roads or improvements to existing roads<br><br>Increased vehicular traffic on roads associated with maintenance and operation of emitter sites and target areas<br><br>No decrease in access to areas still designated for public use<br><br>Potential impact on traditional resources from improved access | Same as Alternative B | Same as Alternative B and rerouting of one primitive road on northeast corner of 12,000-acre range |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 11 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **RECREATION AND VISUAL RESOURCES (Sections 3.11, 4.11)** | | | |
| **Recreation** | | | |
| No change from baseline | One road closure<br>Upgrade of roads<br>Change in federal agency management<br>Over 4 miles to Bruneau-Jarbidge River recommended WSA with recreational values | Same as Alternative B<br>Over 3 miles to Big Jacks Creek recommended WSA with recreational values | Same as Alternative B<br>Road modified within ½-mile of the E. Fork Bruneau Canyon with potential recreational values |
| **Visual Resources** | | | |
| No change from baseline | Some range components contrast with surrounding area<br>All range components in VRM[1] Class III and IV areas<br>Change in federal agency management | Same as Alternative B | Same as Alternative B |
| **SOCIOECONOMICS (Sections 3.12, 4.12)** | | | |
| **Population and Housing** | | | |
| No change from baseline | No change in population and housing | Same as Alternative B | Same as Alternative B |
| **Economic Activity** | | | |
| No change from baseline | Short-term increases in economic activity and employment related to range construction<br>Minor long-term effects on economic activity and employment<br>Potential disruption to permittee ranching operations | Same as Alternative B | Same as Alternative B |

**Table 2.4-1. Comparison of Alternatives by Resource and Potential Impact**

**(Page 12 of 12)**

| ALTERNATIVE A NO-ACTION | ALTERNATIVE B CLOVER BUTTE | ALTERNATIVE C GRASMERE | ALTERNATIVE D JUNIPER BUTTE |
|---|---|---|---|
| **Public Services or Public Finance** | | | |
| No change from baseline | Loss of $1,385 in annual PILT[2] revenues for Owyhee County represent loss of less than one percent of annual PILT[2] revenues and less than one-tenth of one percent of total annual county revenues<br><br>Negligible effect on public services or public finance | Same as Alternative B, but loss of $1,081 in annual PILT[2] revenues for Owyhee County | Same as Alternative B, but loss of $1,315 in annual PILT[2] revenues for Owyhee County |
| **Livestock Grazing** | | | |
| No change from baseline | Minimum agriculture industry impact from loss of 1,000 acres<br><br>Disruption to existing ranching including access, rangeland, water, and operations. Two ranching operations impacted<br><br>Quantifiable permittee impacts could include a loss of 1,032 state and federal AUMs[3], $1,538 in grazing fees, $5,563 in annual net operating income, and $4,415 in annual direct labor earnings | Same as Alternative B, except quantifiable permittee impacts could include loss of 983 state and federal AUMs[3], $5,297 in annual net operating income, and $4,203 in annual direct labor earnings | Same as Alternative B except, quantifiable permittee impact could include loss of 1,171 state and federal AUMs[3], $2,103 in grazing fees, $6,312 in annual net income, and $5,010 in annual direct labor earnings. One ranching operation impacted |
| **Mining and Recreation Industries** | | | |
| No change from baseline | No change in mining industry<br><br>Negligible effects on recreation industry | Same as Alternative B | Same as Alternative B |
| **Environmental Justice** | | | |
| No change from baseline | Environmental concerns of Shoshone-Paiute addressed in relevant resource sections. No disproportional impact to Native Americans or any minority or low income population | Same as Alternative B | Same as Alternative B |

Notes:
1. VRM = visual resource management
2. PILT = Payment in lieu of taxes
3. AUM = animal unit months

# 2.5 CUMULATIVE IMPACTS

## 2.5.1 Definition

The Council on Environmental Quality defines a cumulative impact as follows:

> The impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. (40 Code of Federal Regulations [CFR] §1508.7)

Cumulative environmental impacts are most likely to arise when a relationship exists between a proposed action and other actions expected to occur in the region of influence for the resources analyzed and also in a similar time period. Projects in close proximity to the proposed action would be expected to have a greater potential for a relationship that could result in potential cumulative impacts than those more geographically separated. These projects can be proposed by various agencies (federal, state, or local) or persons.

## 2.5.2 Past and Present Actions

Past and present actions associated with Air Force activities and other public and private entities are addressed in either Chapter 3, baseline conditions, or Chapter 4, environmental analysis. For example, past projects relating to military activity in the region include the *Idaho ANG 124th Wing Aircraft Conversion at Gowen Field* (1996), the *34th Bomb Squadron Relocation to Mountain Home AFB* (1996), and the *Idaho ANG MTR Modification* (1996).

Military activity and overflights associated with these projects have been included in this EIS as part of baseline conditions and the No-Action Alternative. A brief summary is provided below to explain the status of these past projects. Additional information describing historic airspace use and configuration to current conditions is provided in Appendix N.

**124th Wing Aircraft Conversion at Gowen Field, Boise Idaho.** The 124th Wing of the IDANG in Boise, Idaho completed an EA for an aircraft conversion. The 24 F-4G aircraft stationed at Gowen Field were replaced with 15 A-10 close air support aircraft and five C-130E transport aircraft. The proposed aircraft conversion resulted in an overall decrease from current activities at Gowen Field, but increased usage of general aviation airspace and SCR. Sorties in the local MOAs and some MTRs decreased; 124th Wing sorties in other MTRs increased only slightly. On the basis of the EA, a FONSI was issued in August, 1996. Cumulative impacts were also addressed in this document in relationship to the proposed ETI as well as other actions occurring in the area. These cumulative impacts are included as a baseline condition for the ETI proposal, since implementation of the aircraft conversion has already occurred.

**34th Bomb Squadron Relocation to Mountain Home AFB.** Air Combat Command (ACC) completed an EA for the relocation of the 34th Bomb Squadron and its 11 B-1B aircraft from Ellsworth AFB, South Dakota, to Mountain Home AFB, Idaho. The transfer of B-1B aircraft resulted in an overall decrease in the total number of annual sorties flown, but an increase in the use of local airspace (SCR and associated MOAs, Owyhee MOA, Paradise MOA, Saddle MOA, and IR-302 and IR-304). On the basis of the EA, a FONSI was issued in May, 1996 regarding the proposed relocation. Cumulative impacts were also addressed in this document in relationship to the proposed ETI, as well as other actions occurring in the area. These cumulative impacts are included as a baseline condition for the ETI proposal, since implementation of the squadron relocation has already occurred.

**Idaho Air National Guard MTR Modification.** The IDANG prepared an EA and FONSI (December 1996) for the realignment of two segments of an MTR shared by IR-302, VR-1300, and VR-1304 in northern Nevada. The IDANG developed this proposal to realign the route segments to the south to reduce operational constraints stemming from noise avoidance areas, airports, and Duck Valley Reservation, and to enhance route utilization efficiency. No changes to the use of this route were proposed as part of the action. The number, type, and frequency of sorties performed on this route remained the same. Cumulative impacts were also addressed in this document in relationship to the proposed ETI, as well as other actions occurring in the area. These cumulative impacts are included as a baseline condition for the ETI proposal, since implementation of the MTR modification has already occurred.

The environmental effects of all of these past actions, as well as the effects of other pertinent past and ongoing activities (see Appendix N) by the 366th Wing, 124th Wing, and transient users, are accounted for cumulatively through the analysis of the No-Action Alternative and the associated baseline conditions.

## Other Activities

Other activities besides those listed above were also included in the baseline (Chapter 3) and No-Action Alternative for this EIS. The following is a list of projects or activities that are included in the baseline analysis.

- 726th relocation
- Current BLM range management activities
- Current operations of the 366th Wing
- Routine road maintenance
- Fire suppression activities
- Maintenance powerlines/pipelines

- Remote ranges
- Orchard Training Area

The cumulative impacts in relationship to the proposed ETI action are derived primarily from proposed military, public, and private land management practices. Past and present actions in relationship to the ETI proposal are accounted for and analyzed in the affected environment (Chapter 3) and environmental consequences (Chapter 4) sections.

Future foreseeable actions are also accounted for in Chapter 4 under the cumulative impacts heading for each resource. These future foreseeable projects considered for the potential of creating cumulative impacts associated with the proposed ETI project are described in the following section. In each case, the assessment focuses on addressing two fundamental questions: (1) Does a relationship exist such that the impacts from the ETI project might affect or be affected by the impacts of the other actions? and (2) If such a relationship exists, does this assessment reveal any new information of consequence not identified when ETI is considered alone?

### 2.5.3 Elements of Proposed Action

The cumulative impact analysis also includes consideration of the effects of the accumulation of all project elements associated with the proposed action and alternative. These elements, presented in section 2.3, interact to form the proposed range alternatives. Therefore, each resource considers not only the individual project elements, but the potential effects of the implementation of all elements. Each section of section 4.0 includes specific discussion of the potential consequences of cumulative actions.

Special attention was given to including cumulative environmental considerations from ground disturbance, human presence, and operations into the planning process as early as possible to improve decisions. The Air Force sought to develop partnerships with both federal and non-federal stakeholders early in the planning process to improve communication and avoid impacts wherever possible. As previously described, this included meeting with state and BLM representatives, ranchers, Shoshone-Paiute tribal members, public organizations, and interested parties to identify their concerns and plan project elements to minimize impacts.

The potential for cumulative impacts that could come from different elements of the ETI are specifically addressed in Chapter 4. Cumulative impact summaries are presented for each potentially affected environmental resource in Chapter 4 of the EIS.

### 2.5.4 Reasonably Foreseeable Future Actions

Five actions described below vary with regard to specific details available. Three actions are completed and one is in the planning stage. This assessment presents the degree of specificity supported by available information on both actions and their impacts.

**Air Force Communication Tower at Blue Butte.** An EA and FONSI for the use of the former Pershing Missile site at Blue Butte were completed in June 1995. A Categorical Exclusion for constructing a Ground Control Intercept (GCI) communications relay tower at Blue Butte was completed September 1996. The purpose of the GCI communications tower is to transmit information from the existing Grasmere electronic combat site to Mountain Home AFB. In addition, it will provide traffic control of military aircraft in local airspace, particularly in the Duck Valley Reservation area. This action is independent of the ETI proposal and would take effect as a means to better control existing airspace. Construction began in December 1996. The project consists of installing a 60-foot microwave tower base with 8-foot parabolic dishes, a commercial power pole, an 8-by-10 foot equipment shelter, a corner reflector, and a power distribution system. The site consists of approximately one-quarter acre and has been previously developed. The site is gated with a four-strand barbed-wire fence. The Air Force has an established right-of-way with the BLM, which took effect December 2, 1996.

**Administrative Transfer of Electronic Combat Emitter Operations.** In the fall of 1997, management of the electronic combat mission changed from the active duty Air Force (366th RANS) to the IDANG control. These sites include four existing electronic combat sites (i.e., Grasmere and three sites on SCR) and, if implemented, proposed ETI emitter sites. No new facilities will be associated with the change in management. Real property responsibility would remain with the Air Force. The proposed management change would involve reassignment of about 130 personnel. The personnel change would either involve an active Air Force member to change to state guard employment, or existing IDANG members assuming the duties, but no net change in the number of personnel. Transfer of personnel would occur over a 4-year time span.

**Installation of Wind Turbine Generators, Grasmere Electronic Combat (EC) Site.** The purpose of this project is to install two wind turbine generators to augment the electrical power generated by the existing photovoltaic power plant at the Grasmere EC Site, and to further reduce air emissions associated with operation of the site. The proposed action would provide additional use of renewable energy by harnessing the abundant wind resource available at the site. The wind turbine generators would be located on the EC site access road. The wind generators would be installed on two 80-foot towers. Two wood power poles would be used to connect the wind turbine generators to the existing photovoltaic power system. An existing 35-foot pole and a new 25-foot power pole would be installed on the Grasmere EC site.

**Air Expeditionary Force (AEF) BATTLELAB.** Mountain Home AFB is the site for the Air Force's AEF BATTLELAB. It is not a flying organization and does not require any increase in Wing flying operations. The BATTLELAB is a user of Wing statistical information for research and development of tactics, mobilization, and deployment requirements for Air Force AEF operations. Its impact represents fewer than 30 additional personnel at Mountain Home AFB.

Location at Mountain Home AFB is important for immediate capture of information from mobilization and CWT operations and, once information is analyzed, to make timely inputs for Air Force and Wing planning of future mobilization and CWTs.

**The Upper Columbia Basin Ecosystem Management Project.** The Upper Columbia Basin study and the associated Scientific Assessment of the Interior Columbia Basin provide a basis for evaluating regional influences on vegetative patterns, disruption of hydrologic regimes, expansion of exotics, fire severity and frequency, and increases in bare soils.

Review of the Scientific Assessment indicates that the ETI proposal is not inconsistent with the objectives being developed for the Interior Columbia Basin. The ETI Preferred Alternative has been recommended based on environmental factors. Management issues and concerns identified in the ETI EIAP are the same as those identified in the Scientific Assessment, particularly those related to ecological integrity. Each of the ETI alternatives were developed in such a fashion to minimize the area of disturbance and potential for impact.

Mitigations presented in the ETI EIS Preface specifically address steps incorporated into ETI that address habitat preservation, protection of surface waters, measures to reduce fire risks, and construction measures to minimize wind or water erosion. The Air Force will continue to consult with the BLM to ensure ETI maintains consistency with the Interior Columbia Basin efforts to the extent practicable while meeting primary mission needs.

## 2.6 SUMMARY OF PROPOSED MITIGATIONS

The mitigations proposed for ETI can be identified in one of three categories:

- *Mitigation by Avoidance.* These mitigations used existing information or data collected as part of the EIAP to avoid siting alternatives and project components in areas or settings known to contain environmental or cultural resources that could be significantly affected. Such avoidance is not absolute; rather it is balanced with training and operational considerations needed to enhance training in Idaho.

- *Mitigation by Design.* These mitigations used project design, configuration, and/or component location to reduce or eliminate potential impacts to a resource or suite of resources. Because of operational and fiscal requirement, not all possible design mitigations can be incorporated into the alternative components.

- *Operational Mitigation.* These mitigations reflect a specific action taken to resolve issues and reduce the potential for impacts. They are temporally and spatially oriented, and reflect some modifications to and restrictions on certain aspects of the Air Force's use of the proposed range and military training airspace. Since the majority of these mitigations are focused on very specific potential impacts, the geographic areas to which they apply vary, and the relatively brief periods of time they will be operative, they will not result in any significant degradation of enhanced training in Idaho.

Table 2.6-1 is a summary of mitigations associated with the three alternatives proposed for ETI. The table is organized by major environmental resource category, following the same sequence as Chapters 3 and 4 of this EIS. Details associated with each resource include how the potential impact was identified, the type of mitigation (avoidance, design, or operational), the mitigation and resulting environmental consequences, responsible agencies, and implementation time frame.

**Table 2.6-1. Proposed Mitigations**
**(Page 1 of 30)**

| *Resource Category* | **Airspace: Restricted Airspace** |
|---|---|
| *Concern/Potential Effect Addressed* | • Concern about extent of restricted airspace dedicated to military activities.<br>• Concern that military training aircraft would be concentrated in restricted airspace. |
| *Source of Concern* | Air Force, cooperating agencies, and public comments |
| *Mitigation Type* | Mitigation by design |
| *Mitigation* | Design ETI to minimize size of restricted airspace. |
| *Alternatives* | B, C, D |
| *EIS Section* | 4.1 |
| *Resulting Consequences* | • Less restricted airspace in region.<br>• Improved freedom of movement for non-military aviation in region.<br>• Reduced noise over the majority of the Bruneau-Jarbidge River System under existing restricted airspace; noise levels at the confluence of the rivers reduced from 69 dB to 56-59 dB. |
| *Agency Responsible* | Completing: Air Force; Funding: Not Applicable |
| *Time Frame* | After FAA incorporates requested airspace changes. |

| Table 2.6-1. Proposed Mitigations (Page 2 of 30) | |
|---|---|
| ***Resource Category*** | **Airspace: MOAs** |
| ***Concern/Potential Effect Addressed*** | Joint use of MOA airspace is permitted under "see and avoid" flight techniques. MOA airspace proposed to be enlarged and reconfigured. Concern that military aircraft operating near ETI elements located along Highway 51 could potentially conflict with the 8,000-10,000 feet MSL altitude block currently avoided for civil flights. |
| ***Source of Concern*** | Air Force, cooperating agencies, and Shoshone-Paiute Tribes |
| ***Mitigation Type*** | Mitigation by design; Operational mitigation |
| ***Mitigation*** | • Publicize airspace schedule on Mountain Home AFB website and via telephone. Indicate when airspace will be active or inactive. Specify periods of exercises or composite wing training.<br>• Use Military Radar Unit (MRU) and real-time communication to help deconflict military and general aviation aircraft flying in local airspace.<br>• The 366th Wing will ensure transient training aircrews are informed of mitigation measures contained in this EIS and agreed to during semiannual meetings with the BLM and the State of Idaho. |
| ***Alternatives*** | B, C, D |
| ***EIS Section*** | 4.1.2.2 |
| ***Resulting Consequences*** | • Civil aviators aware of the presence of military aircraft in the airspace.<br>• Improved monitoring and communications enhances joint use efficiency.<br>• Improved utilization of joint-use airspace. |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | Concurrent with ETI operation scheduling. |

**Table 2.6-1. Proposed Mitigations**
**(Page 3 of 30)**

| *Resource Category* | **Noise: Training Airspace** |
|---|---|
| *Concern/Potential Effect Addressed* | Concern that existing airspace structure and operational requirements concentrate aircraft north of Duck Valley Reservation and over Owyhee canyonlands, resulting in increased noise. |
| *Source of Concern* | Public comments and agency input |
| *Mitigation Type* | Mitigation by design |
| *Mitigation* | • Adjust MOA airspace to north and southeast to disperse flight activities.<br>• The Air Force, BLM, and State of Idaho will meet at least semiannually in accordance with a Memorandum of Agreement developed to address the needs and expectations of managers and users of resources in southwest Idaho. |
| *Alternatives* | B, C, D |
| *EIS Sections* | 3.1, 4.1 |
| *Resulting Consequences* | • Enhanced ability to address seasonal concerns regarding aircraft noise consistent with operational requirements.<br>• Generally reduced noise exposure throughout most of the military training airspace.<br>• Reduced noise over Owyhee canyonlands from 59-63 dB to 50-59 dB.<br>• Increased noise under northern expansion of Owyhee and Jarbidge MOAs from 46 dB to 51-53 dB.<br>• Increased noise from 56-63 dB to 66 dB under restricted airspace associated with withdrawn land for selected alternative.<br>• Reduced noise over the majority of the Bruneau-Jarbidge River System including the confluence of the two rivers, from 69 dB to 56-59 dB under MOA airspace that formerly was restricted airspace. |
| *Agency Responsible* | Completing: Air Force and FAA; Funding: Not Applicable |
| *Time Frame* | Proposed as airspace changes. Implemented by FAA. |

| Table 2.6-1. Proposed Mitigations (Page 4 of 30) | |
|---|---|
| ***Resource Category*** | **Safety: Fire Prevention** |
| ***Concern/Potential Effect Addressed*** | Concern that use of hot spot charges in training ordnance, flares, and increased human presence increases fire risk. |
| ***Source of Concern*** | Air Force, cooperating agencies, and public comments |
| ***Mitigation Type*** | Mitigation by design; Operational mitigation |
| ***Mitigation*** | • Use cold spot or no-spot training ordnance; no hot spot charges.<br>• Incorporate no-drop targets into training range proposal.<br>• Provide on-site fire suppression capabilities at training range site.<br>• Maintain 2,000 feet AGL flare release minimum altitude in MOA and restricted airspace outside of the exclusive use area of SCR. Flares burnout after descending about 325 feet after release. |
| ***Alternatives*** | A, B, C, D |
| ***EIS Section*** | 4.2 |
| ***Resulting Consequences*** | • Fire risk associated with current and proposed range operations is further minimized.<br>• Potential for secondary effects (e.g., loss of habitat) from fire minimized. |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | Implemented with range operations. Use of cold spot or no spotting charge and flare restriction on first day of range use, if ETI implemented. If ETI not implemented, phase in cold spots or no spotting charges at SCR with flare-use restrictions remaining unchanged. |

**Table 2.6-1. Proposed Mitigations**
**(Page 5 of 30)**

| *Resource Category* | **Safety: Fire Suppression** |
|---|---|
| *Concern/Potential Effect Addressed* | • Concern by agencies, ranchers, public that increased human presence could increase fire risk.<br>• Agency requests for additional fire response capabilities. |
| *Source of Concern* | Air Force, cooperating agencies, and public comments |
| *Mitigation Type* | Mitigation by design; Operational mitigation |
| *Mitigation* | • Include personnel trained in fire suppression and equipment on range for fire control and suppression.<br>• Provide 50,000-gallon water tank, a less than one-acre above-ground reservoir with another 50,000 gallons of water, and a 5,000-gallon water tanker truck.<br>• Locate water reservoir in consultation with ranchers, IDFG, and BLM to create a multiple use water source.<br>• Develop a range support agreement with BLM to include a fire management plan.<br>• The Air Force, BLM, and State of Idaho will meet at least semiannually in accordance with a Memorandum of Agreement developed to address the needs and expectations of managers and users of resources in southwest Idaho. |
| *Alternatives* | B, C, D |
| *EIS Sections* | 2.3.2, 4.3.2.1, 4.8.1, 4.8.6 |
| *Resulting Consequences* | • More rapid response to fires on range; further reduced wildfire risk.<br>• Fire-trained personnel and additional water availability reduces fire risk.<br>• Short-term ground disturbance during construction of reservoir. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | Construct during range development. Complete prior to range operation. |

| Table 2.6-1. Proposed Mitigations (Page 6 of 30) | |
|---|---|
| ***Resource Category*** | **Hazardous Materials and Solid Waste: Waste Management** |
| ***Concern/Potential Effect Addressed*** | Concern that hazardous materials and solid waste have potential to create environmental contamination. |
| ***Source of Concern*** | Air Force and cooperating agency consultation |
| ***Mitigation Type*** | Mitigation by design; Operational mitigation |
| ***Mitigation*** | • Minimize hazardous waste accumulation at proposed training sites.<br>• Regularly transport any waste products to Mountain Home AFB for recycling or disposal.<br>• Use double-walled above-ground fuel tanks with secondary containment to prevent fuel spills.<br>• Recycle training ordnance annually or when most economical. |
| ***Alternatives*** | B, C, D |
| ***EIS Section*** | 4.4 |
| ***Resulting Consequences*** | • Reduce risk of environmental contamination and volume of solid waste.<br>• Reduce expenditure of finite mineral resources |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | All components, processes, and procedures to be in place prior to start of range operations. |

| Table 2.6-1. Proposed Mitigations (Page 7 of 30) | |
|---|---|
| ***Resource Category*** | **Earth Resources: Surface Soil** |
| ***Concern/Potential Effect Addressed*** | Concern that road development and range construction could increase soil erosion. |
| ***Source of Concern*** | Air Force, cooperating agencies, and public comments |
| ***Mitigation Type*** | Mitigation by design; Operational mitigation |
| ***Mitigation*** | • Install road culverts to avoid water quality degradation by erosion.<br>• Construct and improve roadways to reduce potential for erosion<br>• Gravel roadways to prevent dust and erosion potential.<br>• Use erosion control measures (e.g., water, conveyance, energy dissipation structures) and sediment retention measures (e.g., basins, tarps, barriers) to minimize erosion at construction sites.<br>• Rehabilitate vegetation where practicable. |
| ***Alternatives*** | B, C, D |
| ***EIS Section*** | 4.5.3 |
| ***Resulting Consequences*** | Reduced potential for soil erosion, sediment transport, and dust generation. |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | Implementation during engineering and construction; periodic maintenance ensures continued effectiveness. |

**Table 2.6-1. Proposed Mitigations**
**(Page 8 of 30)**

| *Resource Category* | **Water Resources: Surface Water Quality** |
|---|---|
| *Concern/Potential Effect Addressed* | Range construction could increase erosion and increase sediment transport. |
| *Source of Concern* | Air Force and cooperating agency consultation |
| *Mitigation Type* | Mitigation by design; Operational mitigation |
| *Mitigation* | • Site facilities to avoid wetlands or streams to the maximum extent possible.<br>• Minimize ground disturbance during construction.<br>• Rehabilitate vegetation where practicable. |
| *Alternatives* | B, C, D |
| *EIS Section* | 4.6 |
| *Resulting Consequences* | • Short-term construction impacts reduced.<br>• Wetlands, waters of the U.S., and other water resources protected.<br>• More rapid vegetation recovery, providing stability to soils. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | Implementation during site design and construction. |

**Table 2.6-1. Proposed Mitigations**
**(Page 9 of 30)**

| | |
|---|---|
| *Resource Category* | **Water Resources: Surface Water Quality of Clover Creek** |
| *Concern/Potential Effect Addressed* | Concern that bridge reconstruction at Clover Creek Crossing could affect water quality in Clover Creek. |
| *Source of Concern* | Air Force and cooperating agency consultation |
| *Mitigation Type* | Mitigation by design; Operational mitigation |
| *Mitigation* | • Minimize disturbance to streambed through design, location, scheduling construction at low water levels, and following best construction practices.<br>• Reestablish drainage grades to assure water flow. |
| *Alternatives* | B, C, D |
| *EIS Section* | 4.6 |
| *Resulting Consequences* | • Reduced sediment transport into surface water.<br>• Minimal and short-term effect on stream flow.<br>• Minimal or no effect on irrigation.<br>• Increased safety from improved bridge.<br>• Protected water resources from construction scheduling. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | Complete Section 404 permit compliance prior to construction; incorporate into engineering and construction. |

**Table 2.6-1. Proposed Mitigations**
**(Page 10 of 30)**

| *Resource Category* | **Water Resources: Water Use** |
|---|---|
| *Concern/Potential Effect Addressed* | Water resources scarce; Air Force water use at the new range a concern. |
| *Source of Concern* | Air Force, cooperating agencies, and public comments |
| *Mitigation Type* | Mitigation by design; Operational mitigation |
| *Mitigation* | • Transport or contract for transport of water to the ETI sites for support of training activities, maintenance, and filling of the 50,000-gallon fire suppression tank.<br>• Work with ranchers, BLM, and Idaho Department of Fish and Game (IDFG) to protect access to water for multiple users. |
| *Alternatives* | B, C, D |
| *EIS Section* | 4.6 |
| *Resulting Consequences* | • No change in water rights; Air Force uses water from Mountain Home AFB or provided by contractors.<br>• Existing water remains available for traditional uses. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | Implementation during range construction and operation. |

**Table 2.6-1. Proposed Mitigations**
**(Page 11 of 30)**

| *Resource Category* | **Biological Resources: Threatened, Endangered, or Sensitive Species** |
|---|---|
| *Concern/Potential Effect Addressed* | Concern for potential environmental consequences of construction and use of ground facilities. |
| *Source of Concern* | Air Force, cooperating agencies, and Shoshone-Paiute Tribes |
| *Mitigation Type* | Mitigation by design; Operational mitigation |
| *Mitigation* | • Identify critical or crucial habitat.<br>• Site range, emitter pads, and no-drop targets wherever possible on previously disturbed locations.<br>• Avoid critical or crucial habitat during the siting process for no-drop and emitter sites.<br>• Site facilities to reduce potential for environmental impacts.<br>• Disperse and schedule use of emitter sites to address seasonal concerns. |
| *Alternative* | B, C, D |
| *EIS Section* | 2.1, 3.8, 4.8 |
| *Resulting Consequences* | • Eliminate or reduce direct impacts to sensitive locations in training range alternatives.<br>  • Reduced environmental impacts by relocating over 20 no-drop and emitter sites.<br>  • Avoided impacts to rare plants or rare plant habitat at emitter and no-drop sites.<br>  • Avoided impacts to wildlife habitat at emitter and no-drop sites.<br>• Dispersion of emitter sites would enhance ability to address seasonal concerns. |
| *Agency Responsible* | Completing: Air Force; Funding: N/A |
| *Time Frame* | Initiated during proposal definition and siting; completed after land withdrawal. |

| Table 2.6-1. Proposed Mitigations (Page 12 of 30) | |
|---|---|
| ***Resource Category*** | **Biological Resources: Animal Movement and Safety** |
| ***Concern/Potential Effect Addressed*** | Concern that range facilities such as fencing, power lines, or emitter sites could impact regionally important species. |
| ***Source of Concern*** | Air Force, cooperating agencies, and public comments |
| ***Mitigation Type*** | Mitigation by design |
| ***Mitigation*** | • Utilize "wildlife-safe" fencing with barbless lower wire; allows animals to move through area.<br>• Construct eagle-safe power line using Idaho Power Co., IDFG, and BLM guidelines. |
| ***Alternatives*** | B, C, D |
| ***EIS Section*** | 4.8 |
| ***Resulting Consequences*** | • Reduced potential for habitat disruption and/or fragmentation.<br>• Reduced potential for avian electrocution. |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | Concepts in range design. Implementation with range construction. |

| Table 2.6-1. Proposed Mitigations (Page 13 of 30) | |
|---|---|
| ***Resource Category*** | **Biological Resources: Amphibians** |
| ***Concern/Potential Effect Addressed*** | Concern about potential disturbance of amphibian habitat during bridge replacement at Clover Creek crossing. |
| ***Source of Concern*** | Air Force (EIS Analysis) and cooperating agencies |
| ***Mitigation Type*** | Mitigation by design; Operational mitigation |
| ***Mitigation*** | Survey for amphibians, adapt project design, and construct in autumn when amphibians are least likely to be affected and water levels are lowest. |
| ***Alternatives*** | B, C, D |
| ***EIS Sections*** | 3.8.5, 4.8.5 |
| ***Resulting Consequences*** | • No noticeable change in amphibian populations.<br>• Reduced impact upon habitat of water-dependent species. |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | Survey, adapt design, and schedule construction after ETI Record of Decision (ROD). |

| Table 2.6-1. Proposed Mitigations (Page 14 of 30) | |
|---|---|
| ***Resource Category*** | **Biological Resources: Slick Spot Peppergrass** |
| ***Concern/Potential Effect Addressed*** | Concern that approximately 7.3 acres of land containing slick spot peppergrass, a BLM sensitive species, could be affected by Juniper Butte primary ordnance impact area. An additional 67 acres of surveyed land known to support slick spot peppergrass outside the primary ordnance impact area. Only 61 slick spot peppergrass populations known in Idaho. Loss of one population would be adverse regional impact. |
| ***Source of Concern*** | Air Force (EIS Analysis) and cooperating agencies |
| ***Mitigation Type*** | Mitigation by design; Operational mitigation |
| ***Mitigation*** | • Coordinate with the BLM District Botanist to conduct a survey for slick spot peppergrass plants and habitat within the 12,000-acre withdrawal area and use the information to plan construction activities.<br>• Conduct construction activities so as to minimize the impacts on individual plants and identified habitat of slick spot peppergrass.<br>• Shift/modify target locations and range facilities to avoid, to the maximum extent possible, slick spot peppergrass habitat within the 300-acre primary ordnance impact area.<br>• Implement measures such as fencing significant populations to protect known plants and habitat within the 12,000-acre withdrawal area. Locate fencing in consultation with BLM botanists.<br>• Participate in periodic consultation meetings with agency biologists to determine success of protective measures, review the science and monitoring data, and make further adjustments as needed.<br>• Support interagency ecosystem program goals designed to propagate and protect the species (e.g., establish additional plant groups on suitable slick spot habitats).<br>• Facilitate increased knowledge of the species by providing outside agency access to the protected habitat.<br>• The Air Force, BLM, and State of Idaho will meet at least semiannually in accordance with a Memorandum of Agreement developed to address the needs and expectations of managers and users of resources in southwest Idaho. |
| ***Alternative*** | D |
| ***EIS Section*** | 4.8.3.4 |
| ***Resulting Environmental Consequences*** | • Protection of slick spot peppergrass from potential effects of grazing and encroachment by plants that could negatively impact slick spot peppergrass on withdrawn land outside 300-acre primary ordnance impact area.<br>• Possible loss of some individual slick spot peppergrass plants within primary ordnance impact area, but enhanced protection of the population as a whole.<br>• Natural regeneration in non-grazed areas likely to result in increased number of plants.<br>• Improving knowledge of distribution and abundance of slick spot peppergrass.<br>• Small amount of land excluded from grazing. |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | Conduct surveys during 1998 growing season. Target locations further refined during design prior to construction. Fencing of significant populations installed prior to construction. Ongoing consultations with agencies to review results, review the science and monitoring data, and make further adjustments as needed. |

**Table 2.6-1. Proposed Mitigations**
**(Page 15 of 30)**

| *Resource Category* | **Biological Resources: California Bighorn Sheep** |
|---|---|
| *Concern/Potential Effect Addressed* | • Concern there would be direct impacts to bighorn sheep from human presence if Grasmere alternative were selected.<br>• Although most studies suggest bighorn sheep habituate to low-altitude jet overflights, public and agency expressed concern that noise from overflights may impact bighorn sheep ewes during lambing.<br>• Concern that overflight noise would increase over the Little Jacks Creek bighorn sheep habitat. |
| *Source of Concern* | Air Force, cooperating agencies, Shoshone-Paiute Tribes, and public comments |
| *Mitigation Type* | Operational mitigation |
| *Mitigation* | • Annually consult with IDFG and BLM using existing and ongoing studies to determine critical lambing areas, lambing periods, and avoidance criteria. The 366th Wing is prepared to avoid lambing areas in specific locations throughout the training airspace, during critical lambing periods, absent compelling national security circumstances, military contingencies or hostilities.<br>• Supplement IDFG funding for annual survey in 1998 to determine baseline populations for California bighorn sheep in areas where there are ground and airspace changes as a result of ETI.<br>• The Air Force, BLM, and State of Idaho will meet at least semiannually in accordance with a Memorandum of Agreement developed to address the needs and expectations of managers and users of resources in southwest Idaho. |
| *Alternatives* | A, B, C, D |
| *EIS Section* | 4.8.5 |
| *Resulting Consequences* | • Reduced exposure of sheep to low-altitude overflights during critical periods.<br>• Reduced public and agency concern regarding potential impacts to California bighorn sheep populations.<br>• Overflight noise would decrease with ETI over Owyhee and Bruneau-Jarbidge river habitats.<br>• Seasonal adjustments in military aircraft training overflights throughout MOA would reduce noise in areas where flight activity decreases and increase noise in areas where flight activity increases. |
| *Agency Responsible* | Completing: Air Force; Funding: FY98 DoD Legacy Program |
| *Time Frame* | Determine baseline population in 1998. After construction, Air Force and BLM/IDFG meet semiannually to review the science and monitoring data and make further adjustments to this mitigation. |

**Table 2.6-1. Proposed Mitigations**
**(Page 16 of 30)**

| *Resource Category* | **Biological Resources: Sage Grouse** |
|---|---|
| *Concern/Potential Effect Addressed* | • Concerns that construction of ETI facilities would degrade sage grouse habitat.<br>• Concerns were expressed that existing habitat degradation on BLM and private land in southwest Idaho has substantially reduced sage grouse populations.<br>• Concern that additional human presence and noise from training activities may cause breeding or wintering sage grouse to temporarily avoid areas resulting in a moderate impact. |
| *Source of Concern* | Air Force, cooperating agencies, Shoshone-Paiute Tribes, and public comments |
| *Mitigation Type* | Mitigation by avoidance; Operational mitigation |
| *Mitigation* | • Site proposed ETI facilities so as to avoid known sage grouse habitat to the maximum extent possible.<br>• Supplement IDFG funding for annual survey in 1998 to determine baseline populations for sage grouse in areas where there are ground and airspace changes as a result of ETI.<br>• Biologists to seasonally inspect ETI emitter sites and recommend when certain sites would not be available for use.<br>• Train emitter site crew members to identify sage grouse, review locations before use, and be prepared to relocate when appropriate.<br>• Collaborate with cooperating agencies and appropriate sage grouse working groups to review the science and monitoring data and make further adjustments to the mitigation as appropriate.<br>• The Air Force, BLM, and State of Idaho will meet at least semiannually in accordance with a Memorandum of Agreement developed to address the needs and expectations of managers and users of resources in southwest Idaho. |
| *Alternatives* | B, C, D |
| *EIS Section* | 4.8.5.2 |
| *Resulting Consequences* | • Support viability of sage grouse populations.<br>• Support the goals of the IDFG sage grouse management plan.<br>• Coordination among agencies committed to understanding and preventing further population decline.<br>• Reduce potential impacts to sage grouse population. |
| *Agency Responsible* | Completing: Air Force; Funding: FY98 DoD Legacy Program |
| *Time Frame* | Population determined after ROD. After construction, personnel trained annually before breeding season; Biologist inspections to occur annually during breeding season; Meet with IDFG and BLM semiannually to review the science and monitoring data, and to make further adjustments as needed. |

**Table 2.6-1. Proposed Mitigations**
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| *Resource Category* | **Biological Resources: Raptors** |
|---|---|
| *Concern/Potential Effect Addressed* | Concern that human presence and ground disturbance could impact sensitive raptor species during breeding. Intermittent, irregular use of emitter sites may impact raptors if nests occur within 800 feet of emitter sites and if emitter use occurs during breeding season. |
| *Source of Concern* | Air Force, cooperating agencies, and public comments |
| *Mitigation Type* | Mitigation by avoidance; Mitigation by design; Operational mitigation |
| *Mitigation* | • Avoid known raptor nesting sites during emitter site selection.<br>• Have a biologist seasonally inspect ETI emitter sites and recommend when certain sites would not be available for use.<br>• Construct eagle-safe power line using Idaho Power Co., IDFG, and BLM guidelines.<br>• Train emitter site crew members to identify nesting raptors, review locations before use, and be prepared to relocate when appropriate.<br>• Protect known raptor nests in Juniper Draw from human presence by instructing Air Force personnel to maintain an 800-foot buffer from the nest during the nesting season. Minimize the potential for disturbance to Juniper trees in Juniper Draw.<br>• The Air Force, BLM, and State of Idaho will meet at least semiannually in accordance with a Memorandum of Agreement developed to address the needs and expectations of managers and users of resources in southwest Idaho. |
| *Alternatives* | B, C, D |
| *EIS Sections* | 4.8.5, 4.8.10 |
| *Resulting Consequences* | • Reduced public and agency concern about raptors.<br>• Reduce potential impacts to raptors.<br>• Seasonal adjustments in ETI emitter site use. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | After construction, personnel trained annually before breeding season; Biologist inspections annually during breeding season; Meet with IDFG and BLM semiannually to review the science and monitoring data and make further adjustments to this mitigation. |

**Table 2.6-1. Proposed Mitigations**
**(Page 18 of 30)**

| *Resource Category* | **Cultural Resources: Archaeological Resources** |
|---|---|
| *Concern/Potential Effect Addressed* | Concern for potential environmental impacts during site selection or construction. |
| *Source of Concern* | Air Force, cooperating agencies, and Shoshone-Paiute Tribes |
| *Mitigation Type* | Mitigation by avoidance |
| *Mitigation* | • Reviewed literature, consulted with State Historic Preservation Officer and BLM, coordinated with Shoshone-Paiute Tribes, performed surveys, and considered the information in siting of facilities.<br>• When possible, previously disturbed locations were selected as proposed sites.<br>• Emitter sites and no-drop target sites were relocated when archaeological resources were identified. |
| *Alternative* | B, C, D |
| *EIS Section* | 2.1, 3.9, 4.9 |
| *Resulting Consequences* | • No emitter sites contain sensitive archaeological resources.<br>• Training ordnance impact areas sited to reduce impacts.<br>• Reduced potential for impacts to cultural resources. |
| *Agency Responsible* | Completing: Air Force; Funding: N/A |
| *Time Frame* | Completed with site selection and environmental process. |

**Table 2.6-1. Proposed Mitigations**
**(Page 19 of 30)**

| *Resource Category* | **Cultural Resources: Historic Architectural Resources** |
|---|---|
| *Concern/Potential Effect Addressed* | Concern that loss of bridge and associated historic improvements at Clover Creek Crossing would occur as a result of bridge reconstruction. |
| *Source of Concern* | Air Force (EIS Analysis) and cooperating agencies |
| *Mitigation Type* | Mitigation by avoidance; Operational mitigation |
| *Mitigation* | Protection through Historic American Engineering Record documentation and avoidance of some features. |
| *Alternative* | B, C, D |
| *EIS Section* | 3.9, 4.9 |
| *Resulting Consequences* | • Documentation of resource prior to new bridge construction. Avoidance of some features during construction.<br>• Protection of historic resource through documentation.<br>• Improved safety and road carrying capacity at Clover Creek bridge. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | • Section 106 consultation prior to construction of new bridge.<br>• Completed with design and reconstruction of bridge. |

**Table 2.6-1. Proposed Mitigations**
**(Page 20 of 30)**

| *Resource Category* | **Cultural Resources: Traditional Resources** |
|---|---|
| *Concern/Potential Effect Addressed* | Concern that some activities associated with range development and operation could adversely impact Native American traditional resources, access, and values. |
| *Source of Concern* | Air Force, cooperating agencies, and Shoshone-Paiute Tribes |
| *Mitigation Type* | Mitigation by avoidance; Operational mitigation |
| *Mitigation* | • During Environmental Impact Analysis Process: Restricted range components to the eastern-half of Owyhee County, and avoided sites with known traditional resources.<br>• During Environmental Impact Analysis Process: Moved emitter sites and no-drop targets to avoid sensitive cultural resources identified by the Shoshone-Paiute Tribes.<br>• Continue government-to-government dialogue with Shoshone-Paiute Tribes according to Presidential Memorandum (29 April 1994) and ensure the tribes are granted access to sacred and ceremonial sites in accordance with Executive Order 13007.<br>• Consider Shoshone-Paiute Tribes' concerns regarding traditional resources and use areas associated with specific locations and, where possible, avoid those locations (schedule use of emitters to avoid seasonal concerns).<br>• Other mitigation also implemented for sage grouse, raptors, and bighorn sheep |
| *Alternatives* | A, B, C, D |
| *EIS Section* | 4.9 |
| *Resulting Consequences* | • Reduce potential impacts to resources and areas of concern identified by Shoshone-Paiute Tribes.<br>• Reduce potential for impacts to archaeological sites.<br>• Protection of Native American traditional resources and values. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | Completed with site selection process; continuing consultation during construction and operations. |

**Table 2.6-1. Proposed Mitigations**
**(Page 21 of 30)**

| *Resource Category* | **Cultural Resources: Protection of Traditional Resources** |
|---|---|
| *Concern/Potential Effect Addressed* | Shoshone-Paiute concern that the road improvements and public knowledge of the area could lead to increased vandalism of resources and/or more unwelcome visitors to ceremonial areas. |
| *Source of Concern* | Air Force, cooperating agencies, and Shoshone-Paiute Tribes |
| *Mitigation Type* | Operational mitigation |
| *Mitigation* | • Work with the Shoshone-Paiute Tribes and BLM to develop a monitoring and security program to detect, report, and deter vandalism and theft for sensitive locations in the vicinity of ETI range components.<br>• Develop a range standard operating procedure for personnel to report suspicious activity observed during range operation.<br>• The Air Force, BLM, and State of Idaho will meet at least semiannually in accordance with a Memorandum of Agreement developed to address the needs and expectations of managers and users of resources in southwest Idaho. |
| *Alternatives* | B, C, D |
| *EIS Sections* | 4.9.2, 4.9.4.3, 4.9.5.3, 4.9.6.3 |
| *Resulting Consequences* | • Detection of vandals and thieves and reduced potential for vandalism and theft at sensitive resources.<br>• Reduce potential for impact to traditional resources of importance to the Shoshone-Paiute Tribes. |
| *Agency Responsible* | Completing: Air Force; Funding: N/A |
| *Time Frame* | Prior to construction and during operations. Semiannual review. |

**Table 2.6-1. Proposed Mitigations**
**(Page 22 of 30)**

| *Resource Category* | **Land Use: Size of Land Withdrawal** |
|---|---|
| *Concern/Potential Effect Addressed* | • Concern about size of land area required to support safe range operations.<br>• Concern for impact to traditional land users.<br>• Concern that private land would be affected. |
| *Source of Concern* | Air Force, cooperating agencies, and public comments |
| *Mitigation Type* | Mitigation by avoidance; Mitigation by design |
| *Mitigation* | • Design drop and no-drop targets on smallest areas consistent with safety.<br>• Utilize 25-pound non-explosive training ordnance to reduce land area needed.<br>• Permit grazing within 12,000-acre area except in 300-acre training ordnance impact area.<br>• Avoid private land for siting range components. |
| *Alternatives* | B, C, D |
| *EIS Section* | 2.0 |
| *Resulting Consequences* | • Amount of land diverted from traditional uses for all range facilities and roads projected to not exceed 1,000 acres.<br>• Training ordnance impacts primarily 300-acre area.<br>• Minimize size of proposed training range<br>• Minimize ground disturbance from training ordnance impacts.<br>• Minimize disruption to traditional land users.<br>• No private land used for any Air Force facilities. |
| *Agency Responsible* | Completing: Air Force; Funding: N/A |
| *Time Frame* | Implemented during initial design; completed with land withdrawal actions. |

**Table 2.6-1. Proposed Mitigations**
**(Page 23 of 30)**

| *Resource Category* | **Land Use: Special Land Use Areas** |
|---|---|
| *Concern/Potential Effect Addressed* | Concern about potential effects of ground disturbance on special land use management areas. |
| *Source of Concern* | Air Force, cooperating agencies, and public comments |
| *Mitigation Type* | Mitigation by avoidance |
| *Mitigation* | • Identify special use land management areas such as WSAs, ACECs, and waterways considered eligible for Wild and Scenic status.<br>• Site 12,000-acre training range to avoid special land use management areas. |
| *Alternatives* | B, C, D |
| *EIS Section* | 2.0 |
| *Resulting Consequences* | • Reduce or eliminate potential for direct impacts to several sensitive resources.<br>• Avoid potential conflicts to non-impairment policy and other management policies.<br>• Avoid land status and management changes.<br>• Protect land status designations. |
| *Agency Responsible* | Completing: Air Force; Funding: N/A |
| *Time Frame* | Completed during proposal definition, site narrowing. |

**Table 2.6-1. Proposed Mitigations**
**(Page 24 of 30)**

| *Resource Category* | **Land Use: Special Land Use Areas; Recreation; Other Resources** |
|---|---|
| *Concern/Potential Effect Addressed* | • Public concern expressed that changes in military training activity over northern airspace expansion could impact solitude for users of the WSA.<br>• Concern that river floating experience would be impacted by noise or visual intrusion from overflights. |
| *Source of Concern* | Air Force, cooperating agencies, and public comments |
| *Mitigation Type* | Mitigation by avoidance; Operational mitigation |
| *Mitigation* | • The Air Force, BLM, and State of Idaho will meet at least semiannually in accordance with a Memorandum of Agreement developed to address the needs and expectations of managers and users of resources in southwest Idaho. The agreement and the interagency collaboration it fosters will be designed to:<br>  • Maintain values inherent in Owyhee County for ranching, recreational opportunities, and traditional resources<br>  • Promote multiple use of public lands in a safe manner<br>  • Minimize impacts to the environment while providing opportunities for realistic aircrew training<br>  • Maximize opportunities for seasonal adjustments to training activities in order to accommodate multiple use of public lands<br>  • Make effective and efficient use of public funds and agency resources<br>  • Utilize an ecosystem approach to planning and managing public lands<br>• The Air Force will not activate Mountain Home AFB military airspace (remain closed and not be used for training) on Memorial Day, 4th of July, and Labor Day weekends.<br>• Restrict military aircraft training flights to above 10,000 MSL (about 5,000 AGL) from Friday through Monday during May and June over Little Jacks Creek WSA.<br>• During the first floating season after the ETI ROD, the Air Force will institute a two-week flight restriction. This restriction will be during the optimum floating season over the main Bruneau Canyon north of the confluence of the Jarbidge River to the northern edge of the airspace. Low-altitude training sorties (below 5,000 AGL) would conduct only perpendicular crossings of the canyon with no parallel flights within 1 mile of the canyon. Parallel flights would be above 5,000 AGL if within 1 mile of the canyon. The optimum floating season and modifications to restrictions for subsequent years will be determined through consultations with the BLM.<br>• Publicize airspace schedule using Mountain Home AFB website and via telephone. Indicate when airspace will be active or inactive. Specify periods of exercises or composite wing training.<br>• Place signs at all facilities with information on activities and safety.<br>• All flight restrictions will be conducted absent compelling national security circumstances, military contingencies or hostilities. |
| *Alternatives* | B, C, D |
| *EIS Sections* | 4.10.2.3, Table 4.10-3 |

**Table 2.6-1. Proposed Mitigations**
**(Page 25 of 30)**

| *Resource Category* | **Land Use: Special Land Use Areas; Recreation; Other Resources (Cont'd)** |
|---|---|
| *Resulting Consequences* | • ETI design disperses training flights throughout the training airspace, reducing noise over Owyhee and Bruneau-Jarbidge rivers.<br>• Mitigation would reduce seasonal overflights over Little Jacks Creek WSA and canyonlands.<br>• Permits greater conformity to user's expectations regarding wilderness experiences.<br>• Increased user awareness of periods of military training use of the airspace.<br>• Reduced noise levels for recreational areas during specified periods of anticipated high use.<br>• Shift of military aircrew training to other areas of the MOAs would reduce noise in areas where flight activities decrease and increase noise in areas where flight activity increases. |
| *Agency Responsible* | Completing: Air Force; Funding: Not Applicable |
| *Time Frame* | • Flight scheduling publicity would begin with establishment of airspace changes.<br>• Bruneau Canyon restrictions implemented during the first floating season after ETI ROD.<br>• Semiannual agency consultations will review the science and monitoring data and make adjustments to this mitigation as needed. |

**Table 2.6-1. Proposed Mitigations**
**(Page 26 of 30)**

| *Resource Category* | **Recreational Resources: Access** |
|---|---|
| *Concern/Potential Effect Addressed* | • Concern about potential effects of ground disturbance on recreational resources.<br>• Concern that road improvements could enhance access to recreational sites and result in overuse.<br>• Concern that training range facilities could interfere with existing access to recreational sites. |
| *Source of Concern* | Air Force, cooperating agencies, and public comments |
| *Mitigation Type* | Mitigation by avoidance; Mitigation by design |
| *Mitigation* | • Site alternatives to avoid canyons and waterways popular for recreation.<br>• Improve roads only to training range facilities.<br>• Site alternatives to avoid existing roads and jeep trails wherever possible. |
| *Alternatives* | B, C, D |
| *EIS Section* | 2.0 |
| *Resulting Consequences* | • Reduce or eliminate potential for direct impacts.<br>• Avoid or minimize potential effects on recreation activities. |
| *Agency Responsible* | Completing: Air Force; Funding: Not Applicable |
| *Time Frame* | Completed during proposal definition, site narrowing. |

| Table 2.6-1. Proposed Mitigations (Page 27 of 30) | |
|---|---|
| *Resource Category* | **Transportation and Visual: Facilities and Road Design** |
| *Concern/Potential Effect Addressed* | • Concern that access roads result in ground disturbance and landscape alteration.<br>• Concern that targets are not compatible with rural landscape. |
| *Source of Concern* | Air Force, cooperating agencies, and Shoshone-Paiute Tribes |
| *Mitigation Type* | Mitigation by design |
| *Mitigation* | • Design industrial targets to be similar to ranch/agricultural buildings.<br>• Paint targets with non-contrasting desert colors to blend with landscape.<br>• Construct curved roadways that follow slopes to reduce potential impacts to visual resources and avoid erosion.<br>• Gravel roadways to prevent dust and erosion potential. |
| *Alternatives* | B, C, D |
| *EIS Sections* | 2.0, 4.11 |
| *Resulting Consequences* | • Roads and targets avoid negative impacts to soil and visual resources.<br>• Reduced potential for viewshed alteration.<br>• Reduced soil erosion. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | Concepts incorporated into initial design; completed with construction; inspections and periodic maintenance will ensure continued effectiveness. |

| Table 2.6-1. Proposed Mitigations (Page 28 of 30) | |
|---|---|
| ***Resource Category*** | **Transportation: Road Access** |
| ***Concern/Potential Effect Addressed*** | Construction of Juniper Butte Alternative could block through travel on an approximate 1.5-mile portion of a primitive, two-track road that may provide access for livestock operations and recreation. |
| ***Source of Concern*** | Air Force and cooperating agency consultation |
| ***Mitigation Type*** | Mitigation by design |
| ***Mitigation*** | • Adjust fence and construct a new segment of primitive road outside the range perimeter fence.<br>• Perform biological and cultural resources clearance surveys before construction.<br>• Avoid impacts to regulatory significant biological and cultural resources. |
| ***Alternative*** | D |
| ***EIS Section*** | 4.11.4 |
| ***Resulting Consequences*** | • Provide equivalent access.<br>• Negligible ground disturbance, and avoidance of impacts to significant cultural and biological resources. |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | During construction. |

**Table 2.6-1. Proposed Mitigations**
**(Page 29 of 30)**

| *Resource Category* | **Socioeconomics: Ranching Operations** |
|---|---|
| *Concern/Potential Effect Addressed* | • Concern about disruption to specific ranching operations by altering fencing, roads, availability of water, and/or availability of forage.<br>• Concern about reduction in carrying capacity of specific livestock operations affected by range selection. |
| *Source of Concern* | Air Force (EIS Analysis) and cooperating agencies |
| *Mitigation Type* | Mitigation by design; Operational mitigation |
| *Mitigation* | • Install fencing to allow ranchers to manage cattle with little or no disruption of current grazing practices.<br>• Accommodate livestock grazing to the greatest extent practicable to federal lands withdrawn or state lands leased for project facilities.<br>• Avoid impacts to significant biological and cultural resources for construction of fencing, pipelines, and/or above-ground water reservoir.<br>• Payment or compensation in-kind for disruption to grazing ; the Air Force would work with ranchers and BLM to exchange grazing allotments.<br>• Offer current permittee first right of refusal to continue grazing on withdrawn lands.<br>• Protect, move, or extend water pipelines and/or build a less than one-acre above-ground water reservoir to create availability of a 50,000-gallon, joint-use fire-fighting water source. |
| *Alternatives* | B, C, D |
| *EIS Section* | 4.12.2.2 |
| *Resulting Consequences* | • Ranching operations compensated for disruptions.<br>• Temporary ground disturbance from fence emplacement, pipeline re-routing, and water reservoir construction (Alternatives B, D only); No impacts to cultural, biological, and other resources are expected due to avoidance. |
| *Agency Responsible* | Completing: Air Force; Funding: Air Force |
| *Time Frame* | Construction after land withdrawal; current grazing activities continue until mitigation actions in place and operational. Biological and cultural resources clearance surveys completed before construction. |

| Table 2.6-1. Proposed Mitigations (Page 30 of 30) | |
|---|---|
| ***Resource Category*** | **Socioeconomics: Road Maintenance** |
| ***Concern/Potential Effect Addressed*** | Concern about possible economic impact to Owyhee County and Three Creek Good Roads Highway District from increased road use by Air Force vehicles. |
| ***Source of Concern*** | Air Force, cooperating agencies, and public comments |
| ***Mitigation Type*** | Operational mitigation |
| ***Mitigation*** | Execute an Interagency Support Agreement and provide funding for a proportional share of road maintenance. |
| ***Alternatives*** | B, C, D |
| ***EIS Sections*** | 4.10, 4.12 |
| ***Resulting Environmental Consequences*** | • Improved roadway sections<br>• Jointly funded maintenance of roadways.<br>• Minimized economic impact to Owyhee County and Three Creek Good Roads Highway District. |
| ***Agency Responsible*** | Completing: Air Force; Funding: Air Force |
| ***Time Frame*** | Agreement in effect prior to range operations. |

# 3.0 AFFECTED ENVIRONMENT

The environmental impact analysis process (EIAP) is designed to focus analysis on those environmental resources that could potentially be affected by the proposal to enhance training in Idaho. Potential environmental impacts of an alternative cannot be determined without first understanding the current or baseline environmental conditions presented in Chapter 3.

The Regions of Influence (ROI) used in this Environmental Impact Statement (EIS) examine the 12 interdependent resources at three levels. For instance, an impact to vegetation in ROI One could affect the wildlife in ROI Two that depend on that vegetation for food and, that in turn, could result in social and Native American traditional resource concerns for resources throughout ROI Three. This interrelationship is why the EIS is prepared by an interdisciplinary team of scientists who describe each resource in the context of how it relates to other relevant resources. Most of these resources include subcategories to provide a better understanding of the specific aspects of the environment that might be affected by one or more of the alternatives. For example, Biological Resources, section 3.8, includes vegetation, wetlands, rare plants, wildlife, and special status species.

## AFFECTED ENVIRONMENT

The process of collecting scientifically researched and up-to-date information involves reviewing previous studies, talking to agencies and others with responsibility for information on specific resources, reviewing public input during the public comment process, and conducting numerous field studies.

Chapter 3 presents the results of this effort and describes the current conditions of the environment potentially affected by Enhanced Training in Idaho.



Interesting results addressed in the resource sections include the following:

- Enhanced training would reduce aircraft overflight and noise in much of ROI Three with the exception of the added airspace and airspace over a selected alternative.
- Fire risk, the primary safety concern expressed by public and agencies, would be reduced by cold spot charges in training ordnance that do not produce a flash that can start fires.
- Soils at the alternative training range sites have the potential for some wind erosion, but the potential for water erosion and siltation would be very low.
- None of these sites would be near any mineral claims or deposits with the potential to yield economically viable minerals.
- The Clover Butte and Juniper Butte training range sites include very minimal wetland areas. The Grasmere site has a few areas. There are no wetlands in any of the primary ordnance impact areas.
- Grasmere and especially Juniper Butte contain populations of rare plants; Clover Butte contains no rare plants.
- Bighorn sheep were observed only on the Grasmere training range alternative.
- Sage grouse were seen on the Grasmere and Clover Butte training range alternatives, but not on Juniper Butte.
- All three alternative training range sites contain archaeological sites, with the most at Grasmere, fewer at Clover Butte, and very few at Juniper Butte.
- More Native American traditional resources are near Grasmere than near Clover Butte or Juniper Butte.
- Land use and regional economics are primarily based on grazing and each site would result in some disruptions to grazing operations.
- Road improvements do not lead to recreation destinations or other sensitive resources and would not encourage increased access to any area.



# 3.0 AFFECTED ENVIRONMENT

Under the National Environmental Policy Act (NEPA), the analysis of environmental conditions is directly related to the expected environmental consequences of the proposed alternatives. NEPA requires that the analysis addresses those areas and the components of the environment with the potential to be affected by the proposed action; locations and resources with no potential to be affected need not be analyzed. The environment includes all areas and lands that might be affected, as well as the natural, cultural, and socioeconomic resources they contain or support.

In the environmental analysis process, analysts first identify the resources to be analyzed and then select the level of analysis, both in spatial extent and in intensity, that the resources will be examined. For this proposal, the Air Force has examined 12 resources and collected information at three different levels (Table 3.0-1). These levels have been identified as Regions of Influence (ROIs), each with a different spatial extent, ranging from disturbed areas associated with the tactical training range to the area underlying all of the existing and proposed military operations area (MOA) airspace in Owyhee County, Idaho, southeastern Oregon, and northern Nevada. Whether an ROI was examined for a resource, and the extent of the information gathering necessary, depended upon the type of resource and how it could be affected by the action. Figure 3.0-1 illustrates the locations of the three ROIs.

## REGION OF INFLUENCE ONE (ROI One)

ROI One is comprised of the areas potentially affected by ground disturbance and realty actions: the alternative 12,000-acre tactical training ranges, including areas of facility and road construction and areas likely to be affected by training ordnance delivery, including the one-acre emitter site BK, located 6 miles east of the airspace boundary; the 640-acre no-drop site; the five-acre no-drop sites; the one-acre and one-quarter-acre emitter sites. Within the 12,000-acre range alternatives, the primary ordnance impact areas totaling about 300 acres represent a focus for analysis of direct impacts for many environmental resources. Field work, data collection, and analysis, as well as examination of existing information, documents, and literature took place in ROI One.

## REGION OF INFLUENCE TWO (ROI Two)

Research at this level applied to those areas with the potential to receive disturbance, usually from more concentrated aircraft and emitter activity, or resources that could be affected by a change in view or visual setting. For most resources, ROI Two includes areas below military restricted airspace, as well as lands adjacent to or surrounding ROI One sites. Information collection and analysis, literature review, and limited field work were used to evaluate resources in ROI Two.

**Table 3.0-1. Region of Influence by Resource Area**

| *Resource* | *Section* | *ROI One* | *ROI Two* | *ROI Three* |
|---|---|---|---|---|
| **Airspace** | 3.1 | | | X |
| **Noise** | 3.2 | X | | X |
| **Safety** | 3.3 | | | |
| Ground | | X | | |
| Training Ordnance | | X | | |
| Flight | | | | X |
| **Hazardous Materials/ Contamination Study** | 3.4 | X | X | |
| **Earth Resources** | 3.5 | | | |
| Soils | | X | X | |
| Geology | | X | X | |
| Minerals | | X | X | |
| **Water Resources** | 3.6 | | | |
| Floodplains | | X | X | |
| Water Quality | | X | X | |
| Water Rights | | X | | |
| **Air Quality** | 3.7 | | | X |
| **Biological Resources** | 3.8 | | | |
| Vegetation | | X | X | X |
| Rare Plants | | X | | |
| Wetlands | | X | | |
| Wildlife/Wildlife Habitat | | X | X | X |
| Threatened and Endangered Wildlife Species | | X | X | X |
| **Cultural Resources** | 3.9 | | | |
| Archaeological/ Architectural | | X | | X |
| Native American Traditional Resources | | X | X | X |
| **Land Use and Transportation** | 3.10 | | | |
| Ownership/ Management | | X | X | X |
| Transportation | | | X | |
| **Recreation and Visual** | 3.11 | | X | X |
| **Socioeconomics** | 3.12 | | X* | X* |

*The spatial extent of this ROI varies for this resource and is further discussed within this chapter under the appropriate section.

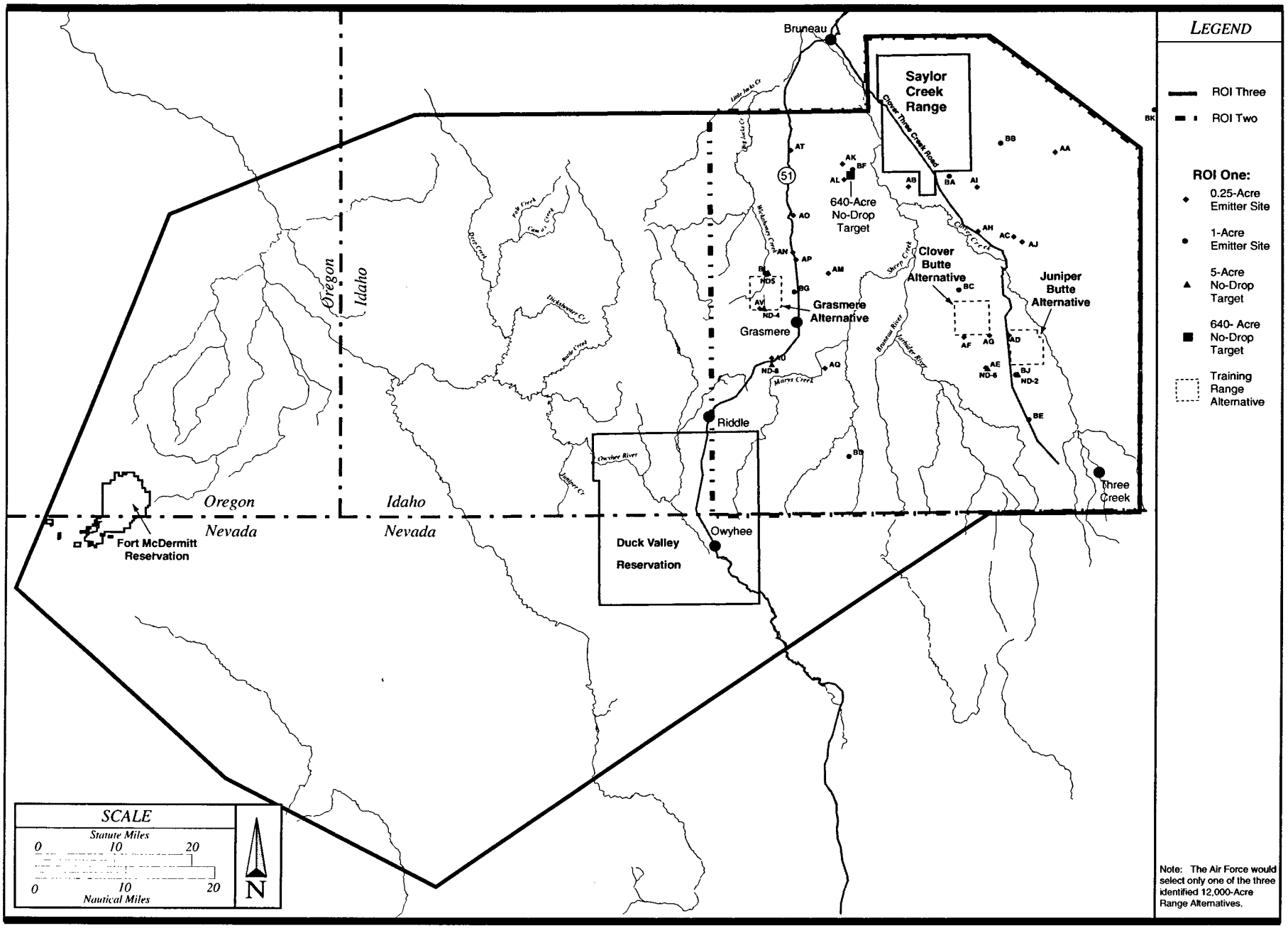



**Figure 3.0-1 Regions of Influence**

## REGION OF INFLUENCE THREE (ROI Three)

ROI Three includes lands under the potentially affected airspace. Analysis concentrated on computer modeling, literature reviews, and published and unpublished research findings. Analysis was focused on known archaeological sites or traditional cultural properties, county economic reports, noise analysis programs, and operations information. Little additional field work other than that performed in ROIs One and Two was conducted.

## AIRCRAFT SORTIE-OPERATIONS ASSOCIATED WITH CURRENT CONDITIONS

Military aviation activities form an important part of the existing environment. Ninety-five percent of military training activities in the local airspace are conducted by the 366th Wing at Mountain Home Air Force Base (AFB) and the Idaho Air National Guard (IDANG) unit at Gowen Field. Other units that make use of the Mountain Home AFB airspace are referred to as transients. Table 3.0-2 reflects annual current use (sortie-operations) of the Mountain Home AFB airspace by all users. These levels of sortie-operations, by specific aircraft type, were provided to all resource analysts for use in their analysis. They were specifically used to support quantitative analytical requirements for the Airspace Management, Noise, Safety, and Air Quality sections of this EIS.

## RESOURCE ISSUES OF CONCERN TO NATIVE AMERICANS

For many years, southwest Idaho and adjacent parts of Oregon and Nevada have been home to the Shoshone and Paiute. Since 1877, members of these tribes have lived on the Duck Valley Reservation in Owyhee County, Idaho and Elko County, Nevada. Other Shoshone and Paiute groups have resided at the Fort McDermitt Reservation in Malheur County, Oregon and Humboldt County, Nevada since it was established in 1892. Many traditional Shoshone and Paiute still use these lands for gathering natural resources and for religious activities, and have intense interest in Air Force activities in the region.

To traditional Shoshone-Paiute, most of the 12 resource categories included in this EIS have a spiritual value. They believe that many elements of the environment, whether living or not, may have spirits that have integral roles in the operation of the spiritual world. Shoshone and Paiute traditions teach that the land, people, plants, animals, spirits, and other elements of their cosmos are an interconnected and interdependent whole. Many Shoshone-Paiute believe that all elements of the natural world are to be treated with respect. To act otherwise risks upsetting the entire system in unpredictable, yet potentially dangerous ways. Because of these beliefs, and because of their proximity to past, present, and proposed Air Force activities, the

| Table 3.0-2. Sortie-Operations Under Current Conditions | | | | |
|---|---|---|---|---|
| *Aircraft* | *SCR / Range Support MOAs* | *Owyhee MOA* | *Paradise MOA* | *Saddle MOA* |
| A-6/EA-6B | 156 | 48 | 40 | 1 |
| AV-8 | 0 | 28 | 35 | 0 |
| A-10 | 2,401 | 1,632 | 154 | 462 |
| B-1 | 349 | 153 | 102 | 20 |
| B-52 | 32 | 0 | 0 | 0 |
| C-130 | 50 | 33 | 12 | 12 |
| F-4 | 86 | 105 | 89 | 34 |
| F-14 | 2 | 0 | 0 | 0 |
| F-15 | 2,646 | 3,137 | 2,939 | 1,041 |
| F-16 | 1,970 | 2,175 | 1,563 | 336 |
| F/A-18 | 24 | 20 | 16 | 0 |
| F-111 | 7 | 0 | 0 | 0 |
| KC-135 | 0 | 2 | 69 | 41 |
| T-37 | 1 | 11 | 66 | 39 |
| UH-1 | 13 | 6 | 6 | 0 |

Shoshone-Paiute Tribes at Duck Valley have been especially interested in all aspects of the Enhanced Training in Idaho (ETI) proposal.

Often in EISs, Native American concerns are discussed in sections describing cultural resources or socioeconomics. This is partly because many Native Americans, including Shoshone-Paiute, consider a wide range of resources to also be traditional cultural resources. In addition, there is a presidential directive to take concentrations of low income or minority people, as on reservations, into consideration when federal decisions are made to ensure that such people do not receive a disproportionate impact from the federal decision. In this EIS, the Air Force has incorporated Shoshone-Paiute concerns into the appropriate resource discussions. For example, sage grouse, discussed as a biological resource in section 3.8, are also discussed in section 3.9 as a traditional cultural resource for the Shoshone-Paiute. The definition of a traditional cultural resource is presented in section 3.9.

Baseline information on issues that have been specifically raised by the Shoshone-Paiute is discussed in the following subsections:

| | |
|---|---|
| *Airspace* | *See section 3.1.3* |
| *Noise* | *See section 3.2.3* |
| *Safety* | *See section 3.3.4* |
| *Water Resources* | *See section 3.6.6* |
| *Biological Resources* | *See section 3.8.12* |
| *Cultural Resources* | *See section 3.9* |
| *Land Use and Transportation* | *See section 3.10.5* |
| *Recreation and Visual Resources* | *See section 3.11.3* |
| *Socioeconomics* | *See section 3.12.7* |

The Shoshone-Paiute have not specifically expressed to the Air Force their concerns about Hazardous Materials and Solid Waste, Earth Resources, and Air Quality. However, their interests in protecting the natural environment would logically include aspects of these resource categories.

# AIRSPACE

## 3.1

Different types of airspace are charted on maps for aviation purposes just as highways and other land areas are shown on a road atlas for travel direction. Similarly, flight rules and air traffic control procedures dictate how pilots fly in this airspace, just as traffic rules and laws govern how vehicle operators drive on the highway system. The combination of charted airspace, flight rules, and direction from air traffic controllers provides for safe, compatible use of the Mountain Home training airspace.

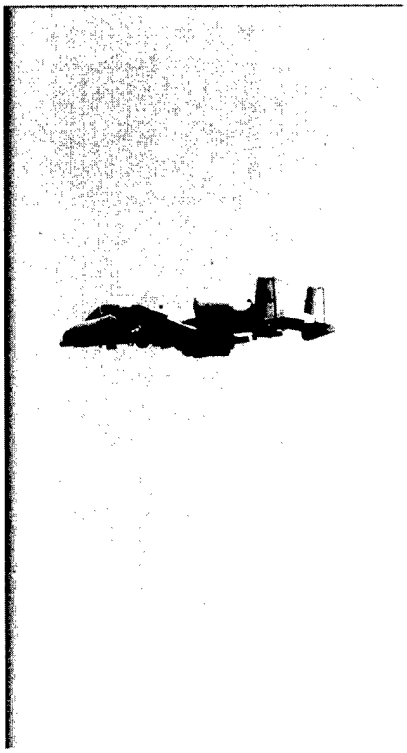
The location and dimensions of airspace are planned and implemented by the Federal Aviation Administration (FAA), in cooperation with civil and military aviation planners, with primary consideration given to accommodating all aircraft categories needing access to airspace within any given region.

The specific types of airspace designed for aviation use in the regional airspace environment include the following:

- Airways that interconnect Boise, Twin Falls, Salt Lake City, and other regional airports
- Terminal airspace that surrounds the Boise Airport and Mountain Home AFB
- Military training airspace managed by Mountain Home AFB

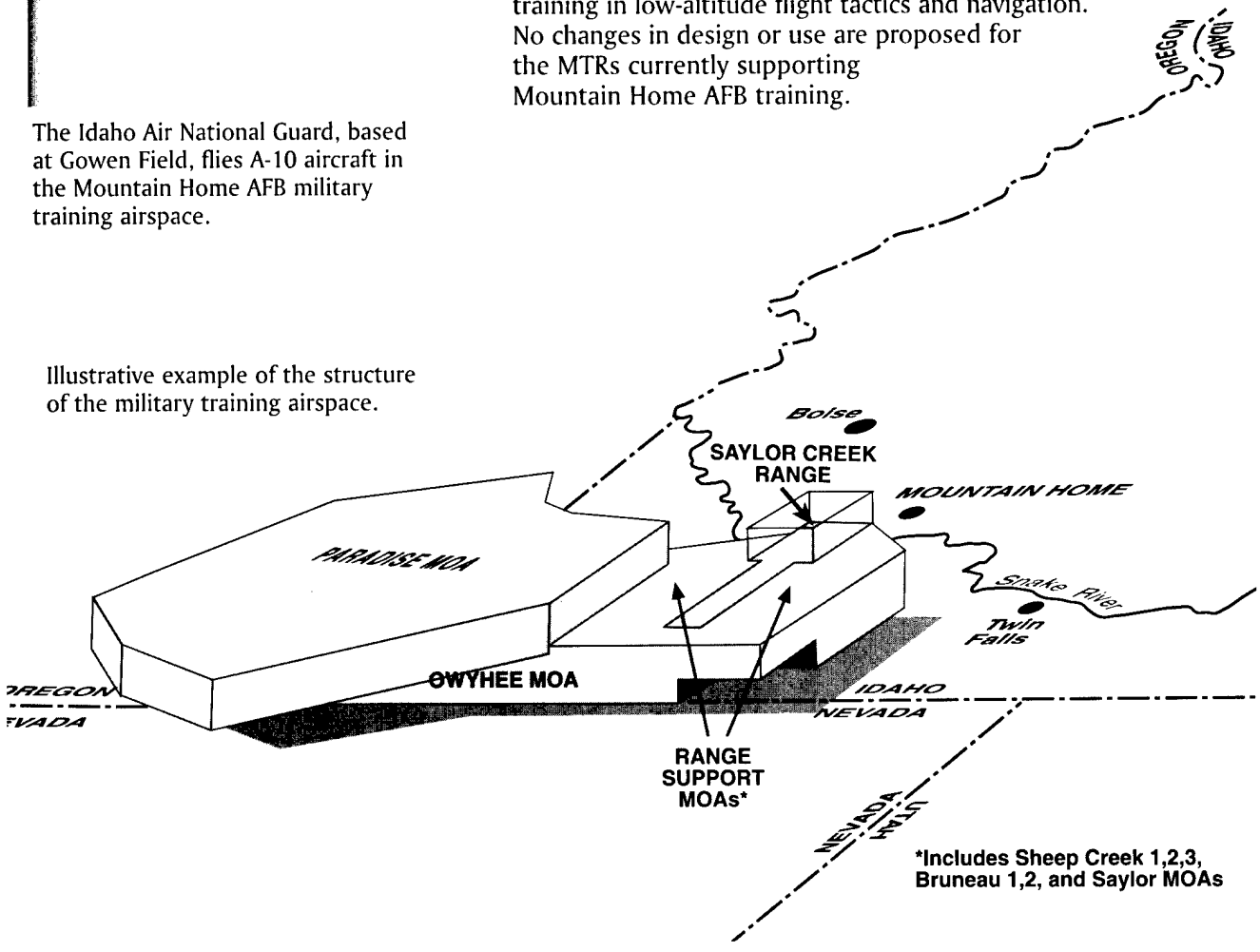
The Mountain Home AFB military training airspace is depicted on aeronautical maps with additional information such as scheduled use and altitude ranges. The following discusses the different types of military training airspace.

- Restricted Areas. Around the south of the SCR is restricted airspace where military training activities, such as ordnance delivery, are conducted. Access to this airspace is limited to only those aircraft participating in these activities. Non-participating aircraft may fly through this restricted airspace only when it is not scheduled for use or when they have otherwise been cleared by air traffic control.
- Military Operations Areas. The MOAs are designed to separate non-hazardous military flight training activities from other air traffic operating under instrument flight rules (IFR) and to identify, for pilots flying under visual flight rules (VFR), where these military operations are being conducted. VFR aircraft are not restricted from flying through these areas; but all VFR and military pilots have to be attentive to each other's position and take actions, as needed, to remain clear of each other.
- Military Training Routes. MTRs are essentially "highways" of varying lengths, widths, and altitudes that provide training in low-altitude flight tactics and navigation. No changes in design or use are proposed for the MTRs currently supporting Mountain Home AFB training.



The Idaho Air National Guard, based at Gowen Field, flies A-10 aircraft in the Mountain Home AFB military training airspace.

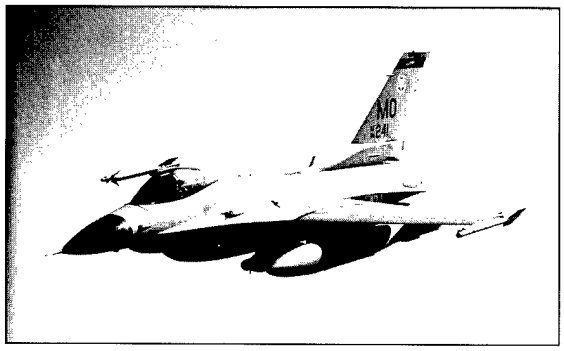
Illustrative example of the structure of the military training airspace.



Overall, current aviation activities in the local airspace environment include:

- Military flight operations
- Airway traffic and airport operations
- General aviation aircraft operating visually (VFR) between small public or private airfields in the region
- Idaho Fish and Game (IDFG) wildlife surveys and Bureau of Land Management (BLM) fire suppression and land management flights
- Emergency or lifeflight rescues

Few civil aircraft operate within any of the military airspace. Civil aircraft routinely operating near restricted areas or within MOAs or MTRs are either separated from military traffic by air traffic control or are sufficiently familiar with military airspace use to be unaffected by day-to-day operations.

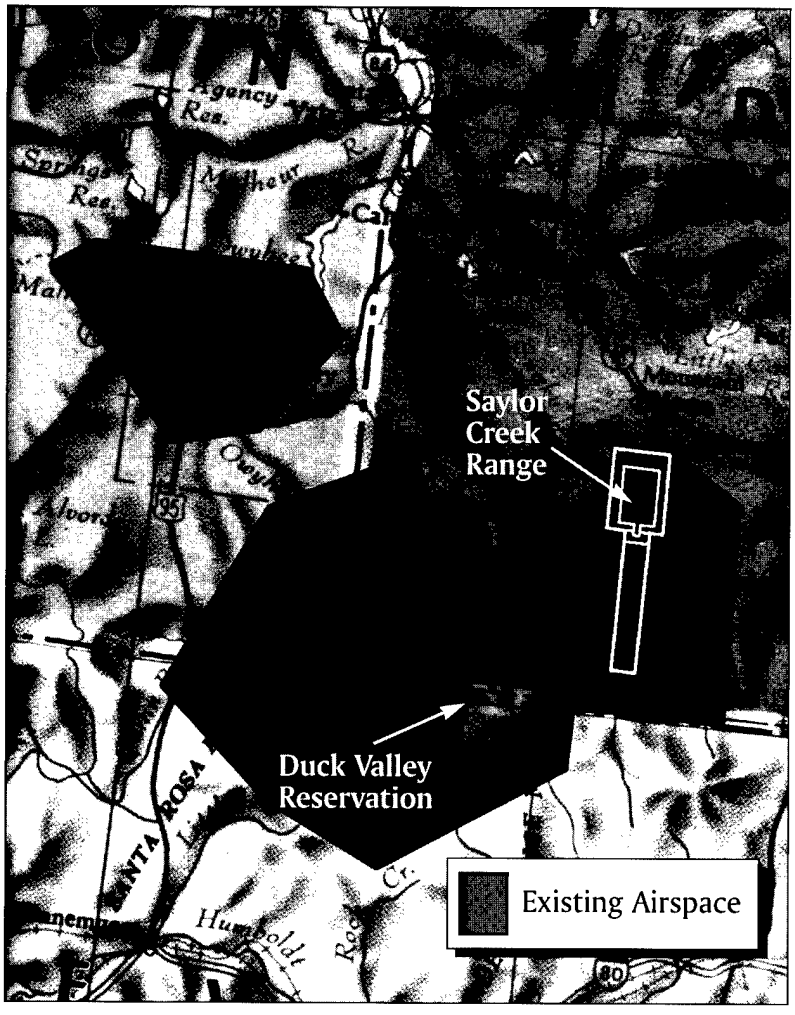


F-16 aircraft based at Mountain Home AFB perform both high-altitude intercept and low-altitude air-to-ground training.

A review of existing airspace shows that if Air Force flights avoid the Duck Valley Reservation and the town of Grasmere, they are concentrated into a relatively narrow west-to-east corridor, thus creating a concentration of overflights and noise.

The range and airspace alternatives would alter that concentration by creating new airspace access areas to SCR and expanding the existing MOAs both to the north and the south. This would permit aircraft to train throughout the airspace and reduce the concentration in the west-to-east corridor.

Most of the existing airspace would face a lower level of flight activity than at present under any of the range alternatives. The exceptions would be increased aircraft overflights in proposed airspace additions and over a selected range alternative.



## 3.1 AIRSPACE

The primary objective of airspace management is to ensure the best possible use of available airspace to meet user needs and to segregate any user needs that are incompatible with other airspace or land uses. The FAA, which has the overall responsibility for managing the nation's airspace, constantly reviews civil and military airspace needs to ensure that all interests are compatibly served to the greatest extent possible.

Airspace use is regulated and managed through the use of flight rules, airspace use designations shown on aeronautical maps, and air traffic control (ATC) procedures and separation criteria. A combination of these measures is needed, for example, to separate airport arrivals and departures, control overflights on the airway system, and segregate IFR aircraft under the ATC system from VFR aircraft flying under "see and avoid" conditions. These measures are also needed to identify areas where activities are conducted that require separation of users, either within the airspace or on the underlying land. Nonrestrictive measures are used to increase pilot awareness of areas where military flight training activities are conducted, while more restrictive measures are used to protect areas of high security, or areas where hazardous operations such as bombing and gunnery ranges occur.

The FAA has delegated and designated airspace around Mountain Home AFB to meet both civil and military requirements. This airspace accommodates air traffic operations at the Boise Airport and Mountain Home AFB, aircraft overflights transiting the region, and military flight training activities. Current levels of military flight training activity are shown in Table 3.0-2, and are used to support this baseline airspace discussion. As currently structured, this airspace environment has accommodated these needs without imposing any significant restrictions or limitations on either civil or military aircraft operations. The following discussion focuses on how this airspace environment is established, used, and managed to serve Mountain Home AFB training activities.

Since ROI Three includes the restricted areas associated with SCR and the ten MOAs, this ROI is applied to the airspace analysis. As detailed in section 2.3.3, the local airspace structure also includes 12 MTRs. No aspect of any alternative would alter the structure or amount of use of these MTRs. While these routes, therefore, do not comprise part of the affected environment of ROI Three, this section includes a brief description of the MTRs to provide an overall understanding of the airspace structure in the region. ROI Three also includes federal airways, jet routes, and a VFR fly-way within and/or adjacent to the Mountain Home AFB training airspace that are used primarily by civil and commercial aviation. Because airspace delegated by the FAA for ATC purposes at Mountain Home AFB would not require any modifications as a result of any alternative, it is not discussed in this EIS.

### 3.1.1 Military Airspace Use and Management in ROI Three

ROI Three includes those local airspace areas currently delegated by the FAA or designated by the Air Force that have been traditionally used by the 366th Wing. That airspace includes restricted area R-3202 (A, B, and C), which protects SCR activities; the Sheep Creek 1, 2, and 3, Bruneau 1 and 2, and Saylor MOAs, which surround and support the SCR; and the Owyhee and Paradise MOAs, which provide some air-to-ground and air-to-air training (Figure 3.1-1). ROI Three also includes the Saddle A and B MOAs, located northwest of the Owyhee/Paradise MOAs, and the airspace included in the proposed expansion of the Owyhee and Sheep Creek 1 MOAs to the north and the Paradise MOA to the northeast. Although not part of the affected environment, 12 MTRs also occur within the region. Except for the Saddle MOAs and a few of the MTRs, Mountain Home AFB manages all local airspace, as delegated by the FAA.

#### *RESTRICTED AREAS*

Restricted areas are comprised of airspace that limits use because of air-to-ground training and other activities considered hazardous to nonparticipating air traffic. Restricted area R-3202A/B/C encompasses nearly 500 square miles of airspace. To provide sufficient maneuvering space and ensure safe operations, Mountain Home AFB schedules and uses the six adjacent MOAs with R-3202. Aircraft operations on the SCR are contained within both this restricted airspace and the surrounding Sheep Creek 1, 2, and 3; Bruneau 1 and 2; and Saylor MOAs while conducting a wide range of training associated with the 12,000-acre training range. About 7,800 annual sortie-operations, the majority of which use altitudes from 500 feet above ground level (AGL) to 18,000 feet above mean sea level (MSL), have been conducted in the SCR and its associated airspace. Nonparticipating civil and military aircraft are restricted from entering R-3202 airspace when it has been activated unless otherwise authorized by a control officer.

#### *MOAs*

MOAs are used to separate military flight activities from IFR traffic and to identify for VFR traffic those areas where nonhazardous military operations are being conducted. In addition to the Sheep Creek, Bruneau, and Saylor MOAs that support range operations, four other MOAs are part of the training airspace. They are the Owyhee, Paradise, and Saddle MOAs. Total baseline annual use of the Owyhee, Paradise, and Saddle MOAs is about 7,300, 5,100, and 2,000 sortie-operations, respectively. Military flight training has occurred in the airspace encompassed by these MOAs since World War II. The altitudes and flight tracks flown in the MOAs during the various types of training missions vary considerably, exhibiting a much more random and far less concentrated patterning than those flown in the SCR airspace and its associated MOAs.

The Owyhee MOA, which covers roughly 2,330 square miles, currently extends from 100 feet AGL to 14,500 feet MSL. From 14,500 to 17,999 feet MSL, a segment of the Paradise MOA overlies the Owyhee MOA entirely. Where the Paradise MOA extends into northern Nevada

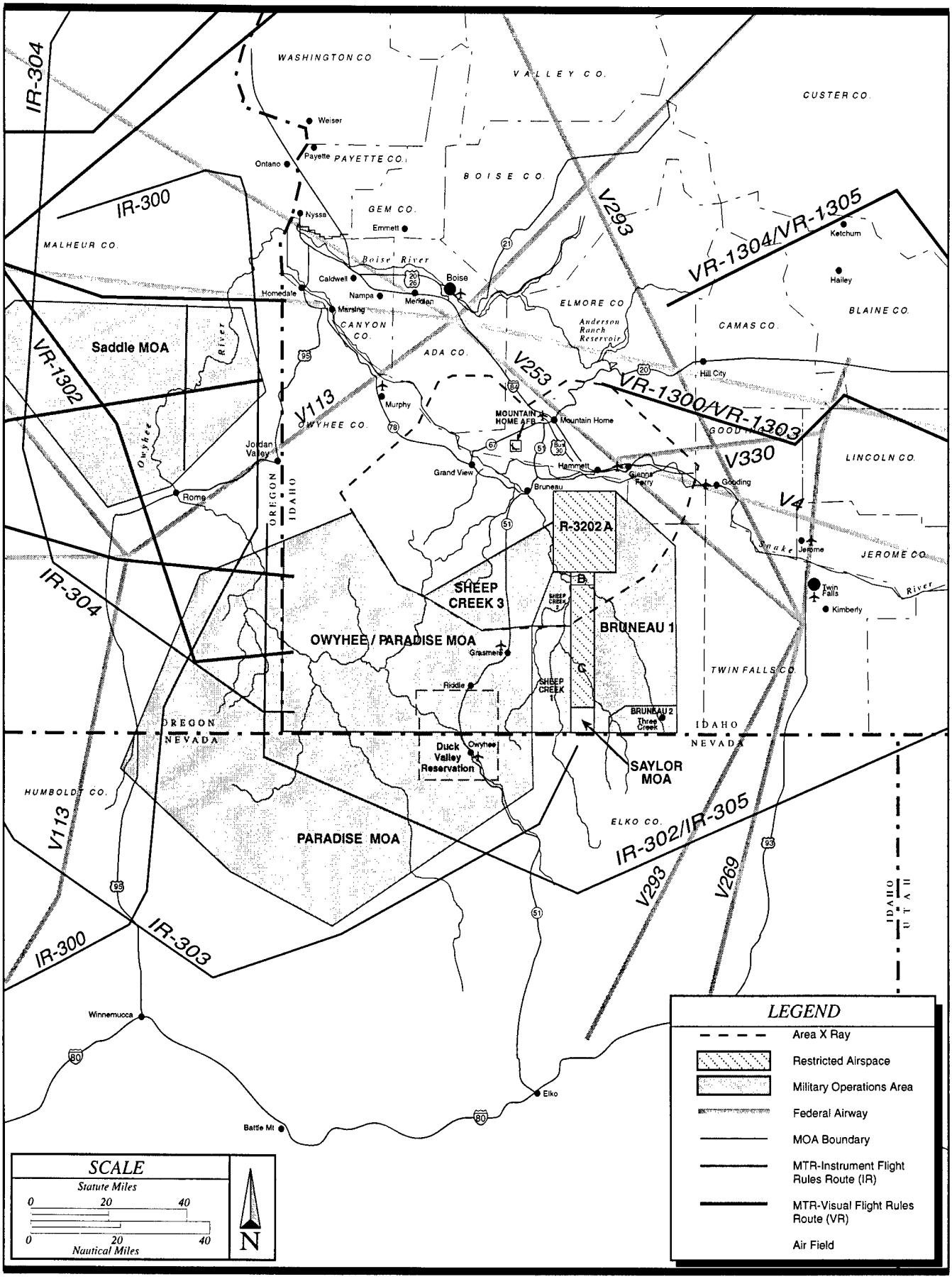



**Figure 3.1-1 Airspace Region of Influence and Other Special Use Airspace**

and southeastern Oregon, its altitude limits remain the same, 14,500 to 17,999 feet MSL, and that airspace covers an additional 4,450 square miles.

Air Traffic Control Assigned Airspace (ATCAA) overlies the Paradise MOA and extends the training airspace upward from 18,000 feet MSL to accommodate higher altitude, non-hazardous flight maneuvers. When active, use of this airspace by nonparticipating aircraft is strictly controlled by the FAA Salt Lake Air Route Traffic Control Center (ARTCC).

The Saddle A/B MOA, located northwest of the Owyhee and Paradise MOAs, is used primarily by IDANG, but receives some use by 366th Wing and other aircraft during composite force and wing training missions. Annual baseline use of the Saddle MOA by all aircraft is about 2,000 sortie-operations. This MOA, which overlies approximately 2,050 square miles, extends from 8,000 (B) and 10,000 (A) feet MSL to 17,999 feet MSL. Numerous MTRs cross under the Saddle MOA.

Although diverse types of flight training activities are conducted in MOAs, their use does not prohibit other nonparticipating aircraft operations and, therefore, does not require the imposition of restrictions. IFR aircraft normally fly routes that circumvent MOAs or they are separated from MOA traffic by the controlling ATC agency. VFR aircraft may transit a MOA when military training is underway but are encouraged to contact the Mountain Home AFB ATC facilities for the MOA status and traffic advisories, as available. These measures, coupled with both military and civil pilot attention to "see and avoid" during active MOA periods, enhance the cooperative and safe use of this airspace for all concerned.

Aircraft from the 366th Wing, IDANG, and transient users conduct a wide range of training activities within these MOAs, including air-to-air combat maneuvering, intercept, suppression of enemy air defenses, and navigation training. The 366th Wing also uses the airspace to conduct composite training in which different types of aircraft (e.g., fighters, bombers, and air refueling tankers) conduct integrated operations to simulate combat conditions. Because of the variety of aircraft using these MOAs and the types of training conducted, altitudes and flight tracks flown overall vary considerably with relatively random distribution of sorties.

Within these MOAs, two primary restrictions on flight activities apply:

1) Supersonic events occur within the airspace above Idaho and above 10,000 feet AGL; and

2) Flights directly above the Duck Valley Reservation are subject to those constraints identified in section 1.3.2.2.

The latter restriction affects the Owyhee and Paradise MOAs. It forces flight activities to the western portion of the Paradise MOA and in the relatively narrow band of MOA airspace bounded by the reservation's northern limits and the Sheep Creek 3 MOA.

Under Alternatives B, C, and D, MOA airspace would be added to the northern limits of the Owyhee and Sheep Creek MOAs, in what is now designated "Area X-Ray," and to the eastern edge of the Paradise MOA. For Alternative D, MOA airspace would also be expanded along the eastern edge of the Bruneau MOAs. The proposed Owyhee MOA expansion lies within the approach control boundaries of Mountain Home AFB. Military transit air traffic currently occurs in this area, although military aircraft training does not occur. In addition, A-10 and C-130 aircraft from the IDANG occasionally cross this area while operating under standard FAA rules for VFR air traffic (i.e., under 250 knots airspeed and below 10,000 feet MSL).

The area of the proposed expansion of the Paradise MOA includes no existing airspace used by military aircraft for the altitudes (14,500 to 17,999 feet MSL) of the expansion. However, portions of MTR corridors cross through the area at much lower altitudes (e.g., 100 AGL to 14,000 feet MSL). Aircraft activities along these corridors (Instrument Route [IR]-303 and IR-302/305, Visual Route [VR]-1300/1303, VR-1304/1305) total about 900 sorties annually.

For the proposed eastward expansion of the Bruneau 1 MOA under Alternative D, no military aircraft activity currently occurs. While more than 7,700 sortie-operations are conducted in the adjacent MOA airspace, the thin (2 nautical mile [NM]-wide) proposed strip of airspace accommodates no scheduled flights.

### *MTRs*

The airspace traditionally used by the 366th Wing includes 12 MTRs that provide low-altitude tactics and navigation training and access to the MOAs and SCR restricted area. Since none of the alternatives would require modifications to these MTRs or affect their use, they are discussed only to the extent of their general standards of use.

MTRs are designed and managed to satisfy low-level, higher speed training requirements while minimizing any disturbances to people and property. MTR locations are published on various aeronautical charts and information regarding their scheduled use is available through FAA advisory systems and military scheduling agencies. Detailed route descriptions in Department of Defense (DoD) Flight Information Publications and pre-flight pilot briefings familiarize military pilots with specific locations to be avoided along the routes, such as airports, towns, and sensitive areas. For example, the IDANG recently moved one segment of an MTR corridor containing several MTRs so that they could eliminate low-altitude military aircraft overflights of the Duck Valley Reservation, as well as several small airfields along the route.

All of the MTRs in the ROI have floor segments as low as 100 feet AGL, but they are normally flown between 500 and 1,000 feet AGL. Both military and civil VFR pilots are responsible for exercising see-and-avoid flight procedures while operating within MTR designated airspace.

Segments of some of the MTR corridors underlie the Paradise and Saddle MOAs. Table 3.1-1 lists those segments and their length under the existing or proposed airspace.

**Table 3.1-1. MTR Corridors Underlying Existing or Proposed MOA Airspace**

| *MOA* | *MTR within Corridors under MOA* | *Corridor Segment Length (NM)* | *Annual Sortie-Operations*[1] |
|---|---|---|---|
| Paradise (existing) | IR-302/305, VR-1300/1303, VR-1304/1305 | 110 | 660 |
| | VR-1302 | 38 | 298 |
| | VR-1301 | 23 | 32 |
| | IR-304 | 47 | 450 |
| | IR-300 | 66 | 31 |
| Paradise (proposed) Paradise East/West | IR-302/305, VR-1300/1303, VR-1304/1305[2] | 49[3]/61[4] | 660 |
| | VR-1302 | 0/38 | 298 |
| | VR-1301 | 0/23 | 32 |
| | IR-304 | 0/47 | 450 |
| | IR-300 | 0/66 | 31 |
| | IR-303 | 15/0 | 229 |
| Saddle MOA | IR-300 | 52 | 31 |
| | VR-1302 | 58 | 298 |
| | VR-316/319 | 53 | 93 |
| | IR-304 | 22 | 450 |

Notes:
1. Sortie-operations account for use of all segments.
2. This corridor represents an exit from these routes for access to SCR.
3. Paradise East.
4. Paradise West.

### *OTHER AIRSPACE USE*

Salt Lake ARTCC has delegated airspace surrounding Mountain Home AFB from the surface to 16,000 feet MSL to Mountain Home radar approach control (RAPCON) for providing ATC services to aircraft arrivals, departures, and overflights. This airspace is designated "Area X-Ray" (Figure 3.1-1) and is returned to Salt Lake ARTCC on a daily basis when no longer required for Mountain Home AFB operations. Locally published arrival and departure routes are established within Area X-Ray which transit the area proposed for the Owyhee MOA extension. IFR aircraft are normally above 8,000 feet MSL while operating through this portion of Area X-Ray. IDANG A-10s occasionally operate VFR through this area between 500 feet and

2,000 feet AGL. Since these lower altitudes may be used by other VFR aircraft, safety is maintained through the "see and avoid" concept.

Mountain Home AFB is establishing a Military Radar Unit (MRU) that will be known as "Cowboy Control." A series of relays will afford the system low-altitude radar coverage throughout the special use airspace south of Mountain Home AFB and enhanced radio coverage in the region.

The system is planned to operate eight hours per day, but times will vary based on the 366th Wing's flying schedule. Cowboy Control will monitor a VHF (very high frequency) during operating hours, and will provide advisory control. When the MRU is not operating, the assigned VHF frequency will be monitored by the RAPCON/Salt Lake Center, which will respond to general aviation inquiries.

This increased radar and radio coverage will enhance safety of flight for both military and civil aviation and increase freedom of navigation in the regional airspace.

### 3.1.2 Civil Aviation Airspace Use in ROI Three

Civil aviation airspace use around ROI Three primarily consists of the federal airways and airports shown on Figure 3.1-1, as well as visual "flyways" commonly flown by VFR general aviation aircraft within this region.

In general, any military training airspace may cause flight diversions or increased attention to other traffic. FAA and military airspace management consider such concerns when planning and implementing airspace actions to accommodate not only military needs, but the protection of airspace around major airports and other areas of high-density aircraft operations. For that reason, restricted areas, MOAs, and MTRs are located within areas that will meet military training needs while minimizing impacts on civil aviation.

Mountain Home AFB airspace is located within an area that has had minimal effects on civil aviation. IFR air traffic operates within the ATC system using either federal airways (below 18,000 feet MSL), jet routes (18,000 feet MSL and above), point-to-point navigational routes, or other courses as directed by ATC. The federal airways shown on Figure 3.1-1 circumnavigate the MOAs and R-3202 and, therefore, are not affected by military operations. A new jet route (J-523) between Rome, Oregon and Ely, Nevada crosses the southwest corner of the Paradise ATCAA. Air traffic at higher altitudes along this jet route and other point-to-point routes through this area is under the control of the FAA Salt Lake ARTCC, which provides vertical and/or lateral separation from all military aircraft. Commercial air traffic between Boise and the other common destination airports is provided with nearly direct routing that is unaffected by the presence or use of the MOAs and R-3202.

The SCR and its supporting R-3202 and MOA airspace is generally removed from the common visual routes and airways used by most civil aircraft in this area. There are two common routes

flown by VFR general aviation aircraft that provide good visual or navigational references when flying south or southeast of Boise. These routes include State Highway 51 between Mountain Home and points south toward Elko, Nevada; and the Snake River, Interstate 84, or federal airways V-253 and 269 between Boise and points southeast toward Twin Falls, and Jackpot, Nevada. Since Highway 51 goes through a portion of the Owyhee MOA, military aircraft avoid flight within 8,000-10,000 feet MSL for two miles on either side of the highway while flying in this area. VFR aircraft in the area are encouraged to fly within those altitudes while following the highway. Past surveys and limited radar tracking in that area indicate that about one VFR flight a day occurs along Highway 51. These routes are sufficiently clear of the SCR airspace that range operations do not conflict with civil air traffic.

Very few aircraft operate within the Paradise East and West MOAs due to the remoteness of this area. Aircraft flying north-south between the Boise area and Winnemucca, Nevada, follow federal airway V-113 or Highway 95, both of which lie wholly or predominantly west of the MOAs. Because the Paradise MOAs begin at 14,500 feet MSL (approximately 10,000 feet AGL throughout the area) VFR aircraft may at times fly farther east of Highway 95 and beneath the MOA floor to reduce their flying distance. No known east-west VFR flyways exist between the southern Oregon, Idaho, northern Nevada, and Utah areas that transit through the Paradise or Owyhee MOAs. Air traffic between Oregon and the Boise area normally remains north of these MOAs.

There are some ranchers and other private aircraft owners who operate at the Grasmere, Owyhee, and Riddle airfields and other more distant points within the ROI. Use of these small airfields is limited and sporadic. These operations and the overall VFR general aviation activities in this region are reported by the Idaho Transportation Department's Aeronautics Division as being low density. Where radar coverage, radio communications, and air traffic workload permit, Mountain Home AFB ATC can provide traffic advisory services to VFR general aviation aircraft upon request.

Nearly all of the MTR segments are located in areas where there is very little general aviation flight activity. Only five MTRs cross the visual north-south routes discussed above that are normally used by VFR general aviation aircraft. These VFR aircraft normally fly at higher altitudes (9,500 and 10,500 feet MSL) for fuel efficiency and safety in the event of an engine failure and, therefore, operate above the MTR traffic. Altitudes flown by IFR traffic on the federal airways in the ROI are also well above the MTR traffic.

Resource management agencies such as the Bureau of Land Management (BLM) and Idaho Department of Fish and Game (IDFG) conduct occasional flights within the regional airspace, including areas near or within R-3202 for fire spotting and response, fire rehabilitation, aerial game surveys, and special agency tours. The number of flights conducted monthly can vary from none to 12 or more, depending on the season, fire activity, and special needs for game surveys and tagging. Both helicopter and small fixed-wing aircraft are used for these flights, and they generally operate at altitudes below 1,000 feet AGL during daylight hours only. Procedures have been established for coordination of these flights with Mountain Home AFB

so that the required airspace can be scheduled to accommodate agency activities and appropriate advisories can be provided to minimize conflicts in the airspace use. This process has generally been effective in accommodating the BLM and IDFG flights. Continuous efforts are made to ensure pertinent flight information is passed between these agencies and military operations personnel.

Discussions with Idaho Transportation Department's Aeronautics Division representatives indicate that safety within the Mountain Home AFB training airspace is a concern even though use within the airspace by civil VFR traffic is low. Although the number of VFR general aviation operations throughout the area cannot be fully accounted for, Mountain Home AFB ATC indicates that less than 200 VFR aircraft per month normally contact the radar or tower facilities for advisory services. Many of these aircraft are not operating in areas affected by R-3202 or the MOAs. The higher density operations at the Boise Airport that primarily include air passenger service are also not a factor. In general, the current Owyhee and Paradise MOA airspace structure has not imposed any unreasonable restrictions or inconveniences on civil aircraft pilots' ability to operate in this environment.

### 3.1.3 Shoshone-Paiute Issues Concerning Airspace

The airspace in the immediate vicinity of the Duck Valley Reservation includes the Owyhee and Paradise MOAs. This airspace is currently used by the Reservation for medical emergencies, tourism, and other reasons. If an emergency flight through this MOA airspace should be necessary while training operations are taking place, the flight can be conducted under VFR procedures and the pilot can notify Mountain Home AFB to ensure that training activities in the vicinity are halted or redirected.

As mentioned in section 1.4.4.2, the Air Force's Good Neighbor Policy and an agreement formalizing local restrictions on military flight activities over the Duck Valley Reservation limit flight activities below 15,000 feet AGL over the Reservation and overflights of Owyhee, Nevada. It also restricts the use of chaff, flares, and supersonic training over the Reservation.

The Fort McDermitt Reservation lies on the border of northern Nevada and southeastern Oregon underneath the Paradise MOA. In this portion of the MOA, military aircraft fly no lower than 14,500 feet MSL. The Air Force has notified the Fort McDermitt Reservation of the proposed action and alternatives.

# NOISE

Noise was identified as an issue of concern during the public comment process. Concern was expressed by public and agency commentors that existing aircraft noise disrupted the wilderness experience and was potentially detrimental to sensitive biological species. Section 3.2 addresses noise. Section 3.8 addresses the impacts of existing and potential changes in noise levels to biological resources.

An assessment of aircraft noise requires a general understanding of sound measurement and noise effects on people and animals. The table on the next page shows typical maximum sound measurements in decibels (dB) and the relationship of those measurements to common sounds. The term "A-weighted" refers to adjustments to approximate the human ear's sensitivity to noise frequency. All sound levels are A-weighted unless otherwise indicated.

Cumulative noise from high-performance aircraft is presented in the baseline sections of this EIS. The noise effect is adjusted upward to account for time of day and surprise or startle effect. In addition, a measure of sound exposure from a low-level aircraft overflight is used in the biological section in response to agency questions about such overflights.

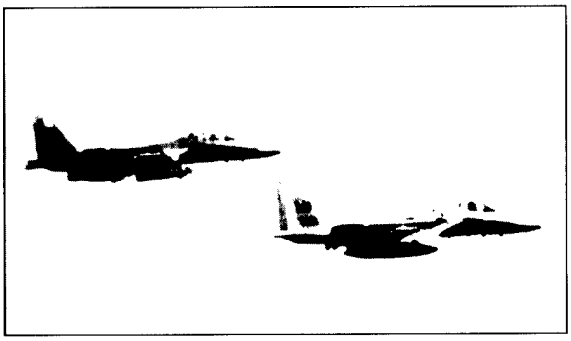
Military aircraft create noise from airframes, engines, and in some instances, sonic booms. The Air Force trains at supersonic speeds in the southwest Idaho MOA airspace above 10,000 feet above ground level. The concentration of aircraft in specific areas within the MOAs would be reduced if one of the three range development alternatives were selected.



ETI noise levels throughout the MOAs are derived from documented studies of aircraft-generated noise in arid areas. Computer-based simulation programs developed from these studies are used to determine noise impacts associated with high performance jet aircraft operations. Noise impacts are quantified by calculating the current or baseline noise environment before an action and the expected noise environment after an alternative is operational.

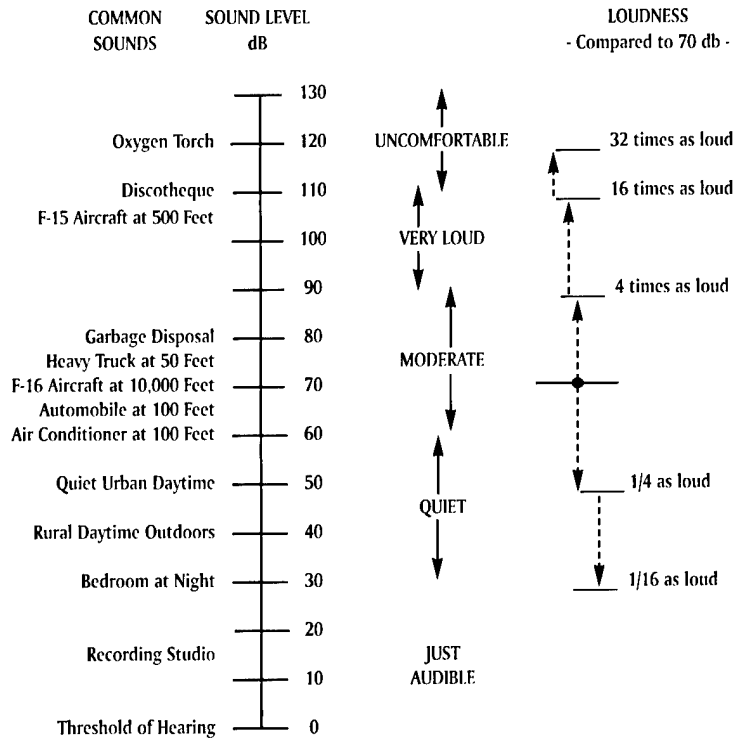
In the EIS Noise section, the noise levels are presented in terms of the Onset Rate-Adjusted Monthly Day-Night Average A-weighted Sound Level ($L_{dnmr}$). $L_{dnmr}$ is not a description of a specific sound but rather is a measure of the total average sound level that can be used for comparison among alternatives. The typical maximum sound levels in the table below are part of the $L_{dnmr}$ cumulative measure. The $L_{dnmr}$ accounts for the cumulative sound energy over a 24-hour period. Although called an average, the $L_{dnmr}$ is more accurately described as a cumulative measure because it accounts for the sound level of individual events, the duration of each event, and the number of events occurring each day. $L_{dnmr}$ has three modifications:

- Day/night operations are taken into consideration by adding 10 dB to the sound levels for aircraft operations between 10:00 p.m. and 7:00 a.m. This adjustment takes into consideration reduced typical night background noise levels and increased sensitivity.
- The surprise or startle effect from high-speed aircraft is taken into account by adding from 0 to 11 dB to the sound exposure level of the aircraft, depending on the rate of speed at which noise from approaching aircraft increases.
- The average operations during the busiest month of the year is the basis for $L_{dnmr}$. This is in contrast to annual averages used at civil airports. This busiest monthly average prevents predictions from being diluted downward by seasonal periods of low military aircraft activity.



Mountain Home-based F-15 aircraft may fly as low as 500 to 1000 feet above ground level. At such altitudes, they create short, intensive noise that can startle and annoy some people.

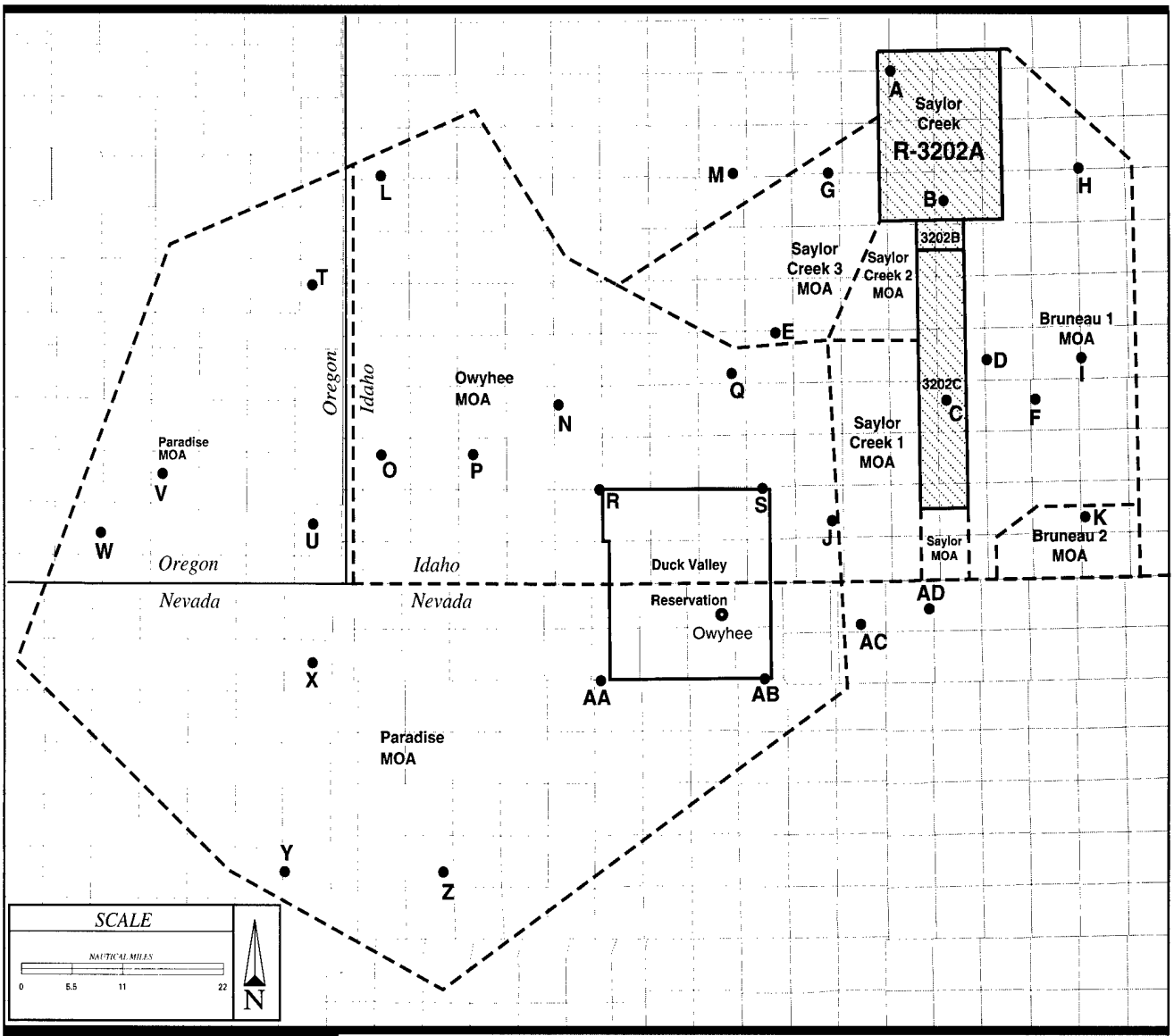
## Typical Maximum A-Weighted Common Sounds




Adapted from: Handbook of Noise Control, C.M. Harris, Editor, McGraw-Hill Book Co., 1979.

A number of study points were selected to compare the existing, or no action, noise environment to the noise environment under each enhanced training alternative. Currently, the $L_{dnmr}$ cumulative noise levels at selected points range from a low of 41-43 dB to a high of 68-69 dB. The current highest cumulative noise levels are located in the restricted airspace supporting the Saylor Creek Range such as points B and C below. The lowest cumulative noise levels are in the portions of the Paradise MOA that are located in the State of Nevada, such as point Z, and in the airspace outside the existing MOAs, such as point M.

Noise from supersonic military aircraft maneuvers produces approximately one sonic boom per day in some areas such as along the west-to-east corridor north of the Duck Valley Reservation.




**Reference Points Used in the Baseline Noise Analysis**

*LEGEND*

- Representative Noise Location with Letter Code
- Restricted Airspace
- Airspace
- Township/ Range Lines

## 3.2 NOISE

Noise is perhaps the most identifiable concern associated with aircraft operations. Although many other sources of noise are present in today's communities, aircraft noise is often singled out for special attention and criticism. An assessment of aircraft noise requires a general understanding of sound measurement and the effects of noise on humans, animals, and structures. Appendix K provides a description of the characteristics and metrics used to describe sound, as well as a discussion of noise and its effects on the environment and land use compatibility. The description of the existing noise environment presented below assumes a working knowledge of the metrics and compatibility guidelines discussed in this appendix.

The word "metric" is used to describe a standard of measurement. As used in environmental noise analysis there are many different types of noise metrics. Each metric has a different physical meaning or interpretation and each metric was developed by researchers in an attempt to represent the effects of environmental noise. The noise metrics used in this EIS are the maximum sound level (abbreviated $L_{max}$), the Sound Exposure Level (abbreviated SEL, and the Onset Rate Adjusted Monthly Day-Night Average Sound Level (abbreviated $L_{dnmr}$). Each of these metrics represents a level of analysis for quantifying the noise environment as discussed below.

$L_{max}$, SEL, and $L_{dnmr}$ employ A-weighted sound levels. "A-weighted" denotes the adjustment of the frequency content of a noise event to represent the way in which the average human ear responds to the noise. Unless otherwise mentioned, all noise metrics are A-weighted.

*Maximum sound level ($L_{max}$)* represents the first level of analysis in quantifying the noise environment. It is the highest sound level measured during a single aircraft overflight. For an observer, the noise level will start at the ambient noise level, rise up to the maximum level as the aircraft flies closest to the observer and returns to the ambient level as the aircraft recedes into the distance.

Maximum sound level is important in judging the interference caused by an aircraft noise event with conversation, sleep, or other common activities.

*Sound Exposure Level (SEL)*, the second level of analysis, combines the maximum level of the event and the duration of the event. The maximum sound level alone may not represent how intrusive an aircraft noise event is because it does not consider the length of time that the noise persists. The period of time over which the noise event is heard is also significant. The SEL combines both of these characteristics into a single metric. It is important to note, however, that SEL does not directly represent the sound level heard at any given time, but rather provides a measure of the total exposure of the entire event.

*Cumulative Noise Metrics.* The first and second levels of analysis ($L_{max}$ and SEL) provide a description of a single aircraft overflight. But neither of these metrics describe in a single measure the overall noise impact from multiple aircraft noise events. The third level of analysis

is the Onset Rate Adjusted Monthly Day-Night Average Sound Level ($L_{dnmr}$). $L_{dnmr}$ sums the individual noise events and averages the resulting level over a specified length of time. Thus, it is a composite metric representing the maximum noise levels, the duration of the events, and the number of events. This cumulative metric does not represent the variations in the sound level heard. It does provide an excellent measure for comparing environmental noise exposures when there are multiple aircraft noise events to be considered.

Noise levels for the subsonic aircraft operations conducted in the Restricted Areas, MOAs, and MTR segments underlying MOAs associated with existing and proposed conditions were calculated using the Air Force's MR_NMAP (MOA Range NOISEMAP) noise modeling computer program (Lucas and Calamia 1996). These levels are presented in terms of $L_{dnmr}$ in units of decibels (dB). The aircraft considered and the numbers of sortie-operations assigned to each aircraft type in applicable units of airspace are shown in Table 3.0-2.

It is important to note that MR_NMAP accounts for the surprise or startle effect that results from a high-speed aircraft overflight by adding from 0 to 11 dB to the SEL for the event, depending on the rate at which noise from the approaching aircraft increases. An additional 10 dB is added to sound levels from nighttime aircraft operations (occurring between 10:00 P.M. to 7:00 A.M.) to take into account reduced background noise levels and increased sensitivity to noise at night.

Noise levels of sonic booms from supersonic aircraft operations associated with current and proposed activities were calculated using the Air Force's BOOMMAP computer program. BOOMMAP is based on extensive in-field measurements and analysis of supersonic training operations (Plotkin et al. 1990). These levels are presented in terms of the C-Weighted Day-Night Average Sound Level (CDNL) in units of decibels, which are abbreviated as dB(C) throughout this EIS.

ROI Three is used for the noise analysis. For the purpose of describing existing conditions in the context of a particular airspace, this includes all aircraft operations that occur within the existing airspace components affected by the alternatives (Figure 3.0-1). Since neither the use nor structure of any MTRs would change as a result of the alternatives, noise levels for each route will not be evaluated. Rather, only the contribution of noise by those segments of MTRs that underlie existing or proposed MOA airspace will be assessed. Refer to Table 3.1-1 in Section 3.1, Airspace, for the length of the segments under consideration. In instances where the airspace is proposed, ROI Three includes aircraft activity that is presently conducted within boundaries where the airspace would occur. It is important to note that noise levels are calculated on a cumulative basis. That is, any other coincidental, intersecting, and overlapping airspace that occurs within ROI Three for a given airspace component being assessed is included in, or added to, the noise analysis.

## 3.2.1 Modeled Flight Operations

### 3.2.1.1 Restricted Areas and Military Operating Areas

Flight operations within Restricted Areas and MOAs occur over a range of altitudes, depending on the type of aircraft, training missions, and airspace dimensions. For noise modeling purposes, the range of representative flight and altitude profiles, engine thrust settings, and airspeeds for each aircraft type performing their various operations were used to calculate the $L_{dnmr}$ for each airspace component. The MR_NMAP computer program, which is adapted to simulate a uniform horizontal distribution, was used to calculate noise within the restricted area R-3202 and the nine existing MOAs. This calculation provided the baseline noise level for comparison with similar levels calculated for the four alternatives addressed in section 4.2, Noise.

### 3.2.1.2 Military Training Routes

Flight operations within MTRs occur over the range of altitudes within these low-level routes, depending on the type of aircraft, training mission, and route dimensions. For noise modeling purposes, representative flight altitude profiles, engine thrust settings, and airspeeds for each aircraft type were used to calculate the $L_{dnmr}$ for each airspace component. The MR_NMAP computer program was used to calculate noise levels for each assessed segment of the pertinent MTRs. Only those MTR segments that underlie MOA airspace within ROI Three are considered in the analysis. This section presents the resulting cumulative noise levels with the highest $L_{dnmr}$ values calculated for conditions directly under the centerline. This provides baseline sound levels for comparison with similar levels calculated for the alternative actions.

### 3.2.1.3 Supersonic Operations

Supersonic flight operations due to air combat maneuver (ACM) training within the Restricted Areas and MOAs occur at altitudes above 10,000 feet AGL. The CDNL of sonic booms due to supersonic operations was calculated using the BOOMMAP computer program. The results represent the highest cumulative noise levels at points located under the training airspace in which ACM occurs. This provides baseline sound levels for comparison with similar levels calculated for the four alternatives presented in section 4.2, Noise.

## 3.2.2 Aircraft Noise

### 3.2.2.1 General Findings

Thirty reference points were chosen to provide a detailed spatial representation of the noise environment and to denote the range of noise levels within ROI Three. These noise levels are summarized in Table 3.2-1.

**Table 3.2-1. Cumulative Baseline $L_{dnmr}$ Values**

| *Reference Point* | $L_{dnmr}$ *(dB)* | *Reference Point* | $L_{dnmr}$ *(dB)* | *Reference Point* | $L_{dnmr}$ *(dB)* |
|---|---|---|---|---|---|
| A | 61 | L | 55 | W | 46 |
| B | 68 | M | 46 | X | 58 |
| C | 69 | N | 61 | Y | 42 |
| D | 61 | O | 59 | Z | 42 |
| E | 56 | P | 63 | AA | 56 |
| F | 57 | Q | 62 | AB | 43 |
| G | 53 | R | 53 | AC | 43 |
| H | 57 | S | 53 | AD | 50 |
| I | 57 | T | 52 | | |
| J | 57 | U | 60 | | |
| K | 50 | V | 57 | | |

Noise reference points A through AD were selected for analysis and comparison with similar levels calculated for the four airspace alternatives appearing in section 4.2, Noise. The 30 analysis locations are presented graphically in Figure 3.2-1 and their interpretation is as follows:

| Points | Description |
|---|---|
| A, B | Represents range of noise levels in R-3202A. |
| C | Located near center of R-3202C. |
| D | Located at the center of R-320X under Clover Butte Alternative. |
| E | Located at the center of R-320X under Grasmere Alternative. |
| F | Located at the center of R-320X under Juniper Butte Alternative. |
| G, H, I, J, K | Located along the boundaries of the range support MOAs. |
| L, N, O, P, Q | Represents the distribution of noise levels in the Owyhee MOA. |
| M | Located inside the expanded airspace. |
| R, S, AA, AB | Located at the four corners of the Duck Valley Reservation. |
| T | Located under Paradise MOA at the intersection of VR-1303, VR-1305, IR-305, VR-1300, VR-1304, IR-302, and VR-1301. |

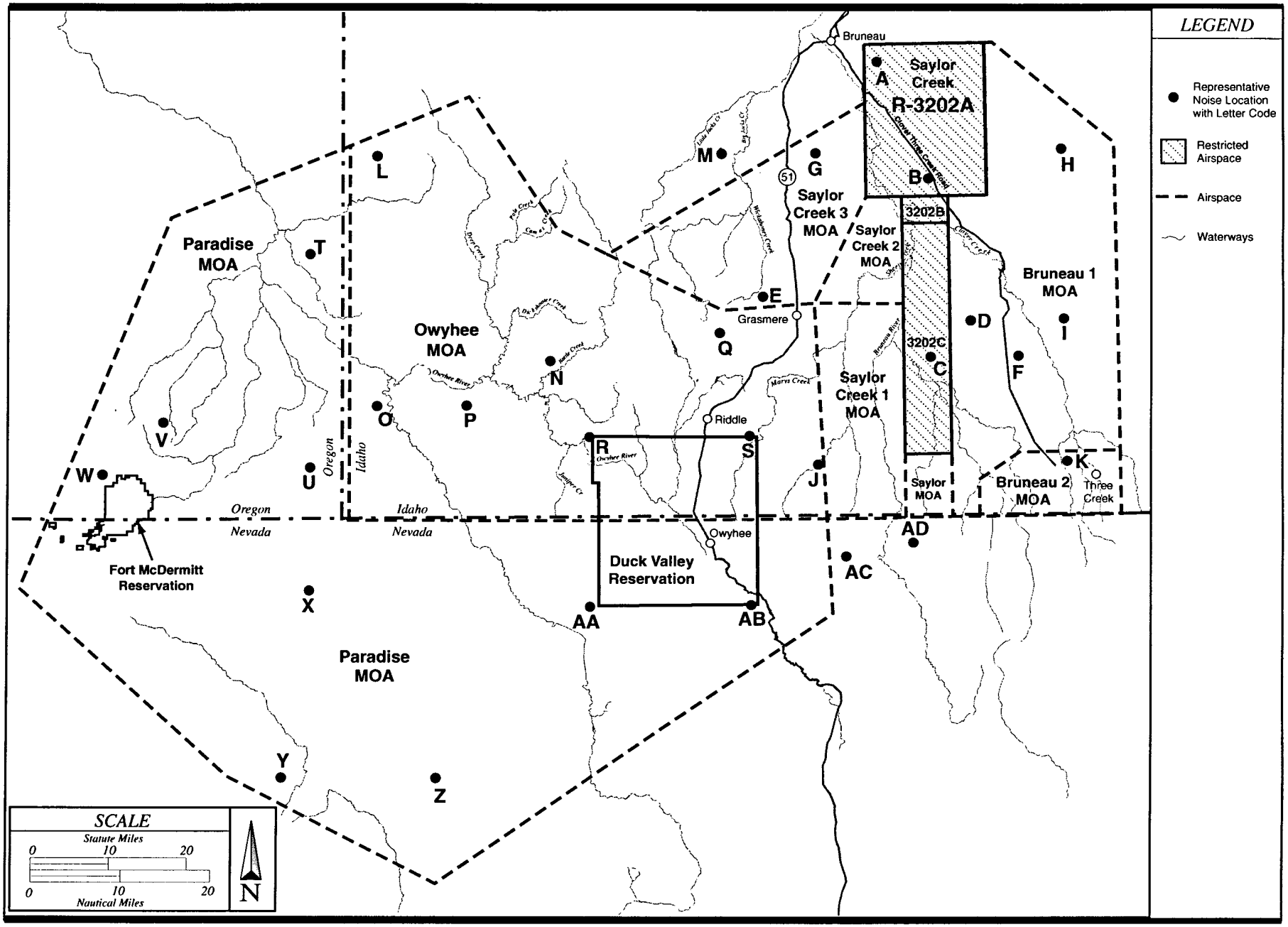



**Figure 3.2-1 Reference Points Used in the Baseline Noise Analysis**

| Points | Description |
|---|---|
| U | Located under Paradise MOA at the intersection of VR-1303, VR-1305, IR-305, VR-1300, VR-1304, IR-302, and VR-1302. |
| V | Located under Paradise MOA at the intersection of VR-1302 and IR-304. |
| W | Located under Paradise MOA on the centerline of IR-300. |
| X | Located under Paradise MOA at the intersection of VR-1303, VR-1305, IR-305, VR-1300, VR-1304, and IR-302. |
| Y, Z | Located under Paradise MOA. |
| AC | Located in the expanded airspace at approximately 5 NM left IR-303. |
| AD | Located in the expanded airspace under the centerline of IR-303. |

The maximum $L_{dnmr}$ values currently range from a low of 41 dB to a high of 69 dB. The highest noise level occurs in R-3202 C, designated in Table 3.2-1 as reference point C. Another area where the noise levels are high due to the convergence of military aircraft activity is along an east-west corridor in the MOAs surrounding SCR and the Owyhee MOA located north of the Duck Valley Reservation. The reference points chosen to illustrate this convergence of aircraft activity are E, N, O, P, and Q. Reference points N, P, and Q are centered along the corridor and have a cumulative noise level of 61 to 63 dB. In the Paradise MOA the noise level due to air-to-air combat training is 42 dB (reference point Y and Z) due to the higher altitudes of operations. At many of the reference points contained within the Paradise MOA the cumulative noise level is greater than 42 dB due to military training on existing MTRs, as illustrated in Table 3.2-1 reference points T, U, V, W, X, AC, and AD.

#### 3.2.2.2 SAYLOR CREEK RANGE

Reference points A, B, and C present the range of cumulative existing noise levels for Restricted Area R-3202, which overlies SCR. The $L_{dnmr}$ values range from a low of 61 dB to a high of 69 dB. These values include the cumulative impacts from all military aircraft operations that share the SCR. (Historically, these noise levels are consistent with those applicable in the past, at least from the mid-1970s to the present.)

The CDNL resulting from supersonic air combat training in the SCR has the highest level of 48 dB(C), occurring near reference point C. On average there are approximately 0.1 sonic booms per day (equivalent to hearing one sonic boom every 10 days) within the area defined by R-3202.

### 3.2.2.3 MOAs Associated with Saylor Creek Range

Reference points D, E, F, G, H, I, and K present the range of cumulative noise levels for the MOAs surrounding SCR used to support range training activities. The $L_{dnmr}$ values range from a low of 50 dB to a high of 61 dB. These values include the cumulative impacts from other coincidental airspace.

The CDNL resulting from supersonic training in these MOAs has a maximum level of 50 dB(C) and was located near reference point J. There is, on average, 0.4 sonic boom heard per day, which is equivalent to hearing one sonic boom every two to three days.

### 3.2.2.4 Owyhee MOA

Reference points J and L and reference points N through S present the range of cumulative existing noise levels for the Owyhee MOA. The $L_{dnmr}$ values range from a low of 53 dB to a high of 63 dB. These values include the cumulative impacts from the Paradise MOA.

No supersonic operations occur in the Owyhee MOA, i.e., above 10,000 AGL. Supersonic operations are conducted in the portion of the Paradise MOA that overlaps the Owyhee MOA above 10,000 feet AGL. The cumulative CDNL resulting from supersonic operations in the Paradise MOA/Owyhee MOA has the highest level of 54 dB(C) and is located near reference point Q. Approximately one sonic boom is heard per day in the vicinity of this reference point.

### 3.2.2.5 Paradise MOA

Reference points J and L and reference points N through AB present the range of cumulative existing noise levels for the Paradise MOA. The average noise level in the MOA due to air-to-air combat training is 42 dB. The $L_{dnmr}$ values range from a low of 42 dB to a high of 63 dB. These values include the cumulative impacts from Owyhee MOA and the surrounding MTRs.

Supersonic operations in the Paradise MOA are confined within the airspace that is above the Owyhee MOA. The maximum CDNL resulting from supersonic operations is 54 dB(C). On the average, approximately one sonic boom is heard per day near reference point Q.

### 3.2.2.6 Saddle MOA

The cumulative $L_{dnmr}$ in the Saddle A MOA calculated under the centerline of VR-316/319 has a value of 42 dB. In the Saddle B MOA the cumulative $L_{dnmr}$ at the intersection VR-316/319 and VR-1302 has a value of 48 dB. Both of these locations represent the highest noise levels in the Saddle MOAs.

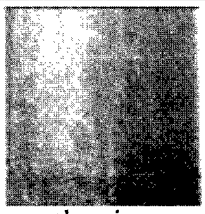
### 3.2.3 Shoshone-Paiute Issues Concerning Noise

Noise associated with aircraft operations over southwest Idaho is an important issue for the Shoshone-Paiute Tribes. In response to these and other concerns, the Air Force, through its Good Neighbor Policy and an agreement formalizing local restrictions on military flight activities over the Duck Valley Reservation (see section 1.4.4.2), limits flight activities below 15,000 feet AGL over the Reservation and overflights of Owyhee, Nevada. The Air Force also restricts supersonic training over the Reservation and, to the greatest extent practicable, will temporarily reschedule or relocate aircraft operations to avoid disturbance to ceremonies and other special traditional activities, upon reasonable notification by the Tribes.

Traditional ceremonies and rituals by the Shoshone-Paiute often depend on isolation, solitude, and silence. Overflights can be very disruptive for Tribal members engaged in ceremonies, sometimes completely preventing these important activities from being conducted. An aircraft flying overhead, even at very high altitudes, may be deemed an intrusion. Traditional cultural resources and related ceremonies are discussed in more detail in section 3.9. Also, many Shoshone-Paiute believe that noise may affect spirits who are active in the environment whether or not human ceremonies are taking place.

As discussed previously, reference points for the baseline noise analysis include four points (R, S, AA, AB) on the corners of the Duck Valley Reservation (refer to Figure 3.2-1). The cumulative baseline $L_{dnmr}$ values for these four points are R, 53 dB; S, 53 dB; AA, 56 dB; and AB, 43 dB (refer to Table 3.2-1). Noise levels in the MOA airspace north of the Reservation are higher (61 to 62 dB) because of the convergence of military activity in that area. In the airspace north of the Reservation, an average of one sonic boom is heard per day.

Reference points V and W are located near the Fort McDermitt Reservation. The cumulative baseline $L_{dnmr}$ values for these two points are: V, 57 dB; and W, 46 dB (refer to Table 3.2-1).

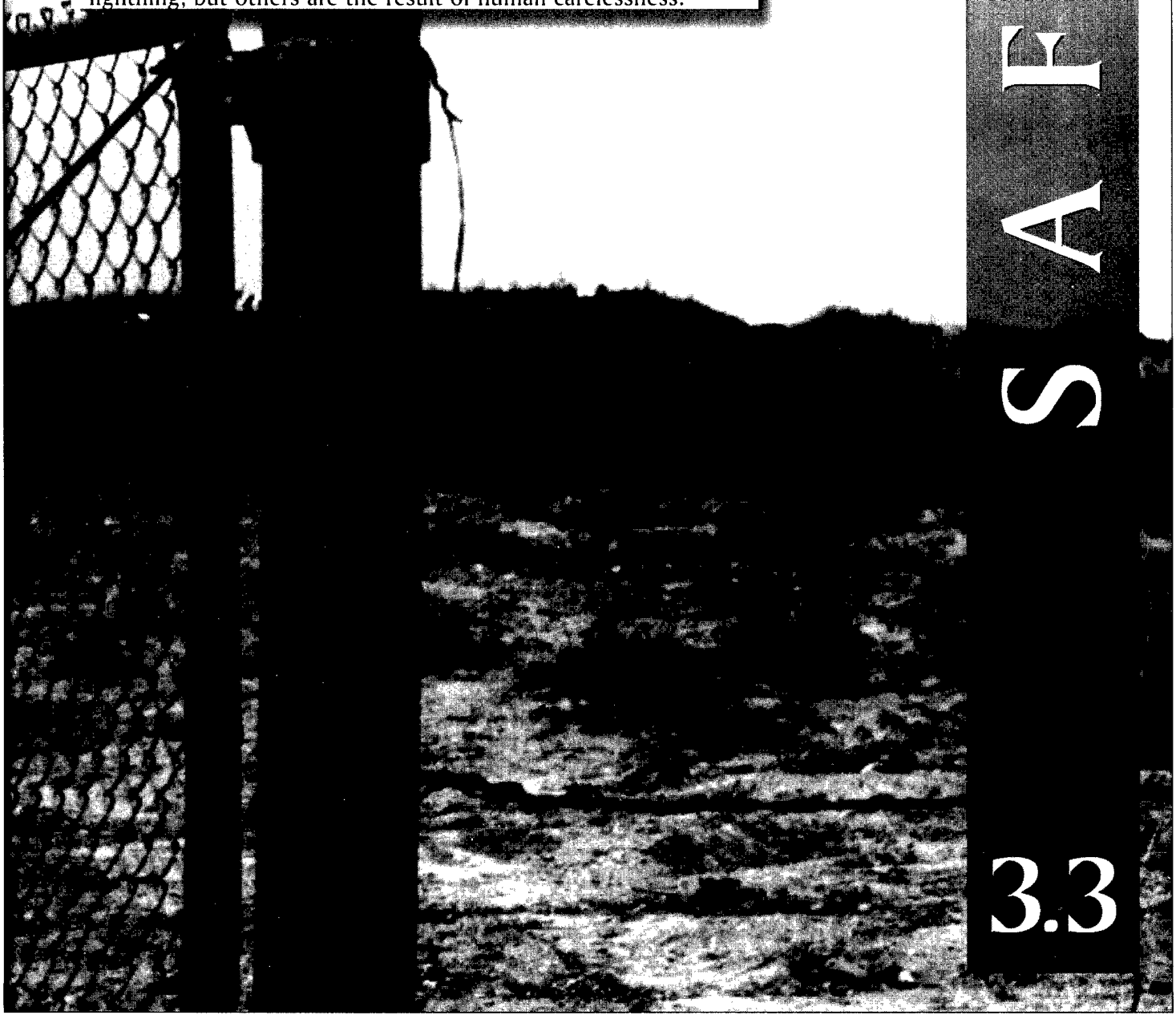


# SAFETY

Safety was another issue raised by individuals during the public comment period for the Draft EIS, with particular concern about fire and ground safety. The EIS Safety section considers potential risks to persons and property that may occur from ground activities, flight operations, and the use of training ordnance.

The greatest ground safety concerns focus on the risk of fire. The potential for the ignition and spread of fire varies throughout the area depending on the vegetation type and time of year. The areas in the vicinity of the proposed ranges have the potential for rapid fire spread.

The concern about fire safety is based upon a history of fires throughout the area. In this region, many fires are caused by lightning, but others are the result of human carelessness.



3.3

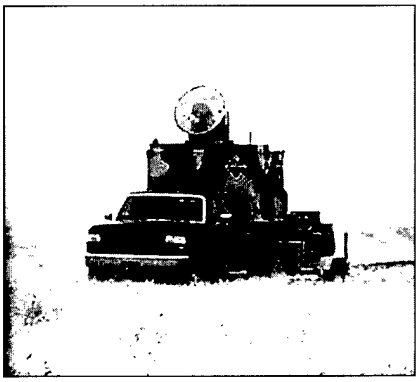
Flight safety considers the risk of aircraft accidents and bird-aircraft strikes. Historical mishap data are used to predict the frequency of major mishaps. Calculations considering the use of all of the Mountain Home military training airspace do not indicate any levels of what could be considered as unacceptable risk. For all of the airspace considered, the highest risk is associated with F-16 aircraft flying on SCR and in the associated range support MOAs where there is a statistically predicted risk of a serious F-16 accident once every 11.1 years. The risk is significantly less for all other aircraft in all other airspace elements.

Training activities on a new range alternative would use 25-pound training ordnance. This ordnance does not contain highly explosive material but, because of the spotting charges, the training ordnance is handled by highly trained personnel. In flight, mechanical and electrical safeguards prevent inadvertent or accidental release.

While chaff and defensive flares are approved for use in the MOAs, their use constitutes a minimal risk. Chaff is ejected from an aircraft using a pyrotechnic device, but the chaff itself is not explosive and is not harmful to human beings or wildlife. Flares in the MOAs are released no lower than 2,000 feet above the ground in accordance with a coordinated agreement with BLM. This altitude is more than double the normally approved safe-release altitude designated by the Air Force for flare use. In response to Shoshone-Paiute concerns, the Air Force has agreed to not use chaff and to not use flares below 20,000 feet in training flights over the Duck Valley Reservation during the day.



Public hearing concerns resulted in five areas of safety being addressed in the EIS: fire safety, flight safety, the use of chaff, radio frequency energy, and laser targeting.



Emitters are operated under strict safety control measures to ensure that the radio frequency energy does not pose a health risk.



# 3.3 SAFETY

Safety issues addressed in this section include fire, ground, flight, and explosive safety considerations. Fire safety focuses on potential fire risks associated with aircraft accidents, and the use of training ordnance and flares in the regional airspace and the areas proposed for the training range. Ground safety issues concern those activities and procedures associated with operation of the existing SCR. Ground safety considerations also include assessment of potential radio frequency emission hazards resulting from the use of the threat-simulation emitters, and the use of lasers on aircraft for training ordnance delivery. Therefore, ROI Two is used to discuss fire and ground safety concerns. ROI Three is applied to aircraft flight safety where the risks of aircraft mishaps and bird-aircraft strike hazards are considered. Levels of sortie-operations considered are identified in Table 3.0-2. Explosive safety considerations involve the use and handling of training ordnance that will be delivered on air-to-ground training ranges, and the use of flares on ranges and throughout the military training airspace within ROI Three.

## 3.3.1 Fire Risk and Management/Ground Safety

Fire risk issues are addressed for all three ROIs, in descending numerical order.

### 3.3.1.1 ROI THREE

In its broadest scope, the ROI for safety includes all of the regional military training airspace, and the lands underlying that airspace. This airspace currently supports military flight training conducted by the 366th Wing at Mountain Home AFB, the IDANG unit at Gowen Field, and other military aviation units. It includes the Saddle, Paradise, and Owyhee MOAs, as well as the restricted airspace associated with the SCR and the surrounding MOAs that provide support for the range.

The Lower Snake River District of the BLM provides fire protection for the approximately 5.75 million acres of public land underlying this airspace. This vast area represents a complex and diverse ecosystem that includes varied vegetation. During the period 1980 to 1991, an average of 134 fires burned approximately 137,000 acres annually with approximately 1.7 million acres burned in total. Investigation has shown that 65 percent of these fires were caused by people, and 35 percent occurred due to natural causes (e.g., lightning) (BLM 1994b).

Based on similarity of fuel types, the BLM has established four major Fire Management Zones (FMZ). These vegetative groupings include annual grasses (FMZ 1), sagebrush and perennial grasses (FMZ 2), upland woodlands (FMZ 3), and timbered areas (FMZ 4). The fuels within each FMZ have different fire risks, since each have individual ignition potential, fire carrying capacity, and fire spread potential (BLM 1994b).

Aircraft flight activity, in and of itself, poses very little fire or ground safety risk. Concerns center around the potential for an aircraft accident resulting in a fire. This is addressed in more

detail in section 3.3.2, Flight Risks. Two aircraft accidents have occurred in ROI Three in the last 10 years; one in 1988 and the other in 1996. However, none has resulted in a fire that spread beyond the immediate vicinity of the crashed aircraft. During training, there are some fire and ground safety risks associated with the use of training ordnance, chaff, and flares. Within the broad expanse of area encompassed by this ROI, training ordnance is never released from an aircraft. While chaff and flares are approved for use in the MOAs within the ROI, their use constitutes minimal risk. Although chaff (small, thin fibers of aluminum-coated mica) may be ejected from an aircraft using a pyrotechnic device, that device remains on the aircraft. The chaff itself is not explosive and is not considered harmful to human beings and wildlife. When used anywhere except on the target area of SCR, flares are released no lower than 2,000 feet above the ground in accordance with a coordinated agreement with the BLM. This altitude is more than double the normally approved safe-release altitude designated by the Air Force for flare use over range impact areas (Mountain Home AFB Instruction 13-287, 1995c). In accordance with the *Inter-Department Memorandum of Agreement among the Bureau of Land Management of Idaho, Nevada, and Oregon and Mountain Home Air Force Base, Idaho,* the following three agreements concerning flare usage were specified:

- The only approved aerial flares by any military aircraft (i.e., Army, Navy, Marine, Air Force, National Guard, Reserve) will be MJU-7 and M-206 flares. These flares totally burn up in less than 400 feet (approximately four seconds). The only failure experienced has been the failure of the cartridge to fire from the aircraft (one percent probability), in which case the flare remains in the aircraft.
- The minimum altitude for flare use in the MOAs will be 2,000 feet AGL in the Owyhee and Jarbidge MOAs, and 14,500 MSL in the Paradise East and Paradise West MOAs.
- No flare will be dropped or used in MTRs outside MOAs.

Additional information on training ordnance, chaff, and flares is contained in section 3.3.3.

### 3.3.1.2 ROI Two

The airspace surrounding the existing and proposed air-to-ground training ranges supports more intense and concentrated flight training activity since aircraft converge in these areas. This region constitutes ROI Two. ROI Two involves portions of FMZ 1 and FMZ 2.

FMZ 1 is dominated by annual grasses. Cheatgrass and medusa head rye are the primary fuel types. These fuels ignite easily, and in areas where vegetation is dense, fires spread rapidly. Rates of spread in hundreds of feet per minute are not uncommon. As a result, containment is difficult, and once ignited, the risk of the fire escaping an area is high. From 1980 to 1991, 894 fires have burned 1,071,345 acres in this FMZ. Of these fires, 68 percent were caused by people and 32 percent resulted from natural causes. Although humans cause the majority of fires, the majority of the acreage burned resulted from natural causes (i.e., lightning) (BLM 1994b). Details of the fire history of this FMZ are presented in Table 3.3-1.

**Table 3.3-1. FMZ 1 Fire History**

| | Person-Caused | | Lightning-Caused | | Total | |
|---|---|---|---|---|---|---|
| *Year* | *Fires* | *Acres* | *Fires* | *Acres* | *Fires* | *Acres* |
| 1980 | 42 | 45,401 | 10 | 19,593 | 52 | 64,994 |
| 1981 | 71 | 90,772 | 12 | 69,253 | 83 | 160,025 |
| 1982 | 48 | 23,572 | 20 | 9,322 | 68 | 32,894 |
| 1983 | 51 | 31,598 | 44 | 133,261 | 95 | 164,859 |
| 1984 | 66 | 39,155 | 40 | 100,540 | 106 | 139,695 |
| 1985 | 52 | 25,350 | 28 | 80,886 | 80 | 106,236 |
| 1986 | 65 | 30,215 | 37 | 193,985 | 102 | 224,200 |
| 1987 | 63 | 24,708 | 51 | 111,709 | 114 | 136,417 |
| 1988 | 39 | 11,102 | 4 | 3,335 | 43 | 14,437 |
| 1989 | 36 | 4,590 | 28 | 14,434 | 64 | 19,024 |
| 1990 | 38 | 3,208 | 6 | 146 | 44 | 3,354 |
| 1991 | 36 | 3,759 | 7 | 1,451 | 43 | 5,210 |
| Totals | 607 | 333,430 | 287 | 737,915 | 894 | 1,071,345 |

Source: BLM 1994b

The primary fuel types in FMZ 2 are sagebrush and perennial grasses. Ample moisture availability in the spring encourages vegetation growth. However, the hot and dry summers with frequent dry lightning storms increase fire risk. Due to the presence of numerous sensitive habitat areas, there are constraints on the use of surface-disturbing and powered equipment, which may hinder suppression efforts. Nevertheless, fire risk in FMZ 2 is somewhat iess than in FMZ 1. From 1980 to 1991, 387 fires have burned 482,692 acres in FMZ 2. The majority of these fires (219) are attributable to natural causes. The remaining 168 fires (43 percent) were person-caused. The greatest identifiable cause is incendiary, followed by equipment use, railroads, and debris burning (BLM 1994b). The fire history of FMZ 2 is presented in Table 3.3-2.

**Table 3.3-2. FMZ 2 Fire History**

| | Person-Caused | | Lightning-Caused | | Total | |
|---|---|---|---|---|---|---|
| *Year* | *Fires* | *Acres* | *Fires* | *Acres* | *Fires* | *Acres* |
| 1980 | 14 | 9,346 | 11 | 16,157 | 25 | 25,503 |
| 1981 | 22 | 22,646 | 5 | 8,956 | 27 | 31,600 |
| 1982 | 12 | 3,555 | 5 | 16,188 | 17 | 19,743 |
| 1983 | 19 | 8,454 | 16 | 3,670 | 35 | 12,124 |
| 1984 | 23 | 6,499 | 31 | 44,116 | 54 | 50,615 |
| 1985 | 12 | 28,714 | 26 | 130,844 | 38 | 159,558 |
| 1986 | 6 | 1,345 | 34 | 121,489 | 40 | 122,834 |
| 1987 | 20 | 7,100 | 15 | 4,534 | 35 | 11,634 |
| 1988 | 13 | 9,051 | 5 | 641 | 18 | 9,692 |
| 1989 | 5 | 109 | 25 | 18,672 | 30 | 18,781 |
| 1990 | 9 | 3,488 | 26 | 2,709 | 35 | 6,197 |
| 1991 | 13 | 4,439 | 20 | 9,970 | 33 | 14,409 |
| Totals | 168 | 104,746 | 219 | 377,946 | 387 | 482,692 |

Source: BLM 1994b

### 3.3.1.3 ROI One

Due to the human activities and military training that would occur within the proposed tactical training range and the emplacement locations for the emitter sites, the greatest potential fire and ground safety risks exist in these locales. Each specific area is addressed in more detail below.

#### *Alternative B — Clover Butte*

The area of the proposed Clover Butte Alternative training range is in FMZ 2. Vegetation at the proposed training range is predominately non-native seeded grasses, such as crested wheatgrass (*Agropyron cristatum*) and intermediate wheatgrass (*Agropyron intermedium*). Additional areas of annual grasses (*Bromus tectorum*) and weeds occupy the western edge of the 12,000-acre training range. The majority of the remaining section is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). Crested wheatgrass extends to the west and north towards the Bruneau River canyon. Near the canyon, Wyoming big sagebrush once again becomes dominate. Overall, 65 percent of the vegetation in the 12,000-acre area is dominated by non-native grass species. Although brushy areas are scattered in the region, it is characterized predominantly by a large grassy area that lies to the east of and follows the course of the Bruneau and Jarbidge rivers. Additional information on the vegetation may be found in section 3.8.

### *ALTERNATIVE C — GRASMERE*

The area of the proposed Grasmere Alternative training range is located predominately in FMZ 2, although a small portion of the northeast corner of the land area extends into FMZ 1. The site is dominated by Wyoming big sagebrush and low sagebrush (*Artemisia arbuscula*). The majority of the remaining acres is non-native seeded crested wheatgrass. Wyoming big sagebrush dominates the areas to the west and east of the site. The proposed impact area is dominated by native and non-native grass species. Additional information on the vegetation may be found in section 3.8.

### *ALTERNATIVE D — JUNIPER BUTTE*

The proposed Juniper Butte Alternative training range lies south and east of proposed Alternative B in FMZ 2. The tactical training range is dominated by intermediate wheatgrass, with a smaller area in the northeast corner dominated by rabbitbrush (*Chrysothamnus* ssp.). In addition, the area near the northern border has been planted to crested wheatgrass. Crested wheatgrass and a bare area from a recent fire extend to the west of Juniper Butte. Wyoming big sagebrush dominates the areas to the east. The Clover Creek Road along the west edge of the alternative and more sparsely vegetated slope to the east of the range form manmade and actual firebreaks. Additional information on the vegetation may be found in section 3.8.

### *NO-DROP TARGETS*

The no-drop target areas would be located throughout FMZ 1 and FMZ 2. The area of the proposed large, 640-acre site is located in FMZ 1, as are three of the smaller sites. The remaining three sites would be located in FMZ 2. The characteristics of these FMZs were discussed above.

### *EMITTER SITES*

The 30 proposed emitter sites would also be located throughout FMZ 1 and FMZ 2. Twenty of the sites would be in FMZ 1, and the other ten would be in FMZ 2.

### *SAYLOR CREEK RANGE / R-3202*

Ground safety on SCR is guided by detailed processes and procedures documented in Mountain Home AFB Instruction 13-287, *Saylor Creek Air Force Range*. This document describes the range and its capabilities. It provides specific information on weapons delivery procedures, which includes training ordnance authorized for use on the range, operational procedures, and any applicable restrictions that must be followed by all aircrews using the range. Additionally, responsibilities for maintenance, range decontamination and explosive ordnance disposal, firefighting, and security are delineated (Mountain Home AFB 1995c).

- SCR is located in FMZ 1. The vegetation on the range is predominantly annual grasses, cheatgrass, and medusa-head rye grass. When dry, these fuels ignite easily and burn rapidly.

The BLM has fire suppression responsibility for the range, with the exception of the exclusive-use area, which is under the control of range staff.

Maintenance and operations on the range are managed and conducted to minimize the risk of fire; or, if a fire should start, to minimize the risk of escape from the point of origin and extensive spreading. When meteorological conditions and fuel characteristics indicate heightened fire risk, range operations are curtailed or sometimes halted until the high risk subsides. These restrictions could apply to the characteristics of the training ordnance used, and the authority to expend flares or other pyrotechnic devices. Characteristics of the spotting charge used in training ordnance are discussed in more detail is section 3.3.3.

The almost 12,000-acre exclusive use area of the range is maintained with a clear disked-area 120 feet inside the perimeter fence. Additional firebreaks crisscross the interior of the range. Regular controlled burns within the exclusive use area reduce fuel availability. When the range is active, and for 30 minutes following use, a fire watch is maintained in operations towers.

Fire response is governed by the *Support Agreement Between 366th Wing, Mountain Home Air Force Base, Idaho and the United States Department of Interior Lower Snake River Ecosystem Boise District Office.* This agreement prescribes operational procedures for pre-suppression, suppression, and post-suppression of fires on the Saylor Creek Gunnery Range. Under this agreement, the 366th Wing contracts the range civilian maintenance crew (approximately five to seven civilian personnel) to provide fire fighting capabilities within the 13,000-acre impact area. The BLM provides fire fighting support to the Air Force within the rest of the area withdrawn by Public Land Order 49-02, dated 16 September 1970. These lands total 109,465.96 acres, consisting of 102,745.96 acres as identified by the U.S. Army Corps of Engineers (USACE), plus 6,080 acres leased by the State of Idaho, and 640 acres owned by the Air Force (Mountain Home AFB 1996c).

Training on SCR is augmented through the use of radio frequency (RF) emitters that simulate enemy radar signals. The operating characteristics of these electronic emitters have been evaluated, and safe-separation distances from the unit have been calculated to ensure that there is no risk associated with these emissions. Safety processes and procedures are in effect to ensure that these separation distances are established and maintained.

Some of the targets on SCR have been approved for laser targeting. Initial approval for these targets required an extensive survey and evaluation by Air Force bioenvironmental engineers. Although these targets are approved for laser targeting, before lasers are used, range operating procedures require the aircrew to confirm that no temporary restrictions exist that could create a hazardous condition. This ensures that no reflective material or other conditions such as large areas of standing water or ice are in the vicinity of the target.

## 3.3.2 Flight Risks

The public's primary concern regarding flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of mid-air collisions, collisions with manmade structures or terrain, weather-related accidents, mechanical failure, pilot error, or bird-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military. Flight safety considerations addressed include aircraft mishaps and bird-aircraft strikes.

The ROI for flight risks includes all of the regional military training airspace involved in the proposals, which is ROI Three.

### *AIRCRAFT MISHAPS*

The Air Force defines four categories of aircraft mishaps: Classes A, B, C, and High Accident Potential (HAP). Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of $1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs of more than $200,000, but less than $1 million, or result in permanent partial disability, but do not result in fatalities. Class C mishaps involve costs of more than $10,000, but less than $200,000, or a loss of worker productivity of more than 8 hours. HAP represents minor incidents not meeting any of the criteria for Class A, B, or C. Class C mishaps and HAP, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damage and injuries, and rarely affect property or the public. This EIS focuses on Class A mishaps because of their potentially catastrophic results.

It is impossible to predict the precise location of an aircraft accident, should one occur. Major considerations in any accident are loss of life and damage to property. The aircrew's ability to exit from a malfunctioning aircraft is dependent on the type of malfunction encountered. The probability of an aircraft crashing into a populated area is extremely low, but it cannot be totally discounted. Several factors are relevant: the ROI and immediate surrounding areas have relatively low population densities; pilots of aircraft are instructed to avoid direct overflight of population centers at very low altitudes; and, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that a disabled aircraft would crash in a populated area.

Secondary effects of an aircraft crash include the potential for fire and environmental contamination. Again, because the extent of these secondary effects is situationally dependent, they are difficult to quantify. The terrain overflown in the ROI is diverse. For example, should a mishap occur, highly vegetated areas during a hot, dry summer would have a higher risk of experiencing extensive fires than would more barren and rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons. Those petroleums, oils, and lubricants not consumed in a fire could contaminate soil and water. The potential for contamination is dependent on several factors. The porosity of the surface soils will determine how rapidly contaminants are absorbed. The specific geologic structure in the region will determine the

extent and direction of the contamination plume. The locations and characteristics of surface and groundwater in the area will also affect the extent of contamination to those resources.

F-16 aircraft carry a small quantity of hydrazine in a sealed canister that is designed to withstand crash impact damage. Hydrazine is a highly volatile propellant that contains toxic elements. It is carried on the F-16 as part of the emergency engine air-restart system. When used for this purpose, hydrazine is completely consumed, and poses no safety hazard. In any crash that is severe enough to rupture the canister, it is most likely that fire will also be involved. In this case, the hydrazine will also burn and be completely decomposed. In the unlikely event that the hydrazine should be released, but not consumed by fire, impacts on soils and groundwater are likely to be of minor consequence. Hydrazine absorbs water at room temperature. It is incombustible in solution with water at concentrations of 40 percent or less, and it evaporates at any given temperature at a rate slightly slower than water. Movement of hydrazine through natural soils has been shown to be slow and limited. Due to its absorption and natural decomposition processes, the probability of released hydrazine significantly contaminating groundwater is extremely low. However, if quantities of hydrazine were to reach a surface water body, aquatic life in those areas experiencing high concentrations could be significantly impacted.

Based on historical information on mishaps at all installations, and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. Combat losses due to enemy action are excluded from these statistics. In the case of MOAs and restricted areas, an estimated average sortie duration may be used to estimate annual flight hours in the airspace. For MTRs, the length of the route and the average flight speed of the aircraft using the route may be used to determine the amount of flight time each specific type aircraft will spend on the route each year. Then, the Class A mishap rate per 100,000 flying hours can be used to compute a statistical projection of anticipated time between Class A mishaps in each applicable element of airspace. In evaluating this information, those data presented are only statistically predictive. The actual causes of mishaps are due to many factors, not simply the amount of flying time of the aircraft.

With the exception of the small amount of area involved in the proposed expansion of the Owyhee MOA, all of the military airspace in ROI Three supports ongoing military training activities. The tables presented below reflect statistical projections of Class A mishaps for the types of aircraft currently using the airspace based on the estimated flying time for that specific aircraft type, the statistical Class A mishap rate per 100,000 flying hours for that aircraft, and the estimated annual flight hours for the aircraft in the ROI.

Table 3.3-3 presents mishap information for the existing operations on and immediately around the Saylor Creek airspace. This includes the restricted airspace (R-3202), as well as the MOAs immediately adjacent to the range that provide range support.

Tables 3.3-4, 3.3-5, and 3.3-6 present similar mishap information for the existing use of the Owyhee, Paradise, and Saddle MOAs, respectively.

**Table 3.3-3. Baseline Saylor Creek Range / Range Support MOAs Projected Class A Mishap Data**

| *Aircraft* | *Class A Mishap Rate* | *Sortie-Operations/ Year* | *Flight Hours/Year* | *Projected Years Between Mishaps* |
|---|---|---|---|---|
| A-6/EA-6B | 3.33 | 156 | 78 | 385.0 |
| A-10 | 2.56 | 2,401 | 1,801 | 21.7 |
| B-1 | 4.02 | 349 | 350 | 71.1 |
| B-52 | 1.29 | 32 | 16 | 4,845.0 |
| C-130 | 0.99 | 50 | 51 | 1,980.6 |
| F-4 | 5.80 | 86 | 44 | 391.8 |
| F-14 | 5.76 | 2 | 1 | 17,361.1 |
| F-15 | 2.62 | 2,646 | 2,647 | 14.4 |
| F-16 | 4.57 | 1,970 | 1,970 | 11.1 |
| F-18 | 2.07 | 24 | 12 | 4,025.8 |
| F-111 | 6.16 | 7 | 4 | 4,058.4 |
| T-37 | 1.12 | 1 | 1 | 89,285.7 |
| UH-1 | 3.43 | 13 | 7 | 4,164.9 |

Source: Mountain Home AFB 1996a
Personal Communications: Air Force and Naval Flying Safety Centers

**Table 3.3-4. Baseline Owyhee MOA Projected Class A Mishap Data**

| *Aircraft* | *Class A Mishap Rate* | *Sortie-Operations/ Year* | *Flight Hours/Year* | *Projected Years Between Mishaps* |
|---|---|---|---|---|
| A-6/EA-6B | 3.33 | 48 | 24 | 1,251.3 |
| AV-8 | 13.03 | 28 | 14 | 548.2 |
| A-10 | 2.56 | 1,632 | 1,632 | 23.9 |
| B-1 | 4.02 | 153 | 115 | 216.3 |
| C-130 | 0.99 | 33 | 33 | 3,060.9 |
| F-4 | 5.80 | 105 | 53 | 325.3 |
| F-15 | 2.62 | 3,137 | 3,137 | 12.2 |
| F-16 | 4.57 | 2,175 | 1,632 | 13.4 |
| F-18 | 2.07 | 20 | 10 | 4,830.9 |
| KC-135 | 0.69 | 2 | 1 | 144,927.5 |
| T-37 | 1.12 | 11 | 6 | 14,880.9 |
| UH-1 | 3.43 | 6 | 3 | 9,718.2 |

Source: Mountain Home AFB 1996a
Personal Communications: Air Force and Naval Flying Safety Centers

**Table 3.3-5. Baseline Paradise MOA Projected Class A Mishap Data**

| *Aircraft* | *Class A Mishap Rate* | *Sortie-Operations/ Year* | *Flight Hours/Year* | *Projected Years Between Mishaps* |
|---|---|---|---|---|
| A-6/EA-6B | 3.33 | 40 | 20 | 1,501.5 |
| AV-8 | 13.03 | 35 | 18 | 426.4 |
| A-10 | 2.56 | 154 | 154 | 253.6 |
| B-1 | 4.02 | 102 | 77 | 323.1 |
| C-130 | 0.99 | 12 | 12 | 8,417.5 |
| F-4 | 5.80 | 89 | 45 | 383.1 |
| F-15 | 2.62 | 2,939 | 2,939 | 13.0 |
| F-16 | 4.57 | 1,563 | 1,173 | 18.7 |
| F-18 | 2.07 | 16 | 8 | 6,038.6 |
| KC-135 | 0.69 | 69 | 35 | 4,140.8 |
| T-37 | 1.12 | 66 | 33 | 2,705.6 |
| UH-1 | 3.43 | 6 | 3 | 9,718.2 |

Source: Mountain Home AFB 1996a
Personal Communications: Air Force and Naval Flying Safety Centers

**Table 3.3-6. Baseline Saddle MOA Projected Class A Mishap Data**

| *Aircraft* | *Class A Mishap Rate* | *Sortie-Operations/ Year* | *Flight Hours/Year* | *Projected Years Between Mishaps* |
|---|---|---|---|---|
| A-10 | 2.56 | 462 | 462 | 84.6 |
| B-1 | 4.02 | 20 | 15 | 1,658.4 |
| C-130 | 0.99 | 12 | 12 | 8,417.5 |
| EA-6B | 3.33 | 1 | 1 | 30,030.0 |
| F-4 | 5.80 | 34 | 17 | 1,014.2 |
| F-15 | 2.62 | 1,041 | 1,042 | 36.6 |
| F-16 | 4.57 | 336 | 252 | 86.8 |
| KC-135 | 0.69 | 41 | 21 | 6,901.3 |
| T-37 | 1.12 | 39 | 20 | 4,464.3 |

Source: Mountain Home AFB 1996a
Personal Communications: Air Force and Naval Flying Safety Centers

As shown, there is relatively low risk associated with flight operations within this regional airspace. The greatest risk is associated with F-16 aircraft flying in the SCR and range support MOA airspace complex, where there is a statistical probability of a Class A mishap once every 11.1 years. For all other operations, risk is significantly less.

***BIRD-AIRCRAFT STRIKE HAZARDS***

Bird-aircraft strikes constitute a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur in a populated area. Aircraft may encounter birds at altitudes of 30,000 feet MSL or higher. However, most birds fly close to the ground. Over 95 percent of reported bird strikes occur below 3,000 feet AGL.

Approximately 50 percent of bird strikes happen in the airport environment, and 25 percent occur during low-altitude flight training (1990 Worldwide Bird-Aircraft Strike Hazard [BASH] Conference).

The potential for bird-aircraft strikes is greatest in areas used as migration corridors (flyways) or where birds congregate for foraging or resting (e.g., open water bodies, rivers, and wetlands).

Migratory waterfowl (e.g., ducks, geese, and swans) are the most hazardous birds to low-flying aircraft because of their size and their propensity for migrating in large flocks at a variety of altitudes and times of day. Waterfowl vary considerably in size, from 1 to 2 pounds for ducks, 5 to 8 pounds for geese, and up to 20 pounds for most swans. There are two normal migratory seasons, fall and spring. Waterfowl are usually only a hazard during migratory seasons. These birds typically migrate at night and generally fly between 1,500 to 3,000 feet AGL during the fall migration and from 1,000 to 3,000 feet AGL during the spring migration.

Although waterfowl are the greatest threat, raptors, shorebirds, gulls, herons, and songbirds also pose a hazard. Peak migration periods for raptors, especially eagles, are from October to mid-December and from mid-January to the beginning of March. In general, flights above 1,500 feet AGL would be above most migrating and wintering raptors.

Songbirds are small birds, usually less than 1 pound. During nocturnal migration periods, they navigate along major rivers, typically between 500 to 3,000 feet AGL.

While any bird-aircraft strike has the potential to be serious, many result in little or no damage to the aircraft, and only a minute portion result in a Class A mishap. During the years 1987 to 1989, a total of 9,334 bird strikes were reported world-wide, with four resulting in loss of the aircraft, and one additional occurrence resulting in damage to the aircraft in excess of $1 million. These occurrences constitute approximately 0.5 percent of all reported bird-aircraft strikes (1990 World-Wide BASH Conference).

The Air Force BASH Team maintains a database that documents all reported bird-aircraft strikes. Historic information concerning strikes during the last 11 years (1985-1996) for the primary training airspace within the ROI is shown in Table 3.3-7. This information reflects total

strikes experienced by all users of the airspace, not just aircraft from Mountain Home AFB and the IDANG.

**Table 3.3-7. Historic Bird-Aircraft Strike Data (1985-1996)**

| *Airspace* | *Number of Strikes* |
|---|---|
| SCR | 21 |
| Owyhee MOA | 8 |
| Paradise MOA | 0 |
| Saddle MOA | 1 |

Source: Personal Communication: Air Force BASH Team 1996

## 3.3.3 Munitions Use and Handling

This section addresses the current use of ordnance, chaff, and flares within the regional military training airspace. Two ROI levels are relevant: ROI Three for chaff and flares, and ROI One for training ordnance.

### 3.3.3.1 ROI Three

Chaff consists of very small fibers of aluminum-coated mica that reflect radar signals and, when dispensed from an aircraft, form a cloud that temporarily hides the aircraft from radar detection. Chaff is composed of a silicon dioxide fiber ranging in diameters from 0.7 to 1 mil (thousandth of an inch), coated by an aluminum alloy and a slip coating of stearic acid (fat). Analyses of the materials comprising chaff indicate that they are generally non-toxic in the quantities used (Air Force 1997). Silicon dioxide is an abundant compound in nature that is prevalent in soils, rocks, and sands. The trace quantities of metals included in the mica fibers are not present in sufficient quantities to pose a health risk. Aluminum is one of the most abundant metals in the earth's crust, water, and air. In general, aluminum is regarded as non-toxic. Trace quantities of silicon, iron, copper, manganese, magnesium, zinc, vanadium, or titanium may be found in the alloy. The quantities involved are a miniscule percentage of levels that might cause concern. Stearic acid is found naturally as a glyceride in animal fat and some vegetable oils. Chaff has also been test-fired in a controlled environment to determine its potential to break down into respirable particulates ($PM_{10}$). The findings of the test detected no particulates less than 10 microns in diameter (Air Force 1997).

Chaff is made to specifically counter radio frequencies on which the radar is operating. This type of chaff provides false targets on the radar. Training chaff, which is the predominant type of chaff used in this airspace, is specifically developed so that it does not interfere with radars used by the FAA for air traffic control. If non-training chaff is used, then altitude and locational restrictions coordinated with the FAA apply. Current authorizations allow the use of chaff and flares in the Owyhee and Paradise MOAs, as well as on SCR and its surrounding airspace. Chaff is currently not authorized in the Saddle MOA or over the Duck Valley Reservation.

Flares are small pellets of highly flammable material (magnesium) that burn rapidly at extremely high temperatures. Their purpose is to provide a heat source other than the aircraft's engine exhaust for an enemy missile to guide on. Within the Owyhee and Paradise MOAs, although flares are authorized for use, they may not be released lower than 2,000 feet above the ground. However, over the Duck Valley Reservation, flares are not released below 20,000 feet AGL during the day, and never at night. Over the impact area of SCR, depending on aircraft type, they may be released as low as 700 feet when fire risks are not severe. Nevertheless, even these minimum release altitudes are sufficient for flares to be completely consumed before they reach the ground; therefore, under normal circumstances, no burning material comes in contact with anything on the ground. Flares are not used in the Saddle MOA.

Current levels of use of chaff and flares throughout the applicable military training airspace are shown in Table 3.3-8.

**Table 3.3-8. Current Training Ordnance Use**

| *Element* | *Type* | *Saylor Creek* | *Owyhee MOA* | *Paradise MOA* |
|---|---|---|---|---|
| Training Ordnance | BDU-33 | 22,584 | None | None |
| | Mk82 Inert | 384 | None | None |
| | Mk84 Inert | 456 | None | None |
| | BDU-50 | 209 | None | None |
| | 20 mm | 78,000 | None | None |
| | 30 mm | 178,200 | None | None |
| Chaff | (Bundles) | 26,820 | 12,142 | 9,934 |
| Flares | (Each) | 14,624 | 6,053 | 4,566 |

Source: Mountain Home AFB 1996a

### 3.3.3.2 ROI ONE

Currently, training ordnance is only dropped on SCR (see Table 3.3-8 for training ordnance use on SCR).

All training ordnance is handled and maintained by specifically trained personnel. Furthermore, Air Force safety procedures require safeguards on weapons systems and training ordnance to ensure that arming, launching, firing, or releasing does not inadvertently occur. All munitions mounted on aircraft, as well as the guns carried within the aircraft, are equipped with mechanisms that preclude release or firing without activation of an electronic arming circuit.

During training missions at SCR, only non-explosive training ordnance or inert munitions are carried. The most commonly used training munition is the bomb dummy unit (BDU)-33. This is a small training ordnance weighing approximately 25 pounds, composed of ferrous metals, and equipped with a small spotting charge that serves as an aid for visual scoring of delivery

accuracy on the range. There are two types of spotting charges. Those designated as Mark 4 Mod 3 are referred to as "hot spots"; those designated CXU-3A/B are referred to as "cold spots." The hot spot is similar to a 10 gauge shotgun shell (Air Force Technical Order [T.O.]11A4-4-7). On impact, a small amount of gunpowder in the cartridge detonates, expelling 10 grams of red phosphorous, which produces a brilliant flash of light and dense white smoke. The red phosphorous ignites at 500° Fahrenheit (F), burns for approximately 0.1 second reaching a maximum temperature of approximately 2,732° F, and produces a 6-8 foot flame that extends out of the rear tube of the ordnance (Kilgore 1990).

Due to the high heat generated by hot spots, during periods of high fire risk, cold spots are used in lieu of hot spots. The cold spot contains 2 grams of gunpowder and approximately 17 cubic centimeters (cc) of titanium tetrachloride stored in a glass ampule (Air Force T.O.11A4-4-7). The gunpowder, which detonates on impact, discharges the crushed ampule of titanium tetrachloride from the rear of the unit. The exposed titanium tetrachloride reacts with available moisture in the air to produce a smoke-like plume that persists for 15 to 30 seconds, depending on the moisture content of the air and wind velocity. Although this is a chemical reaction, it produces little or no heat. Titanium compounds are neither flammable or combustible (Akzo Chemicals 1991). Therefore, training ordnance configured with cold spots poses minimal fire risk.

Some other types of non-explosive training ordnance are and would continue to be used exclusively at SCR. This training ordnance includes inert 20- and 30-millimeter (mm) training ammunition, BDU-50, and Mk 82 and Mk 84 inert. All 20- and 30-mm ammunition used is training ammunition; no high explosive or incendiary rounds are used. The BDU-50, Mk 82 inert, and Mk 84 inert are concrete-filled training ordnance that weigh between 500 and 2,000 pounds. This training ordnance can be fitted with a variety of fins, parachute-like devices, and other accessory kits (e.g., laser or television guidance packages).

### 3.3.4 Shoshone-Paiute Issues Concerning Safety

Members of the Shoshone-Paiute Tribes have expressed concerns to the Air Force regarding three main aspects of safety related to current military training activities in southwestern Idaho. These include aircraft mishaps, the use of chaff, and the use of flares.

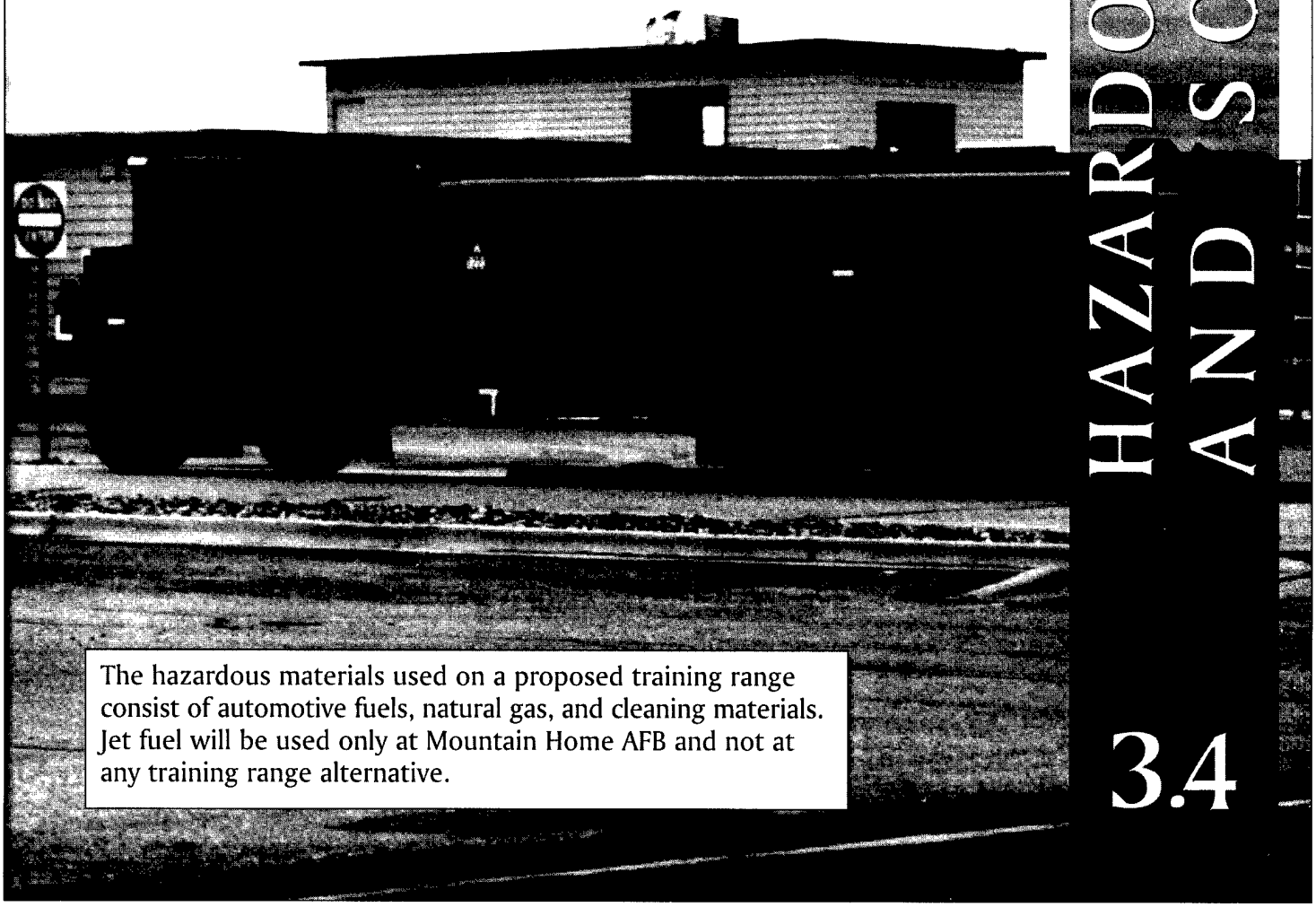
The projected Class A mishap data for aircraft presently using the Paradise MOA and the Owyhee MOA are presented in Tables 3.3-4 and 3.3-5, respectively. As concluded in section 3.3.2, there is relatively low risk associated with military flight operations in the regional airspace. Table 3.3-8 presents the current levels of chaff and flare use in the Paradise and Owyhee MOAs. As stated in section 3.3.3.1, chaff poses no known risks to people or animals. The fire risk associated with flares is low because in these two MOAs, flares are not released below 2,000 feet AGL. The Air Force, through its Good Neighbor Policy and a formal agreement with the Shoshone-Paiute Tribes, has agreed to location restrictions on flight activities and the use of chaff and flares over the Duck Valley Reservation (refer to section 1.4.4.2).

# 3.4 HAZARDOUS MATERIALS AND SOLID WASTE

Operation of the range introduces materials that can be hazardous to people and animals if not handled correctly. Examples include petroleum, natural gas, synthetic gas, and cleaning chemicals.

Hazardous wastes are by-products of hazardous or non-hazardous materials. Hazardous waste is defined as any solid, liquid, contained gaseous or semi-solid waste, or any combination of wastes that pose a substantial presence or potential hazard. Examples of hazardous wastes could be paint thinners and strippers. These substances can be easily ignited and must be properly handled and stored. There are numerous state and federal laws, as well as Air Force policies, that regulate the management of hazardous wastes and materials.

A comparative analysis of existing and proposed hazardous materials and waste management practices was used to document baseline conditions and potential impacts. Hazardous waste generation records were reviewed to estimate the quantity of hazardous waste generation and to evaluate existing management practices and storage capacity.



The hazardous materials used on a proposed training range consist of automotive fuels, natural gas, and cleaning materials. Jet fuel will be used only at Mountain Home AFB and not at any training range alternative.

## 3.4 HAZARDOUS MATERIALS AND SOLID WASTE MANAGEMENT

Hazardous materials, listed under the Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA) and the Solid Waste Disposal Act (SWDA), and the Emergency Planning and Community Right-to-Know Act (EPCRA), are defined as any substance that, due to quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health, welfare, or the environment. Examples of hazardous materials include petroleum, natural gas, synthetic gas, and toxic chemicals. Hazardous wastes, listed under the Resource Conservation and Recovery Act (RCRA), are defined as any solid, liquid, contained gaseous or semisolid waste, or any combination of wastes that pose a substantive present or potential hazard to human health or the environment. Additionally, hazardous wastes must meet either a hazardous characteristic of ignitability, corrosivity, or reactivity under 40 Code of Federal Regulations (CFR) 261, or listing as a waste under 40 CFR 263.

There are two ROIs for hazardous materials and solid waste. ROI One includes the area encompassing the proposed 12,000-acre tactical training range alternatives, emitter sites, and no-drop target areas. ROI Two includes areas below portions of the Owyhee and Jarbidge MOAs and SCR restricted airspace, as well as land adjacent to ROI One sites. This ROI incorporates those areas with the potential to experience more concentrated activity associated with the proposed action. Analysis for ROI Two focuses on support activities conducted on these lands that may require the use of hazardous materials, as well as the capacity of hazardous material and waste disposal programs.

### 3.4.1 Hazardous Waste Management

Hazardous materials and wastes are federally regulated by the U.S. Environmental Protection Agency (USEPA), in accordance with the Federal Water Pollution Control Act; the Clean Water Act (CWA); the SWDA; the Toxic Substance Control Act (TSCA); RCRA; CERCLA; and the Clean Air Act (CAA). Pesticide application, storage, and use is regulated by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The federal government is also required to comply with the intent of the acts and with all applicable state laws and regulations under Executive Order (E.O.) 12088 and DoD Directive 4150.7, Air Force Instruction (AFI) 32-1053.

Mountain Home AFB generates, stores, and transports hazardous waste as defined under RCRA, as amended. The hazardous wastes generated by the base include waste paint, used paint filters, Safety-Kleen solvents, waste munitions, and miscellaneous halogenated/ nonhalogenated solvents. Nonhazardous wastes are recyclable used petroleum products, used JP-4 (jet fuel), diesel fuel, and anti-freeze.

Implementation of the comprehensive hazardous waste management program mandated by RCRA requires maximum cooperation of all activities on Mountain Home AFB. The primary objective of the Hazardous Waste Management Plan 3208-96, Mountain Home AFB, is to

provide a management plan that gives personnel involved with hazardous waste the essential tools for effective management. Responsibilities for implementing this plan are distributed throughout the base organizations that generate, accumulate, store, transport, turn-in, monitor, treat, dispose of, or respond to incidents involving hazardous waste.

An Environmental Baseline Survey (EBS) was completed to determine if the sites considered for acquisition are contaminated or have the potential for environmental contamination (Appendix C). If the sites are contaminated, an EBS documents the nature, magnitude, and extent of environmental contamination. Therefore, an EBS establishes environmental due diligence and assesses any health and safety risks associated with the real property transaction. This EBS applied to all sites except for one five-acre no-drop target (ND-8), one one-acre emitter (BK), and two one-quarter-acre emitters (AU and AV). These sites were surveyed in 1995 under an EBS for locating temporary mobile emitters (Mountain Home 1995a).

#### 3.4.1.1 ROI Two

***PUBLIC LANDS***

The BLM has a number of statutory responsibilities considered in establishing hazardous materials management objectives and actions. Legal requirements include, but are not limited to, CERCLA, EPCRA, RCRA, as amended by the Federal Facilities Compliance Act (FFCA), CWA, TSCA, Comprehensive Environmental Response Facilitation Act (CERFA), and applicable state and local laws.

To reduce the occurrence and severity of hazardous material incidences on public lands, the BLM is committed to monitoring authorized land use actions. This includes periodic review of NEPA documents, field review compliance, yearly assessment of reported sites and follow-up monitoring on a case-by-case basis. The BLM seeks to prevent and reduce the generation and acquisition of hazardous wastes and provide for the responsible management of waste materials to protect the natural resources of BLM-managed lands, as well as the people that depend on them. The BLM also advocates and provides for the aggressive cleanup and restoration of lands that are contaminated by waste materials.

Additionally, the BLM has developed guidance documents, detailing responsibilities regarding hazardous waste generated on public land. The *Idaho Contingency Plan for Hazardous Materials Incidents* is a working tool used in the event of a hazardous material incident on public land. Individual field offices throughout Idaho supplement this plan with District Contingency Plans. A Health and Safety Plan (HASP) for all BLM employees has also been established. This document details a plan for all BLM employees within Idaho who are engaged in operations at hazardous waste sites on BLM-administered lands.

### *STATE OF IDAHO LANDS*

State lands governed by the Idaho Land Board and administered through the Idaho Department of Lands (IDL) exist within the proposed range alternatives as well as certain no-drop targets and emitter sites. The State of Idaho requires an annual report to be submitted from hazardous waste generators and treatment, storage, and disposal facilities covering hazardous waste activity over the previous year.

The state also requires compliance with hazardous materials (HAZMAT) planning and response as detailed in the contingency plan. The purpose of the contingency plan is to provide an organized plan of action and delegation of responsibilities and authority to specific facility personnel to respond to emergency situations that may require both the facility and/or outside resources. The contingency plan is designed to minimize hazards to humans and the environment from events such as fires, explosions, or release of hazardous waste in compliance with the requirements of 40 CFR 265.52 Subpart D. In addition, the Idaho Hazardous Waste Management Act was enacted in 1983. Many of the provisions incorporated in this act are analogous to RCRA.

Additional state organizations responsible for adherence to federal hazardous waste management laws include the IDFG and the Idaho Department of Health and Welfare (IDHW) Division of Environmental Quality (DEQ).

### *SAYLOR CREEK RANGE*

DoD implements management programs at SCR required by RCRA as enforced by the USEPA. Procedures for managing hazardous waste includes guidelines outlined in the Mountain Home AFB Hazardous Materials Emergency Planning and Response Plan 3209-96 and the Hazardous Waste Management Plan.

Petroleum, oil, and lubricants located on the range are stored in six above-ground storage tanks (ASTs), three 500-gallon diesel tanks, two 500-gallon motor gas tanks, one 85-gallon lube oil tank; and a 300-gallon, double-wall diesel tank is also located on site. These facilities are managed in accordance with Mountain Home AFB Plan 3209-96.

In the event of a spill at SCR, a detailed response protocol has been developed. The order of action depends on the existing conditions. The appropriate range maintenance teams will be notified and affected areas evacuated, if necessary. Special precautionary measures will be taken to remove all sources of ignition and to avoid any contact with the scene. Personnel will be notified and evacuated to reduce all possible hazards to human health. Areas affected by a spill will be confined immediately. Identification procedures to ascertain the character, source, amount, and extent of materials released will be classified. Containment, cleanup, decontamination, and disposal will proceed according to established guidelines.

### 3.4.2 Hazardous Waste Sites

Mountain Home AFB and SCR currently generate hazardous waste during operations and maintenance activities. Mountain Home AFB and SCR facilities use a variety of solvents for degreasing, painting, paint stripping, carbon removal, and general purpose cleaning of aircraft and support equipment. Hazardous waste generated by these facilities are stored at accumulation points. Managers are assigned to inspect hazardous waste containers for proper labeling, contents, structural integrity, and date of waste entry. Drums containing hazardous waste other than those listed under a service contract are taken to the Defense Reutilization and Marketing Office (DRMO) storage facility after the 90-day accumulation period allowed at accumulation points has expired. The DRMO operates a permitted RCRA storage facility at Mountain Home AFB. Hazardous wastes are stored at this facility until DRMO arranges for off-site disposal.

Mountain Home AFB currently has several disposal options. A solvent-recycling service contract exists to provide solvent for parts cleaning vats around the base and to provide solvent change out at predetermined intervals. Also, a recycling/disposal contract is available. This allows routinely generated waste to be removed on a timely basis from the shops. Used oils are wastes that cannot be managed by a base-level service contract and are sent to Building 1297 for a "30 day last look," before going to the DRMO for disposal.

#### 3.4.2.1 ROI Two

Each building or facility that generates hazardous waste establishes a location for hazardous waste storage. Hazardous waste at Mountain Home AFB is managed within the following three categories: accumulation points, accumulation sites, and at the permitted storage building. An accumulation point is a location where a generator collects hazardous waste or used hazardous materials in containers while awaiting movement to a treatment, storage, or disposal (TSD) facility. The maximum volume of hazardous waste permitted at each initial accumulation point is 55 gallons, or one quart of acute hazardous waste on the P-List. Once these limits are exceeded, the waste must be moved within 72 hours to its designated hazardous waste accumulation site. Forty accumulation points for hazardous waste exist at Mountain Home AFB. An accumulation site is an area near the waste generating activity where hazardous waste is accumulated in containers or tanks for a period of up to 90 days. The two accumulation sites for hazardous waste at Mountain Home AFB are the Central Collection Facility (Building 1297) and the Base Hospital Collection Facility (Building 6000). Hazardous waste may only be accumulated at controlled accumulation sites or accumulation points located in the same area that waste streams are generated. Each accumulation site or point must comply with associated requirements.

A permitted storage facility is a facility that has been granted a RCRA Part B permit by the IDHW DEQ to store hazardous waste. DRMO operates the hazardous waste storage facility in Building 1322. The permit should be referred to for specific operating procedures and restrictions. Wastes restricted from land disposal may be stored at this facility for up to one

year. It is the policy of Mountain Home AFB to ship hazardous waste off site as expeditiously as possible.

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The EDR Radius Map is a custom report that identifies all hazardous waste sites within a prescribed area. No mapped hazardous waste sites were found on or around the subject property in EDR's search of available government records. The nearest site is a storage site operated by Envirosafe Services of Idaho (ESII), located two miles west of the proposed site for the 640-acre no-drop target (ND-1) (Figure 3.4-1). In 1985, ESII submitted a closure plan for the facility to the USEPA.

### 3.4.2.2 ROI ONE

All areas within ROI One were examined to determine if property considered in the proposal is contaminated or has the potential for environmental contamination. A variety of survey methodologies were used for data collection. A comprehensive records search was conducted of technical documents provided by the 366th Wing, the BLM, and the State of Idaho. Persons familiar with the historical and current uses of the properties of interest and the local area and technical representatives of various agencies were consulted. In addition, all sites were visited, surveyed, and photographed. Each site was located and traversed to identify unnatural surface features, stained soils, stressed vegetation or exposed soil, stormwater drainage patterns, signs of human activity, and any unusual odors that could indicate potential contamination (a more detailed report regarding contamination can be found in Appendix C). All defined hazardous waste generation associated with the range would be transferred to the permitted storage facility or disposed of at Mountain Home AFB facilities for ultimate disposal.

#### *12,000-ACRE TACTICAL TRAINING RANGE*

There are no known incidences of hazardous waste or hazardous materials spills, releases, or disposal sites located within the proposed areas of the Clover Butte, Grasmere, or Juniper Butte alternatives. These areas have been primarily used for grazing, and no evidence exists that any activities involving hazardous materials have occurred at these sites.

#### *NO-DROP TARGET AREAS*

There are no known incidences of hazardous waste or hazardous materials spills, releases, or disposal sites located within the proposed no-drop target areas. These areas have been primarily used for grazing. No evidence exists that any recent activities involving hazardous materials have occurred at these sites. A single ordnance fragment, identified as World War II ordnance, was discovered at the proposed 640-acre no-drop target site.

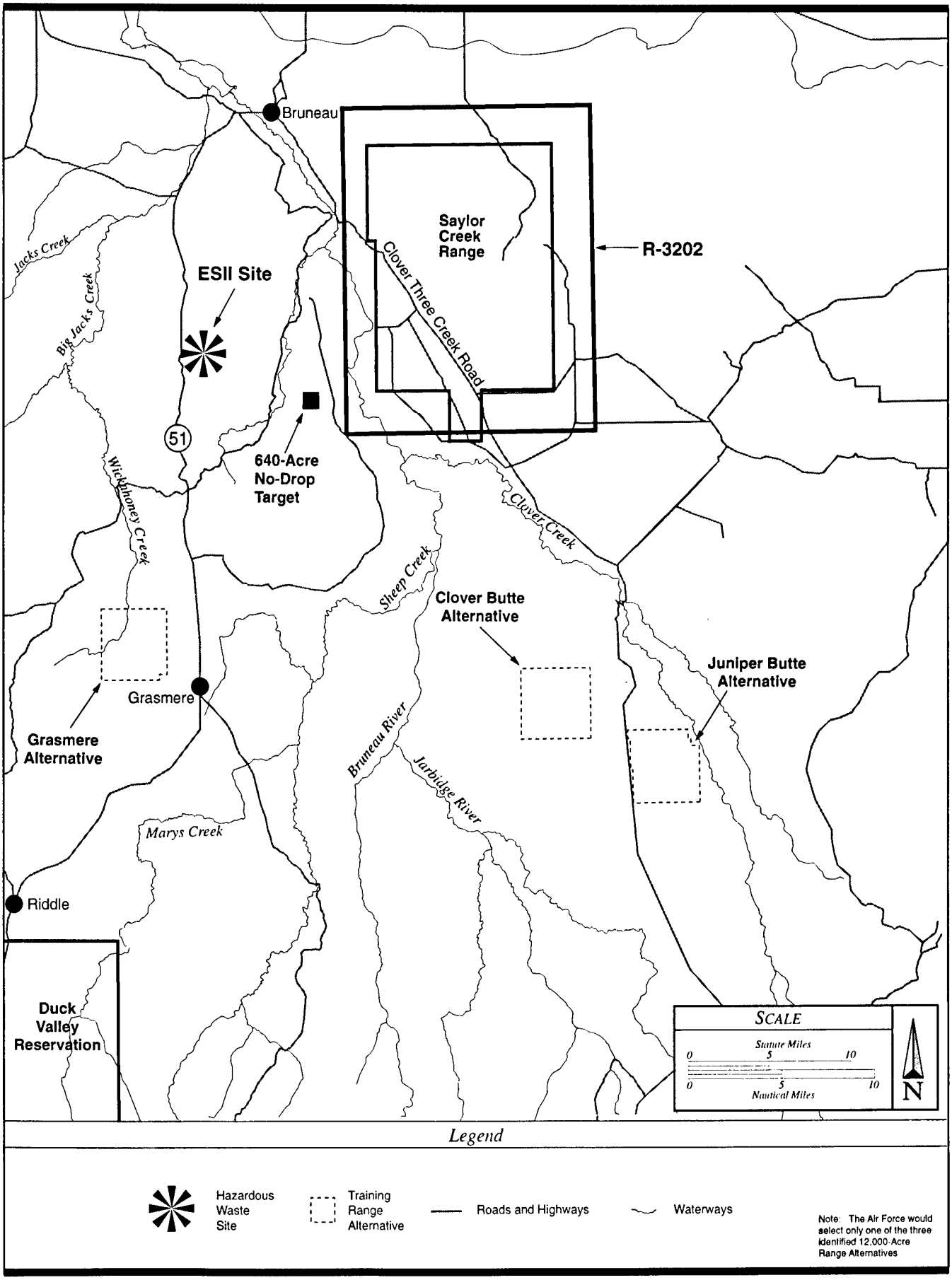



**Figure 3.4-1 Hazardous Waste Site in ROI Two**

### *EMITTER SITES*

There are no known incidences of hazardous waste or hazardous materials spills, releases, or disposal sites located within the proposed areas of the action. These areas have been primarily used for grazing, and no evidence exists that any activities involving hazardous materials have occurred at these sites.

### *SAYLOR CREEK RANGE / R-3202*

SCR uses and maintains heavy equipment and vehicles on site for range maintenance and fire suppression. As a result, the range maintenance facility within the exclusive use area stores small quantities of hazardous substances to maintain equipment and support general maintenance activities. These substances consist primarily of fuels, oils, and lubricants that are stored in bulk (typically in 55-gallon drums or less) on a drum rack within the maintenance facility. Waste oils generated from maintenance of equipment, vehicles, and generators are collected and transported to Mountain Home AFB for recycling. Ordnance consisting of firework-type aerial charges (e.g., Smoky surface-to-air missiles [SAMs]) are stored in a small metal storage building. A recent asbestos investigation identified instances of use of this substance at some facilities in the exclusive use area. The material is scheduled to be removed, taken to Mountain Home AFB, and disposed of using the rules and regulations at the base. Pesticides for rodent control are occasionally used at the facility, and are applied by personnel certified in rodenticide use. Herbicides are not used on the range; cleared areas used as fire breaks are disked.

Non-explosive training ordnance is released from aircraft during air-to-ground training on the range. These training ordnance can contain a small marking device (either a cold spot or hot spot) that is used to score the training event.

The cold spot contains 2 grams of gunpowder and approximately 17 cubic centimeters (cc) of titanium tetrachloride contained in a glass ampule (Air Force T.O. 11A4-4-7). Titanium tetrachloride is an irritant to the skin, eyes, and mucous membranes, but is not classified as toxic. Titanium compounds are considered to be physiologically inert (Sax and Lewis 1987), and neither flammable nor combustible (Akzo Chemicals 1991). The compound is neutralized with water.

The gunpowder in the hot spot contains nitroglycerin and nitrocellulose. These materials are ignited and consumed upon impact. Gunpowder combustion products include carbon monoxide, carbon dioxide, and nitrogen oxides (Hercules, Inc. 1989). For the small proportion of duds, the gunpowder either decomposes or is neutralized by explosive ordnance disposal (EOD) personnel.

The small quantities of these substances in training ordnance, and the byproducts that they produce, are rapidly dispersed and neutralized. Quantities are insufficient to create major

human health concerns. Regular range cleaning prevents significant accumulation of any materials, and makes the transport of any residue into the environment unlikely.

The larger inert training ordnance range in weight from 250 pounds to 2,000 pounds. They consist of a steel casing filled with concrete to simulate the delivery of actual weapons. Waste products from these larger inert training ordnance consist primarily of scrap steel, concrete, cast iron, aluminum, and parachute nylon. Waste is collected every two weeks around each target and is recycled or disposed of in a permitted landfill on the range (IDL, No. 7020-1).

In addition to training ordnance, aircraft using the range also strafe with 20-mm ammunition. Aircrews use training ammunition only; no high-explosive or incendiary rounds are used. Each projectile is steel or steel-capped aluminum; gunpowder used in the round is consumed when fired from the aircraft. Dud rounds are retained on the aircraft.

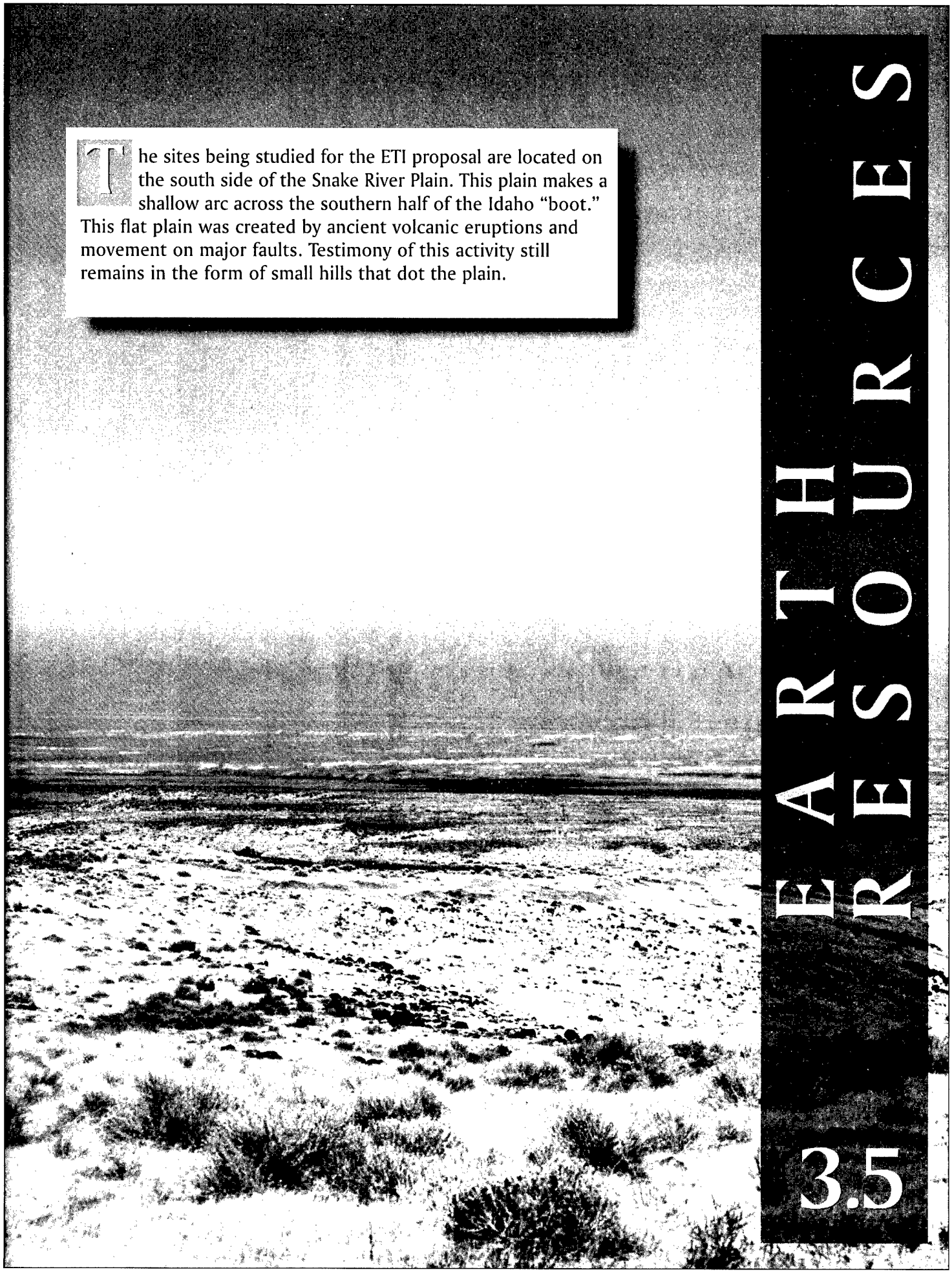
### 3.4.3 Solid Waste

There are no known ongoing solid waste activities associated with the locations of the proposed tactical range, no-drop targets, or emitter sites that generate any solid waste. None of these sites include documented solid waste landfills.

SCR has a conditional use permit and variances for an industrial solid waste landfill from the IDHW DEQ. This permit allows the disposal of spent training ordnance casings and concrete filler material and precludes this site from receiving waste not generated at the range. The current SCR landfill occupies two acres, with the capacity to support continuing operations.

Solid waste, such as paper trash and household waste (e.g., tin cans, paper towels), not approved for disposal in the SCR landfill is transported in small quantities to the Mountain Home AFB permitted landfill.

All 20-mm ammunition casings expended on the range are retained in a drum on each aircraft. Numerous aircraft fire 20-mm ammunition. The drum is used for collection of all brass from the 20-mm ammunition casings and from the rounds that fail to function. After each aircraft lands, the drum is removed and the brass and nonfunctional shells are collected. Waste products on the range are limited to steel and small quantities of aluminum from the projectiles. These waste products are collected and recycled.



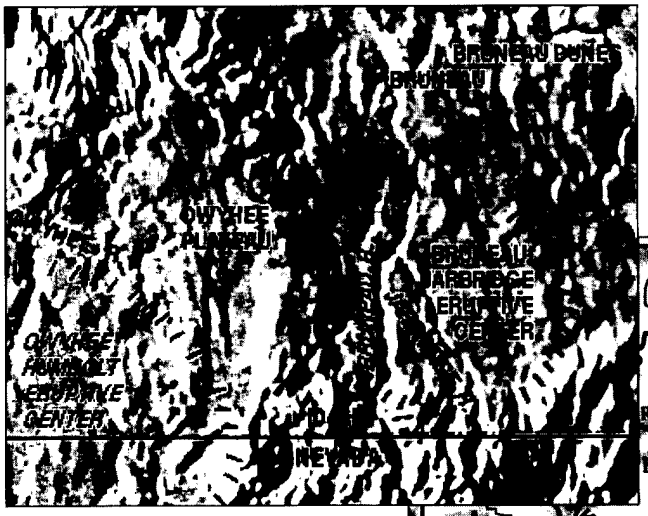
# EARTH RESOURCES 3.5

The sites being studied for the ETI proposal are located on the south side of the Snake River Plain. This plain makes a shallow arc across the southern half of the Idaho "boot." This flat plain was created by ancient volcanic eruptions and movement on major faults. Testimony of this activity still remains in the form of small hills that dot the plain.

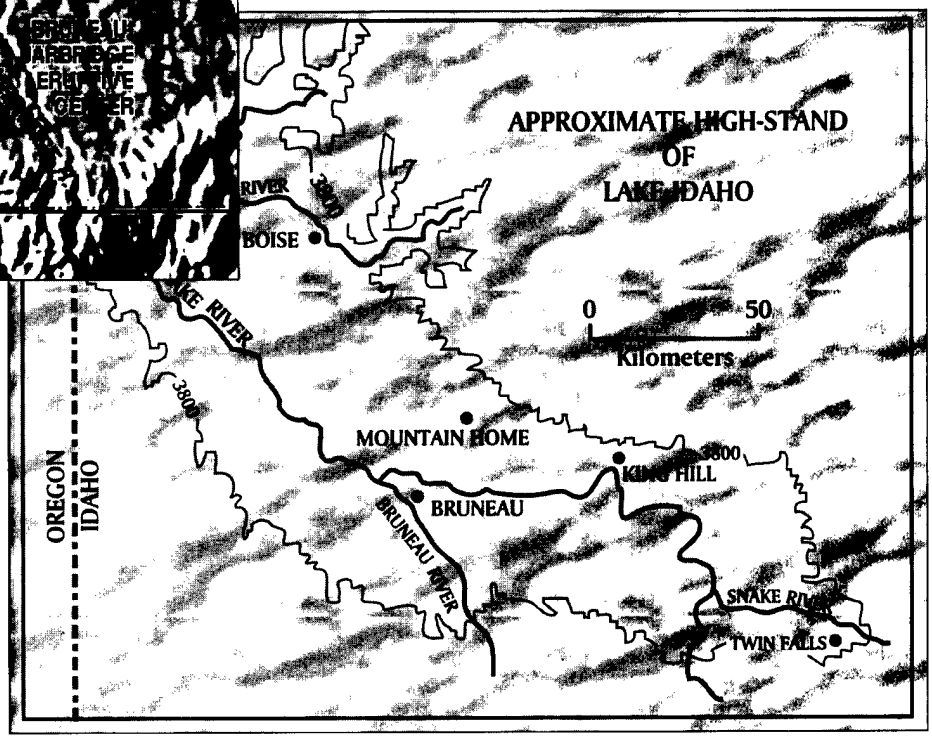
In this part of the Snake River Plain there is little known mineralization. As a result, the sites being studied do not contain mines or mining claims.

Over time, the basalt flows erode and, with weathering, create soils that thinly cover the rocks. However, due to the dust storms that frequently sweep the area, some of the soil from the ancient lake basin is picked up and redeposited nearby in low areas. The fairly flat nature of the landscape causes these areas to be poorly drained, but in general, it also means that water erosion is not a hazard in the proposed Enhanced Training in Idaho sites. Only a few of the soils contain clays that can swell and cause road-building problems.





Sites proposed for the 12,000-acre training range do not have problems with water erosion but have some expansive clay soils.




Ancient Lake Idaho combined with volcanic flows to create the thin soils on relatively flat terrain characteristic of the three 12,000-acre training range alternatives.

# 3.5 EARTH RESOURCES

Geologic resources consist of all soil and bedrock materials. For the purpose of this study, the terms soil and rock refer to unconsolidated and consolidated materials, respectively, regardless of depth. Geologic resources include mineral deposits, significant landforms, tectonic features, and paleontologic (fossil) remains. These resources can have scientific, economic, and recreational value, and may also have value as traditional cultural resources to the Shoshone-Paiute.

ROI Two and ROI One were used for the earth resources analysis, as these are the areas likely to be affected by ground disturbance associated with the alternatives. Figure 3.0-1 depicts the boundaries of these ROIs.

The data gathering process for baseline conditions included a reconnaissance geologic field survey of specific ROI One sites; a review of pertinent geologic, soils, and mineral resource literature; discussions with university and Idaho Geological Survey research geologists working within ROI Two, as well as district BLM geologists and IDL state mineral resource personnel; and a search of BLM and IDL claim and lease files.

## 3.5.1 Geology

### 3.5.1.1 ROI Two — Regional Geology

*Topographic Setting*

ROI Two is within the statewide Snake River Plain (SRP) geologic and physiographic province. The SRP volcanic province encompasses both a physiographic lowland, called the SRP, and the surrounding mountains, including the Owyhee Mountains to the south, Mount Bennett Hills to the north, and the Cassia Mountains to the east. The SRP was formed as the result of two tectonic events. The western SRP, from the Oregon border to the area of Mountain Home, Idaho, is a graben, or depression, that originated from extensional faulting similar to that of the Basin and Range Province in Nevada and eastern Idaho. The central and eastern SRP is part of a southwest-northeast volcanic/tectonic trend that extends from northern Nevada, across the southern part of Idaho, to the Yellowstone National Park area in northwestern Wyoming (Jenks and Bonnichsen 1989).

In particular, ROI Two lies within the intersection of the western SRP graben and the southwest-volcanic trend. Topographic features within ROI Two include the Inside, Bruneau, Blackstone, and J-P Deserts, and the Big Hill. All of these features were formed as a result of volcanic events.

### *GEOLOGIC SETTING*

The SRP volcanic province began to form at the intersection of the present states of Nevada, Oregon, and Idaho approximately 14 to 17 million years ago (Bonnichsen et al. 1988). The volcanism was bimodal, first erupting rhyolite ash-flow tuffs and lava flows, followed by basalt shield volcanoes. All of the volcanic units within ROI Two erupted from the Bruneau-Jarbidge eruptive center, a large caldera-like feature that formed from 11 to 6 million years ago in the area from Grasmere on the west, to the Nevada border on the south, to Bruneau on the north, and to east of Clover Creek (Bonnichsen 1982a). The first units erupting from the Bruneau-Jarbidge center were a series of 11 large ash flow tuffs, collectively called the Cougar Point Tuff (Bonnichsen and Citron 1982). The discharge of these major ash flows was followed by subsidence of the Bruneau-Jarbidge eruptive center. The resulting caldera was then filled from 9 to 6 million years ago with a series of 12 or more large rhyolite lava flows, including the Sheep Creek, Dorsey Creek, and Bruneau-Jasper Rhyolites (Bonnichsen 1982b). The final volcanic activity was the eruption of more than 40 small basalt shield volcanoes from 8 to 4 million years ago, whose flows form the present nearly flat topography that underlies most of ROI Two (Jenks et al. 1984; Jenks and Bonnichsen 1985). Figure 3.5-1 is a generalized geologic map showing the basic volcanic, structural, and sedimentary formations found within the boundaries of ROI Two.

During the later stages of the eruptions from the Bruneau-Jarbidge eruptive center, the western SRP graben also began to form. The structural subsidence caused a large lake, Lake Idaho, to form from approximately 8 to 1.5 million years ago. This Lake Ontario-sized body of water filled the western SRP from the Oregon border on the west to approximately the area of Twin Falls on the east. The sediments deposited within the lake basin are mapped as the Idaho Group sediments. The basalt from the Bruneau-Jarbidge eruptive center flowed into the Lake Idaho basin and mingled with the lake sediments. These units are all exposed within the northern part of ROI Two.

The ancestral SRP drainage was captured approximately 1.5 million years ago by the Columbia River drainage cutting through the area of Hells Canyon in west-central Idaho. Lake Idaho drained and the present canyons of the Snake, Bruneau, and Jarbidge rivers began to downcut. The formation of the canyons was hastened by the Bonneville Flood, which occurred approximately 14,500 years before present, caused by the catastrophic drainage of the ancestral Great Salt Lake north through the Snake River canyon. The flood deepened and widened the canyon to its present size, which in turn caused increased downcutting of all of the tributary canyons, including the Bruneau and Jarbidge canyons that dissect ROI Two. The youngest geologic features in the area are the stream alluvium deposits in the river and stream bottoms and the intermittent lake sediments that are deposited by wind and water erosion in depressions in the surface of the basalt flows.

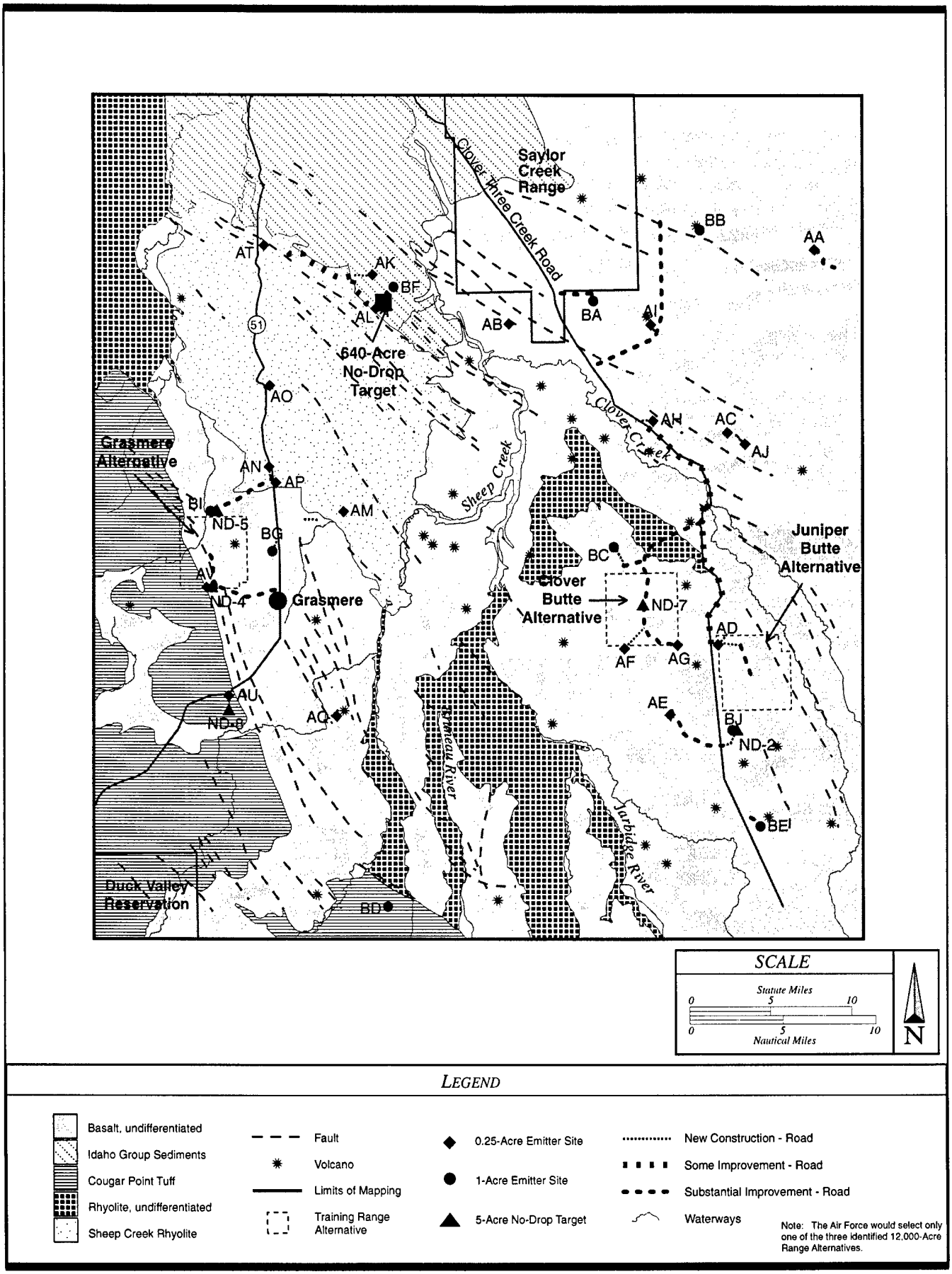



**Figure 3.5-1 Regional Geologic Map of ROI Two**

*STRUCTURAL SETTING*

The faults located within ROI Two are all normal or block faults with one side downthrown in relation to the other. Figure 3.5-1 shows the placement of these faults within ROI Two. Generally, faults in the southern part of ROI Two have a north-south direction. This changes in the central and northern parts of ROI Two to a northwest-southeast trend. The areas that contain the largest numbers of faults are those underlain by the rhyolite lava flows and ash flow tuffs. These faults are probably present but masked in the areas covered by the Idaho Group sediments and the basalt flows from the shield volcanoes.

Major faults, with displacements of more than 100 feet, are located within ROI Two on the north and south sides of Big Hill, and are the faults that create the Grasmere escarpment on the western side of the area. The Grasmere escarpment faults probably mark the western boundary of the Bruneau-Jarbidge eruptive center.

The ROI Two area is generally aseismic, with no reported historical earthquakes centered in the area. Like much of Idaho, the area was slightly shaken by the 1959 Hegben Lake earthquake centered near the Idaho/Wyoming/Montana border and the 1983 Borah Peak earthquake north of the SRP in east central Idaho.

### 3.5.1.2 ROI ONE — SITE-SPECIFIC GEOLOGY

*ALTERNATIVE B — CLOVER BUTTE*

The proposed Clover Butte tactical range area is underlain by basalt flows erupted from nearby shield volcanoes as well as volcanoes to the south (refer to Figure 3.5-1). Nearby volcanoes that contributed the flows that underlie the area include Clover Butte, Juniper Butte, Mosquito Lake Butte, Middle Butte, Burnt Butte, and Poison Butte/east, as well as two unnamed volcanoes, designated by their upper elevations, Hill 5090 (Mirage) and Hill 5199 (Camp). The eastern side of the range encloses the western part of the Clover Butte shield and the northern edge of the range includes two small subsidiary vents of Hill 5090. The 60-foot-high escarpment on the west side of the range are edges of lava flows that erupted from Clover Butte, Hill 5090, and Hill 5199.

*ALTERNATIVE C — GRASMERE*

The proposed Grasmere tactical range area is within a topographically low part of the Bruneau-Jarbidge eruptive center called the "moat zone" (Bonnichsen 1982b) (refer to Figure 3.5-1). The moat zone lies between the edge of the eruptive center on the west (marked by the faults that form the Grasmere escarpment) and the edge of the Sheep Creek Rhyolite on the east. The moat zone has been filled with the basalt flows from nearby volcanoes, including Poison Butte/west, Buster Butte, and Hill 5250, as well as Black Rock Hill to the south. The west side of the range is underlain by the units of the Cougar Point Tuff exposed in the Grasmere escarpment. The hill in the east side of the range is Poison Butte, a small basalt shield volcano.

Small amounts of recent alluvium are located in the bottoms of the Wickahoney and China Creek drainages.

#### *ALTERNATIVE D — JUNIPER BUTTE*

The proposed Juniper Butte tactical range area principally encloses the northern part of the shield and crater of Juniper Butte, the largest shield volcano in the Bruneau-Jarbidge eruptive center (refer to Figure 3.5-1). In the northwest corner of the range is a small subsidiary volcano, Hill 4997. Some of the flows that underlie the northern part of the range could also have been contributed by Clover Butte. The basalt flows exposed as a "finger" escarpment on the east edge of the range probably originated from one of the volcanoes to the south, either Mosquito Lake Butte or Burnt Butte. The flows exposed in Juniper Draw in the northeast corner of the range may have erupted from volcanoes located to the east of Clover Creek, or by one of the numerous volcanoes south of Juniper Butte.

#### *NO-DROP TARGETS AND ELECTRONIC EMITTER SITES*

The no-drop target and electronic emitter sites are located throughout the Bruneau-Jarbidge eruptive center and are underlain by all of the geologic units found in the area. Figure 3.5-1 shows the locations of the ranges and emitter sites on a generalized geologic map. The number of no-drop targets and emitter sites located on each geologic unit are listed in Table 3.5-1.

**Table 3.5-1. Geological Units**

| *Geologic Unit* | *Project Component* |
|---|---|
| Idaho Group sediments | 1 no-drop target and 3 emitter sites |
| Basalt flows | 5 no-drop targets and 14 emitter sites |
| Basalt shield volcanoes | 0 no-drop targets and 7 emitter sites |
| Sheep Creek Rhyolite | 0 no-drop targets and 3 emitter sites |
| Cougar Point Tuff | 2 no-drop targets and 3 emitter sites |

(Note: Site ND-1 is underlain by both basalt flows and Idaho Group sediments, thereby increasing the total number of no-drop targets to eight)

## 3.5.2 Soils

### 3.5.2.1 ROI TWO — REGIONAL SOILS

Two soil surveys were conducted for ROI Two. One, covering ROI Two areas in Elmore County, was published by the Soil Conservation Service (SCS) in 1986. The other, covering most of the Owyhee County ROI Two sites, has not been published, but was made available from SCS for this study. Table 3.5-2 lists the soil types found at each site, the percent slope where these soils are typically found, wind and water erosion hazards, and shrink-swell

**Table 3.5-2. Soils Within the ETI Project Area (page 1 of 3)**

| *Site* | *Map Unit* | *Soil Name* | *NRCS Soil Type Percent Slope* | *Water Eros. Hazard* | *Wind Eros. Hazard* | *Shrink-Swell Potential* |
|---|---|---|---|---|---|---|
| One-quarter-acre Emitter Sites | | | | | | |
| AA | 148 | Sidlake-Bruncan Complex | 1-8 | moderate | moderate | low-moderate |
| AB | 185 | Typic Torripsamments-Typic Torrifluvents Complex | gentle slope | low | high | - |
| AC | 144 | Shano-Owsel Complex | 0-12 | moderate | moderate | low-moderate |
| AD | 75 | Hardtrigger-Snowmore-Vickery Complex | 1-5 | low-moderate | moderate | moderate |
| AE | 31 | Bruncan-Snowmore Silt Loams | 1-8 | low-moderate | moderate | moderate |
| AF | 75 | Hardtrigger-Snowmore-Vickery Complex | 1-5 | low-moderate | moderate | moderate |
| AG | 75 | Hardtrigger-Snowmore-Vickery Complex | 1-5 | low-moderate | moderate | moderate |
| AH | 120 | Purdam Silt Loam | 0-4 | low | moderate | low-moderate |
| AI | 113 | Owsel-Purdam Complex | 1-12 | moderate | moderate | low-moderate |
| AJ | 35 | Colthorp-Minveno Stony Silt Loams | 0-8 | moderate | moderate | low |
| AK | 135 | Royal-Davey Complex | 0-12 | low-moderate | moderate-high | low |
| AL | 146 | Shoofly Loam | 0-4 | low | moderate | low-high |
| AM | 182 | Troughs-Sugarcreek Association | 2-15 | low | moderate | moderate |
| AN | 210 | Willhill-Cottle Association | 3-35 | low-moderate | moderate | low-moderate |
| AO | 210 | Willhill-Cottle Association | 3-35 | low-moderate | moderate | low-moderate |
| AP | 210 | Willhill-Cottle Association | 3-35 | low-moderate | moderate | low-moderate |
| AQ | 32 | Bruncan-Troughs Very Stony Loams | 1-10 | low | low | moderate |
| AT | 100 | McKeeth-Veta Gravelly Loams | 2-15 | low | moderate | moderate |
| AU | 204 | Wickahoney-Monasterio-Yatahoney Association | 1-20 | low-moderate | moderate | moderate-high |
| AV | 204 | Wickahoney-Monasterio-Yatahoney Association | 1-20 | low-moderate | moderate | moderate-high |
| One-acre Emitter Sites | | | | | | |
| BA | 35 | Colthorp-Minveno Stony Silt Loams | 0-8 | moderate | very low-low | low |
| BB | 31 | Colthorp Stony Silt Loam | 0-8 | moderate | very low | low |
| BC | 75 | Hardtrigger-Snowmore-Vickery Complex | 1-5 | low-moderate | moderate | moderate |
| BD | 23 | Brace-Freshwater Complex | 1-15 | low-high | low-moderate | moderate |

| Table 3.5-2. Soils Within the ETI Project Area (page 2 of 3) | | | | | | |
|---|---|---|---|---|---|---|
| *Site* | *Map Unit* | *Soil Name* | *NRCS Soil Type Percent Slope* | *Water Eros. Hazard* | *Wind Eros. Hazard* | *Shrink-Swell Potential* |
| BE | 82 | Heckison-Freshwater Complex | 1-20 | moderate | moderate | moderate |
| BF | 158 | Trevino-Minidoka Complex | 8-30 | moderate | moderate | low |
| BG | 181 | Troughs-Owsel Complex | 1-10 | low | low | moderate |
| BI | 27 | Bruncan-Hardtrigger-Buncelvoir Complex | 1-8 | moderate | moderate | moderate-high |
| BJ | 82 | Heckison-Freshwater Complex | 1-20 | moderate | moderate | moderate |
| BK | 113 | Owsel-Purdham Complex | 1-12 | moderate | moderate | low-moderate |
| No-drop Target Areas | | | | | | |
| ND1 | 146 | Shoofly Loam | 0-4 | low | moderate | low-high |
| | 158 | Trevino-Minidoka Complex | 8-30 | moderate | moderate | low |
| ND2 | 82 | Heckison-Freshwater Complex | 1-20 | moderate | moderate | moderate |
| ND4 | 204 | Wickahoney-Monasterio-Yatahoney Association | 1-20 | low-moderate | moderate | moderate-high |
| ND5 | 27 | Bruncan-Hardtrigger-Buncelvoir Complex | 1-8 | moderate | moderate | moderate-high |
| ND6 | 31 | Bruncan-Snowmore Silt Loams | 1-8 | low-moderate | moderate | moderate |
| ND7 | 75 | Hardtrigger-Snowmore-Vickery Complex | 1-5 | low-moderate | moderate | moderate |
| ND8 | 207 | Wickahoney-Zecanyon Complex | 3-45 | low-high | moderate | high |
| Training Ranges | | | | | | |
| Alternative - B Clover Butte | 75 | Hardtrigger-Snowmore-Vickery Complex | 1-5 | low-moderate | moderate | moderate |
| | 31 | Bruncan Snowmore Silt Loams | 1-8 | low-moderate | moderate | moderate |
| | 118 | Owsel-Coonskin-Orovada Complex | 1-5 | low | moderate | moderate |
| | 12 | Babbington-Piline Association | 0-3 | low | low-moderate | moderate-high |
| | 30 | Bruncan-Minveno Complex | 2-15 | low-high | low-moderate | moderate |
| | | | | | | |
| Alternative - C Grasmere | 208 | Wickahoney-Zecanyon-Hat Association | 1-20 | low-moderate | moderate | high |
| | 144 | Rubbleland-Rock Outcrop-Pachic Argixerolls Complex | very steep | moderate-high | moderate | moderate |
| | 207 | Wickahoney-Zecanyon Complex | 3-45 | low-high | moderate | high |
| | 64 | Goose Creek Loam | 1-3 | low | moderate | moderate |
| | 59 | Freshwater-Larioscamp-Dishpan Complex | 1-20 | moderate-high | low | moderate-high |

**Table 3.5-2. Soils Within the ETI Project Area (page 3 of 3)**

| *Site* | *Map Unit* | *Soil Name* | *NRCS Soil Type Percent Slope* | *Water Eros. Hazard* | *Wind Eros. Hazard* | *Shrink-Swell Potential* |
|---|---|---|---|---|---|---|
| Alternative - C Grasmere (cont'd.) | 27 | Bruncan-Hardtrigger-Buncelvoir Complex | 1-8 | moderate | moderate | moderate-high |
| | 8 | Arbidge-Laped-Slickspots Complex | 0-8 | moderate | moderate | moderate |
| | 204 | Wickahoney-Monasterio-Yatahoney Association | 1-20 | low-moderate | moderate | moderate-high |
| | 114 | Northcastle-Bluecreek-Yatahoney Loams | 1-10 | low | moderate | moderate-high |
| | 181 | Troughs-Owsel Complex | 1-10 | low | low | moderate |
| | 180 | Troughs-Jenor-Laped Association | 1-10 | low-moderate | low-high | moderate |
| Alternative - D Juniper Butte | 75 | Hardtrigger-Snowmore-Vickery Complex | 1-5 | low-moderate | moderate | moderate |
| | 188 | Vickery-Snowmore Complex | 1-5 | moderate | moderate | moderate |
| | 5 | Arbidge-Chilcott Silt Loams | 1-8 | moderate | moderate | moderate-high |
| | 81 | Heckison-Bigflat Silt Loams | 1-10 | moderate | moderate | moderate-high |
| | 82 | Heckison-Freshwater Complex | 1-20 | moderate | moderate | moderate |
| | 80 | Haw-Renslow Association | 0-4 | low | moderate | moderate |
| | 3 | Alzola-Troughs-Bigflat Stony Loams | 5-35 | low-high | moderate | moderate-high |
| | 147 | Scism Silt Loam | 5-20 | low-moderate | high | - |
| | 182 | Troughs-Sugarcreek Association | 2-15 | low | moderate | moderate |
| | 30 | Bruncan-Minveno Complex | 2-15 | low-high | low-moderate | moderate |

potential using SCS terminology, measurement, and definitions. In general the soils that underlie ROI Two range from shallow to very deep, and in numerous cases are limited by a hardpan layer. Almost all of the soils are well-drained, with poorly drained soils only in swale bottoms and depression areas. Runoff is generally slow to medium, with the bottomlands mapped as very slow and the rocky and high relief areas shown as rapid to very rapid. The water erosion hazard is generally low to moderate, with no areas categorized solely as high. This fact is probably the result of the generally low slopes that underlie the ETI sites. The slopes listed for affected soils range from 0 to 35 percent with most in the 0 to 10 percent range. The wind erosion hazard is generally rated as low to moderate, with a few areas rated as high.

Of all of the soil parameters, the shrink-swell potential of the soils, which principally affects road construction, varies the most with four high ratings and numerous moderate to high and low to high ratings.

### 3.5.2.2 ROI ONE — SITE-SPECIFIC SOILS

#### *ALTERNATIVE B — CLOVER BUTTE*

The majority of the proposed Clover Butte Alternative is underlain by two soil types: the Hardtrigger-Snowmore-Vickery (HSV) complex (which underlies the primary ordnance impact area with a slope of 2 percent) and, to a lesser extent, the Babbington-Piline (BP) association (Figure 3.5-2). Both are deep soils, but their drainage varies from well-drained for HSV to poorly to moderately well-drained for BP. In both cases, the runoff rates are slow to very slow, with some ponded areas in BP. Only one area on the east side of the range is underlain by shallow soils that are well-drained and have medium to rapid runoff rates. That same area, underlain by the Bruncan-Minveno soil complex, is the only part that has a high rating for water and wind erosion potential. Even this high rating varies, depending on the slope of the particular part of the soil complex. Within the range boundaries only the BP soil has a moderate to high rating for shrink-swell potential, which accords with the poor drainage in that area.

#### *ALTERNATIVE C — GRASMERE*

The varied topography and rock type from west to east in the proposed Grasmere alternative is underlain primarily by three soil types. The Wickahoney-Zecanyon (WZ) complex comprises the upper west surface, the Rubbleland-Rock outcrop-Pachic Argixerolls (RRP) is found in the western canyons of Wickahoney and China creeks, and the Bruncan-Hardtrigger-Buncelvoir (BHB) complex covers most of the flat area on the eastern side of the range where the primary ordnance impact area is located with an average slope of 2 percent (Figure 3.5-3).

The WZ soil is shallow to moderately deep and well-drained with medium to rapid runoff rates. It has varying erosion hazards with a low to high water hazard and a moderate wind hazard. Its shrink-swell potential is high. The RRP soil has no depth and rapid to very rapid runoff rates on the canyon cliffs and rims, but very deep soils with very rapid runoff on the

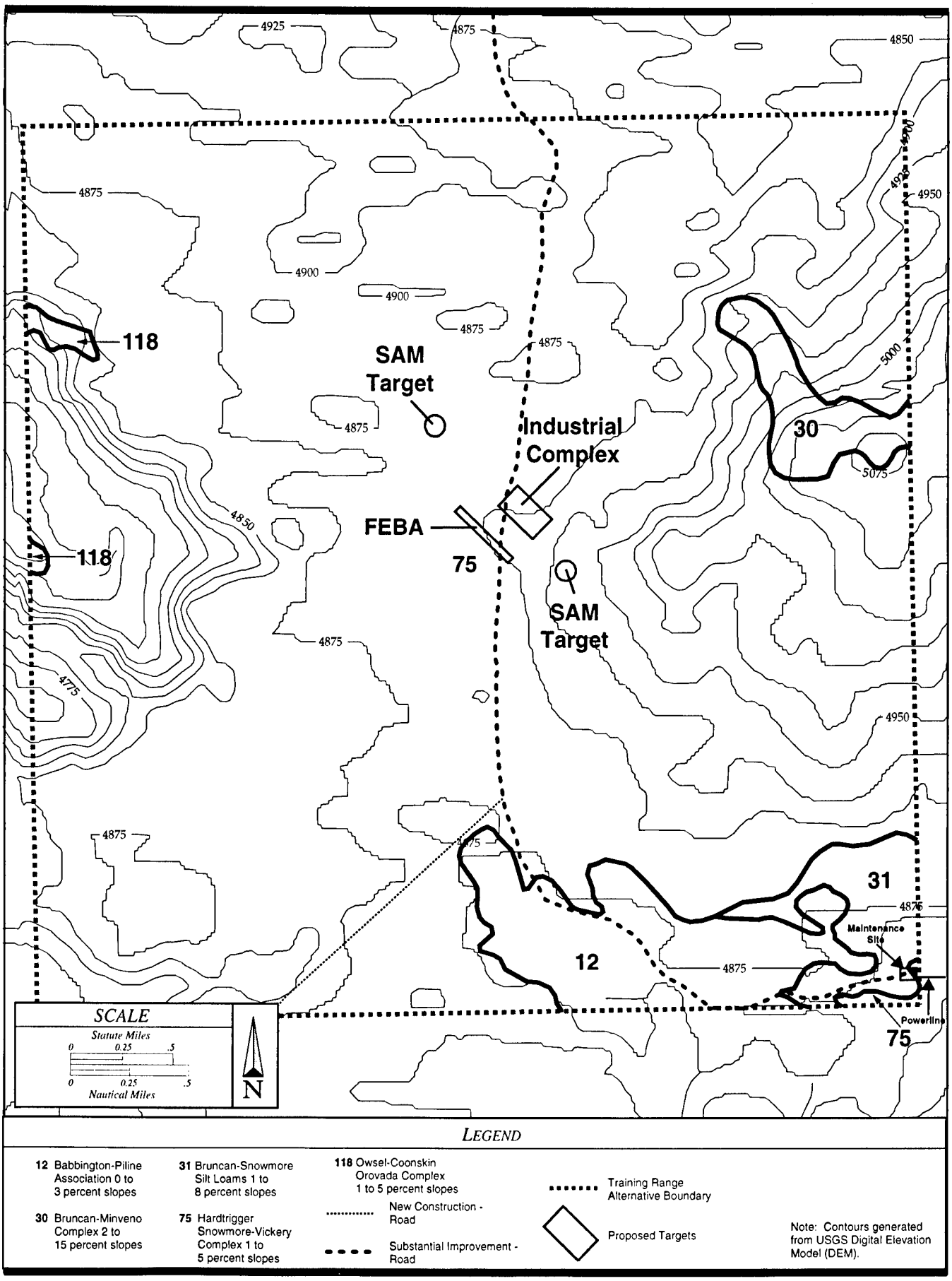



**Figure 3.5-2 Soils Underlying Alternative B - Clover Butte**

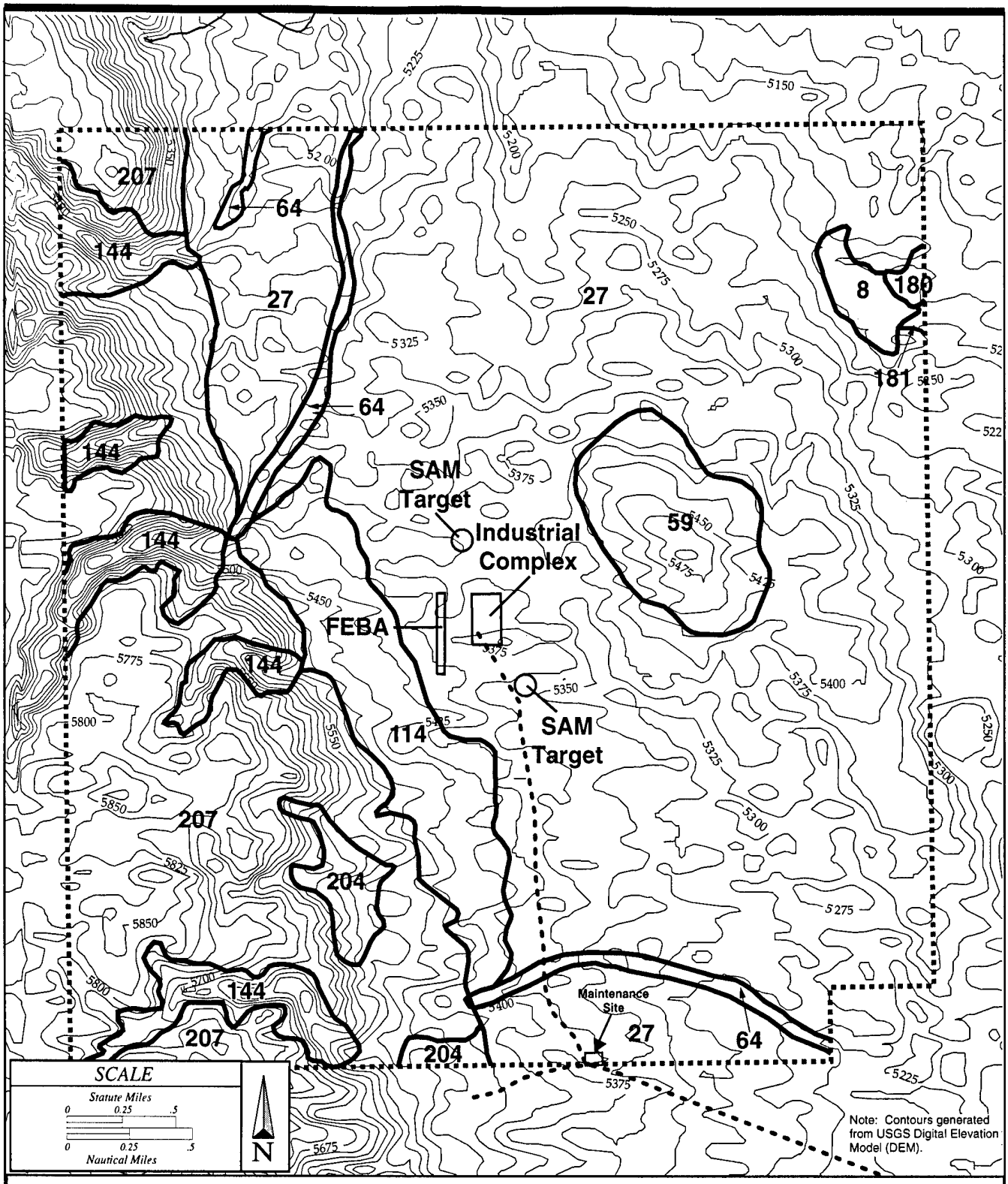



**Figure 3.5-3 Soils Underlying Alternative C - Grasmere**

canyon sideslopes. Its erosion hazard varies from moderate to high and it has a moderate shrink-swell potential. In the eastern part of the range, the BHB soil is shallow to very deep, depending on its topographic placement. It is well-drained with runoff rates generally slow to medium, but very slow to slow on smooth or convex slopes. The erosion rate is moderate and it has a moderate to high shrink-swell potential. Other minor soil areas in the range have similar characteristics, with the exception of the top of Poison Butte. Because of its higher slopes, this area has moderate to high ratings for water erosion and shrink-swell potential. The other unusual soil, the Goose Creek Loam, is mapped in the creek bottoms on the east side of the range. It is a very deep soil, with very slow to slow runoff rates and a low-water erosion hazard.

### *ALTERNATIVE D — JUNIPER BUTTE*

The proposed Juniper Butte Alternative has varied topography because it contains the northern half of the Juniper Butte shield volcano, as well as the steeper topography of Juniper Draw, a tributary of Clover Creek (Figure 3.5-4). The flatter areas in the northern part of the range and on the lower slopes of the butte (where the primary ordnance impact area is located) have very deep to moderately deep soils that are well drained with runoff rates of very slow to slow. Therefore, these areas also have low to moderate erosion hazards and generally moderate shrink-swell potentials, although the Arbidge-Chilcott Silt Loams on the lower slopes of the butte have a moderate to high potential.

The swales cut in the lower slopes of the butte have very deep soils that are well-drained but have very slow to slow runoff rates. Therefore, they have a low water erosion hazard and moderate wind erosion hazard. Within Juniper Draw, the soils vary with their topographic position. All soils are shallow to moderately deep and well drained with moderate to rapid runoff rates. Their erosion hazards are higher than the soils covering the rest of the range, with low to high water erosion hazards, and one soil on the west draw wall that has a high wind erosion hazard. All the Draw soils have a moderate shrink-swell potential. The upper slopes and top of Juniper Butte have soils that are moderately deep and well drained with slow-to-rapid runoff rates, depending on their slopes. They also have moderate erosion hazards and moderate-to-high shrink-swell potentials.

### *NO-DROP TARGETS AND ELECTRONIC EMITTER SITES*

Because of the scattered locations of the no-drop targets and electronic emitter sites throughout ROI One, the soils that underlie the sites also vary with their topographic positions and underlying rock types. Of the one-quarter-acre emitter sites, approximately half are underlain by shallow soils and half are underlain by deep to very deep soils. All the sites are well drained; runoff rates are slow-to-medium on shallow soils and very slow to slow on deep soils. Only three one-quarter-acre emitter sites (AN, AO, and AP) on the Sheep Creek Rhyolite rock type have rapid runoff rates.

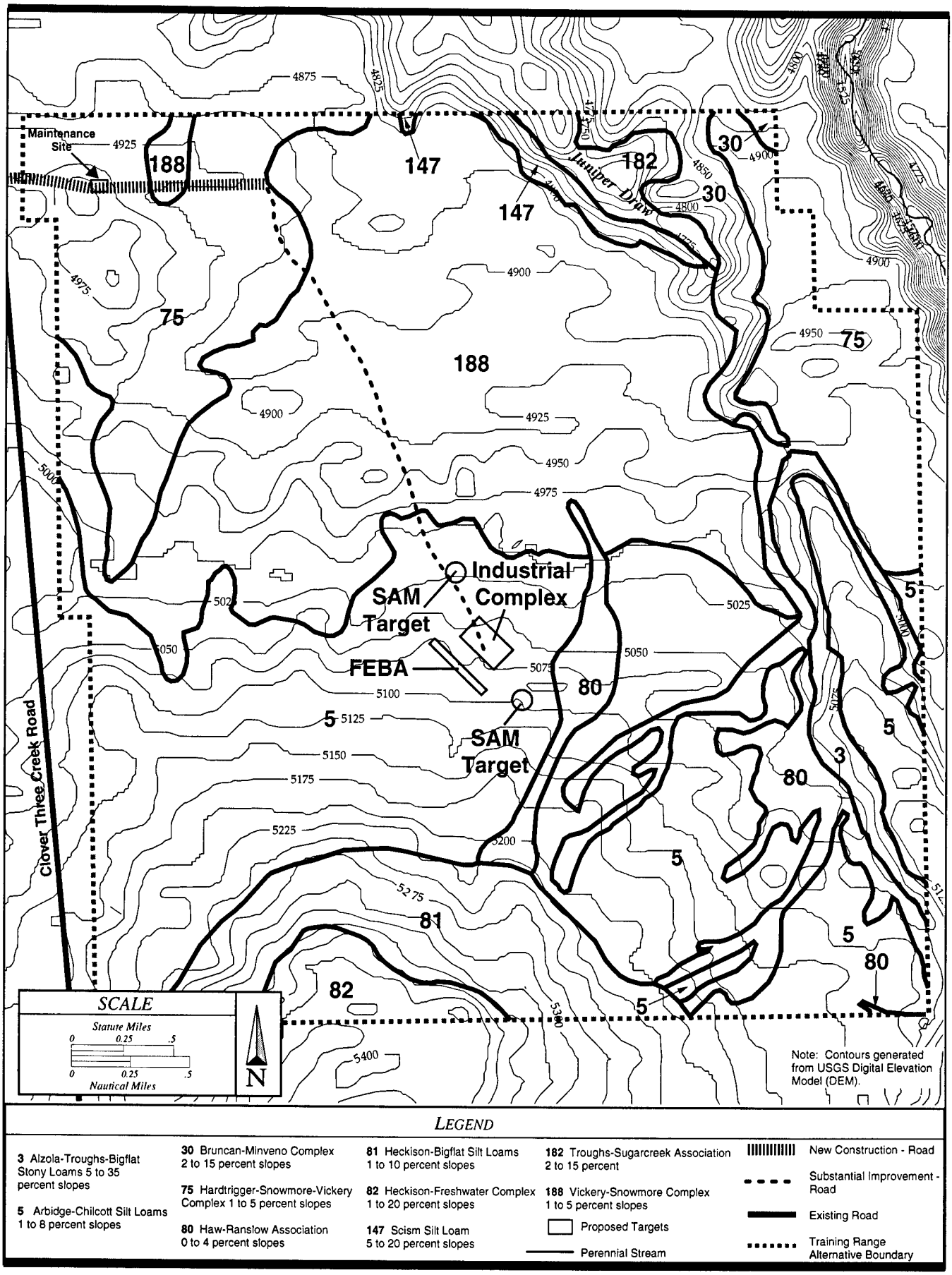



**Figure 3.5-4 Soils Underlying Alternative D - Juniper Butte**

The one-acre emitter sites generally are located on the summits and sideslopes of the shield volcanoes. Soil depths range from shallow to moderately deep, in several cases with a hardpan base. These sites are well-drained and generally have slow to medium runoff rates, except in the deeper soil areas. Only one one-acre emitter site, BD, has low to high ratings for water erosion hazard and all of the sites have very low to moderate ratings for wind erosion. The shrink-swell potentials for these sites are generally low to moderate, but one emitter site, BI, has a moderate to high rating.

The no-drop targets have the most variety in soil depths of all the target and emitter sites. Depths range from shallow to moderately deep with one site, ND-5, underlain by some areas of very deep soil. All of the no-drop targets have well-drained soils and runoff rates vary from slow to rapid. Both water and wind erosion hazards for these target sites are low to moderate, but several sites, ND-1, ND-4, ND-5, and ND-8 have shrink-swell potential ratings of moderate to high.

## 3.5.3 Mineral Resources

### 3.5.3.1 ROI Two — Regional Mineral Resources

According to the claim and lease files of the BLM and IDL (September 1996) five areas within ROI Two presently contain active mining claims or leases. These include the Hot Springs limestone in the northern part of ROI Two, the Bruneau jasper mines in the bottom of the Bruneau Canyon in the central portion of ROI Two, the opal deposits in the southern part, the guano claims on the eastern side, and a sand and gravel pit in the northern section. The Hot Springs limestone has a resource range from 22 to more than 25 million tons with a calcium oxide (CaO) range of 48.0 to 52.9 percent (Zilka 1973). First claimed in 1910, the limestone has been reclaimed and explored many times, but never mined. The Bruneau jasper mines are located in the bottom of the Bruneau River canyon near Indian Hot Springs. For the last 30 to 40 years they have been sporadically worked with bulldozer-cut trenches and pits (Lawrence et al. 1988). Annually, several thousand pounds of gem-quality jasper are mined from the deposit. The opal deposits are located in the Cat Creek drainage in the southern part of ROI Two. A local rancher reports some recent exploration activity, but these deposits have never been commercially mined. The guano claims are located on the east side of Clover Creek. The sand and gravel pit is located next to the Clover-Three Creek Road near the present SCR turnoff. The active and inactive claim and lease sites within ROI Two are shown in Figure 3.5-5.

Most of ROI Two was covered by a mineral resources investigation made by the U.S. Geological Survey (USGS) in the late 1980s for the Bruneau River, Jarbidge River, Sheep Creek West, and Duncan Creek Wilderness Study Areas (WSAs) (Lawrence et al. 1988; McIntyre et al. 1988). This investigation involved a reconnaissance geochemical study, collecting stream sediment and rock samples. Geochemical analyses of the samples showed anomalous values for barium (5,000 to >10,000 parts per million [ppm]), tin (>2,000 ppm), thorium (200-500 ppm), silver (10

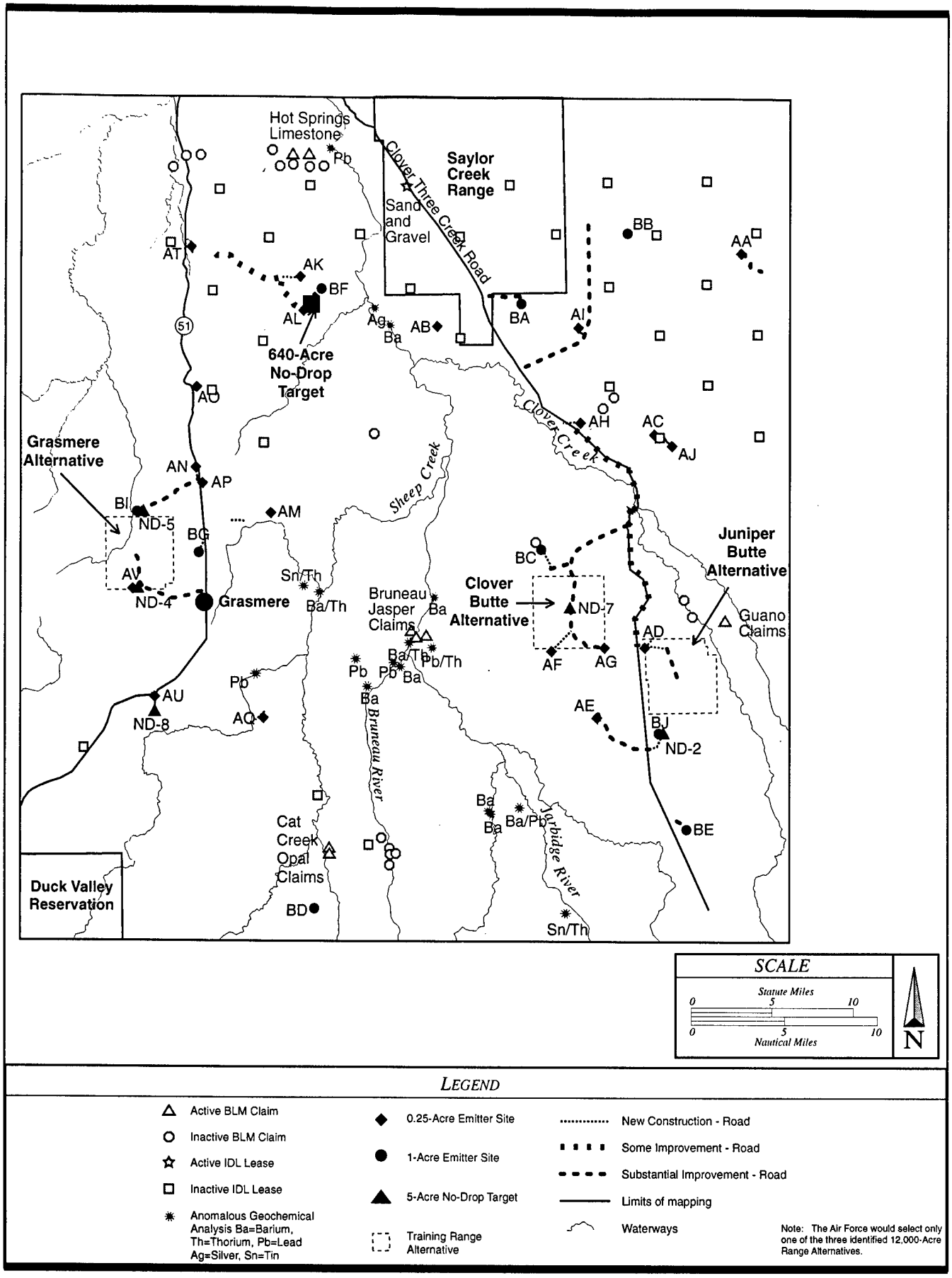



**Figure 3.5-5 Active and Inactive Claim and Lease Sites**

ppm), lead (100 to 10,000 ppm), and bismuth (20 ppm). The researchers suggest that the high barium levels are related to nearby hot spring activity or are from cavity or fracture fillings in the bedrock. No barite veins were noted in the study. The researchers did not have an explanation for the high tin values, but related the presence of the high thorium values to the presence of the mineral zircon in the stream sediment concentrates. The high lead values were thought to result from contamination by human activities, because the extremely high value samples were collected in areas of more intense human activity along jeep and pack trails. The single high silver value was found in one isolated area in the northern part of ROI Two near Miller Water. It is thought to be the result of an isolated mineralized fracture. The high bismuth value was not explained. In general, this investigation rates the mineral resource potential as low throughout all of the WSAs that were studied. This rating was made with a relatively high level of certainty because the available information gives a good indication of the level of mineral resource potential.

Historically, various parts of ROI Two have been claimed or leased for gold placer mining, agate mining, petrified wood collection, oil and gas exploration, and geothermal exploration. The placer mining was generally located in the bottoms of the Bruneau and Jarbidge river canyons and was recreational in its extent. Agate mining and petrified wood collection has occurred in the Idaho Group sediments in the northern part of ROI Two near the Hot Springs limestone. The northern area has also been the site of leases for oil and gas exploration during the 1970s and 1980s. All of these leases have since expired. Finally, the area contains one known geothermal resource in the area of Indian Hot Springs in the bottom of the Bruneau River canyon in the center of ROI Two. The northern part of ROI Two has been leased in the 1970s and 1980s for geothermal exploration, due to the proximity of the Indian Bathtub Hot Springs and the known geothermal resources of the nearby Bruneau and Little valleys. However, all of these exploration leases have also expired and been abandoned.

#### 3.5.3.2 ROI ONE — SITE-SPECIFIC MINERAL RESOURCES

Possible mineral resources for each ROI One site were evaluated based on a review of pertinent geologic and mineral resource literature, a reconnaissance field survey, discussions with district BLM geologists and IDL head of minerals division, and a search for active and inactive mineral claims in the IDL and BLM claim and lease files. Claim information in the BLM files dates from 1976 and lease information in the IDL files dates from the original land acquisition date in the late 1800s. This survey and data gathering process meets or exceeds the BLM standard for mineral data analysis required in their land withdrawal process, as defined in their Instruction Memorandum No. 93-208, April 6, 1993. The results of this survey are presented in Appendix D.

During the field investigation, four stream sediment samples were collected for analysis from within the boundaries of the Grasmere and Clover Butte ranges. Analyses on the samples were run by SVL Analytical, Inc., Kellogg, Idaho, and included 27 common metallic and non-metallic elements, gold, and silver. Table 3.5-3 summarizes the results for gold, silver, and the elements previously found to have anomalous levels in the WSA mineral resource report.

**Table 3.5-3. Samples Results of Mineral Resources within the ROI Two Project Area**

| *Site Location* | *Sample No.* | *Gold (ppb)* | *Silver (ppm)* | *Barium (ppm)* | *Bismuth (ppm)* | *Lead (ppm)* | *Tin (ppm)* | *Thorium (ppm)* |
|---|---|---|---|---|---|---|---|---|
| Grasmere | AF-1 | <5 | <0.1 | 58 | <10 | 9 | <15 | 17 |
| Grasmere | AF-2 | <5 | 0.1 | 64 | <10 | 8 | <15 | 15 |
| Grasmere | AF-3 | <5 | 0.1 | 100 | <10 | 10 | <15 | 14 |
| Clover Butte | AF-4 | <5 | <0.1 | 400 | <10 | 18 | <15 | 10 |

The results of the analysis indicate that the samples are well below the reported anomalous amounts. The samples also do not show anomalous results for any other elements.

### *ALTERNATIVE B — CLOVER BUTTE*

No mining claims or mining operations occur within the selected lands for the proposed Clover Butte training range (refer to Figure 3.5-5). The closest active claims are the Bruneau jasper mines, six miles west in the bottom of the Bruneau River canyon near Indian Hot Springs.

### *ALTERNATIVE C — GRASMERE*

No mining claims or mining operations occur within the selected lands for the proposed Grasmere training range (refer to Figure 3.5-5). The closest active claims are the Cat Creek opal deposits almost 20 miles southeast of the range.

### *ALTERNATIVE D — JUNIPER BUTTE*

No mining claims or mining operations occur within the selected lands for the proposed Juniper Butte training range (refer to Figure 3.5-5). The closest active claims are the guano claims on the east side of Clover Creek, two miles away.

### *NO-DROP TARGETS AND ELECTRONIC EMITTER SITES*

No mining claims or mining operations occur within the selected lands for the no-drop targets and electronic emitter sites (refer to Figure 3.5-5). No-drop target area ND-1 and emitter sites AK, AL, and BF are located approximately eight miles south of the Hot Springs limestone claims. Emitter site BD is approximately four miles south of the Cat Creek opal claims. The other no-drop targets and emitter sites are all more than five miles from the closest active mining claims.

## 3.5.4 Paleontological Resources

### 3.5.4.1 ROI Two — Regional Paleontological Resources

All of the paleontological resources in ROI Two are within the Idaho Group sediments. These lake and stream sediments contain the fossilized remains of fish, snails, clams, mammals and other vertebrates, wood, and a barrier reef of freshwater sponges. In addition, the sediments contain many species of microfossils including ostracods, diatoms, and pollen. The fish fossils have received the most study by scientists at the University of Michigan, Ann Arbor (Smith 1975; Smith et al. 1982). Lake Idaho supported an abundant variety of fish, including salmon, minnows, bottom-feeding suckers, trout, and whitefish. The fish fossils are found in the beach or nearshore sand and pebble gravel sediments of the lake, which can also contain fossilized wood, clams, and snails. The vertebrate fossils found within the Idaho Group sediments reflect the variety of creatures living along the shores of Lake Idaho, including the fossilized remains of snakes, frogs, lizards, and turtles. The Hot Springs limestone, mentioned in the previous mineral resources section of this report represents the barrier reef deposit. First thought to be algal in origin (Straccia et al. 1990), it is now thought to be made up of the shells of freshwater sponges, similar to those presently growing in Lake Baikal in Siberia, with channel areas filled with snail shells (Jenks et al. 1993). The microfauna fossil assemblage has not been studied in any detail, with the exception of a 1991 USGS drilling program that studied the pollen in a 900-foot-deep core drilled just east of the town of Bruneau.

### 3.5.4.2 ROI One — Site-Specific Paleontological Resources

#### *Alternative B — Clover Butte*

No paleontological resources occur within the selected lands for the proposed Clover Butte training range. The closest fossil localities are the sediments in the Cedar Tree Trail cove on the west side of the Bruneau River canyon south of Indian Hot Springs.

#### *Alternative C — Grasmere*

No paleontological resources occur within the selected lands for the proposed Grasmere Alternative. It is also more than 15 miles from the closest known fossil localities in the Idaho Group sediments on the opposite side of Big Hill.

#### *Alternative D — Juniper Butte*

No paleontological resources occur within the selected lands for the proposed Juniper Butte Alternative. No fossil localities are located near the Juniper Butte range area.

#### *No-Drop Targets and Electronic Emitter Sites*

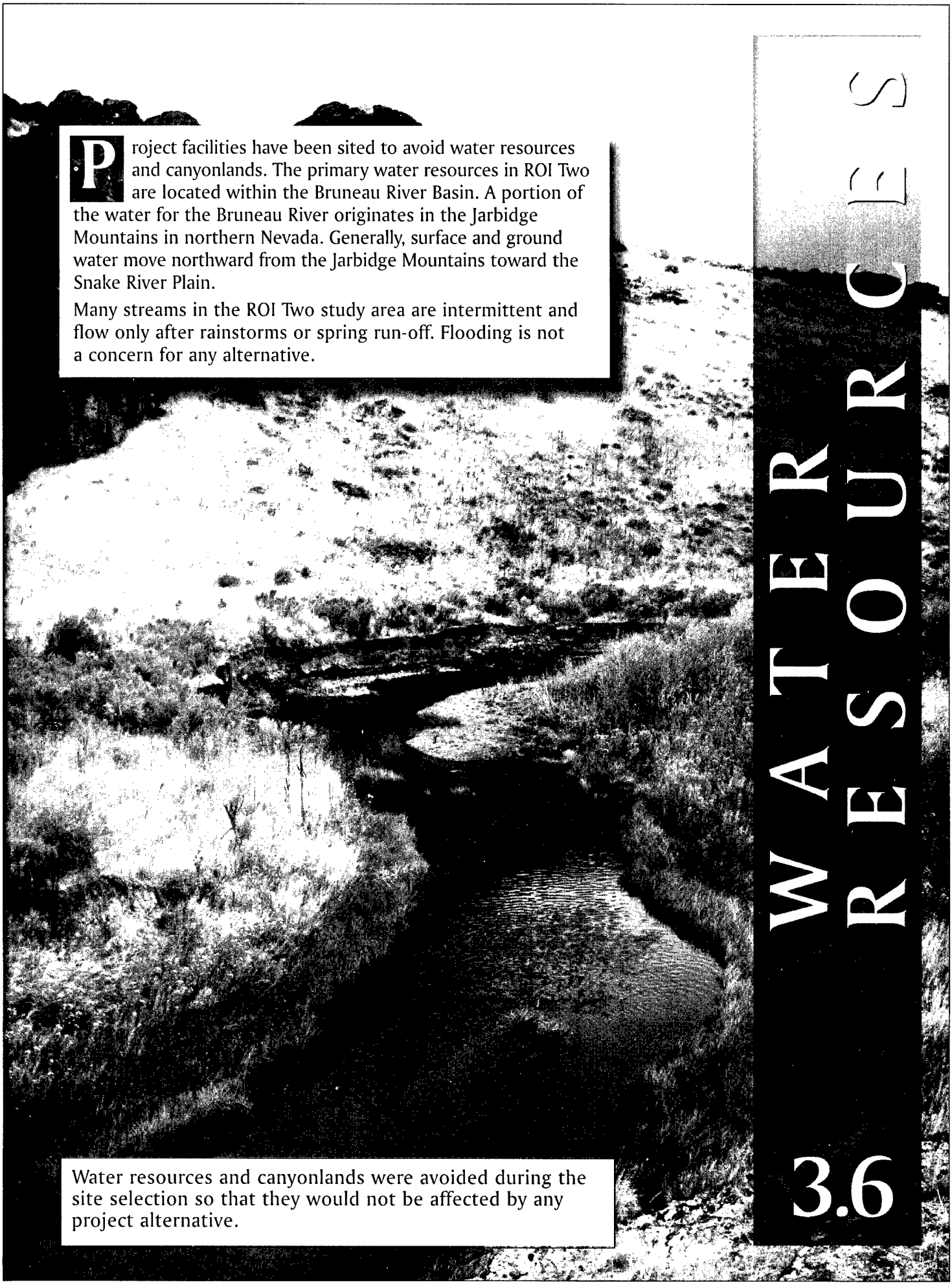
No paleontological resources occur within the selected lands for the no-drop targets and electronic emitter sites. No-Drop Target One and emitter sites AK, AL, AT, and BF are all

located within the area underlain by Idaho Group sediments. However, all of these sites are at the edges of the Lake Idaho basin, where fossil localities are less abundant.

Field inspection of an outcrop of sediments near Windy Well, 0.5 mile west of sites ND-1 and AL, located a handful of poorly preserved mammal fossils, but it is not a unique nor abundant locality. A report from a vertebrate paleontologist does confirm the presence of mammalian fossils at the locality. However, sites ND-1 and AL revealed no evidence of fossils or of the fossil-bearing sediments.

An excellent fish locality outcrop on the east side of Highway 51, one mile north of emitter site AT, was identified. However, field inspection of similar sediments exposed in Highway 51 roadcuts on the west side of the gravel bench containing the emitter site revealed no fossil remains of any kind. Emitter sites AK and BF are located on gravel benches and have no nearby fossil localities.

# 3.6 WATER RESOURCES



Project facilities have been sited to avoid water resources and canyonlands. The primary water resources in ROI Two are located within the Bruneau River Basin. A portion of the water for the Bruneau River originates in the Jarbidge Mountains in northern Nevada. Generally, surface and ground water move northward from the Jarbidge Mountains toward the Snake River Plain.

Many streams in the ROI Two study area are intermittent and flow only after rainstorms or spring run-off. Flooding is not a concern for any alternative.

Water resources and canyonlands were avoided during the site selection so that they would not be affected by any project alternative.

The area being studied for ETI receives an average annual precipitation of about 12 inches. Approximately 8 inches are lost to the atmosphere by evaporation and transpiration. The remaining 4 inches flow into rivers and lakes. Amounts of both precipitation and runoff vary greatly with geography and season.

In the study area, ground-water quality is essentially the same as the surface-water quality of Bruneau River Basin tributary streams. Dissolved solids concentrations are generally less than 400 miligrams per liter, which is better than the USEPA's Water Quality Standard threshold limit. The sources of potential water pollution are *point sources* - discharges into pipes, culverts, or ditches; and *non-point sources* - dispersal of pollutants over wide areas, as in insecticide and herbicide application.

Currently, there are no known point or significant nonpoint sources of pollution along the Bruneau River system. The majority of the Bruneau River system apparently receives minimum impact from nonpoint sources. For most of Bruneau River's lower few miles, from near the mouth of the canyon to the mouth of the river, livestock grazing is the only significant potential form of nonpoint source pollution.

The Clover-Three Creek bridge across Clover Creek, a tributary to the Bruneau River, is proposed to be replaced as part of ETI road improvements associated with any action alternative.



## Sources of pollution

There are many substances that cause water pollution and various ways those pollutants reach water supplies. ***Point Sources*** refer to pollutants, such as municipal wastes, that are discharged directly into pipes, culverts, or ditches. ***Nonpoint Sources*** affect a water supply through dispersal of toxic substances over wide areas, as in the application of insecticides and herbicides.



# 3.6 WATER RESOURCES

Water resources is a multidisciplinary subject that deals with the occurrence, circulation, and distribution of the Earth's waters. Water resources within the ROI include all surface water and ground water within the boundaries of the proposed ETI range areas and associated sites. Surface water resources which refer to the natural water in streams and lakes, are important for economic, ecological, recreational, and human health reasons. Surface water resources also have played a significant role in determining historical migratory and settlement patterns of most mammals, greatly influenced nesting and migratory activities of avian species, represented a primary factor in landform evolution through their roles in the erosion process, and are key elements in several global systems including temperature modification and oxygen replenishment.

The term ground water is applied to any water that occurs beneath the surface of the earth in a saturated geological formation of rock or soil. Ground water, an essential resource in many areas, is used for potable water consumption, agricultural irrigation, and industrial applications. Ground-water properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.

Streams that have measurable flow during the entire hydrological season (a hydrological year begins on October 1, and ends on September 30 of the following year) are called perennial streams. Intermittent streams are streams without a measurable flow during certain times of the hydrological year. Floods are caused by precipitation over large areas or by the melting of winter accumulation of snow or both. The large volume of water overflows the river channel and inundates the adjacent floodplain. A floodplain is the normally dry area adjacent to a stream channel that is likely to be flooded.

The attributes of water resources considered for assessment of impacts from implementation of this proposal include the availability, use, quality (including protection zones), flood hazard, and claims to water rights for both surface and ground water. ROI One and Two, which cover all regional water resources, were used for this analysis. ROI One for water resources consists of an area covering the proposed 12,000-acre training areas and associated emitter sites. ROI Two encompasses the ROI One site-specific area and the greater regional water resources.

## 3.6.1 Ambient Water Quality Standards

The Safe Drinking Water Act, which authorizes the establishment of national standards for drinking water, provides specifically for the promulgation of federal regulations to protect water. Drinking water standards established by the USEPA have been adopted by the state of Idaho. These standards consist of maximum contaminant levels (MCLs) established for each constituent listed. Primary MCLs are established to protect against adverse health effects and are enforceable on public drinking water supplies. Secondary MCLs are established for aesthetic reasons such as taste, color, or odor and are not enforceable on public drinking water

supplies. An action level for selected constituents triggers the need for water or distribution treatment after the concentration of a percentage of samples exceeds the action level.

Total dissolved solids (TDS) may be defined as the total amount of solids left when a ground-water sample is evaporated to dryness (Drever 1988) and is an indication of mineralization. The concentration of TDS is one indicator of how potable, or drinkable, water is. Water very low in TDS may taste bland; while water very high in TDS may taste saline (Crocket 1995). The major contributors to TDS are common ions: calcium, magnesium, sodium, potassium, bicarbonate, carbonate, chloride, fluoride, sulfate, and silica. A secondary MCL has been established for TDS at 500 milligrams per liter (mg/l) (USEPA 1991).

## 3.6.2 Surface Water

### 3.6.2.1 ROI Two — Regional Surface Water

*Water Availability and Use*

Owyhee County has a semiarid climate. The major surface waters in Owyhee County consist of several rivers and large creeks that drain north and west into the Snake River. ROI Two is situated on a relatively flat plateau that is bounded by the Snake River canyon to the north, the Bruneau River canyon in the central portion, and the Owyhee River basin to the west. In the vicinity of the proposed ETI range, rainfall averages about 9 inches per year. Most of this rainfall is lost to evaporation, which averages about 45 inches per year from free water surfaces or from shallow lakes (Farnsworth et al. 1982). Rainfall is infrequent during the summer and most precipitation (including snowfall) is from October through March. Surface water runoff accounts for 0.2 to 2 inches per year (USGS 1986), and the remainder either evapotranspires or recharges ground-water reserves. All surface water flows northward into the Snake River, mainly via the Bruneau and Owyhee rivers. Several surface water flows follow smaller streams or wash directly into the Snake River.

Three major drainages are located in ROI Two: the Bruneau, the Owyhee, and the C.J. Strike drainages. The most significant is the Bruneau drainage, which runs along the central portion of the proposed area. The Bruneau drainage basin is bounded on the south by the Jarbidge Mountains, on the west by the Owyhee Mountains and the Chalk Hills, on the north by the Snake River, and on the east by the Bruneau plateau. It has an approximate drainage area of 3,310 square miles.

The Bruneau drainage basin is located within an area characterized by high elevations, great topographical relief, and precipitation of 8 to 12 inches annually. The higher precipitation is mainly in the form of snowfall. Snowmelt and rainfall is drained through deeply incised canyons of the major perennial watershed. The major tributaries of the Bruneau River are the East and West Forks of the Bruneau River, the East and West Forks of the Jarbidge River, Sheep Creek, and Marys Creek (Figure 3.6-1). Many other streams in the study area are minor and intermittent, and flow only in response to rainstorms or spring runoff. These include Black Leg

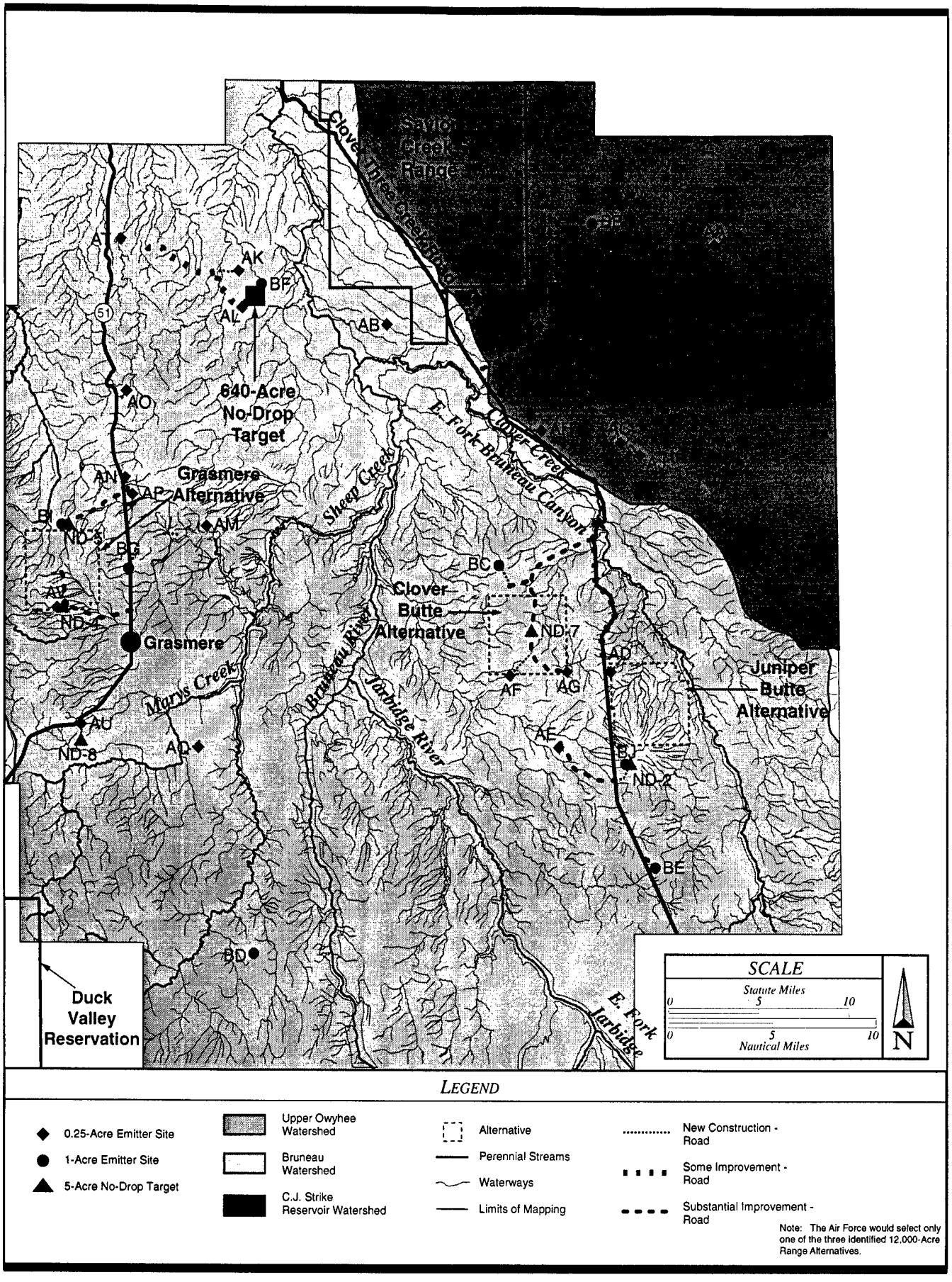



**Figure 3.6-1 Location of Alternatives within Watersheds/Streams**

Creek, Bull Creek, Cat Creek, Columbet Creek, Cottonwood Creek, Cougar Creek, Dorsey Creek, Hot Creek, Louse Creek, Loveridge Creek, Miller Water Canyon, Poison Creek, and Pole Creek. Big Jacks Creek and Little Jacks Creek enter the Bruneau River downstream from the Highway 51 bridge west of Bruneau (Clark 1979).

Another major drainage along the periphery of the proposed project area is the Owyhee River, which runs along the western edge of the proposed project area. The Owyhee River drainage extends along the south side of the Owyhee Mountains, the Owyhee Range, and the entire southwestern plateau portion of Owyhee County. The water passes in and out of eastern Oregon before draining into the Snake River north of Owyhee County. The rivers and creeks have been impounded in many locations to create small reservoirs used for stock watering, irrigation, recreation, power, and domestic and municipal water supplies.

The Owyhee drainage basin is located within an area characterized by higher elevations, greater topographical relief, and more precipitation (14 inches annually) than other areas of Owyhee County. The higher precipitation is mainly in the form of snowfall on the Owyhee Mountains. Snowmelt and rainfall is drained through deeply incised canyons of the major perennial watercourse including Blue Creek, Battle Creek, Deep Creek, the Owyhee River, the South Fork of the Owyhee River, and the Little Owyhee River.

The third major watershed, the C.J. Strike Reservoir watershed, lies on the northeast periphery of the proposed project. The southern region of the C.J. Strike Reservoir watershed consists of Brown's Creek, Deadman Creek, and Saylor Creek. Many of these streams are intermittent and flow northward to the Snake River.

The proposed project area also includes many intermittent drainages, several of which are fed by moderately large catchments and form incised canyons. These drainages have carried large quantities of water after thunderstorms and heavy rains. Numerous springs, many of which have been impounded for stock watering, are dispersed throughout the proposed training range area. Other stock ponds are also present.

There are several perennial lakes and minor intermittent drainages with small catchments within the proposed ETI training ranges. Closed playa depressions in the area hold some water after snowmelt and rains, but are generally dry. Small watering ponds, water storage facilities, and stream access points for livestock are used throughout the area. Most of the Bruneau River drainage area consists of public land used for livestock grazing under the jurisdiction of the BLM. The area has experienced limited irrigation since the turn of the century. Water for irrigation is obtained from streams and from flowing and pumped wells. The Air Force does not use any of the surface waters within the proposed ETI ranges for any ongoing activities.

### *WATER QUALITY*

Field data collection on water quality for specific rivers and streams in Owyhee County is limited to information available from the USGS. According to the Idaho Statewide Ground

Water Quality Monitoring Program, the network of sites (wells and springs) used to characterize surface water quality is not complete. The main watershed in the ROI is the Bruneau drainage basin, which is fed throughout by varying quantities of precipitation, snowmelt, irrigation runoff, and springs. Since no point sources (directly releasing waste water into the river) are known along the river, any major impacts on water quality must be attributed to natural sources (animal waste) and to nonpoint sources (indirect runoff from agricultural or other uses), especially in the highly irrigated Bruneau Valley (Clark 1979). In areas lacking irrigated croplands, the quality of the water in the intermittent drainage is likely to be very good. Runoff of byproducts of livestock grazing, however, have the potential to reduce water quality in some locations, especially those downstream from intensively grazed pasture lands.

At SCR, ordnance delivery (i.e., dropping training ordnance) and target maintenance (i.e., grading) result in limited erosion. Generally flat topography, low runoff rates, low precipitation, and small drainages substantially reduce the amount of sediment transported outside the impact area. Small amounts of residue from the phosphorus spotting charges in the practice munitions can be expected to remain on or within training ordnance debris. The spotting charges burn off on impact and leave minimal residues. Leaching of chemicals from training ordnance debris into either surface water or ground-water supplies is unlikely.

#### 3.6.2.2 ROI ONE — SITE-SPECIFIC SURFACE WATER

##### *ALTERNATIVE B — CLOVER BUTTE*

The proposed Clover Butte site is situated in an area that is essentially level with an overall slope to the southeast of the proposed range. The site ranges in elevation from approximately 4,700 to 5,060 feet MSL. A number of small rills, gullies, and channels extend outward from the southern area of the proposed range. Currently, there is no perennial stream at the proposed site, but several minor creeks flow intermittently during the wet season.

##### *ALTERNATIVE C — GRASMERE*

The site is situated on the foothill of the eastern Owyhee Mountain range. Hilly with an overall slope to the southwest, the site ranges in elevation from approximately 5,100 to 5,860 feet MSL. A number of minor intermittent creeks cross the site from southwest to northeast. A single perennial stream, Wickahoney Creek, also crosses the site from the west to the north. The drainage basin headwaters of Wickahoney Creek are located on the east-facing slopes of the Owyhee Mountains, located approximately two miles west of the site.

##### *ALTERNATIVE D — JUNIPER BUTTE*

The site is situated in an area that is essentially level with an overall slope to the south of the proposed range. The elevation at the site ranges from 4,780 to 5,400 feet MSL. A number of small rills, gullies, and channels extend outward from the southern area of the proposed range.

Currently, there is no perennial stream at the proposed site; however, several minor creeks flow intermittently during the wet season.

*NO-DROP TARGETS AND ELECTRONIC EMITTER SITES*

The locations of the no-drop targets and electronic emitter sites are scattered throughout the ROIs One and Two. Several small intermittent streams are located near particular sites. All the one-quarter-acre emitter sites and the no-drop target areas are proposed to be located outside streams and floodway fringes.

## 3.6.3 Floodplains

### 3.6.3.1 ROI TWO — REGIONAL FLOODPLAINS

Floods are natural and inevitable events along most rivers. For the ROI Two area, some floods are seasonal, such as those that occur when spring rains and melting snow fill river channels. Other floods such as flash floods are sudden, and usually are the result of torrential rain or cloudbursts.

Many streams within the state have been studied by the Federal Emergency Management Agency (FEMA) for flood insurance purposes in the Flood Insurance Study (FIS) (FEMA 1989). Currently, information is not available from the FIS for Owyhee County. However, FEMA notes that runoff from all the streams in the Owyhee County is moderate, with appreciable flows occurring mostly during and immediately after precipitation. During large storms, streamflow increases rapidly, and floodwaters can contain high amounts of sediments and debris, causing occasional flood damage (FEMA 1989).

The principal concern with flooding is the potential for injury and loss of life, and property damage caused by major floods (i.e., those having an average recurrence interval of 25 to 100 years) (Merritt 1983). Floodplain management is a land-use technique designed to avoid flood damage by restricting new development and construction in areas subject to flooding. This is accomplished through zoning restrictions on the area subject to flooding, typically defined as the 100-year floodplain. Land use activities in the floodprone area are restricted to those that would not suffer extensive damage from flooding.

The frequency and duration of flooding and the size of the area inundated depend on the natural features of a watershed. A drainage basin area subject to inundation may be identified on the basis of such geomorphic features as levees, cut banks, terraces, and scarps. The information required to map the floodplains come from historical rainfall records and visual geomorphic features on USGS topographic and relief maps.

With respect to flood hazards, streams throughout the Bruneau River basin are subject to occasional, temporary flooding. These floods are caused by snowmelt in the surrounding mountains, high-intensity thunderstorms, or a combination of the two. Snowmelt is the main

cause of floods on streams at high altitudes, while localized thunderstorms are the primary flood producers on streams below 6,000 feet (Riggs and Harenberg 1976). While these floods increase stream-bank erosion and downstream sediment load, they do not pose significant hazard to human health because there are no residences located within flood-prone areas in ROI Two.

#### 3.6.3.2 ROI ONE — SITE-SPECIFIC FLOODPLAINS

All of the proposed tactical training ranges are located below 6,000 feet in elevation and are not within the 100-year floodplain of the Bruneau River drainage area.

### 3.6.4 Ground Water

#### 3.6.4.1 ROI TWO — REGIONAL GROUND WATER

*WATER AVAILABILITY AND USE*

In ROI Two, ground water is stored in and moves through volcanic rocks, except in some areas where sedimentary rocks overlie the volcanic rocks. Ground water flows northward through the volcanic-rock aquifer to the sedimentary-rock aquifer, from areas of recharge along the Jarbidge and Owyhee mountains into the Bruneau Valley area, where it is discharged as spring flow or leaves the area as underflow. Recharge to aquifers in the uplands encompassing most of the range is primarily composed of infiltration from rivers, intermittent streams, stock ponds, reservoirs, and precipitation. The amount of recharge is affected primarily by geologic structure, primary porosity, and rock textures or composition of the geologic units containing the aquifers (Parliman 1983) as well as availability of water.

To support livestock and wildlife, numerous wells, pipelines, and watering troughs occur within the proposed ETI ranges. The wells are developed by drilling into one of the water-bearing zones. The wells are normally drilled in an upland area so that water flows downhill from the well head through a system of pipelines to watering troughs. Without the extensive use of ground water on dry upland surfaces, it would be difficult to graze cattle in the region. The Air Force neither draws nor uses any ground water in this area.

In response to declining ground-water levels in underlying aquifers, the Idaho Department of Water Resources (IDWR) has designated a portion of the area south of the Snake River as a Ground Water Management Area (Idaho Code, Section 42-233b). Within the past 25 years, discharge from monitored springs along Hot Creek and the Bruneau River has declined, most notably from Indian Bathtub Spring. Discharge from Indian Bathtub Spring in 1964 was about 2,400 gallons per minute, and by the summer of 1989, discharge was zero (Berenbrock 1993). This trend for ground water at other locations is expected to continue due to an increase in irrigation-intensive agriculture in the area.

*WATER QUALITY*

Ground-water quality is determined principally by the chemical nature of the characteristic sediments and rocks in which the ground water is contained. Ground water is typically evaluated for its chemical constituents to assess current conditions and beneficial uses, or to identify possible contamination sources. Chemical constituent sources can be natural (e.g., contact with mineralized rock) or human-related (e.g., pesticide or fertilizer contamination).

Ground-water quality information for the proposed range area are limited to information available from the USGS; therefore, the following discussion provides a general description of water quality for the county as a whole. Since this description includes information from irrigated and developed lands, it can be assumed that ground-water quality in the open range area is as good as or better than that described.

Many factors affect the quality of ground water, including the composition of aquifer materials, water temperature, and source of recharge. Preliminary ground-water quality information collected in Owyhee County thus far indicate that the majority of ground water appears to be both potable and generally acceptable for most uses, although local supplies may contain chemical constituents or physical properties that restrict its uses. Ground-water quality concerns are both natural and human-induced.

Of 1,165 monitoring sites where samples were collected from 1991 through 1993, 121 (10 percent) exceeded established primary MCLs. Health concerns with natural ground-water chemistry in Bruneau River basin are associated with arsenic, fluoride, and possibly sulfate. The greatest health concerns from human-induced contaminants are associated with increased levels of nitrate (Crockett 1995). Given the remoteness of the range and the lack of agriculture, aesthetic concerns in the local aquifer are unlikely.

### 3.6.4.2 ROI ONE — SITE-SPECIFIC GROUND WATER

*ALTERNATIVE B — CLOVER BUTTE*

The proposed Clover Butte site is located in an area where ground water is usually free to move under the influence of gravity from higher to lower elevations. The conditions for ground-water flow exist at least intermittently during the wet season.

*ALTERNATIVE C — GRASMERE*

Because the proposed site is located in the foothills, ground water is usually free to move under the influence of gravity from higher to lower elevations. Ground water generally migrates into the Wickahoney Creek area within the proposed site. The conditions for ground-water flow exist at least intermittently during the wet season.

*ALTERNATIVE D — JUNIPER BUTTE*

The proposed site is located in an area where ground water is usually free to move under the influence of gravity from higher to lower elevations. The conditions for ground-water flow exist at least intermittently during the wet season.

## 3.6.5 Water Rights and Improvements

The discussion regarding water rights focuses on water right claims associated with the proposed 12,000-acre alternative range sites and the 300-acre primary ordnance impact area that would be located at the center of each range. All water right claims analyzed for the alternatives are subject to the jurisdiction of the Snake River Basin Adjudication (personal communications, Madenford and Dutcher 1996). Appendix F lists all claims located within the proposed training range alternatives and in close proximity of the associated project components along with claim sources and amounts.

### 3.6.5.1 ALTERNATIVE B – CLOVER BUTTE

IDWR information (IDWR 1996) indicate that four claims to water rights are currently held for water resources within the Clover Butte range alternative. None of these claims are within the anticipated location of the 300-acre primary ordnance impact area at the range's center. BLM holds all four claims and uses all for stock watering. Additional uses for the four claims include water for wildlife and domestic use. In addition, two main BLM pipelines and associated pipeline network carrying water for stock and wildlife travels through the training range site.

### 3.6.5.2 ALTERNATIVE C – GRASMERE

A total of 13 claims to water rights are currently held for water resources within the Grasmere range alternative (IDWR 1996). One claim may be located within the 300-acre primary ordnance impact area, although it does not appear to have improvements within the primary ordnance impact area. Four of the 13 claims are privately held, while BLM holds the rest. Claims in the alternative are used for stock and wildlife watering.

### 3.6.5.3 ALTERNATIVE D – JUNIPER BUTTE

IDWR information (IDWR 1996) indicate that four claims to water rights currently exist within the Juniper Butte alternative. All are held by BLM for stock and wildlife watering. No claims are located within the anticipated location of the 300-acre primary ordnance impact area. In addition, a spur BLM pipeline and associated pipeline network used for stock and wildlife watering travels through the site.

#### 3.6.5.4 NO-DROP AND EMITTER SITES

No claims to water rights are located within the proposed 640-acre no-drop target. Because the smaller no-drop targets and the proposed emitter sites are all located on buttes or areas of higher elevation, no water resources are located within the proposed site locations, but some claims to water rights are located within close proximity. Appendix F lists these claims and the associated project components.

### 3.6.6 Shoshone-Paiute Issues Regarding Water Resources

The Duck Valley Reservation lies primarily in the watershed of the Owyhee River and partly within the watershed of the Bruneau River (via Sheep Creek). Both rivers join the Snake River to the north. Precipitation on the Duck Valley Reservation is infrequent, averaging about 9 inches per year, primarily between October and March.

The Fort McDermitt Reservation is drained by the Quinn River to the south and southwest and by streams flowing into the Owyhee River to the north and northeast.

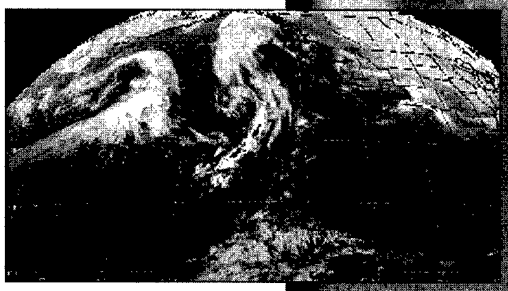
Water is a crucial resource to the Shoshone-Paiute and has several sacred aspects in their traditions. These traditions recognize water as the vital source of life for all beings. It is also consumed during ceremonies to help purify and strengthen the body and spirit. Springs, rivers, lakes, and similar features are considered in Shoshone-Paiute traditions to be especially sensitive spiritual places.

# AIR QUALITY

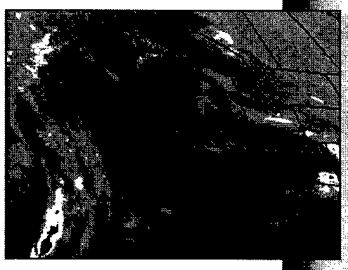
# 3.7

Air quality is determined by the concentration of various pollutants in the atmosphere. The lower the concentration of pollutants, the better the overall quality. Air pollutants are either solid, liquid, or gaseous and come from many different sources. For example:

- Stationary or point sources are primarily commercial or industrial sources such as power generators. Training range alternatives have these.
- Mobile sources include cars, buses, planes, trucks, and trains. Training range alternatives have some of these.
- Natural sources are wildfires, wind blown dust, and pollens. Construction could expose surface areas.



The process of accounting for all sources of air pollution in any one area is called an emissions inventory. Existing air quality at the range alternatives and in the MOAs is generally considered very good due to the remote, unpopulated location with limited pollutant sources.



Current estimates from modeling of ground-level pollutant concentrations for existing conditions within the ETI study area indicate that aircraft emissions offer a negligible contribution to existing air quality conditions. They represent minimal fractions of pollutant concentration limits established by the USEPA to protect human health and safety.

## 3.7 AIR QUALITY

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the USEPA for criteria pollutants including ozone ($O_3$), carbon monoxide (CO), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), particulate matter equal to or less than 10 micrometers in diameter ($PM_{10}$), and lead (Pb). NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare. Short-term standards (1-, 8-, and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (annual averages) are established for pollutants contributing to chronic health effects.

CAA Amendments of 1990 place most of the responsibility to achieve and maintain the NAAQS on individual states. The primary mechanism for implementation is known as the State Implementation Plan (SIP), which the USEPA requires each state to prepare. Each SIP identifies goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. Each state has the authority to adopt standards stricter than those established under the federal program. Table 3.7-1 depicts the NAAQS, as well as air quality standards established by states underlying potentially affected airspace.

The CAA prohibits federal agencies from supporting any activities that do not conform to an USEPA-approved SIP. The USEPA has issued regulations clarifying the applicability of and procedures for ensuring that federal activities comply with the CAA. The USEPA Final Conformity Rule, 40 CFR 93 subpart B (for federal agencies) and 40 CFR 51 subpart W (for state requirements), implements Section 176(c) of the CAA, as amended in 42 United States Code (USC) 7506(c). This rule was published in the Federal Register on November 30, 1993, and took effect on January 31, 1994.

The USEPA Final Conformity Rule requires all federal agencies to ensure that any agency activity conforms with an approved SIP or Federal Implementation Plan (FIP). Conformity means compliance with a SIP or FIP for the purpose of attaining or maintaining the NAAQS. Specifically, this means ensuring the federal activity will (1) not cause a new violation of existing NAAQS, (2) not contribute to an increase in the frequency or severity of violations of existing NAAQS, or (3) not delay the timely attainment of any NAAQS, interim milestones, or other milestones to achieve attainment. The current ruling applies to federal actions in NAAQS nonattainment or maintenance areas only. The Final Conformity Rule applies to all federal agencies until the applicable state's SIP conformity requirements are approved by the USEPA.

Under the rules, certain actions are exempted from conformity determinations, while others are assumed to be in conformity if total project emissions are below the *de minimis* levels established under 40 CFR Section 93.153. Total project emissions include both direct and indirect emissions that can be controlled by a federal agency.

**Table 3.7-1. National Ambient Air Quality Standards for Affected States**

| *Air Pollutant* | *Averaging Time* | NAAQS *Primary* (>) | NAAQS *Secondary* (>) | IDAHO AAQS *Primary* (>) | IDAHO AAQS *Secondary* (>) | *Nevada AAQS* | *Oregon AAQS* |
|---|---|---|---|---|---|---|---|
| Carbon Monoxide | 8-hour<br>1-hour | 9 ppm<br>35 ppm | 9 ppm<br>35 ppm | 9 ppm<br>35 ppm | 9 ppm<br>35 ppm | 9 ppm[c]<br>35 ppm | 9 ppm<br>35 ppm |
| Nitrogen Dioxide | Annual<br>1-hour | 0.053 ppm<br>– | 0.053 ppm<br>– | 0.05 ppm<br>– | 0.05 ppm<br>– | 0.05 ppm<br>– | 0.053 ppm<br>– |
| Sulfur Dioxide | Annual<br>24-hour<br>3-hour<br>1-hour | 0.03 ppm<br>0.14 ppm<br>–<br>– | –<br>–<br>0.5 ppm<br>– | 0.03 ppm<br>0.14 ppm<br>–<br>– | –<br>–<br>0.5 ppm<br>– | 0.03 ppm<br>0.14 ppm<br>0.5 ppm<br>– | 0.02 ppm<br>0.10 ppm<br>0.50 ppm<br>– |
| Total Suspended Particulates | AGM[a]<br>24-hour | –<br>– | –<br>– | 75 μg/m³<br>260 μg/m³ | 60 μg/m³<br>150 μg/m³ | –<br>– | 60 μg/m³<br>150 μg/m³ |
| $PM_{10}$ | AAM[b]<br>24-hour | 50 μg/m³<br>150 μg/m³ | 50 μg/m³<br>150 μg/m³ | 50 μg/m³<br>150 μg/m³ | 50 μg/m³<br>150 μg/m³ | 50 μg/m³<br>150 μg/m³ | 50 μg/m³<br>150 μg/m³ |
| Ozone | 1-hour | 0.12 ppm | 0.12 ppm | 0.12 ppm | 0.12 ppm | 0.12 ppm[d] | 0.12 ppm |
| Lead | Calendar Quarter | 1.5 μg/m³ | 1.5 μg/m³ | 1.5 μg/m³ | 1.5 μg/m³ | 1.5 μg/m³ | 1.5 μg/m³ |

[a] Annual geometric mean
[b] Annual arithmetic mean
[c] At elevations of 5,000 feet above MSL or greater, the CO standard is 6.0 ppm
[d] Ozone 1-hour limit for the Lake Tahoe Basin area is 0.10 ppm

The USEPA assigns classifications to areas throughout the United States with respect to air quality conditions. When an area is considered for classification, there are three possible outcomes of the designation process for each of the criteria pollutants: (i) *nonattainment,* any area that does not meet (or that contributes to ambient air quality in an area that does not meet) the national primary or secondary standard for the pollutant, (ii) *attainment,* any area (other than an area identified in clause [i]) that meets the national primary or secondary ambient air quality standard for the pollutant, or (iii) *unclassifiable,* any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

The CAA also establishes a national goal of preventing any further degradation or impairment of visibility within federally designated attainment areas. Attainment areas are classified as Class I, II, or III and are subject to the Prevention of Significant Deterioration (PSD) program. Mandatory Class I status was assigned by Congress to all international parks, national wilderness areas, and memorial parks larger than 5,000 acres and national parks larger than 6,000 acres. Class III status is assigned to attainment areas to allow maximum industrial growth while maintaining compliance with NAAQS. All other attainment areas are designated Class II. In Class I areas, visibility impairment is defined as a reduction in regional visual range and atmospheric discoloration or plume blight (such as emissions from a smokestack). Determination of the significance of an impact on visibility within a PSD Class I area is typically associated with stationary emission sources. Mobile sources such as aircraft are generally exempt from PSD permit review by regulating agencies.

Defining an ROI for air quality requires matching a given area with the volume of air most affected by pollutant emissions from the proposed action. This also requires consideration of both local and regional meteorology affecting pollutant dispersion, as well as individual treatment of pollutant sources and dispersion processes (e.g., weather, turbulence). Because of the different effects dispersion processes can have on air emissions, the spatial scale for aircraft emissions can vary from 0.5 to 2.5 miles (urban scale) to 2.5 to 30 miles or more (regional scale), depending on the pollutant being studied. These scales are adopted from USEPA regulations concerning ambient air quality monitoring. In light of these considerations, effects on air quality from flight operations under the proposed action and alternatives are expected to be found primarily in ROI Three, the geographic area encompassing southwest Idaho, southeast Oregon, and northern Nevada. Levels of pollutants expected to be discharged into this area from military aviation activities in the region are based on the sortie-operations identified in Table 3.0-2.

## 3.7.1 Regional and Local Air Quality Conditions

### CLIMATE

The areas under study are located in the southern portion of the Columbia Plateau. This region has a continental climate that is characterized by low precipitation averages (8.4 inches); large variations in average annual and daily temperatures (daily means ranging between 63°F and

30°F); and low relative humidity with annual averages varying between 44 and 65 percent (National Climatic Data Center [NCDC] 1996). Due to prevailing westerly winds, the area is often affected by Pacific air masses. As these masses pass over the Cascade Mountain Range to the west, they often lose much of their moisture through precipitation generated by orographic lifting (i.e., movement of air over mountainous areas). As a result, the drier air masses help to create the region's semi-arid climate. The Rocky Mountains and Continental Divide protect the area from many of the extreme continental Arctic air masses that cross the northern Great Plains located to the east. During the summer months, the region is typically influenced by warm, dry, continental air masses.

During the winter months, cold air often drains down the Snake River Valley, and winds prevail from easterly and southeasterly directions. During warmer months, winds tend to prevail from the northwest. The passage of storm systems throughout the year produces widely variable wind speeds.

Temperature inversions are common to the area and generally are more severe during summer mornings. Average mixing heights (heights at which air pollutants effectively become trapped in the lower atmosphere due to a lack of air dispersion) vary seasonally from an average of about 1,200 feet in the winter to as low as about 600 to 900 feet in the summer (NCDC 1996). Baseline ground-level emission concentrations were calculated assuming an annual average mixing height of 1,000 feet AGL.

### LOCAL AIR QUALITY

The USEPA has prepared a report with the assistance of meteorologists from the National Oceanic and Atmospheric Administration that quantifies the tendency for community air pollution to occur. The study provides a means of appraising the general meteorologic potential for air pollution in semi-urban, semi-rural, and rural areas. According to the study, the total number of forecast-days of high meteorological potential for air pollution in a 5-year period in the areas defining the ROI varies between 50 and 60. On an annual level, this represents approximately 10 to 12 days where meteorologic conditions could facilitate localized air pollution if sufficient air pollution sources were present. None of the areas within the ROI contain such sources. The nearest source of pollutants of sufficient quantity to warrant specific monitoring is an industrial phosphate production facility located near Pocatello, Idaho, more than 100 miles east of the ROI (USEPA 1996).

### IDAHO

The ROI for air quality analysis includes Elmore and Owyhee counties, which form a portion of Idaho Air Quality Control Region (AQCR) 63. The two counties underlie potentially affected airspace and contain the proposed tactical target areas, scoring system locations, emitter sites, and other elements of the proposed action. Twin Falls County is adjacent to the ROI and is included to address potential emission dispersion from the ROI. The IDHW DEQ has the authority to regulate air pollution sources in the State of Idaho.

A review of federally published attainment designations for Idaho (40 CFR Part 81.313) and discussions with the USEPA Region X staff indicate that the affected counties have air quality designated better than national standards for total suspended particulates (TSP) and $SO_2$, unclassifiable/attainment for $O_3$, CO, $PM_{10}$, not designated for Pb, and either cannot be classified or are better than the NAAQS for $NO_2$.

These areas include no significant ground-based activities that produce any appreciable amount of air emissions. Fires started by lightning or people have occurred in this area without resulting in any long-term adverse impacts on regional air quality. This area is also used by off-highway vehicles that produce exhaust emissions and fugitive dust. However, these activities have not degraded air quality to any measurable extent in ROI Three. The attainment status of the region substantiates the minor and transitory nature of these emissions.

Air quality in the vicinity of Mountain Home AFB, the city of Mountain Home, and Elmore County is generally considered very good. Consequently, ambient pollutant concentrations have rarely been monitored. The nearest monitoring stations are located in Boise, approximately 50 miles northwest of Mountain Home AFB and in a highly urbanized area. Particulate monitoring in the cities of Kimberly and Hansen, the next-nearest monitoring stations, was discontinued in 1992.

**NEVADA**

Elko and Humboldt counties are the only two counties in Nevada that underlie the affected airspace. The Nevada Division of Environmental Protection, Bureau of Air Quality, has the authority to regulate air pollution sources for this region.

A review of federally published attainment status designations indicated that air quality in Elko and Humboldt counties is designated better than national standards for TSP and $SO_2$; unclassifiable/attainment for $O_3$, CO, and $PM_{10}$; not designated for Pb; and either cannot be classified or is better than the NAAQS for $NO_2$ (40 CFR Part 81.329).

The Jarbidge Wilderness Area, located in Elko County, Nevada, is the only PSD Class I designated area in any portion of the ROI.

**OREGON**

The Oregon Air Quality Division of DEQ has the authority to regulate air pollution sources within the State of Oregon. The counties within the ROI include Malheur and Harney, which are included as part of Oregon AQCR 191. Review of the federally published attainment status designations for Oregon indicated that the two potentially affected counties are classified as better than national standards for TSP and $SO_2$; unclassifiable/ attainment for $O_3$, CO, and $PM_{10}$; not designated for Pb; and either cannot be classified or is better than the NAAQS for $NO_2$ (40 CFR Part 81.338). Information provided by both the Oregon Air Quality Division of DEQ and the USEPA Region X staff has confirmed that all the counties that underlie the

affected airspace are considered in attainment of the NAAQS for all of the federally regulated air pollutants.

## 3.7.2 Current Emissions From Military Use

### 3.7.2.1 ROI Three — Military Operations Areas

The ROI for describing the local airspace environment extends from Idaho to the adjacent states of Utah, Nevada, and Oregon. Review of the USEPA AIRS database (USEPA 1996), shows that none of the airspace in Idaho potentially affected by the proposed action overlies designated nonattainment areas. All other counties in the affected states are in attainment or are currently unclassifiable with respect to the NAAQS and any applicable state standards (USEPA 1996).

Baseline air quality conditions in these affected areas were determined using two measurements or quantifications. For annual total emission contributions, emissions factors for aircraft engines were obtained from the Air Force Air Conformity Applicability Model (Air Force 1995), Aircraft Environmental Support Office (AESO) Report 6-90 (1990), USEPA AP-42 (1995), and the Air Force Calculation Methods for Criteria Air Pollutant Emissions Inventories (Armstrong Aerospace Medical Research Laboratory [AAMRL] 1994). These factors yield total emissions, typically measured in tons per year, for each of the affected areas.

The calculation of ground-based pollutant concentration levels was performed through application of the Multiple Aircraft Instantaneous Line Source (MAILS) model (Air Force 1990b). This technique yields ground-based concentrations of pollutants that are more consistent with the NAAQS and PSD increments.

### 3.7.2.2 Saylor Creek Range

The estimated annual emissions and corresponding ground-level pollutant concentration levels for SCR and its associated airspace are shown in Tables 3.7-2 and 3.7-3, respectively. The annual emissions estimates are based on the total number of sortie-operations flown on the range. Each aircraft was assumed to be operating at military engine power settings, spending up to one hour per sortie-operation on the range and adjacent airspace.

Stationary source emission contributions were calculated for SCR in the Mountain Home AFB 1993 air emissions inventory and proved to be orders of magnitude less than the threshold levels required for obtaining a Tier 1 operating permit. These contributions were also well below NAAQS thresholds. Since the proposed action would not result in any foreseeable change in the level of stationary source emissions at SCR, these emissions are excluded from further discussion.

Estimated annual emissions for the Owyhee, Paradise, and Saddle MOAs were calculated in a similar manner. Aircraft were assumed to operate at military engine power settings and spent times varying from 30 minutes to one hour per sortie-operation in a MOA. Emissions estimates were based on the number of sortie-operations flown in each MOA. The annual emission contribution estimates are presented in Table 3.7-4.

**Table 3.7-2. Baseline Emissions[1] for Saylor Creek Range[2] and Associated Airspace[3]**

| Airspace Component | Annual Emissions (tons/year) | | | | |
|---|---|---|---|---|---|
| | *CO* | *THC*[4] | *$NO_x$* | *$SO_x$* | *$PM_{10}$* |
| Range | 69.1 | 4.4 | 463.2 | 25.3 | 11.4 |
| Support Airspace | 33.0 | 3.1 | 663.1 | 26.3 | 10.0 |
| Total | 102.1 | 7.5 | 1126.3 | 51.6 | 21.4 |

Notes:
1. Calculations based on total annual sortie-operations of 7,737.
2. Range includes R-3202A.
3. Support airspace includes R-3202B, and C; Bruneau 1 and 2 MOAs; Sheep Creek 1, 2, and 3 MOAs; and SCR.
4. Volatile organic compounds (VOC) included in total hydrocarbons (THC).

**Table 3.7-3. Baseline Ground-Level Pollutant Concentrations for Saylor Creek Range and Associated Airspace**

| *Pollutant* | *Averaging Periods* | *Concentration ($\mu g/m^3$)* | *NAAQS ($\mu g/m^3$)* |
|---|---|---|---|
| CO | 1-hour | 4.01 | 40 |
| | 8-hour | 0.33 | 10 |
| $NO_2$ | Annual | 0.08 | 100 |
| $SO_2$ | 3-hour | 0.22 | – |
| | 24-hour | 0.03 | 365 |
| | Annual | <0.01 | 80 |
| $PM_{10}$[1] | 24-hour | 0.03 | 150 |
| | Annual | <0.01 | 50 |

Note: 1. Particulates reported as $PM_{10}$

**Table 3.7-4. Baseline Emissions for Local MOAs**

| MOA | Annual Sortie-Operations | ANNUAL EMISSIONS (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|
| | | CO | THC[1] | $NO_x$ | $SO_x$ | $PM_{10}$ |
| Owyhee | 7,350 | 68.0 | 5.7 | 1193.8 | 49.3 | 20.8 |
| Paradise | 5,091 | 50.4 | 4.6 | 1038.4 | 40.5 | 14.0 |
| Saddle | 1,986 | 18.1 | 1.5 | 357.3 | 14.5 | 6.2 |

Note: 1. VOCs included in THC

Since the operating floor of the Paradise MOA is at a high altitude (14,500 feet above MSL), and the lowest floor of the Saddle MOA is 8,000 feet above MSL, ground-level pollutant concentrations in Paradise and Saddle MOAs are negligible. Pollutants released from such heights and over such a vast area would become so widely dispersed that modeled estimates of resulting ground-based pollutant levels would be meaningless. Since the lower operating altitude of the Owyhee MOA is beneath 500 feet AGL, a representative MOA utilization scenario was established to determine the ground-level concentrations of pollutant levels. A ceiling of 5,000 feet AGL is a conservative estimate for the average height of an inversion. An inversion varies between 1,000 and 5,000 feet AGL and can significantly limit, if not effectively block, vertical mixing and dispersion of air pollutants. During an inversion, pollutants can be trapped between the base of the inversion and the ground. For the purpose of emission modeling in the ROI, the inversion ceiling was established at 1,000 feet AGL, in accordance with USEPA mixing height data. Aircraft in the MOA were assumed to operate at or below this height.

Since the pollutant concentrations are measured in 1-, 3-, 8-, 24-hour, and annual time periods, it is assumed that the MOA scenario represents realistic aircraft activity in the airspace over short periods. For example, only a certain number of aircraft can be scheduled into a MOA for a 1-hour period due to airspace limitations. For modeling purposes, it is assumed that similar restrictions limit the total number of aircraft operating in a MOA during any given day. The annual usage was set to represent the utilization in the Owyhee MOA. Table 3.7-5 presents the results of the analysis. As shown in the table, baseline ground-level pollutant concentrations are well below NAAQS thresholds.

### 3.7.2.3 MILITARY TRAINING ROUTES

Two MTR corridors occur beneath portions of the airspace in the ROI. The two corridors collectively represent seven individual MTRs. One corridor contains only IR-303. The second contains IRs-302 and 305, and VRs-1300, 1303, 1304, and 1305. The estimated emissions from aircraft operating in these MTRs are presented in Table 3.7-6. Each of the MTR corridors lies over, or is adjacent to, the Jarbidge Wilderness Area PSD Class 1 area. Maximum allowable incremental pollutant increases under PSD regulations are shown in Table 3.7-7.

**Table 3.7-5. Baseline Ground-Level Pollutant Concentrations for Owyhee MOA**

| *Pollutant* | *Averaging Periods* | *Concentration ($\mu g/m^3$)* | *NAAQS ($\mu g/m^3$)* |
|---|---|---|---|
| CO | 1-hour | 4.45 | 40 |
| | 8-hour | 0.37 | 10 |
| $NO_2$ | Annual | 0.08 | 100 |
| $SO_2$ | 3-hour | 0.18 | – |
| | 24-hour | 0.02 | 365 |
| | Annual | <0.01 | 80 |
| $PM_{10}$[1] | 24-hour | 0.01 | 150 |
| | Annual | <0.01 | 50 |

Note: 1. Particulates reported as $PM_{10}$

**Table 3.7-6. Baseline Aircraft Emissions in MTRs**

| *MTR* | *Annual Sortie-Operations* | ANNUAL EMISSIONS (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|
| | | *CO* | *THC*[2] | *$NO_x$* | *$SO_x$* | *$PM_{10}$* |
| IR-303 | 217 | 0.9 | 0.2 | 18.7 | 0.7 | 0.4 |
| IR-302[1] | 784 | 42.1 | 2.8 | 90.1 | 9.2 | 4.4 |

Notes: 1. Includes IR-305, VRs-1300,1303, 1304 and 1305
2. VOCs included in THC.

**Table 3.7-7. Maximum Allowable Incremental Increases under PSD Regulations**

| *Pollutant* | *Averaging Time* | PSD INCREMENTS ($\mu g/m^3$) | |
|---|---|---|---|
| | | *Class I* | *Class II* |
| $NO_2$ | Annual | 2.5 | 25 |
| $PM_{10}$[1] | Annual | 4 | 17 |
| | 24-hour | 8 | 30 |
| $SO_2$ | Annual | 2 | 20 |
| | 24-hour | 5 | 91 |
| | 3-hour | 25 | 512 |

Note: 1. All particulates reported as $PM_{10}$

The IR-302 airspace corridor is the most frequently used MTR under the potentially affected airspace. Therefore, these pollutant concentrations represent the highest concentrations of ground-level pollutants resulting from aircraft overflights along the MTRs in the ROI. The ground-level pollutant concentrations for the MTR corridor shown in Table 3.7-8 are well below NAAQS thresholds and maximum allowable incremental increases for Class I and Class II areas under PSD regulations.

**Table 3.7-8. Baseline Ground-Level Pollutant Concentrations for MTRs**

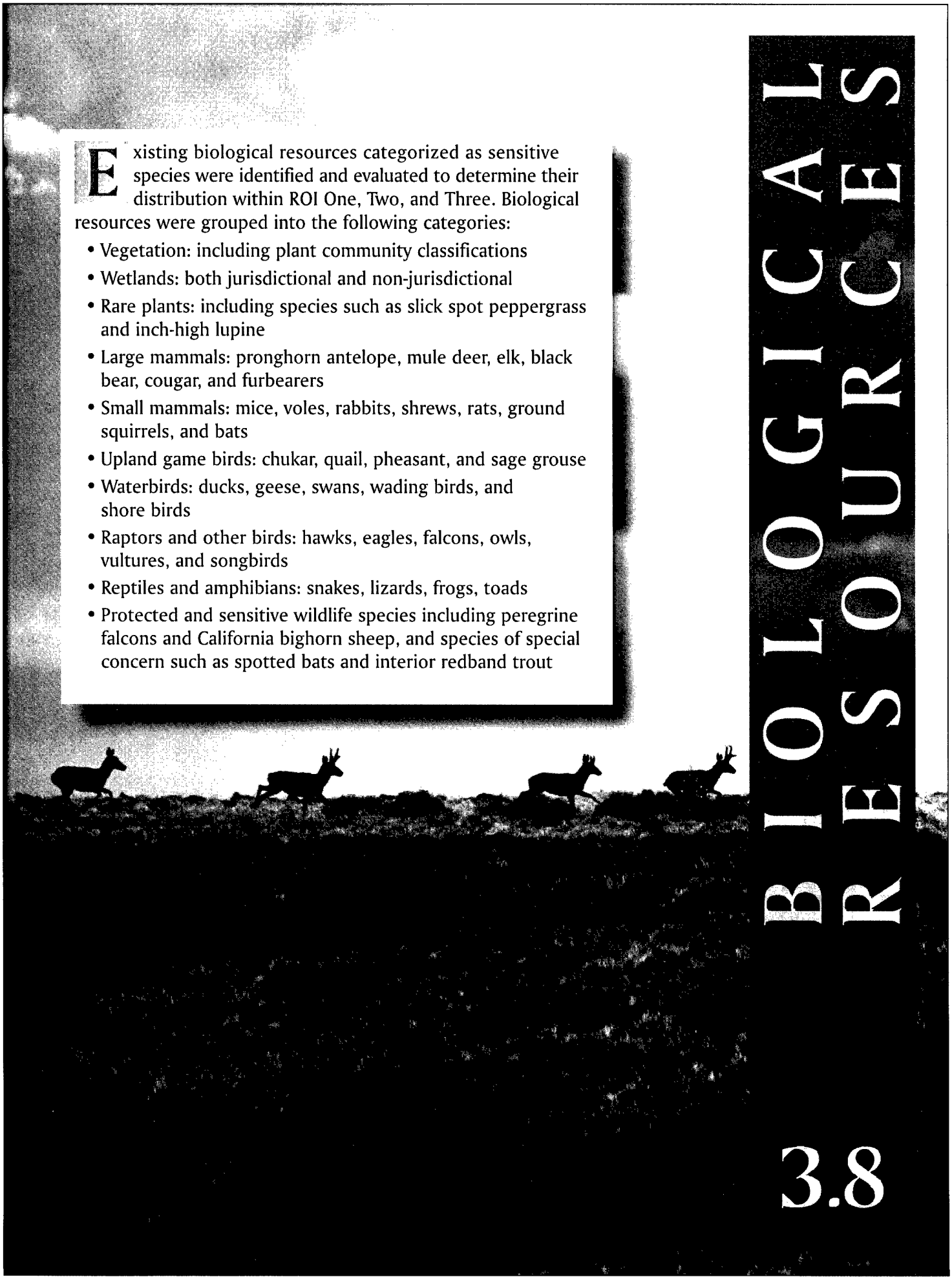
| *Pollutant* | *Averaging Period* | *Concentrations ($\mu g/m^3$)[1]* | *NAAQS ($\mu g/m^3$)* |
|---|---|---|---|
| CO | 1-hour | 4.18 | 40 |
| | 8-hour | 0.35 | 10 |
| $NO_2$ | Annual | <0.01 | 100 |
| $SO_2$ | 3-hour | 0.22 | – |
| | 24-hour | 0.03 | 365 |
| | Annual | <0.01 | 80 |
| $PM_{10}$[2] | 24-hour | 0.02 | 150 |
| | Annual | <0.01 | 50 |

Notes: 1. All concentrations represent less than one percent of any PSD Class I increment.
2. All particulates reported as $PM_{10}$.

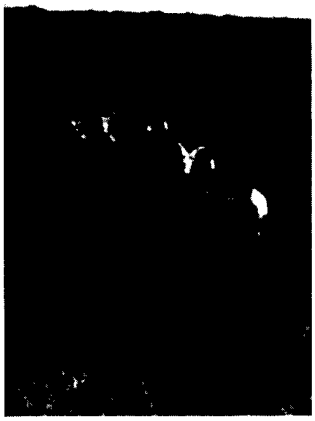
# 3.8 BIOLOGICAL RESOURCES

Existing biological resources categorized as sensitive species were identified and evaluated to determine their distribution within ROI One, Two, and Three. Biological resources were grouped into the following categories:

- Vegetation: including plant community classifications
- Wetlands: both jurisdictional and non-jurisdictional
- Rare plants: including species such as slick spot peppergrass and inch-high lupine
- Large mammals: pronghorn antelope, mule deer, elk, black bear, cougar, and furbearers
- Small mammals: mice, voles, rabbits, shrews, rats, ground squirrels, and bats
- Upland game birds: chukar, quail, pheasant, and sage grouse
- Waterbirds: ducks, geese, swans, wading birds, and shore birds
- Raptors and other birds: hawks, eagles, falcons, owls, vultures, and songbirds
- Reptiles and amphibians: snakes, lizards, frogs, toads
- Protected and sensitive wildlife species including peregrine falcons and California bighorn sheep, and species of special concern such as spotted bats and interior redband trout



## BIOLOGICAL RESOURCES



A California bighorn sheep herd was sighted at the Grasmere site on several occasions during ETI EIS field studies.



Water resources represent sensitive biological habitat in arid areas. The Air Force's mitigation by avoidance specifically identified and avoided such areas for all alternatives.



Biological resources were assessed by combining existing information available from past studies, and information gathered during recent field surveys. Information was obtained from state and federal agencies, including:

- Idaho Department of Fish and Game
- Nevada Department of Wildlife
- Oregon Department of Fish and Wildlife
- U.S. Bureau of Land Management
- U.S. Fish and Wildlife Service

Additional published and unpublished literature were also reviewed to obtain information about historical distribution and habitat use of species likely to occur in the study areas. Field surveys were conducted between May and October, 1996; winter surveys for raptors, pronghorn antelope, and mule deer were conducted in February 1997.

After available information and past studies were reviewed and the 12,000-acre alternative sites surveyed, the following summaries of findings were prepared.

### Clover Butte Alternative Site

- Crested wheatgrass, intermediate wheatgrass, and big sagebrush constitute the major plant communities
- Two wetlands totalling 1.2 acres were identified
- No known rare plants occur
- Pronghorn antelope and mule deer are present
- Limited bat, amphibian, or waterbird habitat occurs
- Sage grouse habitat is present, and sage grouse are known to occur
- Moderate diversity of nesting raptors and song birds occurs, including short-eared owl, golden eagle, and sage thrasher
- No federal or state threatened or endangered species are known or likely to occur; BLM Sensitive species known to be present include sage grouse, western burrowing owl, northern harrier, sage sparrow, and Brewer's sparrow

### Grasmere Alternative Site

- Big sagebrush, low sagebrush, crested wheatgrass, and annual grassland plant communities were identified
- Four depressional wetlands totalling 30.7 acres were delineated
- Pronghorn antelope, mule deer, and California bighorn sheep are present
- High diversity of small mammals occurs, including big brown bat, California myotis bat, western small-footed bat, and montane shrew
- Sage grouse occur in sagebrush vegetation within the 12,000-acres
- High diversity of nesting raptors and songbirds occurs, including golden eagle, red-tailed hawk, short-eared owl, and sage thrasher
- Pacific tree frog is common; suitable habitat is present for spot ted frog, western toad, and northern leopard frog



Biological field studies in ROI One identified plant and animal species and estimated their distribution throughout the training range alternatives.

- No federal or state threatened or endangered species are known or likely to occur; BLM Sensitive wildlife species present include California bighorn sheep, spotted bat, long-eared bat, long-legged bat, white-faced ibis, longbilled curlew, ferruginous hawk, burrowing owl, prairie falcon, loggerhead shrike, gray flycatcher, Brewer's sparrow, sage sparrow, and interior redband trout
- No federal threatened or endangered plant species are found within the 300-acre primary ordnance impact area; BLM sensitive plant species located are inch-high lupine (*Lupinus unicales)*, dimeresia (*Dimersia howellii*), and dwarf skullcap (*Scutellaria nana* var. *nana)*.

### Juniper Butte Alternative Site

- Crested wheatgrass, intermediate wheatgrass, and rabbitbrush constitute the major plant communities
- Slick spot peppergrass (a BLM sensitive species) is known to occur within the 300-acre impact area
- Pronghorn antelope and mule deer are present
- Limited bat, amphibian, or waterbird habitat occurs within 12,000 acres; habitat is available for bats, amphibians, and water birds immediately adjacent to the site
- Limited sage grouse habitat occurs, and three inactive sage grouse lek sites are present
- Moderate diversity of nesting raptors and songbirds occurs, including short-eared owl, red-tailed hawk, and golden eagle
- No federal or state threatened or endangered species are known or likely to occur; BLM Sensitive species include western burrowing owl, prairie falcon, northern harrier, and ferruginous hawk



### Areas of No Ground Disturbance (ROI Two and ROI Three)

Areas that have no proposed ground disturbance, but are part of the proposed airspace expansion, were reviewed. This review produced the following findings for wildlife:

- Pronghorn antelope, mule deer, elk, and California bighorn sheep are present
- Federal and state endangered and threatened species with potential to occur include nesting peregrine falcon and wintering bald eagle
- Federal candidate species known to occur include bull trout and spotted frog
- BLM Sensitive species known or likely to occur include California bighorn sheep, spotted bat, long-eared bat, long-legged bat, Townsend's big-eared bat, white-faced ibis, long-billed curlew, ferruginous hawk, burrowing owl, northern goshawk, mountain quail, sage grouse, loggerhead shrike, northern leopard frog, western toad, longnose snake, western groundsnake, and interior redband trout

# 3.8 BIOLOGICAL RESOURCES

Biological resources are defined as terrestrial and aquatic vegetation; terrestrial wildlife (not including livestock); aquatic animals; and threatened, endangered, and sensitive plant and animal species. For purposes of discussion and analyses, resources have been divided into vegetation, wetlands, rare plants, wildlife habitat, protected and sensitive animal species, large mammals, bats and other small mammals, upland game birds, waterbirds, raptors and other birds, and amphibians and reptiles.

The affected environment for biological resources for the proposed alternatives includes the following: ROI One, including the 12,000-acre training range, the 640- and five-acre no-drop areas, the one- and one-quarter-acre emitter sites, and access roads to these areas; ROI Two, areas adjacent to ROI One and the general area encompassing all emitter sites, no-drop targets and drop target areas; and ROI Three, the lands under the airspace associated with the proposed action or alternatives in Idaho, Oregon, and Nevada. Throughout this section, the discussion for ROI One refers only to undeveloped sites. Because the five-acre no-drop target area referred to as ND-8 and emitter sites BK and AU are already developed, they were not considered in the biological analysis. Discussion of emitter site AV is included as part of the road analysis because this site is located within the right-of-way.

The following general attributes were used to describe baseline conditions for biological resources:

- list of species, habitats, vegetation assemblages, and species assemblages known or with potential to occur within the ROI
- abundance, distribution, habitat requirements, seasonal movements, and diversity of species known to occur within the ROI
- seasonal movements and habitat requirements of mobile species and populations in southern Idaho
- recovery goals and activities for any threatened or endangered species known to occur within the ROI for federally protected species

Described baseline conditions were developed by considering the current effect of military flight training in the region. This considered both location, levels of sortie-operations, and aircraft type (refer to Table 3.0-2).

Biological resources were assessed by combining existing information with the results of field surveys. Existing information was obtained from state and federal agencies including IDFG, Nevada Department of Wildlife (NDOW), Oregon Department of Fish and Wildlife (ODFW), BLM, and U.S. Fish and Wildlife Service (USFWS). Published and unpublished literature were also consulted to obtain information about historical distribution and habitat use of species

likely to occur in the area. Consultations with regional wildlife experts were used to collect baseline data, identify data gaps, and design survey methodologies.

To supplement existing information, field surveys were conducted using accepted survey protocols designed for each resource. Field surveys for vegetation resources included transects within different plant communities, soil and vegetation assessment for wetlands classification, and walking surveys for rare plants within areas of suitable habitat in ROI One.

Walking surveys were conducted by teams of biologists within ROI One for large mammals, reptiles, upland game birds, raptors, and other birds between May and October 1996. Surveys for bats, small mammals, and amphibians were conducted during the same period in areas of suitable habitat within ROI One and included observational and direct sampling. Winter surveys for large mammals, raptors, and upland game birds were conducted from a fixed-wing aircraft at 300 feet AGL over areas of suitable habitat in ROI Two during February 1997.

### 3.8.1 Vegetation

This section describes the vegetation resources, which for this analysis includes terrestrial plants and plant communities, found within the three ROIs. No impacts to vegetation resources are expected within ROIs Two and Three as a result of the proposed action and alternatives, but this information is provided as a basis for the determination of wildlife habitat in these areas. Baseline conditions described represent a synthesis of information derived from literature review, agency consultation and field studies. Data collection methods varied among the three ROIs because of the level of detail needed to perform the analysis. A description of the methods used to identify baseline vegetation resources within each of the ROIs is described below:

*ROI Three.* Vegetation types were identified by using Gap Analysis Project (GAP) maps (scale of 1:250,000) for Idaho, Nevada, and Oregon.

*ROI Two.* A vegetation map at a scale of 1:100,000 was developed using BLM fire history incident reports and maps, natural color aerial photography, soil survey data, and field surveys. Fire history and preburn and post-burn plant communities are discussed to provide a context for wildlife habitat types and availability.

Vegetation types were first delineated with the following broad types: sagebrush, grasslands, wetlands, agricultural, canyon shrublands, and riparian. These preliminary delineations were verified by field visits where shrub cover was visually estimated and average height measured. Sagebrush communities follow nomenclature provided in Hironaka et al. (1983). Vegetation information gathered during a 1994 survey were used in the SCR. This information was collected using similar methods, albeit on a slightly smaller scale.

To provide information for wildlife habitat in ROI Two, the sagebrush communities were further subdivided by the amount of horizontal and vertical cover of sagebrush. Sagebrush

cover classes were 0 to 5 percent, 6 to 15 percent, 16 to 25 percent, or greater than 26 percent; height classes included 1 to 15 inches, 16 to 24 inches, and greater than 25 inches. This provided a mean to assess each area for wildlife habitat. For example, habitat for sage grouse wintering areas included sagebrush with 30 to 50 percent cover and variable height but with some shrubs at least 30 inches tall, while the sage grouse nesting habitat requires as low as 12 percent and upward of 20 to 25 percent cover and 18 to 24 inches tall and a residual herbaceous (e.g., grasses, lupine) component of 6 inches or taller particularly near the base of the nest shrub.

*ROI One.* Characterization of vegetation was based primarily on field surveys conducted in May through September 1996 and existing information, such as soil survey data and aerial photography.

Within ROI One, sampling methods included use of Daubenmire frames (8 inches x 20 inches) and Robel poles. Daubenmire frames provide an area of reference to determine vegetation frequency and canopy cover. Robel poles are used to measure average height of the vegetation.

Systematic random sampling transects were located on a 1:24,000 scale map within the Grasmere and Clover Butte Alternatives, prior to field surveys. Within the Juniper Butte Alternative, only the primary ordnance impact area was sampled. Transects were randomly selected within this area. At each 137-foot transect, the Daubenmire frame was systematically placed at 16-foot intervals along the 137-foot tape to measure canopy cover. Canopy cover was estimated within the Daubenmire plot by using a "projection" of the foliage cover of the plants to the ground surface. Frequency was calculated by using a point intercept method along the 137-foot tape. The point intercept method calculates frequency for each species by the number of times it occurs along the tape at specified intervals.

Plant communities were classified and delineated using the plot samples and a multivariate analysis computer program. For simulated target areas, emitters, roads, and powerlines, the species on site were recorded, height was measured, and cover occularly estimated by experienced botanists.

#### 3.8.1.1 ROI THREE

ROI Three lies within the regional landform and vegetation classification known as the Intermountain Sagebrush Province/Sagebrush Steppe Ecosystem (Bailey and Kuchler 1966), which is widespread over much of southern Idaho, eastern Oregon, eastern Washington, and portions of northern Nevada, California, and Utah. This ecosystem contains a large diversity of landform and vegetation types, ranging from vast expanses of flat sagebrush-covered plateaus to rugged mountains blanketed with juniper woodlands and grasslands. The BLM broadly classifies this area as rhyolite canyonlands/sagebrush-bunchgrass ecosystem, which is widespread over much of southern Idaho, eastern Oregon, southeastern Washington, and portions of northern Nevada, California, and Utah (BLM 1984).

Vegetation types identified by the GAP data for Idaho, Oregon, and Nevada were grouped to allow for analysis of wildlife habitat (Figure 3.8-1). Under ROI Three, 25 plant community types were used for analysis. These 25 categories were then further collapsed by similar vegetation characteristics into seven general vegetation categories (Table 3.8-1).

### 3.8.1.2 ROI Two

No ground disturbance is anticipated within ROI Two outside of the ROI One areas as a result of the proposed actions or alternatives. As such, ROI Two is provided in this baseline analysis not specifically for the vegetation resource analysis, but as a means to establish an analysis area to determine habitat availability for wildlife. Although the exact perimeter is somewhat arbitrary, ROI Two encompasses all ROI One sites including Training Ranges, no-drop target areas, emitter sites, roads, and powerline. Figure 3.8-2 shows the vegetation types in ROIs One and Two. Table 3.8-2 describes the vegetation cover types and acreages in ROI Two. The large size of the area, totaling over 1.5 million acres, provides a means to analyze wide-ranging species such as pronghorn antelope.

The SRP borders ROI Two on the north while the area encroaches the very lower reaches of the Jarbidge Mountains to the south. The elevation ranges from approximately 3,100 feet (950 meters) on the northern boundary to nearly 6,300 feet (1,900 meters) on the southern edge. As such, the salt desert shrub communities are found at lower elevations in the north, as evidenced by saltbush and shadscale which transition to Wyoming big sagebrush in the south. The east and west boundaries are more subtle with no dominant feature or landmark.

Two dominate landscape features within ROI Two are the rolling plateaus and low buttes and the highly dissected canyons. The Bruneau and Jarbidge rivers running north roughly bisect ROI Two. Sheep Creek provides another dominant, deep, narrow canyon north of the confluence of the Bruneau and Jarbidge rivers.

The canyons support a wide variety of plant communities. The river corridor can vary from nearly no vegetation, as a result of scouring by high spring runoff, to narrow meadow communities that include sedges (*Carex* spp.) and rushes (*Juncus* spp.), tall shrub communities such as willows (*Salix* spp.) or willows and rose (*Rosa* spp.), or stringers of cottonwood (*Populus* spp.) communities. The benches can have isolated or small groups of trees, such as juniper (*Juniperus* spp.), hackberry (*Celtis* spp.), mountain mahogany (*Cercocarpus* spp.), or aspen (*Populus* spp.). Basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) communities are found at the edge of the sandbars, at the confluence of creeks, and around some seeps. The slope of canyons have a wide variety of shrubs, but are dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). On these slopes, sagebrush is joined in low densities with other shrubs such as rabbitbrush (*Chrysothamnus* spp.), golden currant (*Ribes aureum*), bitterbrush (*Purshia tridentata*), four-wing saltbush, and shadscale (*Atriplex* spp.). Dominant grass species vary according to moisture regime with bluebunch wheatgrass (*Agropyron spicatum*) on the south-facing slopes, Idaho fescue (*Festuca idahoensis*) dominating the more

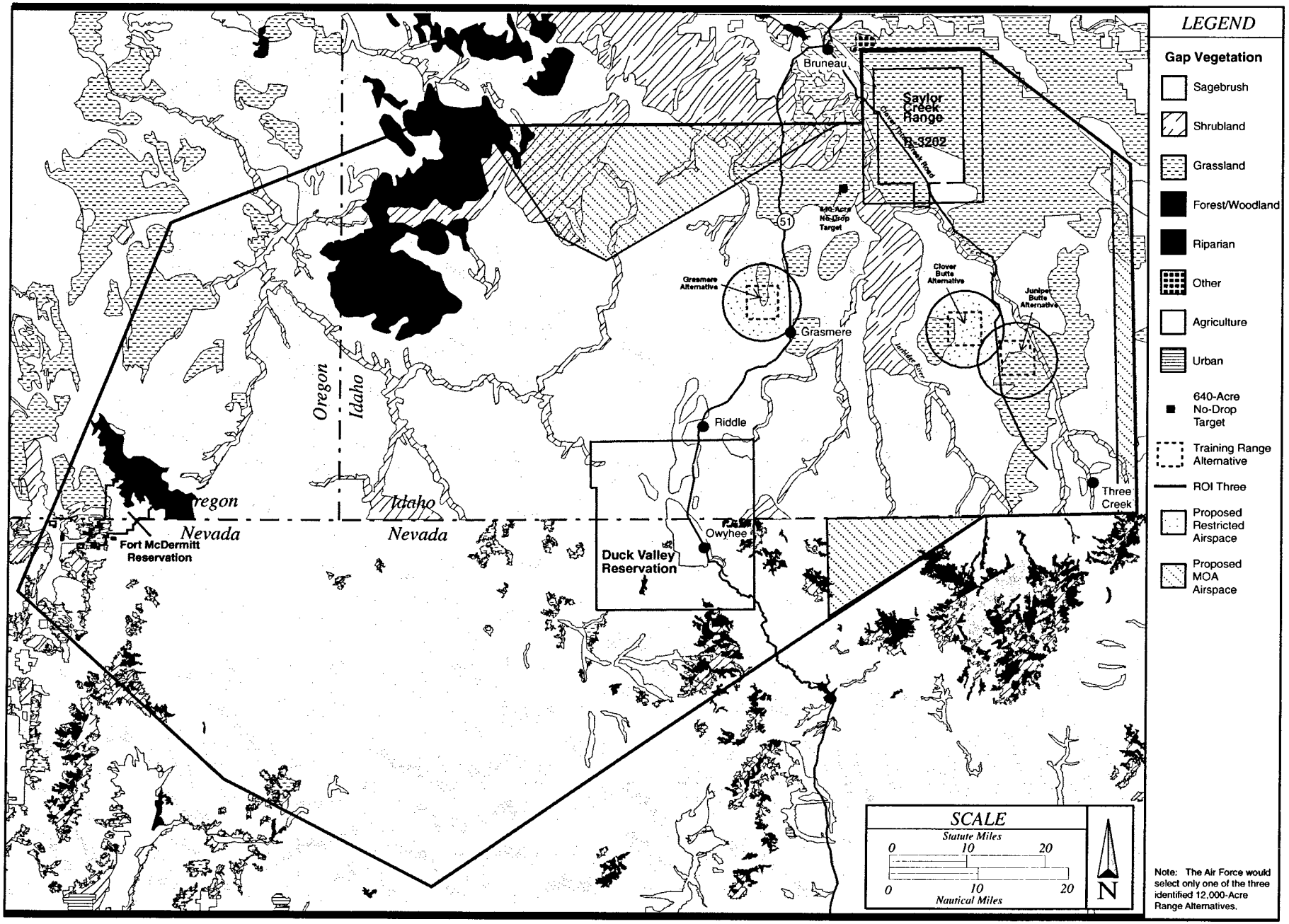



**Figure 3.8-1 Vegetation Types in ROI Three**

**Table 3.8-1. Vegetation Types Found in ROI Three and Associated Acreage**

| *Vegetation Type* | *Acres* |
|---|---|
| Grasslands<br>Crested wheatgrass<br>Annual grassland<br>Perennial bunchgrass<br>Alpine grassland | 556,287 |
| Sagebrush<br>Big sagebrush<br>Low sagebrush-steppe<br>Silver sagebrush playa<br>Mountain sagebrush<br>Big-low sagebrush mosaics | 4,701,085 |
| Shrubland<br>Canyon shrub[1]<br>Mountain brush<br>Salt desert shrub<br>Greasewood | 494,956 |
| Forest/Woodland<br>Aspen<br>Juniper<br>Douglas fir<br>Sub alpine conifer<br>Mountain mahogany | 272,157 |
| Riparian<br>Meadow<br>Riparian<br>Water | 2,872 |
| Agricultural | 133,896 |
| Urban | 1,149 |
| **Total** | **6,163,303** |

Note: 1. Includes Juniper, Mountain Mahogany, Serviceberry, Chokecherry, Currant, and Rose.

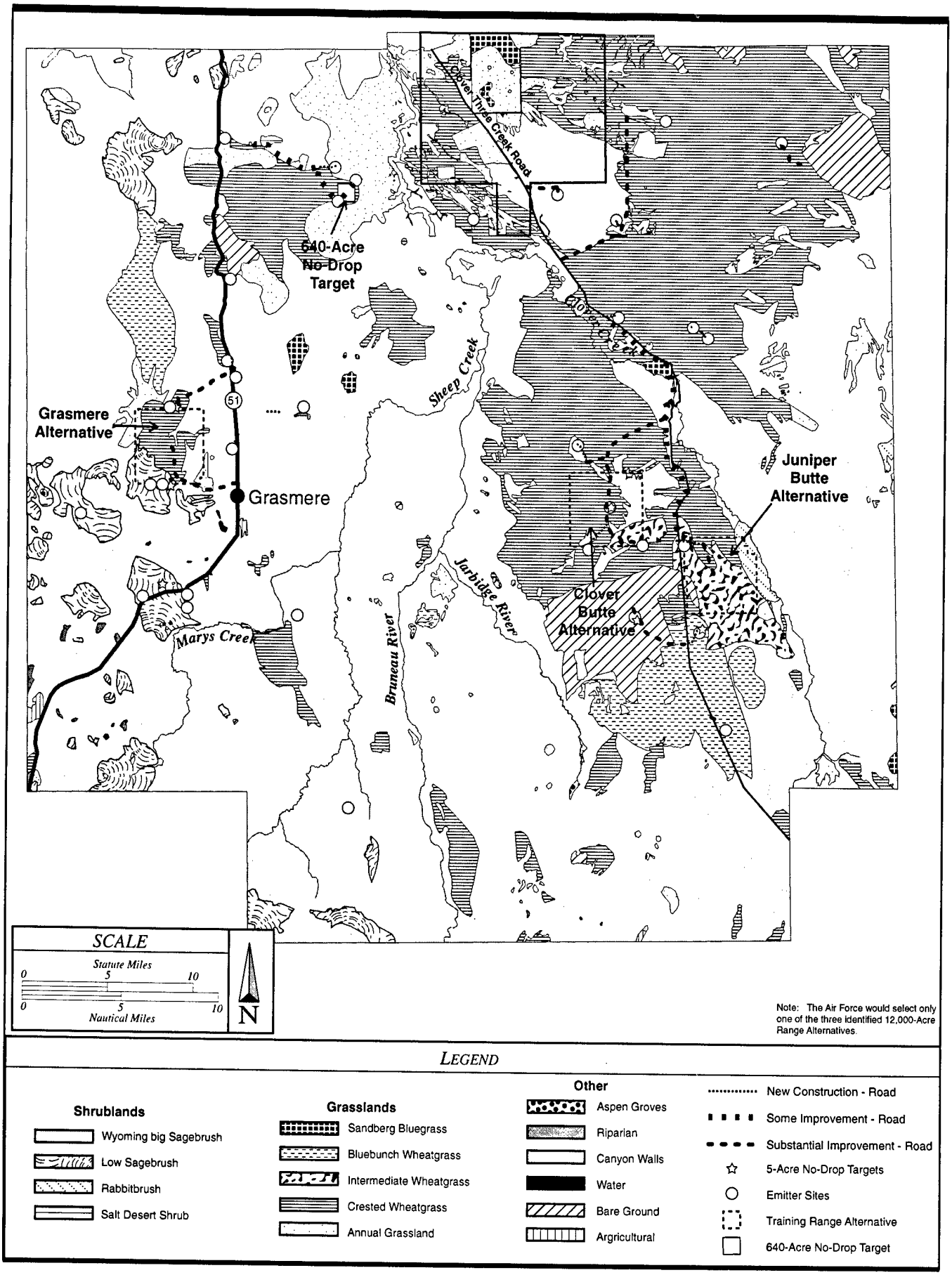



**Figure 3.8-2 Vegetation Types in ROI One and ROI Two**

| Table 3.8-2. Vegetation Cover Types and Acreages Found in ROI Two | |
|---|---|
| *Plant Community Types* | *Total Acres* |
| **Shrublands** | |
| Wyoming big sagebrush | 1,020,484 |
| Low sagebrush | 47,207 |
| Rabbitbrush | 4,366 |
| Salt desert shrub | 7,140 |
| **Grasslands** | |
| Sandberg's bluegrass | 6,427 |
| Bluebunch wheatgrass | 46,192 |
| Intermediate wheatgrass | 17,126 |
| Crested wheatgrass | 377,387 |
| Annual grassland | 104,054 |
| **Other** | |
| Aspen groves | 249 |
| Agricultural | 1,360 |
| Riparian | 5,564 |
| Bare ground (recently burned) | 43,217 |

mesic north slopes, and Great Basin wildrye (*Elymus cinereus*) in the more moist areas around seeps and along sand bars and draws and at the base of rimrock.

Although the canyon environment has the highest biological diversity within ROI Two, the rolling plateaus and low buttes dominate the landscape. These topographically subtle areas contain vast areas of Wyoming big sagebrush communities that existed prior to European settlement. These areas are accented by low cliffs with short rubble slopes that harbor dense shrub-steppe communities of Wyoming big sagebrush, rabbitbrush, bitterbrush, and golden currant, bluebunch wheatgrass, and Great Basin wildrye. Wyoming big sagebrush/Idaho fescue and Wyoming big sagebrush/bluebunch wheatgrass plant communities dominate ROI Two. In undisturbed areas, the ground is covered by lichen and mosses forming a cryptogamic crust (Anderson et al. 1982). Grazing or other disturbances may destroy this crust and provide openings for weedy species. Most of the grasses are found under the sagebrush plants and the ground is bare in the opening between. However, while there is a distinct correlation between grazing and a lack of cryptogamic crust development, other factors such as elevation, precipitation or ground cover, may also influence crust presence. Cheatgrass (*Bromus tectorum*) is a common non-native grass, which in the northern, drier, half of ROI Two can form a dense stand after disturbance (i.e., fire). Low sagebrush (*Artemisia arbuscula*) and mixed low sagebrush and Wyoming big sagebrush plant communities are found on the stony and gravely ridges in the western part of ROI Two. Rabbitbrush is found in swales, especially in areas that have been burned.

Intensive livestock grazing, fire, and range reseeding programs have altered the uplands vegetation especially in the northern half of ROI Two. The Jarbidge Resource Area has had numerous fires and repeat fires resulting in a conversion from sagebrush grasslands to grasslands. These grasslands are dominated by crested wheatgrass and intermediate wheatgrass that have been seeded into the area and exotic annual grasslands (i.e., cheatgrass). The effect of conversion from sagebrush to grasslands on fire spread is well illustrated in the following example. In 1996, the Clover Butte Complex burned approximately 80,000 acres when three separate fires burned together. Portions of this area had burned prior to 1990 and were reseeded to crested wheatgrass by the BLM. The crested wheatgrass and the increase in cheatgrass then provided the fine fuels that easily ignite and carry fire for large distances. The following section provides information on the fire history for ROI Two.

### *FIRE HISTORY*

As illustrated above, there is a fundamental relationship between vegetation and spread of fire. Fires can have a devastating and long-lasting effect on shrubs in sagebrush-grass communities (Wright and Bailey 1982). Big sagebrush, a non-sprouter, is highly susceptible to fire injury (Pickford 1932; Blaisdell 1953). Although big sagebrush communities will carry fire, low productivity of these communities provides for a fairly low rate of spread prior to invasion of cheatgrass.

Because the Wyoming big sagebrush community grows in areas of low precipitation, and warm, dry summers, forage production is low and perennial grasses are non-continuous and of low density (Hironaka et al. 1983). Because of these conditions, burning can be difficult and fire spreads slowly (Wright et al. 1979). Fire spread in these communities may average 300 acres per day; by comparison, under the same weather conditions and fuel moisture, the rate of spread in grassland types may exceed several hundred acres per hour. But when fires do occur, Wyoming big sagebrush is slow to reestablish itself and fast-growing, annual species invade. These species include cheatgrass and other native and non-native species. In addition, the BLM has seeded burned areas in crested wheatgrass, a non-native perennial species. These grasses form a continuous, fine fuel source that ignites easily and allows fire to spread rapidly.

The BLM fire frequency data (unpublished data) report 41 fires within ROI Two between 1991 and 1995 (Table 3.8-3). Mapped fire location data provide additional information on fires within the two Resource Areas. The BLM has developed a map of fire occurrences within Jarbidge Resource Area according to those pre-1990 and post-1990. In addition, between 1985 and 1995, Bruneau Resource Area has mapped individual fires associated with their fire frequency files.

The Jarbidge Resource Area has a history of numerous, large fires including large areas that have burned repeatedly. Between 1991 and 1995, 32 of the 41 fires recorded in ROI Two occurred on the Jarbidge Resource Area, burning a total of 142,896 acres. By contrast, the Bruneau Resource Area had only nine fires which resulted in 2,571 acres burned. A large portion of the human-caused fires occur in late summer or early fall, perhaps due to the increase in human activity during hunting season. In addition, many of these same areas are susceptible to burning on an annual or biannual basis because of the increase in continuous fine fuels after an initial fire.

The Boise District BLM provides fire protection for the area under ROI Two. Based on similarity of the fuel types, the Boise District has established four major FMZs, two of which, FMZ 1 and FMZ 2, lie within ROI Two. These FMZs include annual grasslands (FMZ 1) and sagebrush and perennial grasses (FMZ 2). The fuels associated with each FMZ have different fire risks. Additional information on FMZ may be found in the safety section 3.3.1 on Fire Risk and Management/Ground Safety.

The current BLM Fire Management Activity Plan Update (April 23, 1996), and state fire management suppression policy for both the Jarbidge and Bruneau Resource Areas state that all fires on or threatening public lands will be aggressively attacked and suppressed.

### 3.8.1.3 ROI ONE

Using existing information and the transect methods described above, the vegetation located within the proposed training ranges within ROI One was classified into 14 plant community types, including bare ground (Table 3.8-4). A description of each of these types is provided in Appendix L.

**Table 3.8-3. Fire History of ROI Two between 1991 and 1995**

| *Year* | *Fire #* | *Name* | *Cause* | *Date* | *Acres* | *BRA* | *JRA* |
|---|---|---|---|---|---|---|---|
| 1995 | F010 | Hotsprings | Human | 14-Jun | 30 | | X |
| | F022 | Blackstone | Lightning | 6-Jul | 236 | X | |
| | F031 | Cedar Mesa | Lightning | 9-Jul | 5 | | X |
| | F032 | Black Butte | Lightning | 9-Jul | 512 | | X |
| | F047 | Three Creek | Human | 26-Jul | 2426 | | X |
| | F064 | Clover Complex | Lightning | 29-Jul | 64193 | | X |
| | F068 | South Clover | Lightning | 29-Jul | 13456 | | X |
| | F069 | Inside Desert | Lightning | 29-Jul | 4312 | | X |
| | F070 | Blue Gulch | Lightning | 29-Jul | 15236 | | X |
| | F074 | Ranger | Human | 5-Aug | 1 | X | |
| | F075 | Clover Creek | Lightning | 29-Jul | 35 | X | |
| | F089 | Big Draw | Lightning | 22-Aug | 133 | | X |
| | F090 | Millertab | Lightning | 22-Aug | 1583 | X | |
| | F100 | Heil Well | Lightning | 3-Sep | 1660 | | X |
| | F135 | Signal Butte | Human | 15-Oct | 6698 | | X |
| 1994 | F082 | Coonskin Rd | Human | 19-Jun | 56 | | X |
| | F087 | Pot Hole South | Lightning | 22-Jun | 201 | | X |
| | F111 | Middle Butte | Human | 17-Jul | 969 | | X |
| | F113 | Crawfish Spring | Human | 18-Jul | 2889 | | X |
| | F116 | Clover Butte | Lightning | 22-Jul | 25 | | X |
| | F117 | Blue Butte | Lightning | 23-Jul | 4 | | X |
| | F157 | Crows Nest | Human | 2-Sep | 8045 | | X |
| 1993 | F014 | MP 51/Hwy 51 | Human | 10-Jul | 1 | X | |
| | F044 | Saylor Creek #1 | Lightning | 14-Aug | 205 | | X |
| | F045 | Saylor Creek #2 | Lightning | 14-Aug | 416 | | X |
| 1992 | F215 | Echo | Lightning | 9-Jun | 797 | | X |
| | F219 | Saddle Creek | Lightning | 10-Jun | 1 | | X |
| | F220 | Flat Springs | Lightning | 10-Jun | 1 | | X |
| | F265 | Grainery | Human | 6-Aug | 38 | X | |
| | F286 | Well Field | Lightning | 21-Aug | 12677 | | X |
| | F290 | Curtis Draw | Human | 27-Aug | 81 | | X |
| | F304 | Cowan Res. | Human | 30-Sep | 593 | | X |
| 1991 | F120 | Jarbidge | Lightning | 13-Jul | 3069 | | X |
| | F121 | Saylor Creek | Lightning | 13-Jul | 35 | | X |
| | F127 | 3 Creek Well | Lightning | 14-Jul | 3757 | | X |
| | F128 | Countyline | Lightning | 14-Jul | 174 | | X |
| | F144 | Alder | Lightning | 28-Jul | 661 | X | |
| | F154 | Over | Lightning | 3-Aug | 9 | X | |
| | F162 | Deadwood Creek | Lightning | 18-Aug | 7 | X | |
| | F180 | Cross Road | Human | 1-Sep | 3 | | X |
| | F181 | Big Ben | Human | 2-Sep | 237 | | X |
| **TOTAL** | | | | | **145,467** | **9** | **32** |

Source: BLM 1996 unpublished data.

**Table 3.8-4. Plant Community Types and Acreages Found within the Proposed Training Ranges**

| *Plant Community Type* | *Clover Butte (acres)* | *Grasmere (acres)* | *Juniper Butte (acres)* |
|---|---|---|---|
| ***Shrublands*** | | | |
| **Wyoming big sagebrush/Sandberg's bluegrass** *(Artemisia tridentata* var. *wyomingensis/Poa secunda)* | 4,197 | 2,429 | 0 |
| **Wyoming big sagebrush/bluebunch wheatgrass** *(Artemisia tridentata* var. *wyomingensis/Agropyron spicatum)* | 0 | 1,644 | 0 |
| **Wyoming big sagebrush/Bluebunch-Low sagebrush/Idaho fescue** *(Artemisia tridentata* var. *wyomingensis/Agropyron spicatum-Artemisia arbuscula/Festuca idahoensis* | 0 | 176 | 0 |
| **Wyoming big sagebrush/golden currant/bluebunch wheatgrass** *(Artemisia tridentata* var. *wyomingensis/Ribes aureum/Agropyron spicatum)* | 0 | 187 | 0 |
| **Low sagebrush/Idaho fescue** *(Artemisia arbuscula/Festuca idahoensis* | 0 | 2,447 | 0 |
| **Rabbitbrush/Intermediate wheatgrass** *(Chrysothamnus* spp./*Agropyron intermedium)* | 0 | 0 | 1,876 |
| **Tall shrubs** | 0 | 52 | 0 |
| ***Grasslands*** | | | |
| **Crested wheatgrass** *(Agropyron cristatum)* | 6,118 | 3,066 | 2,286 |
| **Intermediate wheatgrass** *(Agropyron intermedium)* | 136 | 0 | 6,877 |
| **Cheatgrass** *(Bromus tectorum)* | 477 | 233 | 34 |
| **Bluebunch wheatgrass** *(Agropyron spicatum)* | 0 | 664 | 0 |
| **Sedge/Rush meadow** *(Carex/Juncus* spp.*)* | 0 | 32 | 0 |
| ***Other*** | | | |
| **Tumble mustard** *(Sisymbrium altissimum)* | 867 | 0 | 0 |
| **Bare ground (recently burned)** | 0 | 0 | 465 |
| **Total acres native plant communities** | 4,197 | 7,609 | 1,876 |
| **Total acres non-native plant communities** | 7,598 | 3,299 | 9,661 |
| **Total acres** | 11,795 | 10,908 | 11,537 |

Using these types, the vegetation within each of the three Training Ranges was mapped and digitized into the Geographic Information System (GIS). A description of the vegetation for each component of the three alternatives within ROI One follows.

### *CLOVER BUTTE*

A total of five plant communities were identified in the Clover Butte training range: crested wheatgrass (*Agropyron cristatum*), intermediate wheatgrass (*A. intermedium*), tumble mustard (*Sisymbrium altissimum*), cheatgrass and Wyoming big sagebrush (Table 3.8-4 and Figure 3.8-3). Approximately 65 percent (7,598 acres) of the vegetation found within the Clover Butte training range is dominated by non-native plant communities as a result of previous fire and subsequent rehabilitation efforts.

Non-native seed mixes are used for rehabilitation efforts following fire because of the limited availability of native plant materials. As a result, within these seeded or non-native grasslands only two native species were notable: phlox (*Phlox* spp.), and Sandberg's bluegrass. Sagebrush or other shrub species in these areas are lacking. The fire and subsequent seeding with non native species sharply reduced native plant cover. In addition, large portions of these communities are dominated by a high percentage of bare ground due to recent burning. The tumble mustard community occupies the steeper slopes on the western and southern portion of the Clover Butte site. These areas were planted with crested wheatgrass, but it is sparse underneath the dense cover of tumble mustard.

The Wyoming big sagebrush/Sandberg's bluegrass stands at Clover Butte are fairly uniform in character. The average height of the sagebrush is 25-29 inches and the average cover is between 13 and 30 percent. The understory cover is dominated by cheatgrass but Sandberg's bluegrass is a co-dominant in some areas with scattered bottlebrush squirreltail (*Sitanion hystrix*), phlox, buckwheat (*Eriogonum* spp.), Indian paintbrush (*Castilleja* spp.), lupine (*Lupinus* spp.), milkvetch (*Astragalus* spp.), aster (*Aster* spp.), fleabane (*Erigeron* spp.), and wild onion (*Allium* spp.). Little cryptogamic crust is present because of past disturbances.

The primary ordnance impact area is completely within the above-described crested wheatgrass plant community.

### *GRASMERE*

The proposed Grasmere training range has the highest diversity of plant communities of the three proposed training ranges with a total of 11 plant communities mapped (Table 3.8-4 and Figure 3.8-4). This diversity is largely because of the windswept ridges, steep slopes with scattered seeps, canyons, and riparian areas located in the western half of the site. The wind swept ridges are dominated by barren rhyolite gravels with a typically sparse low sagebrush/ Idaho fescue plant community. This community type steps down the shallow benches on the southwestern corner of the site. Other shrubs that may be found growing with the low sagebrush are rabbitbrush (*Chrysothamnus* spp.) and especially in the rocky areas, gutereizia

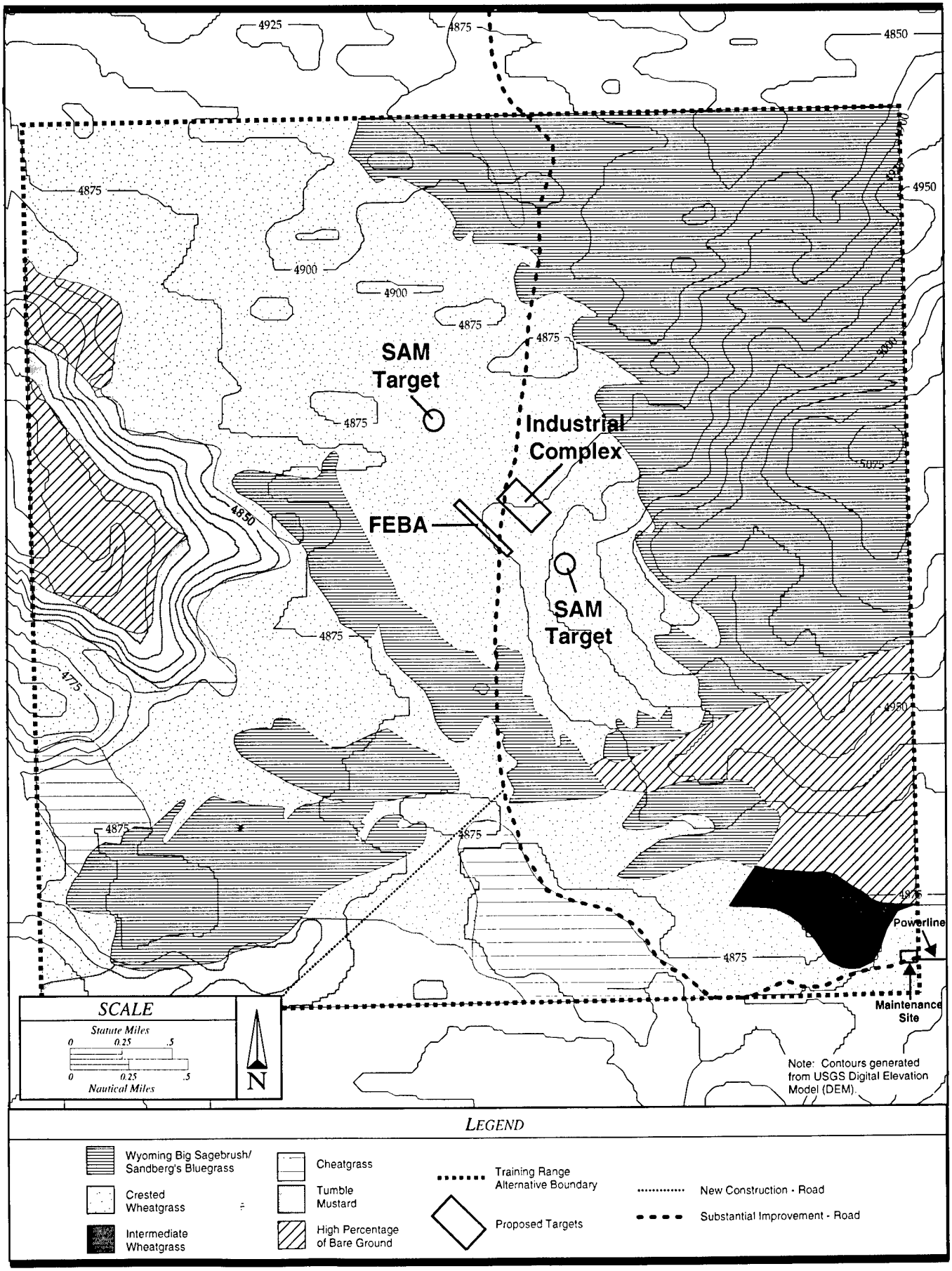



**Figure 3.8-3 Vegetation within Alternative B - Clover Butte**

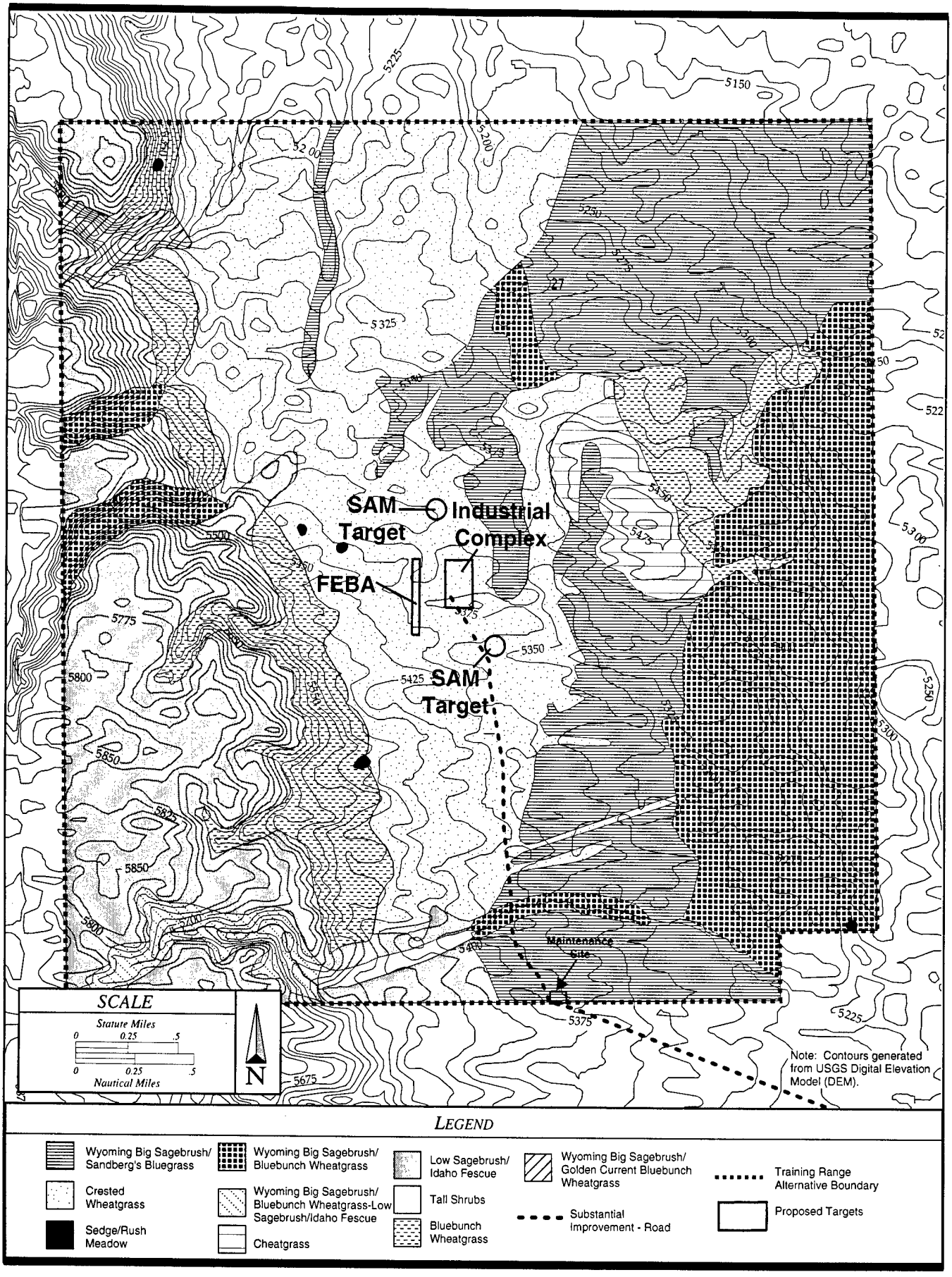



**Figure 3.8-4 Vegetation within Alternative C - Grasmere**

(*Gutierrezia sarothrae*) co-dominates with low sagebrush. Numerous forbs are found in the early spring such as monkeyflower (*Mimulus nanus*), phlox, Indian paintbrush, larkspur (*Delphinium* spp.), wild onions, rayless daisies, (*Erigeron aphanactis),* low hawkweed, (*Crepis* spp.), Hooker's balsamroot (*Balsamorhiza hookerii*), rock rose (*Lewisia rediviva*), and milkvetch.

The low sagebrush and Wyoming big sagebrush communities co-dominate some areas on the canyon slopes. The Wyoming big sagebrush grows on the areas with the deeper soils, while the low sagebrush inhabits the shallower ledges and rocky areas. Forb species from both the Wyoming big sagebrush and low sagebrush communities may be found in this area.

The canyons are dominated by Wyoming big sagebrush/bluebunch wheatgrass communities with some reaches abundant with golden currant. Other species found within this community are Hooker balsamroot, Indian paintbrush, aster, wild onions, phlox, and Sandberg's bluegrass. Great Basin wildrye is found along the lower slopes along with numerous tall forbs, such as nettle-leaf horsemint (*Agastache urticifolia*). Narrow riparian areas within the canyons are dominated by tall shrub communities of willows and interior rose and areas of wet meadows of sedges and rushes. However, many of these drainages do not contain sufficient moisture to have a marked difference in vegetation from the hillsides.

The Wyoming big sagebrush communities dominate the eastern half of the site and extend around the base of Poison Butte. The average height of the Wyoming big sagebrush is 19 to 24 inches and the average cover is between 13 and 30 percent. The understory is composed of either Sandberg's bluegrass or bluebunch wheatgrass. Associated species include bottlebrush squirreltail, phlox, buckwheat, Indian paintbrush, lupine, Indian ricegrass (*Oryzopsis hymenoides*), milkvetch, aster, fleabane, and wild onion. Only very small areas of cryptogamic crust remains due to the presence of livestock grazing and also seeding (Anderson et al. 1982).

The center third of the site is dominated by native and non-native grasslands. Crested wheatgrass dominates the past burn as a result of rehabilitation effort. The primary ordnance impact area is proposed within this area. The lower southwest slope of Poison Butte, which was burned but not reseeded, is currently dominated by annual grasslands (cheatgrass) and exotic weeds, including tumble mustard and clasping-leaf peppergrass (*Lepidium perfoliatum*). The remaining areas of the past burn (lower eastern-facing slopes of the previously discussed ridge and southwestern part of Poison Butte) are dominated by bluebunch wheatgrass.

Associated grasslands within these areas include needle-and-thread grass (*Stipa comata*), Idaho fescue, and Sandberg's bluegrass.

One noxious weed species, as defined by the State of Idaho Noxious Weed List, whitetop (*Cardaria draba*), was found on the Grasmere site.

***JUNIPER BUTTE***

Approximately 84 percent of the proposed Juniper Butte training range is dominated by non-native plant communities as a result of recent fires or past fires and rehabilitation efforts (Table

3.8-3). Intermediate wheatgrass and crested wheatgrass dominate the site, totaling 9,163 acres (Figure 3.8-5). The proposed primary ordnance impact area is dominated by a stand of cheatgrass surrounded by intermediate wheatgrass and rabbitbrush. Rabbitbrush, a native seral species, has reestablished in the lower sandy soil areas within the intermediate wheatgrass seedings. The shrub cover provided by rabbitbrush ranges from 6 to 25 percent and the height ranges between 19 to 24 inches. Within this community, there are patches of dense cheatgrass. However, 169 acres of rabbitbrush fall into the classification of a native plant community based on shrub species dominance and percent cover (16-25 percent). Associated species within the rabbitbrush community are clasping-leaf peppergrass, cheatgrass, phlox, tragopogon (*Tragopogon dubius*), Sandberg's bluegrass, bottlebrush squirreltail, and bluebunch wheatgrass.

### *NO-DROP TARGET AREAS*

One (ND-4) of the seven no-drop target areas contains sagebrush-grassland vegetation, for a total of 5 acres of native vegetation (Table 3.8-5). The remaining six undeveloped no-drop target areas (ND-1, ND-2, ND-5, ND-6, ND-8, ND-7) contain crested wheatgrass (655 acres), bare ground (five acres), and annual grasslands (five acres). A total of 640 acres of the crested wheatgrass is located within no-drop target area ND-1. The additional 15 acres of crested wheatgrass are located within ND-5, ND-6, and ND-7.

### *EMITTER SITES*

Vegetation located within each specific emitter site is summarized in Table L-1, Appendix L. A total of 4.25 acres of native vegetation occurs at the emitter sites. An additional 4.5 acres of crested wheatgrass, 1.25 acres of bare ground, and 5.0 acres of annual weedy species occur at the remaining sites. The emitter site locations were selected to avoid native plant communities where feasible.

**Table 3.8-5. Summary of Vegetation Types Located within No-Drop Target Areas**

| *No-drop Target Areas* | *Acres* | VEGETATION TYPES | | |
|---|---|---|---|---|
| | | *Sagebrush-grasslands* | *Crested wheatgrass* | *Annual grasslands* |
| **ND-1** | 640 | | X | |
| **ND-2** | 5 | | | X |
| **ND-4** | 5 | X | | |
| **ND-5** | 5 | | X | |
| **ND-6** | 5 | | X | |
| **ND-7** | 5 | | X | |
| **ND-8 (previously developed)** | 5 | | | |




**Figure 3.8-5 Vegetation within Alternative D - Juniper Butte**

### *ROADS*

The total acres of vegetation located along proposed new roads and powerlines varies for each alternative. Table 3.8-6 summarizes the total acres of native and non-native vegetation along proposed new road construction and powerlines.

**Table 3.8-6. Acreages of Vegetation Occurring along Proposed New Roads and Powerlines**

| *Type of vegetation* | *Alternative B Clover Butte* | *Alternative C Grasmere* | *Alternative D Juniper Butte* |
|---|---|---|---|
| Native vegetation | 515 | 511 | 522 |
| Non-native vegetation | 1,251 | 1,335 | 1,365 |
| Total acres | 1,766 | 1,846 | 1,887 |

### *SAYLOR CREEK RANGE*

Plant communities on SCR were classified and delineated during an ecosystem survey of the range in 1994 (Air Force 1996a). Within the 110,000-acre range, the dominant plant communities are crested wheatgrass covering 51,354 acres, mixed cheatgrass/Sandberg's bluegrass (28,484 acres), Wyoming big sagebrush (19,271 acres), and cheatgrass (6,329 acres). Livestock grazing, fires, and BLM reseeding programs have altered the vegetation so that most of the range outside of the exclusive use area is now dominated by non-native grasses such as crested wheatgrass and cheatgrass.

As a result of prescribed burns and accidental fires, the 12,200-acre exclusive use area (EUA) includes grassland areas dominated by Sandberg's bluegrass and other areas dominated by non-native grasses and herbaceous species such as prickly lettuce and Russian thistle. In large portions of the EUA, Sandberg's bluegrass, bottlebrush squirreltail, and other native grasses and forbs recovered following fire, as indicated by the high percent cover. Outside of the EUA, where BLM reseeded with crested wheatgrass following fires, bluegrass is not as abundant. An aggressive fire prevention effort at SCR includes maintaining target areas and a 300-foot-wide fire break around the perimeter of the EUA.

In 1994, Mountain Home AFB commenced a sagebrush-grassland restoration research project in the southwestern corner of the exclusive use area in an effort to develop and test rehabilitation methods to re-establish the native vegetation. Use of this research area for training ordnance delivery is now prohibited.

### 3.8.2 Wetlands

The high desert of Owyhee County has a scattering of small wet depressions, springs, and occasional canyons and arroyos that contain water for a sufficient period to support wetlands. Because wetlands are so rare, they are a critical resource for the survival of many wildlife species and represent a unique biotic ecosystem for a variety of plant and invertebrate species. They provide breeding, rearing, and feeding grounds, thermal shelter, and hiding cover for many species of animals. Reduction of these wetlands could cause a decrease in the species dependent on them. Wetlands perform physical and chemical functions essential for health of an ecosystem, including surface and subsurface storage of water, microbial processing, and organic carbon export, among others.

Wetlands are regulated under the CWA. Section 404 of the Act regulates the discharge of dredge or fill materials into "waters of the U.S.," including wetlands. The USACE administers Section 404 of the program and is responsible for jurisdictional wetland determinations, evaluating and issuing permit applications, and enforcement actions. E.O. 11990, Protection of Wetlands, requires all federal agencies to consider wetland protection in their decisionmaking. The USFWS and, in Idaho, the IDFG have an advisory role under Section 404.

"Waters of the U.S." that are regulated under the CWA include water bodies such as lakes and ponds and unvegetated streambeds, in addition to vegetated wetlands. Unvegetated streambeds are regulated when the area is subject to inundation by the ordinary high waters. The "ordinary high water mark" on non-tidal rivers is the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas.

Jurisdictional waters of the U.S. located at the alternative sites are limited in value. These sites are usually narrow unvegetated drainages which rarely contain water (ephemeral) and provide little or no fish and wildlife habitat. These ephemeral areas primarily carry off excess run-off and rarely pond or retain water.

Wetlands have been defined by scientists and government agencies using many different criteria and standards. Most definitions recognize the interaction of hydrology, soils, and vegetation in creating physical and biological characteristics unique to wetlands. For the purposes of assessment when a federal action is proposed, wetlands are identified and delineated using the USACE *Wetlands Delineation Manual* (USACE 1987). This method defines wetlands as areas with the following attributes:

> The site supports predominantly hydrophilic vegetation, or vegetation in the area is dominated primarily by species that are almost always (obligate) or often (facultative) found in wetland plants.

The substrate is predominantly hydric soil. Hydric soils (soils formed under wetland conditions) are a positive indicator of wetland conditions. Hydric soil is defined as a soil "that in its undrained condition is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic [wetland] vegetation" (SCS 1987). Classification of hydric and non-hydric soils follows the SCS (1987) list.

Wetland hydrology is present when the substrate is saturated or inundated by water for a period greater than 12.5 percent of the growing season each year (or in atypical situations between 5 and 12.5 percent of the growing season). Typically, wetland hydrology occurs where the presence of water has an overriding influence on vegetation and soils, resulting in the development of wetland soils and wetland plant communities. Sites with wetland hydrology are periodically inundated and/or saturated during part of the growing season. Wetland hydrology normally exists where topography directs water into low relief areas dominated by soils with poor drainage characteristics. Inundation or soil saturation were the most obvious indicators of wetland hydrology. Where saturation was absent, other indications of seasonal flow or flooding were used.

Jurisdictional wetlands are identified by examining vegetation, soils, and hydrology for wetland or upland characteristics. Sites that display characteristics of all three wetland parameters are considered wetlands. This multi-parameter approach provides a logical, technical basis for determining jurisdictional wetlands.

Another wetland classification system useful for describing wetlands on the basis of hydrology, geology, and vegetation was published by the USFWS (Cowardin et al. 1979). This is a hierarchical classification scheme that includes a categorization at the system, class, and subclass levels with modifiers to describe wetlands. It uses a multi-faceted approach that incorporates a combination of features including topography, substrate, water regime, and vegetation. This system was used in a national effort by the USFWS to map wetlands using aerial photography and other more detailed sources when available. The National Wetlands Inventory (NWI) maps and reports (1989) were the product of this effort.

Wetland types that occur in the study area fit one of the following descriptions according to Cowardin:

*Riverine* comprises all wetland and deep water habitat confined within a channel, except wetlands dominated by trees, shrubs, or persistent emergents. A channel may be natural or artificially created which, at least periodically, contains moving water. The Riverine system is comprised of four subsystems, but only two are found in the 12,000-acre training range. Upper perennial and intermittent are characterized by stream velocity, water permanence, gradient, substrate, and extent of floodplain development. Riparian areas are not considered to be jurisdictional wetlands unless all three wetland parameters (e.g., hydric soils, hydrophytes, and hydrology) are present; however, most

unvegetated riverine channels are considered jurisdictional "waters of the United States."

*Palustrine* consists of nontidal wetlands dominated by trees, shrubs, or persistent emergents. This system also includes wetlands lacking vegetation if (1) the area is less than 20 acres in size; (2) active wave-formed or bedrock shoreline features are lacking; and (3) water depth is less than 6.6 feet in the deepest part at low water.

Classes, subclasses, and modifiers are added to the classification scheme to more sufficiently describe the wetlands. The following four classes of wetland are found within the 12,000-acre training range of ROI One.

*Unconsolidated Shore* has unconsolidated substrates with less than 75 percent areal cover of stones, boulders, or bedrock; less than 30 percent areal cover of vegetation other than pioneering plants; and any of the following water regimes: irregularly exposed, regularly flooded, irregularly flooded, seasonally flooded, temporarily flooded, intermittently flooded, saturated, or artificially flooded.

*Streambed* is limited to the intermittent subsystem of the riverine system and varies greatly in substrate.

*Emergent* has hydrophytic vegetation that is erect, rooted, and herbaceous, excluding mosses and lichens. Vegetation is present during most of the growing season and perennials are usually dominant.

*Scrub-Shrub* is dominated by woody vegetation less than 20 feet tall.

Water regime forms an important modifier in the classification and describes at what season(s) and for what duration a wetland is inundated with water. The following five water regimes occur within the 12,000-acre training range of the proposed action or alternatives:

*Intermittently flooded* wetlands are covered for variable periods without any detectable seasonal periodicity.

*Permanently flooded* wetlands are covered year-round and obligate hydrophytes are found.

*Seasonally flooded* is present during the early period of the growing season.

*Saturated* wetlands are present when surface water is seldom present, but the substrate is saturated during part of the growing season.

*Temporarily flooded* wetlands are covered only briefly during the growing season.

The only other special modifiers applicable to the conditions in the ROI One target areas are diked/impounded and excavated wetlands. Both are human-caused and purposefully or unintentionally obstruct the flow of water.

## METHODS

Field surveys specifically for wetlands were limited to the proposed Grasmere, Clover Butte, and Juniper Butte 12,000-acre training range alternatives, roads, and powerline. Emitter sites were specifically located to avoid wetlands and the no-drop target areas did not have wetlands as evidenced by NWI maps and field surveys for other vegetation resources.

Prior to field studies, biologists reviewed NWI maps to identify potential wetlands. To identify hydrophytic plants, soils, and wetland hydrology, sample plots were located in wetlands identified in the three target areas. The USFWS classification of wetlands (Cowardin et al. 1979) differs from the USACE wetlands delineation method (USACE 1987) in that the former is a classification system that describes and categorizes various types of wetlands, and the latter is a method to delineate a wetland-upland boundary for compliance with USACE regulations. Wetland-upland boundaries are required by the USACE for the issuance of permits under Section 404 of the CWA. The focus that the USFWS had in developing the classification system for wetlands was to "provide basic data on the characteristics and extent of the Nation's wetlands and facilitate the management of these areas" (Cowardin et al. 1979); whereas, the focus in using the USACE wetland delineation method is to quantify the amounts and exact locations of wetlands for the purpose of issuing or denying permits for the dredging or filling of wetlands. As such, both systems have been used for the ETI project for different purposes.

NWI maps, based on the USFWS (Cowardin) classification system, were used for wetlands identification at the proposed tactical training ranges. The NWI maps depict the general locations and extent of wetlands and were used to focus field efforts. The wetland habitats were described in accordance with the USFWS (Cowardin) classification system that incorporates standard hydro-geomorphic and ecological characteristics. Furthermore, wetland delineation's were conducted in the field, in accordance to the USACE method, to map the extent of any wetlands that can be regulated under the CWA.

Field surveys were performed between June 11-13, 1996 for Grasmere; July 8, 1996 for Clover Butte; and October 9-10, 1996 for Juniper Butte. Sample sites were selected to represent the range of wetlands found at the site. Information on existing vegetation soils and hydrology at each wetlands sample site was recorded on Data Form 1 from the 1987 USACE *Wetlands Delineation Manual*. The Routine On-site Determination method was employed due to the small size and relative homogeneity of wetlands in the 12,000-acre training range.

Vegetation at potential wetlands was described by identifying each plant species and estimating its cover. In addition, for dominant plants' adaptation to wetlands, conditions were identified using the *National List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (Reed 1988). Plant names are consistent with *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973).

Soil profiles were examined for hydric indicators to a depth of 18 inches where possible; however, many sites were too rocky to penetrate. When rocky soils prevented the collection of soils data, the wetland designation relied on the vegetation and hydrology properties.

Topographic features and indications of scouring were used to infer wetland hydrology for surveys conducted during the dry season (June). In these cases, wetland designation relied more heavily on vegetation and soil properties.

Based on the USFWS System for describing wetland communities, the NWI mapping, USGS maps, and field survey data, an analysis of the specific project components is provided below. The wetlands classifications found within the 12,000-acre training range are presented in Table 3.8-7.

### 3.8.2.1 ROI THREE

Wetlands (non-jurisdictional and jurisdictional) and waters of the U.S., are limited within ROI Three. Based on NWI maps, the majority of potential wetland areas are associated with drainages (see maps and tables in section 3.8.1).

### 3.8.2.2 ROI TWO

Wetlands (non-jurisdictional and jurisdictional) and waters of the U.S., are limited within ROI Two. Based on NWI maps, the majority of potential wetland areas are associated with drainages (see maps and tables in section 3.8.1).

### 3.8.2.3 ROI ONE

The following section describes the type of wetlands and acres or miles of each type of wetlands for the three target areas. In addition, the wetland determination including jurisdictional or waters of the U.S. status is provided.

#### *CLOVER BUTTE*

No wetlands are found within the primary ordnance impact area or along proposed roads. Clover Butte is largely a flat plain and gradually sloping butte with four small depressional areas identified by NWI as potential wetlands. Field surveys to delineate wetlands revealed that two of the four sites showed sufficient evidence to indicate wetland vegetation and hydrology (Table 3.8-7). The total area of jurisdictional wetland habitat occurring on the Clover Butte site is approximately 1.2 acres. No permanent streams coincide with the proposed training range, but a few intermittent drainages carry storm water for short periods and may be classified as jurisdictional waters of the U.S. under CWA regulations. Approximately 25 miles of these drainages occur in the area.

*Wetland Determination:* Although the hydric soils criterion is not met, both hydric vegetation and wetland hydrology are present at two of the sites. These depressions would be considered "atypical situations" as defined in the USACE *Wetland Delineation Manual* (USACE 1987). Atypical situations occur when positive indicators of one of the criteria could not be found because of recent human activities or natural events. The large uniform depressions on site presumably have been excavated as indicated by the NWI maps. The hydrology was altered

| Table 3.8-7. Wetland Determinations for Field Sample Plots (page 1 of 2) | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Wetland Criteria | | | | | |
| *Plot No.* | *Wetland Classification* | *Vegetation* | *Soils* | *Hydrology* | *Atypical Situation* | *Wetland Determination* | *Location/Hydrogeomorphic Class* |
| Grasmere | | | | | | | |
| 1 | R4SBA | no | yes | yes* | no | U.S. waters | Tributary to Wickahoney Creek/Intermittent Stream |
| 2 | R4SBA | no | yes | yes* | no | U.S. waters | Tributary to Wickahoney Creek/Intermittent Stream |
| 3 | R4SBA | yes | rocky | yes | no | yes | Tributary to Wickahoney Creek/Intermittent Stream |
| 4 | R4SBA | yes | rocky | yes | no | yes | Tributary to Wickahoney Creek/Intermittent Stream |
| 5 | PSSA | no | rocky | yes* | no | no | Wickahoney Creek/Intermittent Stream |
| 6 | PSSA | yes | rocky | yes | no | yes | Wickahoney Creek/Perennial Stream |
| 7 | PSSA | yes | rocky | yes | no | U.S. waters | Wickahoney Creek/Perennial Stream |
| 8 | PEMA | yes | yes | yes | no | yes | Depressional Wetland/Swale |
| 9 | PEMA | yes | yes | yes | no | yes | Depressional Wetland/Swale |
| 10 | PEMA | yes | yes | yes | no | yes | Depressional Wetland/Swale |
| 11 | PEMA | yes | no | yes | no | no | Depressional Wetland/Swale |
| 12 | R4SBA | no | rocky | yes | no | yes | China Creek/Intermittent Stream |
| 13 | PEMB | yes | yes | yes | no | yes | Watering Hole above China Creek/Spring |
| 14 | PSSB | yes | rocky | yes | no | yes | Watering Hole above China Creek/Spring |
| 15 | R4SBC | yes | rocky | yes | no | yes | Wickahoney Creek/Intermittent Stream |
| 16 | PUSAh | yes | yes | yes | no | yes | Tributary to China Creek/Depression |

**Table 3.8-7. Wetland Determinations for Field Sample Plots (page 2 of 2)**

| Plot No. | Wetland Classification | Wetland Criteria | | | Atypical Situation | Wetland Determination | Location/Hydrogeomorphic Class |
|---|---|---|---|---|---|---|---|
| | | Vegetation | Soils | Hydrology | | | |
| Clover Butte | | | | | | | |
| C-1 | PEMAx | yes | no | yes* | yes | yes | Depressional Wetland |
| C-2 | PEMAx | yes | no | yes* | yes | yes | Depressional Wetland |
| C-3 | PUSCx | no | no | no | yes | no | Depression |
| Juniper Butte | | | | | | | |
| J-1 | PEMAx | no | yes | yes | yes | no | Depression |
| J-2 | PEMA | yes | no | yes | no | no | Depression |
| J-3 | PUSAh | yes | no | no | yes | no | Depression |

*No hydrology determination was made on the wetland sheet, but plot is in streambed or large depression.

| Wetland Classification | Definition |
|---|---|
| PEMA | Palustrine, Emergent, Temporarily Flooded |
| PEMB | Palustrine, Emergent, Saturated |
| PSSA | Palustrine, Scrub-Shrub, Temporarily Flooded |
| PSSB | Palustrine, Scrub-Shrub, Saturated |
| PUSA | Palustrine, Unconsolidated Shore, Temporarily Flooded |
| PUSC | Palustrine, Unconsolidated Shore, Seasonally Flooded |
| R4SBC | Riverine, Intermittent, Streambed, Seasonally Flooded |

Modifiers Added Following Main code: x=Excavated h=Diked/Impounded

such that hydric conditions now exist for a brief period during the growing season where they previously did not exist. This was a permanent alteration and now constitutes the "normal circumstances." The hydric soil indicators have not developed because of insufficient time having passed to allow their development. The soils in these two areas are assumed to function as hydric soils (USACE 1987). A determination can be made, therefore, for the presence of jurisdictional wetlands at two of the four sites. The two sites were the small depressional wetlands located along the southern border.

### *GRASMERE*

Several wetlands are present in the proposed Grasmere site, including intermittent streams, depressional wetlands or swales, and springs. However, no wetlands are located within the primary ordnance impact area. Both palustrine and riverine systems are represented in this area. Wickahoney Creek is an intermittent stream that forms a deep rugged canyon through the western portion of the site, flowing northward. Wetlands persist along its length as well as along two tributary canyons to Wickahoney and another deep canyon in the southern portion, China Creek. There are four canyons with wetlands (24.1 acres) and four additional depressional/swale wetlands (6.6 acres) within the 12,000-acre training range (total of 30.7 acres). The Grasmere area is crisscrossed by many other intermittent streams that do not support wetlands but may be classified as jurisdictional waters of the U.S. Approximately 48 miles of these waters of the U.S. occur within the Grasmere area, including 2.4 miles within the primary ordnance impact area. These ephemeral drainages have negligible wetland values. They are unvegetated, approximately three feet wide and provide no fish or wildlife habitat.

*Wetland Determination:* Out of the 16 wetland plots sampled, 13 were determined to be jurisdictional wetlands using the USACE wetland delineation method (Table 3.8-7). One reach of an intermittent stream (plot 2) did not support more than 50 percent wetland species. This segment has a clearly defined unvegetated channel that is not wetland but would be regulated as a waters of the U.S. Another site along the margin of Wickahoney Creek (plot 5) also did not have over 50 percent wetland species, although it was characterized by a willow riparian scrub.

The third site that did not meet all three wetland criteria is a wet depression (plot 11) that did not have hydric soils, although it had a predominance of wetland plants.

### *JUNIPER BUTTE*

The Juniper Butte proposed training range is comprised of the northern slope of a large butte and includes a canyon, Juniper Draw, which dissects the eastern portion of the site. Juniper Draw is designated as an intermittent stream by the USGS. In addition, numerous intermittent streams drain the north slope of the butte. Four small potential wetlands are mapped in the Juniper Butte area by the NWI, but none were located within the primary ordnance impact area. Field surveys indicated that none of the four sites fall within the federal definition of

wetlands (Table 3.8-7). Therefore, no wetlands under federal jurisdiction occur on the Juniper Butte site. The intermittent drainages that carry storm water for short periods may be classified as jurisdictional waters of the U.S. under CWA regulations. Approximately 63 miles of these drainages occur within the Juniper Butte area, including 2.4 miles within the primary ordnance impact area. These ephemeral drainages have negligible wetland values. They are unvegetated, approximately 3-feet wide and provide no fish or wildlife habitat.

*Wetland Determination*: The NWI mapping indicates two small potential wetland areas along Juniper Draw. These riparian sites were determined to be federally non-jurisdictional as described above. These sites are classified as palustrine, emergent, scrub-shrub, temporarily flooded, and overlie non-hydric soils.

Two potential depressional wetlands located in the northeastern portion of the proposed training range mapped by NWI were found to be non-jurisdictional. One site is on the flat surface of a small butte; it is adjacent to a jeep trail and has been excavated. This area is classified as Palustrine, Emergent, Temporarily Flooded, and overlies non-hydric soils. The other site is impounded within an intermittent stream and is classified as Palustrine, Unconsolidated Shore, Temporarily Flooded.

### *NO-DROP TARGET AREAS*

The no-drop targets are scattered throughout the project area and have purposefully been located to avoid wetlands. The 640-acre no-drop target near Broken Wagon Flat has no wetlands and no intermittent streams or waters of the U.S. Wetlands in these areas were not surveyed to determine classification. Only three five-acre no-drop sites, ND-4, ND-5, and ND-8, have wetlands within a 1-mile radius (Table 3.8-8).

China Creek occurs within approximately 1,500 feet of the ND-4 site. Wetlands here are Riverine, Intermittent Streambed, Temporarily Flooded. Also occurring in the vicinity are depressional wetlands classified as Palustrine, Emergent, Saturated and Palustrine, Scrub-Shrub, Saturated.

### *EMITTER SITES*

These one-acre and one-quarter-acre sites will be developed with gravel pads for emitters. As noted for the no-drop target areas, the locations of the proposed emitters also have been chosen to avoid wetlands. Fourteen of the emitter sites are within 1 mile of wetlands mapped by the NWI (Table 3.8-8). Most of the wetlands lie greater than 1,500 to 3,000 feet from the emitters. The types of wetlands mapped in the vicinity of emitters include those from the Palustrine and Riverine systems with one Lacustrine wetland, i.e., Blackstone Reservoir. Wetlands in these areas were not surveyed to determine classification.

**Table 3.8-8. Wetlands near Emitter Sites and No Drop Targets (Page 1 of 2)**

| *Emitter or No-Drop Target* | *Wetland Classification* | *Approximate Distance from Emitter/No Drop Target to Nearest Wetland* | *Hydrogeomorphic Class/Location* |
|---|---|---|---|
| AA | N/A | Greater than one mile | N/A |
| AB | N/A | Greater than one mile | N/A |
| AC | N/A | Greater than one mile | N/A |
| AD | PEMAx<br>PEMCh | 1,500 feet | Leo Waterhole<br>Depressional Wetland/Swale |
| AF | PUSCx | 1,500 feet | Depressional Wetland/Swale |
| AG | PEMAx | 4,000 feet | Depressional Wetland/Swale |
| AH | N/A | Greater than one mile | N/A |
| AI | N/A | Greater than one mile | N/A |
| AJ | N/A | Greater than one mile | N/A |
| AK | PEMAh | 2,000 feet | Depressional Wetland/Swale |
| AL | PUSA | 4,000 feet | Depressional Wetland/Swale |
| AM | PUSA<br>PEMCh<br>R4SBC<br>L1UBKh<br>PUBHh<br>R3UBH<br>PEMA | 1,000 feet | Depressional Wetland/Swale<br>Louse Creek<br>Louse Creek<br>Blackstone Reservoir<br>Depressional Wetland/Swale<br>Depressional Wetland/Swale<br>Depressional Wetland/Swale |
| AN | PUSA | 4,000 feet | Depressional Wetland/Swale |
| AO | PEMA<br>PEMAh | 2,000 feet | Depressional Wetland/Swale |
| AP | PUSCx<br>PUSAh<br>PEMCx | 3,000 feet | Depressional Wetland/Swale |
| AQ | N/A | Greater than one mile | N/A |
| AT | N/A | Greater than one mile | N/A |
| AU | PEMB<br>PEMA<br>PSSA<br>PUSAx | 2,500 feet | Depressional Wetland |

**Table 3.8-8. Wetlands near Emitter Sites and No Drop Targets (Page 2 of 2)**

| *Emitter or No-Drop Target* | *Wetland Classification* | *Approximate Distance from Emitter/No Drop Target to Nearest Wetland* | *Hydrogeomorphic Class/Location* |
|---|---|---|---|
| AV | PEMP<br>R4SBA<br>PSSB | 2,500 feet | China Creek<br>Depressional Wetland |
| BA | N/A | Greater than one mile | N/A |
| BB | N/A | Greater than one mile | N/A |
| BC | PUSCx | 4,000 feet | Depressional Wetland/Swale |
| BD | N/A | Greater than one mile | N/A |
| BE | N/A | Greater than one mile | N/A |
| BG | PSSA | 3,500 feet | Depressional Wetland/Swale |
| BI | R4SBC<br>R4SBF<br>PSSA<br>PEMC | 1,500 feet | Wickahoney Creek<br>Wickahoney Creek<br>Wickahoney Creek<br>Wickahoney Creek |
| BK | N/A | Greater than one mile | N/A |
| ND-4 | R4SBA<br>PEMB<br>PSSB | 1,500 feet | China Creek<br>Depressional Wetland/Swale |
| ND-5 | R4SBC | 4,000 feet | Wickahoney Creek |
| ND-8 | PEMB<br>PEMA<br>PSSA<br>PUSAx | 2,500 feet | Depressional Wetland |

Note:

| Wetland Classification | Definition |
|---|---|
| PEMA | Palustrine, Emergent, Temporarily Flooded |
| PEMB | Palustrine, Emergent, Saturated |
| PSSA | Palustrine, Scrub-Shrub, Temporarily Flooded |
| PSSB | Palustrine, Scrub-Shrub, Saturated |
| PUSA | Palustrine, Unconsolidated Shore, Temporarily Flooded |
| PUSC | Palustrine, Unconsolidated Shore, Seasonally Flooded |
| R4SBC | Riverine, Intermittent, Streambed, Seasonally Flooded |

Modifiers added following main code: x=Excavated h=Diked/Impounded

### *ROADS*

New roads to access various facilities such as emitter sites and drop targets are proposed to be constructed throughout the project area. Many existing roads would also be used. Some of the existing roads could be used as is, whereas others would need to be upgraded. Potential wetlands along new and existing roads were delineated using GIS data. Information was compiled by overlaying project roads over USGS maps at 1:24,000 scale, and calculating the number of intermittent and perennial stream crossings. The new roads to be constructed would cross intermittent streams in approximately six to eight locations. Existing roads that would be upgraded would cross intermittent streams in 43 to 50 locations and a perennial stream in one location. At least one of the crossings of intermittent streams would involve wetlands and potentially more that are outside the 12,000-acre sites. The perennial stream crossing also would be likely to involve wetlands. The existing roads that would not be upgraded cross intermittent streams in approximately 97 locations.

### *SAYLOR CREEK RANGE*

A detailed study of SCR (Air Force 1996a) found no jurisdictional wetland areas located on the range. Other types of wetlands located on the range include intermittent riverine, palustrine emergent, and palustrine unconsolidated shore. None contained water year-round. The riverine wetlands temporarily and intermittently flood. The Palustrine wetlands are also temporarily and seasonally flooded. Wetlands at the range are generally confined to intermittent streams, small playas and impoundments. However, these wetland areas did not meet criteria for jurisdictional wetlands.

## 3.8.3 Rare Plants

The study area for rare plants is ROI One, which includes those areas identified for ground disturbance, including the 12,000-acre training range, new and improved roads, no-drop targets, powerline, and emitter sites. Rare plants are defined as all terrestrial and aquatic plants designated as listed, proposed, or candidates for threatened or endangered under the Endangered Species Act (ESA), or considered sensitive by the BLM and/or the Idaho Native Plant Society (INPS). Listed species are those species with legal protection and are identified as threatened or endangered by the USFWS in accordance with the ESA of 1973, as amended. Definitions of terms categorizing rare plants are found on Table 3.8-9. It should be noted that the status of some of these sensitive species is based on limited study of their abundance and distribution. Further field investigation could confirm or change the currently defined conservation status.

**Table 3.8-9. Definitions of Terms Categorizing Rare Plants**

| *Category* | *Definition*[1] |
|---|---|
| Endangered Species Act | Species include those in danger of extinction throughout all or a significant portion of their range. |
| Threatened | Species represent those likely to become an endangered species in the foreseeable future throughout all or a significant portion of their range. |
| Candidate | Species are taxa for which substantial biological information exists on file to support a proposal to list as endangered or threatened but no proposal has yet been published. |
| BLM | |
| Sensitive | Species, as defined by the BLM are those who meet any of the following criteria; (1) species currently under status review by the USFWS; (2) species whose numbers are declining so rapidly that federal listing may become necessary; (3) species who typically have small and widely dispersed populations; or (4) species who inhabit ecological refugia or other specialized habitats. |
| Watch | Species are those which the BLM is concerned with due to restrictions on populations and range, but information is lacking as to the cause or if the species is indeed heading towards extinction and in need of management action to reduce or remove threats. |
| Idaho Code | |
| Wildflowers | Protected under Idaho Code Section 18-3913, which gives the Idaho Department of Parks and Recreation authority to establish a list of plant species that need protection to prevent their extinction. |
| Idaho Native Plant Society Priority 1 | Defined as a taxon in danger of becoming extinct from Idaho in the foreseeable future if the factors contributing to its decline continue to operate. |
| Idaho Native Plant Society Priority 2 | Defined as a taxon that is likely to be classified as Priority 1 in the future if factors contributing to its population decline or habitat degradation or loss continue. |
| Sensitive | Species include taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification of 1 or 2, but whose populations and habitat may be jeopardized without active management or removal of threats. |
| Monitor | Species include taxa that are common within a limited range, as well as those that are uncommon but have no identifiable threats. |
| Review | Species include taxa that may be of conservation concern, but for which there is insufficient data to base a recommendation regarding their appropriate classification. |

Note: 1. Mosely and Groves 1992.

### *METHODS*

Five steps were used to identify the list of rare plant species potentially occurring in ROI One.

1. Information was gathered on known rare plant occurrences in Owyhee County using information provided by the Idaho Conservation Data Center (ICDC).

2. Distribution data and habitat requirements were collected on the rare plants identified in step one.

3. Plant communities, soil, slope and aspects found within ROI One were identified.

4. Federal and state agencies were contacted for additional information on species of concern.

5. A final species list was developed by comparing rare plant habitat requirements to available habitat within ROI One.

Following the above steps, 21 rare plant species were identified as potentially occurring in the study area. This study area in particular, and Owyhee County as a whole, has had few rare plant surveys due to the area's inaccessibility. Furthermore, because some of the rare plants on the list have a low number of known occurrences, the habitat requirements and distribution may not provide a complete representation of the species' suitable habitat. As such, extensions of the known range and habitat records were possible (though none were discovered). Table L-2, Appendix L, lists the potential rare plants considered for the ground surveys and their respective ICDC, USFWS, INPS, and BLM status and county distribution data.

This list included four of the five species recommended by the USFWS under Section 7 of the ESA, consultation report SP# 1-4-96-SP-197, File #200.0211. Mulford's milkvetch (*Astragalus mulfordiae*) was not specifically included in the list of species because of the geographic separation between the known locations and the study area and the habitat requirements are fairly well recognized for this species and are not found in the study area. This species would likely have been recognized if it occurred in the study area as other milkvetch species were included on the survey list increasing the likelihood of finding this species if it occurred on site. Field crews were instructed to identify all species unknown to them.

### *FIELD SURVEY*

A rare plant survey was conducted between May 25 and July 8, 1996, for all rare plant species potentially occurring in the Clover Butte and Grasmere 12,000-acre training range. Surveys at the Juniper Butte primary ordnance impact area occurred during October of 1996. The habitats with a high potential for rare plants included undisturbed low sagebrush ridgetops, Wyoming big sagebrush habitat, canyon riparian areas, and "slick spots." To help in identification of potential rare plant habitat, a search image was developed by site visits to known rare plant occurrences, and by using habitat data from ICDC data on known populations. The optimal

phenological period for locating and identifying the species was determined through literature search and by review of previous observation forms (see Table 3.8-10).

Following guidelines outlined in Nelson (1986), a meandering walking survey was used to first locate rare plant habitat, then within that habitat search for the rare plant. Search pattern and survey intensity varied with each site depending on species diversity of the site surveyed, habitat of the plant, and plant community structure. In a given area, the amount of time spent searching, or space between transects, was dependent on two factors: the potential for finding a rare plant (i.e., habitat that fits requirements for one or more rare plants); and, the difficulty of seeing the rare plant. For example, an area that met habitat requirements for dimeresia, an inch-tall annual forb, was searched slowly and with very narrow transects over the entire area to avoid missing this tiny species.

One BLM Sensitive species, an Idaho endemic, slick spot peppergrass (*Lepidium papilliferum*) may be found within seeded areas and other disturbed ground. To provide a thorough search for this species, all areas of the Grasmere and Clover Butte 12,000-acre training ranges were surveyed. Walking transects were performed over all community types at both sites. Survey intensity was greatest on native habitat areas and areas that would receive the most ground disturbance. All emitter sites and no-drop targets were surveyed including a 246-foot buffer zone outside the site. All areas of new road construction were surveyed, including a 46-foot buffer on either side of the proposed road site. The area of construction for the powerline was also surveyed for potential rare plant habitat.

Following the above methods, only two species were assessed as potentially occurring within the 12,000-acre Juniper Butte Alternative. These species were dwarf skullcap and slick spot peppergrass. Actual field surveys for these species were performed only within the 300-acre primary ordnance impact area and a 300-acre buffer zone. However, results from the 600-acre survey and nearby rare plant occurrences were used to extrapolate the further possibility of rare plant occurrences within the entire 12,000 acres based on habitat attributes on the 12,000-acre area compared to habitat requirements of the plant species.

Rare plant surveys of the clover Butte and Grasmere 12,000-acre training ranges, no-drop target areas, emitter sites, and new and improved road segments were conducted between April and July 1996. Surveys of the Juniper Butte 12,000-acre training range and powerline corridor were conducted in October 1996 and focused on identifying suitable rare plant habitat.

Trained botanists and biological technicians conducted the survey. Each rare plant population located was documented on an ICDC Rare Plant Observation Form and photographs were taken. These forms were forwarded to the ICDC for entry into the state rare elements database.

**Table 3.8-10. Special Status Plant Species Likely to be Encountered by Vegetation Type and Optimum Phenological Period**

| *Species* | *Vegetation Type* | | | | | | | | *Optimum Phenological Period* |
|---|---|---|---|---|---|---|---|---|---|
| | BS | WM | LS | CC | SG | RB | AG | NG | |
| Annual salt buckwheat *(Eriogonum salicornioides)* | | | X | | | | | X | May-June |
| Bacigalupi's downingia *(Downingia bacigalupii)* | | X | | | | | | | June-July |
| Bruneau River prickly phlox *(Leptodactyon glabrum)* | | | | X | | | | | May |
| Davis' peppergrass *(Lepidium davisii)* | | X | | | | | | | May-July |
| Dimeresia *(Dimeresia howellii)* | | | X | X | | | | X | April-June |
| Dwarf rabbitbrush *(Chyrsothamnus humilis)* | X | | X | | | | | | August-September |
| Dwarf skullcap *(Scutellaria nana* var. *nana)* | | X | X | X | | | | X | May-June |
| Inch-high lupine *(Lupinus uncialis)* | X | | | X | | | | | May-June |
| King's desertgrass *(Blepharidachne kingii)* | | | X | X | | | | X | May-July |
| Osgood Mountain milkvetch *(Astragalus yoder-williamsii)* | X | | X | | | | | | May-Early August |
| Rabbitbrush goldenweed *(Haplopappus bloomeri)* | | | X | | | | | X | July-September |
| Rigid threadbush *(Nemacladus rigidus)* | X | | X | X | | | | | May-June (July) |
| Simpson's hedgehog cactus *(Pediocactus simpsonii* var. *robustior)* | | | X | X | | | | X | May-June |
| Slick spot peppergrass *(Lepidium papilliferum)* | X | | | | X | X | X | X | April-June |
| Southern mudwort *(Limosella acaulis)* | | X | | | | | | | May-June |
| Spine-noded milkvetch *(Peteria thompsoniae)* | | | X | X | | | | | Late April-June |
| Stiff Milkvetch *(Astragalus conjunctus)* | X | | X | | | | | X | Mid April-June |
| Stylocline *(Stylocline filaginea)* | X | | X | | | | | | April-June |
| Texosporium *(Texosporum sancti-jacobi)* | X | | | | | | | | April-May |
| Trout Creek milkvetch (*Astragalus salmonis)* | X | | X | | | | | X | May-June |
| White eatonella *(Eatonella nivea)* | | | X | X | | | | | May-June |

BS = Wyoming Big Sagebrush
WM = Wet Meadows, Ephemeral Drainage, Playas
LS = Low Sagebrush
CC = Canyons-Cliffs-Talus
NG = Native Grassland
SG = Seeded Grasslands
RB = Rabbitbrush
AG = Annual Grasslands

### 3.8.3.1 ROI ONE

#### *CLOVER BUTTE*

No rare plant populations were located on the Clover Butte 12,000-acre site. Slick spot peppergrass is known to occur within a 5-mile vicinity of Clover Butte, and some habitat was located, but no occurrences were located on the site. Some potential rare plant habitat was located in the sagebrush stands, although much of the area had been recently burned and seeded, lowering the potential for finding rare plants or their habitat.

#### *GRASMERE*

Nine rare plant occurrences of three species occur within the 12,000-acre Grasmere site. Two of the species, inch-high lupine *(Lupinus unicalis)* and dimeresia *(Dimeresia howellii)*, are listed by ICDC as S2 or imperiled due to rarity, and dwarf skullcap *(Scutellaria nana* var. *nana)* is listed as a monitor species. All three are also listed as Sensitive by the BLM. All populations occur outside the area identified for proposed ground disturbance activities. Table 3.8-11 includes detail on the populations by species, occurrence number, number of populations, and number of individuals of rare plants.

**Table 3.8-11. Rare Plant Occurrences at Grasmere**

| *Species* | *ICDC Occurrence #* | *# of individuals* | *Total # of acres* |
|---|---|---|---|
| Inch-high lupine *(Lupinus unicalis)* | 006 | 700 | 3.7 |
| Dimeresia *(Dimeresia howellii)* | 008<br>009 | 330<br>200 | 5.4 |
| Dwarf skullcap *(Scutellaria nana var. nana)* | 020<br>021 | 15<br>460 | 29 |

#### *JUNIPER BUTTE*

A field survey of the 300-acre primary ordnance impact area and a buffer zone around it, totaling approximately 600 acres, was completed at Juniper Butte in October 1996. Detailed research into known rare plant occurrences and rare plant habitat correlations established only slick spot peppergrass and dwarf skullcap could occur in the available habitat within the Juniper Butte Alternative. Consequently, field surveys focused on these two plant species within the 600-acre survey site. Within this area, no dwarf skullcap plants or habitat were located, but it is known to occur within the Juniper Butte 12,000-acre site outside of the primary ordnance impact area. Dwarf skullcap is known to inhabit cobbly intermittent streambeds in Juniper Draw which runs along the eastern side of the alternative. This alternative site also

includes some other large drainages located in the northern and eastern areas. Overall, the potential for this rare plant encompasses about 150 acres, all of which lie outside the 300-acre primary ordnance impact area.

Slick spot peppergrass was located within the area surveyed. Approximately 300 plants were located in 45 separate slick spots. The slick spots occupy 74.3 acres of the survey site, with 7.3 acres occurring within the primary ordnance impact area. Currently, the BLM lists slick spot peppergrass as sensitive and the ICDC lists it as a G2/S2. The ICDC recommended that slick spot peppergrass be listed as threatened (Moseley 1994). Similar habitat types that could support slick spot may be located throughout the entire 12,000-acre alternative. However, neither the number of slick spots nor the abundance and distributions of the plants can be determined from general habitat suitability. The small size of the slick spots prevents estimation of slick spot numbers and distribution from aerial photos, or soil maps. Therefore, no prediction may be made concerning potential slick spot peppergrass occurrences.

No rare plants or habitat were located along the powerline or maintenance area.

#### *NO-DROP TARGET AREAS*

Some potential rare plant habitat was found at the no-drop target areas, including low sagebrush and Wyoming big sagebrush. Fourteen species of rare plants were identified as having the potential to occur in the low sagebrush habitat. In addition, six rare plant species could have occurred in the big sagebrush habitat. The rare plant species and habitat requirements are listed on Table 3.8-10. During the survey, however, no rare plants were located.

#### *EMITTER SITES*

No rare plant species were located during field surveys. Emitter sites were selected to avoid native plant communities when possible. Eighteen of the 33 sites were dominated by annual weeds or had been reseeded to crested wheatgrass.

#### *ROADS AND POWERLINE*

Some potentially suitable sagebrush habitat was found for two species, stiff milkvetch (*Astragalus conjunctus*), and Trout Creek milkvetch (*Astragalus salmonis*), but no rare plant occurrences were located along new road construction sites. The area potentially disturbed by construction of the powerline to the Clover Butte area was also surveyed, but no suitable rare plant habitat was located.

#### *SAYLOR CREEK RANGE*

SCR was first surveyed for rare plants in 1990 (Bernatas 1991) and additional areas were more intensively surveyed in 1995 (Air Force 1996b). Although some suitable habitat for Davis' peppergrass was identified, no rare plants were located. Two rare plant species, thistle

milkvetch (*Astragalus kentrophyta* var. *jessiae*), large-flowered gymnosteris (*Gymnosteris rudicaulis*), were identified in the 1991 report. However, these species were dropped from consideration for rare plant status during the 1994 INPS Annual Rare Plant Conference (INPS 1994), because it was found to be more common than previously believed.

### 3.8.4 Wildlife Habitat

The sagebrush-steppe ecosystem provides an array of wildlife habitats varying in quality and size. Important wildlife habitats in the ecosystem are characterized by vegetation communities such as shrub-steppe, grasslands, wetland and riparian areas, isolated trees and woodlands, and agricultural fields.

Shrub-steppe vegetation communities are diverse and usually dominated or codominated by big sagebrush, low sagebrush, antelope bitterbrush, rabbitbrush, or shadscale. In relatively undisturbed areas, the shrub understory is covered by native grasses and microbiotic crusts. Wildlife species' abundance and diversity in shrub-steppe habitats are second only to those in wetland and riparian habitats.

Grassland vegetation communities are dominated by exotic perennial seedings (intermediate wheatgrass, crested wheatgrass) or non-native weedy annuals (cheatgrass, tumble mustard, peppergrass) and lesser so by native perennials (bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass, needle-and-thread). Because the majority of wildlife species are adapted to the shrub-steppe communities that once dominated the region, seedings and weedy grasslands provide only marginal habitat. These non-native habitats provide little cover and reduced species diversity. Besides bare ground, cheatgrass probably provides the lowest quality habitat in the region. Cheatgrass is an exotic annual that essentially outcompetes native grasses and only provides temporary low-quality forage. It is usually the first to sprout, seed, and senesce. Cheatgrass contributes enormously to fuel loads and greatly increases the potential for catastrophic wildfires.

Wetlands include ephemeral pools, seeps, springs, marshes, reservoirs, and stock ponds. Riparian habitats are characterized by intermittent or perennial water courses and generally are composed of a vegetation community dominated by willows, currant, wild rose, rushes, and sedge.

Woodlands in the higher elevations are composed of juniper, aspen, and mountain mahogany. These juniper-dominated forests continue down the slopes, gradually thinning out until small stands or isolated trees dot the drier high desert plateaus.

Landscape characteristics such as topographic relief and lithic features are also an important component of the ecosystem and are integral in determining the occurrence of vegetation communities. Canyons and buttes are characteristic of the landscape and give rise to lithic features such as cliffs, slide rock, large boulder piles, talus, and rocky outcrops that enhance and diversify vegetation communities and provide additional wildlife habitat.

Land used for agricultural endeavors also occur in the environment but provide changing habitat for wildlife.

An integral part of the composition and structure of wildlife habitat is grazing by domestic animals. Livestock grazing alters plant composition on rangelands (Daubenmire 1974; Robinson and Bolen 1984). Plant species respond differently to grazing. Some plant species have the ability to regrow rapidly after grazing while other species regrow more slowly or not at all. In addition, grazing animals have preferences to different species and different ages of plants. Therefore, the level of grazing on individual plants and plant species results in selective and differential grazing by animals.

In addition, grazing alters vertical structure of vegetation and the amount of available forage wildlife may otherwise use for cover and feed, respectively. As an example, tall grasses used for bedding and fawning by big game may become less available or of poor quality because of grazing. Grazing can reduce cover creating improved habitat for species that prefer more open habitats and communities of lower successional stages.

Grazing management practices and goals throughout ROI Three, attempt to balance the need for livestock production, wildlife production, recreation, and other land uses. As discussed in section 3.12.4, livestock grazing is one of the common uses of much of the ROI with livestock grazing intensity ranging from 0.04 to 0.21 animal unit month (AUM) acre. These grazing levels were developed with the intent to balance the multiple use goals.

A summary and comparison of available wildlife habitat types and their relative proportion among the alternatives is given in Table 3.8-12.

#### 3.8.4.1 ROI THREE

All the wildlife habitats mentioned above exist within ROI Three. The vegetation types and associated acreages within ROI Three can be found in Table 3.8-1.

#### 3.8.4.2 ROI TWO

ROI Two contains most of the habitat types found in the region with the possible exception of continuous large stands of woodlands. Trees are usually found in isolated small stands or as individual trees. Total acreage and proportion of wildlife habitat types in ROI Two are presented in Table 3.8-13. Bare ground resulting from recent wildfires constitutes a notable amount of area (42,444 acres, 2.8 percent of ROI Two). Because burned areas lack vegetation for cover or food, they offer the most marginal habitat for the majority of wildlife species. Landscape features are mostly composed of buttes, canyons, and draws of varying size.

**Table 3.8-12. Comparison of Available Wildlife Habitat among the Alternatives in ROI One (Page 1 of 2)**

| *Habitat Type* | | *Alternative B Clover Butte* | *Alternative C Grasmere* | *Alternative D Juniper Butte* |
|---|---|---|---|---|
| *Shrub-steppe* | Acres[1] | 4,710 | 7,780 | 2,430 |
| | % of habitat type[1] | 33.7% | 62.4% | 15.5% |
| | Rank[2] | 2 | 1 | 3 |
| *Grasslands* | Acres | 8,790 | 4,890 | 10,500 |
| | % of habitat type | 66.3% | 36.8% | 80.6% |
| | Rank | 2 | 3 | 1 |
| *Wetlands/ Riparian* | Acres | 1 | 34 | 1 |
| | % of habitat type | >0.1% | 0.3% | >0.1% |
| | Description | 25 miles of intermittent streambeds/few ephemeral pools | 48 miles of intermittent streambeds, numerous springs, several stock ponds, numerous draws | 63 miles of intermittent streambeds/few temporarily flooded areas |
| | Rank | 3 | 1 | 2 |
| *Lithic Features* | Description | Small draw with 6-foot-high rock wall | Five canyons and Poison Butte (slide rock, cliffs, rocky outcrops, boulder piles, talus slope) | Small cliffs, slide rock, boulders in and to the east of Juniper Draw |
| | Rank | 3 | 1 | 2 |

**Table 3.8-12. Comparison of Available Wildlife Habitat among the Alternatives in ROI One (Page 2 of 2)**

| *Habitat Type* | | *Alternative B Clover Butte* | *Alternative C Grasmere* | *Alternative D Juniper Butte* |
|---|---|---|---|---|
| *Woodlands* | Acres | 0 | 52 | 0 |
| | % of habitat type | – | 0.5% | – |
| | Description | No trees | Willows, currant, wild rose, serviceberry, mountain mahogany, junipers, and aspen | Various stands of juniper and a stand of aspen in Juniper Draw |
| | Rank | 3 | 1 | 2 |
| *Bare Ground (recently burned)* | Acres | 6.5 | 6.5 | 472 |
| | % of habitat type | – | – | 3.9% |
| | Rank | 2 | 1 | 3 |

Notes:
1. The total acreage and relative proportions of habitat types are presented as ROI One cumulative totals for each Alternative. ROI One includes the 12,000-acre training range, 640-acre and 5-acre no-drop target areas, 1-acre and 0.25-acre emitter sites, and powerline and road corridors.

2. The ranking of habitat types among the alternatives is based on the acreage and quality or relative quantity of habitat type, with a rank of 1 being highest overall quality and 3 being the lowest.

| Table 3.8-13. Total Acreage and Proportion of Wildlife Habitat Types in ROI Two | | |
|---|---|---|
| *Habitat Type* | *Acres* | *% of ROI Two* |
| Shrub-steppe | 1,054,480.44 | 69.90 |
| Grasslands | 404,451.48 | 26.80 |
| Wetlands/Riparian | 5,832.49 | 0.40 |
| Woodlands | 248.71 | 0.02 |
| Agriculture | 1,300.09 | 0.08 |

### 3.8.4.3 ROI ONE

#### *CLOVER BUTTE*

The Clover Butte site is characterized by relatively flat terrain with no canyons or permanent water sources. In the southwestern section of the site several small rocky points extend westward toward a shallow valley. Lithic features are limited to a small rocky gully to the west of Clover Butte. The gully provides a few small cliff faces (6 feet) no greater than 20 feet long, which are far smaller and less abundant than those found in Juniper Butte or Grasmere.

Exotic grasslands composed of seedings and non-native weedy annuals constitute the majority (7,597.55 acres; 64.4 percent) of habitat found in ROI One for Alternative B. The proportion of grassland habitat in Alternative B is second only to that found in the Juniper Butte Alternative and nearly twice as much as that found in the Grasmere Alternative. Although many native shrub-steppe community species have suffered due to the conversion of shrub-steppe to grasslands, undoubtedly some disturbance-related species might have benefited and expanded into previously unused areas.

Big sagebrush at Clover Butte represents the remainder (4,196.31 acres; 35.6 percent) of the available wildlife habitat in ROI One. The amount of shrub-steppe habitat at Clover Butte is less than that found in the Grasmere Alternative but twice as much as that found in the Juniper Butte Alternative.

No riparian habitat occurs in Clover Butte, and only a few ephemeral pools provide temporary wetlands in the spring and early summer. Isolated trees or woodland habitats are absent within ROI One for Alternative B. Compared to the other two alternatives, the Clover Butte Alternative has the lowest proportion of these habitat types.

### *GRASMERE*

The dominant feature of the Grasmere 12,000-acre tactical range is the Grasmere escarpment, an area of high relief abruptly rising almost 500 feet along the western margin of the site. Stream channels cut severely into rhyolytes of the escarpment, forming steep draws and canyons with broad regions of exposed rocky cliff faces, rocky outcroppings, slide rock, boulder piles, talus slopes, and caves. Poison Butte, located in the eastern portion of the 12,000-acre training range, gently rises 200 feet above the surrounding landscape and is marked by large areas of exposed slide rock on its northern slope. The lithic features in Grasmere are more numerous and greater in scale than those found in Alternatives B and D.

The draws and canyons contain approximately 80 acres (0.8 percent of ROI One) of riparian habitat. Numerous springs and seeps also are present. The wetland and riparian habitat found in Grasmere also are unique among the alternatives and surpasses any other wetland or riparian habitat found in the other target areas in overall species diversity.

Shrub-steppe communities dominated by either big sagebrush or low sagebrush constitute the majority (6,553.03 acres; 60.1 percent) of habitat found in ROI One for Alternative C, and represents the highest percentage of this habitat type among the three alternatives. The diversity of the shrub-steppe vegetation community (i.e., significant amounts of dense big sagebrush, large areas of low sagebrush, substantial stands of bitterbrush) in turn enhances wildlife species diversity.

Exotic grasslands composed of seedings and non-native weedy annuals constitute a significant proportion (4,271.12 acres; 39.1 percent) of habitat found in ROI One for Alternative C, but represent the lowest percentage of this habitat type among the three alternatives. The grasslands at Grasmere host a fair amount of native perennial bunchgrasses such as bluebunch wheatgrass, Idaho fescue, and Sandberg's bluegrass. The relatively larger amount of native grasses improves the quality of this habitat type in relation to the grassland communities found in the other alternatives.

In addition, isolated serviceberry (*Amelanchier alnifolia*), mountain mahogany, and aspen trees occur on top of the escarpment near the heads of the canyon drainages. Although sparse, these stands of trees are unique among the alternatives.

### *JUNIPER BUTTE*

The Juniper Butte site is characterized by relatively flat terrain with no permanent water sources other than a few temporarily flooded areas. The eastern margin of the 12,000-acre training range captures Juniper Draw, a boulder-strewn drainage with considerable relief (60 to 120 feet) rising on its eastern banks. Long sections of small cliff faces and rocky outcroppings parallel the draw and litter the slopes with slide rock. The 12,000-acre training range also abuts a canyon (East Fork Bruneau) to the east.

The vegetation in the 12,000-acre training range has a history of disturbance with large areas currently lying bare (465.21; 4.0 percent) or covered with exotic grasslands dominated by intermediate wheatgrass (9,196.01; 79.7 percent). The grassland habitat in Juniper Butte has the highest proportion among the 12,000-acre training range, making up considerably more than that found at Clover Butte and nearly doubling that present at Grasmere.

A shrub-steppe community composed almost exclusively of rabbitbrush covers the remainder of the 12,000-acre training range (1,875.91 acres; 16.3 percent). The lack of any sagebrush component makes this habitat type the least diverse among the 12,000-acre training range. The heavily disturbed shrub-steppe habitat in the 12,000-acre training range also is the smallest proportion among the sites, nearly twice as small as that available in Clover Butte and over three times smaller than that available at Grasmere.

A few small stands of juniper occur within the draw and provide scarce but important woodland habitat. Although not comparable to the amount of this habitat type in Grasmere, it provides considerably more than that available at Clover Butte.

### *No-Drop Target Areas*

The majority of the 5-acre no-drop target areas are composed of exotic grasslands dominated by crested wheatgrass or cheatgrass. As discussed above, exotic grasslands provide marginal wildlife habitat. Two 5-acre no-drop target areas contain low sagebrush with native annuals. Because these two areas are composed of a native habitat type, they may provide higher quality habitat than the other sites.

The 640-acre no-drop target area is relatively flat with a low hill near the eastern margin and a slope rising to the north. The area is located approximately 2.5 miles to the west of Bruneau Canyon and is dominated by crested wheatgrass. Proximity to a major canyon may contribute to wildlife species' diversity; however, because the site is dominated by an exotic seeded species, overall quality of the habitat for forage, cover, or breeding is low.

### *Emitter Sites*

Of the 15 acres where emitter sites are proposed, 12 acres (80.0 percent) are composed of exotic grassland communities providing marginal wildlife habitat. The remaining 3 acres are made up primarily of shrub-steppe communities (1.5 acres of big sagebrush and 1.25 acres of low sagebrush) and bare ground (one-quarter acres). Native shrub-steppe vegetation provides optimal wildlife habitat, whereas bare ground is low-quality habitat for the majority of species that occur in the region.

### *Roads and Powerline*

Powerline corridors that occur along pre-existing roads are composed of exotic grasslands usually dominated by cheatgrass. Generally, cheatgrass provides poor-quality wildlife habitat. Habitat near pre-existing roads already is heavily disturbed and probably provides opportunities for only the most disturbance-tolerant wildlife species.

*SAYLOR CREEK RANGE*

Wildlife habitats in the SCR are relatively diverse due to the presence of several vegetation communities. In addition, the presence of sand dunes and portions of Bruneau and Pot Hole canyons contribute to this diversity of habitats, lithic features, and soil conditions. The majority of SCR is composed of exotic grasslands (139,340 acres; 79.7 percent), primarily dominated by crested wheatgrass. Shrub-steppe habitat is significantly smaller but makes up the majority of the remaining available habitats (34,280 acres; 19.6 percent). The remaining 1,214 acres are composed of bare ground (785 acres), canyon habitat including slope and riparian habitat (327 acres), agricultural fields (60 acres), sand dunes (42 acres), and standing water (0.47 acres). These habitats provide breeding, foraging, burrowing, wintering, and hibernating opportunities for a variety of wildlife species.

### 3.8.5 Protected and Sensitive Wildlife Species

Protected and sensitive wildlife includes federally endangered, threatened, proposed, and candidate species; BLM sensitive species; and IDFG threatened, endangered, protected nongame species, and species of special concern.

Table 3.8-14 lists the protected and sensitive wildlife species with potential to occur in southwest Idaho. Species identified in Table 3.8-14 may have more than one status designation. For example, the bull trout is a federal candidate species, a BLM sensitive species, and a state priority species of special concern.

*Endangered Species* are those in danger of becoming extinct throughout all or a significant portion of their range. *Threatened Species* are those likely to become endangered in the foreseeable future. These species have gone through the listing process and are considered "fully listed" or "listed species" and are protected under the ESA of 1973, as amended. A federal action that "may affect" these species must undergo Section 7 consultation with the USFWS under the ESA.

*Candidate Species* are those species being considered by the USFWS for listing as endangered or threatened species, but are not yet the subject of a proposed rule for listing. Therefore, candidate species have no legal protection under the ESA; however, candidate species can be emergency listed if the USFWS determines that the species' well-being is at risk. Candidate species are those taxa for which the USFWS has on file enough substantial information about biological vulnerability and threats to support proposals to list them. Because the USFWS anticipates development of proposals to list candidate species, they encourage federal agencies to give them special consideration in environmental planning. It is the policy of the BLM to manage candidate species and their habitats to ensure that management actions do not contribute to the need to list any candidate species as threatened or endangered. Species that had formerly been identified by the USFWS as Category 2 candidate species are still considered to be of concern to the USFWS.

*IDFG Endangered Species* are those in danger of becoming extinct throughout all or a significant portion of their range. *IDFG Threatened Species* are those likely to be classified as endangered in the foreseeable future. The bald eagle and peregrine falcon are state endangered species.

**Table 3.8-14. Protected and Sensitive Animal Species Known or with Potential to Occur within the General ROI of the Proposed Action (page 1 of 3)**

| *Common Name* | *Species Name* | *USFWS Status* | *IDFG Status* | *BLM Status* |
|---|---|---|---|---|
| **Invertebrates** | | | | |
| Idaho Dunes tiger beetle | *Cicindela arnicola* | Concern | | Sensitive |
| Bliss Rapids snail | *Taylorconcha serpenticola* | Threatened | | Sensitive |
| Bruneau hot springsnail | *Pyrgulopsis bruneauensis* | Endangered | | Sensitive |
| California floater | *Anodonta californiensis* | Concern | | Sensitive |
| Columbia pebblesnail | *Fluminicola columbiana* | | | Sensitive |
| Idaho springsnail | *Pyrgulopsis idahoensis* | Endangered | | Sensitive |
| Short-face lanx | *Fisherola nuttali* | | | Sensitive |
| Snake River physa snail | *Physa natricina* | Endangered | | Sensitive |
| Utah valvata snail | *Valvata utahensis* | Endangered | | Sensitive |
| **Fish** | | | | |
| Bull trout | *Salvelinus confluentus* | Candidate | Special concern | Sensitive |
| Interior redband trout | *Oncorhynchus mykiss gairdneri* | Concern | Special concern | Sensitive |
| Lahontan cutthroat trout | *Oncorhynchus clarki henshawi* | Threatened | | |
| Leatherside chub | *Gila copei* | | Special concern | Sensitive |
| Shoshone sculpin | *Cottus greenei* | | Special concern | Sensitive |
| White sturgeon | *Acipenser transmontanus* | | Special concern | Sensitive |
| **Amphibians & Reptiles** | | | | |
| Northern leopard frog | *Rana pipiens* | | Special concern | Sensitive |
| Spotted frog | *Rana pretosia* | Candidate | Special concern | Sensitive |
| Western toad | *Bufo boreas* | | Special concern | Sensitive |
| Mojave black-collared lizard | *Crotaphytus bicinctores* | | Special concern | Sensitive |
| Longnose snake | *Rhinocheilus lecontei* | | Special concern | Sensitive |
| Western groundsnake | *Sonora semiannulata* | | Special concern | Sensitive |
| **Birds** | | | | |
| Bald eagle | *Haliaeetus leucocephalus* | Threatened | Endangered | Sensitive |
| Ferruginous hawk | *Buteo regalis* | Concern | Protected | Sensitive |
| Northern goshawk | *Accipiter gentilis* | | Special concern | Sensitive |
| Peregrine falcon | *Falco peregrinus* | Endangered | Endangered | Sensitive |
| Prairie falcon | *Falco mexicanus* | | | Sensitive |
| Northern harrier | *Circus cyaneus* | | | Sensitive |
| Western burrowing owl | *Speotyto cunicularia hypugaea* | Concern | Protected | Sensitive |

**Table 3.8-14. Protected and Sensitive Animal Species Known or with Potential to Occur within the General ROI of the Proposed Action (page 2 of 3)**

| *Common Name* | *Species Name* | *USFWS Status* | *IDFG Status* | *BLM Status* |
|---|---|---|---|---|
| Sage grouse | *Centrocercus urophasianus* | | | Sensitive |
| Columbia sharp-tailed grouse | *Tympanuchus phasianellus columbianus* | | Special concern | Sensitive |
| Mountain quail | *Oreortyx pictus* | | Special concern | Sensitive |
| White-faced ibis | *Plegadis chihi* | Concern | Protected | Sensitive |
| Trumpeter swan | *Cygnus buccinator* | Concern | Special concern | Sensitive |
| Loggerhead shrike | *Lanius ludovicianus* | Concern | Special concern | Sensitive |
| Black tern | *Childonias niger* | Concern | | |
| American white pelican | *Pelecanus erythrorhynchos* | | Special concern | Sensitive |
| Swainson's thrush | *Catharus ustulatus* | | | Sensitive |
| Solitary vireo | *Vireo solitarius* | | | Sensitive |
| Yellow warbler | *Dendroica petechia* | | | Sensitive |
| Townsend's warbler | *Dendroica townsendi* | | | Sensitive |
| MacGillivray's warbler | *Oporornis tolmiei* | | | Sensitive |
| Black-throated gray warbler | *Dendroica nigrescens* | | | Sensitive |
| Wilson's warbler | *Wilsonia pusilla* | | | Sensitive |
| Green-tailed towhee | *Pipilo chlorurus* | | | Sensitive |
| Brewer's sparrow | *Spizella breweri* | | | Sensitive |
| Sage sparrow | *Amphispiza belli* | | | Sensitive |
| Grasshopper sparrow | *Ammodramus savannarum* | | | Sensitive |
| Bobolink | *Dolichonyx oryzivorus* | | | Sensitive |
| Yellow-headed blackbird | *Xanthocephalus xanthocephalus* | | | Sensitive |
| Yellow-billed cuckoo | *Coccyzus americanus* | | | Sensitive |
| Calliope hummingbird | *Stellula calliope* | | | Sensitive |
| Rufous hummingbird | *Selasphorus rufus* | | | Sensitive |
| Lewis' woodpecker | *Melanerpes lewis* | | | Sensitive |
| Red-naped sapsucker | *Sphyrapicus nuchalis* | | | Sensitive |
| Cordilleran flycatcher | *Empidonax occidentalis* | | | Sensitive |
| Dusky flycatcher | *Empidonax oberholseri* | | | Sensitive |
| Gray flycatcher | *Empidonax wrightii* | | | Sensitive |
| Willow flycatcher | *Empidonax traillii* | | | Sensitive |
| Hammond's flycatcher | *Empidonax hammondii* | | | Sensitive |

**Table 3.8-14. Protected and Sensitive Animal Species Known or with Potential to Occur within the General ROI of the Proposed Action (page 3 of 3)**

| *Common Name* | *Species Name* | *USFWS Status* | *IDFG Status* | *BLM Status* |
|---|---|---|---|---|
| **Mammals** | | | | |
| Fringed myotis | *Myotis thysanodes* | | Special concern | Sensitive |
| Long-eared myotis | *Myotis evotis* | | | Sensitive |
| Long-legged myotis | *Myotis volans* | | | Sensitive |
| Spotted bat | *Euderma maculatum* | Concern | Special concern | Sensitive |
| Townsend's big-eared bat | *Corynorhinus townsendii* | Concern | Special concern | Sensitive |
| Yuma myotis | *Myotis yumanensis* | Concern | | Sensitive |
| Dark kangaroo mouse | *Microdipodops megacephalus* | | | Sensitive |
| Pygmy rabbit | *Brachylagus idahoensis* | | | Sensitive |
| Kit fox | *Vulpes macrotis* | | Special concern | Sensitive |
| California bighorn sheep | *Ovis canadensis californiana* | Concern | | Sensitive |

*IDFG Species of Special Concern* are native species that are either low in numbers, limited in distribution, or have suffered significant habitat losses. Category A (Priority Species) includes those species that meet one or more of the criteria above and for which Idaho presently contains or formerly constituted a significant portion of their range. The ferruginous hawk, mountain quail, American white pelican, and redband trout are Priority Species. Category B (Peripheral Species) includes those species that meet one or more of the criteria above but whose populations in Idaho are on the edge of a breeding range that falls largely outside the state. The kit fox, Mojave black-collared lizard, and western ground snake are Peripheral Species. Category C

(Undetermined Status Species) includes those species that may be rare in the state but for which there is little information on their population status, distribution, and/or habitat requirements. The spotted bat and Townsend's big-eared bat fall into this category.

*IDFG Protected Nongame Species* include all non-game, native birds and non-game mammals such as chipmunks and some ground squirrel species. These species cannot be taken or possessed at any time or in any manner, except by special permit (Section 36 of the Idaho Code).

*BLM Sensitive Species* are designated by the BLM state director, usually in cooperation with the state agencies responsible for managing the species as sensitive. These species are (1) under status review by the USFWS; (2) declining so rapidly that federal listing may become necessary; (3) typically small and widely dispersed populations; or (4) inhabiting ecological refugia or other specialized or unique habitats. Sensitive species are managed by the BLM under the same policy as candidate species.

***INVERTEBRATES***

Eight aquatic mollusk species with special status are known to occur within ROI Three. Of these, seven species are found only in the Snake River and a few tributaries. The Bruneau hot springsnail, the only species known to occur within ROI Two, is found in several springs in the northern portions of the Bruneau River. Federally endangered and threatened mollusk species are discussed in the Biological Assessment.

Populations of Bruneau hot springsnail are known to occur within Hot Creek and over 120 springs near the Bruneau River within ROI Two (personal communication, Klott 1996). These populations are found within hot springs immediately adjacent to the river within the Bruneau River canyon. Extensive surveys in the Bruneau River and its tributaries have not detected additional populations (USFWS 1993).

No population of protected or sensitive invertebrate species are known to exist within ROI One for any alternative. Suitable habitat does not exist in these areas for aquatic invertebrate species.

### *FISH*

Three of the special status fish species listed in Table 3.8-14 (leatherside chub, white sturgeon, and Shoshone sculpin) are known to occur within ROI Three only in the Snake River and a few tributaries.

The redband trout is a subspecies of rainbow trout. Populations are threatened by habitat alteration and hybridization with other salmonid species (IDFG 1992). Their habitat is described as cold streams.

Distribution information from IDFG (BLM, unpublished data 1996e) indicates that redband trout range from common to rare in perennial streams within ROI Three. Redband trout are rare in most of the Owyhee River but are common in Red Canyon Creek where a spawning area was observed. Redband trout are considered to be abundant in the Bruneau and Jarbidge rivers within ROI Two and are also found in the East Fork of the Bruneau River within ROI Two.

The Jarbidge River in southern Idaho and northern Nevada supports a migratory population of bull trout. Resident populations of bull trout are found in the headwaters of the East and West Forks of the Jarbidge River and several tributaries (Zoellick et al. 1996). Bull trout are discussed in detail in the Biological Assessment.

The Lahontan cutthroat trout is located in ROI Three only within the upper-basin tributaries of the Humboldt River in Nevada (Gerstung 1988). This trout species is discussed in detail in the Biological Assessment.

Migratory bull trout may be present seasonally in the East and West Forks of the Jarbidge River within ROI Two.

Interior redband trout are known to occur in the East Fork of the Bruneau River upstream from Juniper Butte. Redband trout are also found in Wickahoney Creek immediately adjacent to the proposed Grasmere drop area.

Suitable habitat for bull trout or Lahontan cutthroat trout does not exist within ROI One for any alternative.

### *HERPTILES*

#### *Amphibians*

Populations of the spotted frog south of the Snake River are listed as a candidate species. This species is discussed in detail in the Biological Assessment.

The spotted frog is an opportunistic feeder, consuming a variety of insects, mollusks, crustaceans, and arachnids. This species is unable to survive in areas where introduced bullfrogs establish healthy populations (Nussbaum et al. 1983).

The northern leopard frog (*Rana pipiens*) occurs in central and eastern Canada, the northern Plains and Midwest of the United States, as well as throughout the Great Basin to Arizona and New Mexico (Stebbins 1985). In arid regions, its distribution is patchy (Stebbins 1985). In addition, throughout much of its range, including Idaho, its numbers are declining for unknown reasons (Nussbaum et al. 1983; Munger et al. 1993).

The northern leopard frog is found in a variety of habitats, from grasslands and shrublands to high mountain forests (Stebbins 1985). However, the species is usually encountered in marshes, wet meadows or other quiet water with substantial vegetation (Nussbaum et al. 1983). In southern Idaho, the species is more confined to valleys in the west (Nussbaum et al. 1983). Recent surveys in the Bruneau and Jarbidge resource areas did not detect any northern leopard frogs (Munger et al. 1993; Munger et al. 1994; McDonald 1996).

The range of the western toad encompasses much of western North America. Breeding western toads can be found in aquatic habitats associated with sagebrush deserts, montane meadows, grasslands, and woodlands (Stebbins 1985). In southwest Idaho, few observations of western toads exists. Historic records indicate western toads were present in Twin Falls County (McDonald 1996). More recently, in 1994, western toads were found in two locations in the Jarbidge Resource Area (McDonald 1996). However, surveys conducted in 1995 could not locate western toads in these areas. Two adult western toads were found in the Owyhee Mountains (Munger et al. 1996).

Western toads may use ponds, spring pools, lakes shallows, slow moving streams, stock tanks, or reservoirs for breeding (Nussbaum et al. 1983). During the non-breeding season, movements of western toads are highly terrestrial. Western toads have been observed burying themselves in loose soils and also inhabiting rodent burrows.

BLM and ICDC databases do not show any occurrences of spotted frogs, northern leopard frogs, or western toads within ROI Two or ROI One for any alternative. Suitable habitat for these species exists, however, specifically within Wickahoney and China creeks in the Grasmere 12,000-acre site as well as in Wickahoney and China ponds immediately adjacent to the Grasmere site. Additional breeding habitat for western toads occurs at two spring pools at the Clover Butte site. Surveys of these areas in June 1996 did not detect any of these species, but the surveys may not have been conducted during appropriate survey seasons. Potentially suitable habitat for all three species also occurs within ROI One at Clover Crossing on the East Fork of the Bruneau River.

### *Reptiles*

The range of the Mojave black-collared lizard extends from southwest Idaho and southeast Oregon, south into Nevada, California, and into parts of Utah and Arizona (Stebbins 1985). Black-collared lizards inhabit sparsely vegetated rocky areas (small boulders, piles of rocks, or talus) associated with slopes of canyons, gullies, and hillsides in arid and semi-arid regions. In the Snake River Birds of Prey National Conservation Area (NCA), black-collared lizards were primarily found on canyon rims (Diller and Johnson 1982).

The western ground snake occurs in southern Idaho, Utah, Colorado, and Missouri south to Baja California, Chihuahua, and Tamaulipas. In Idaho, it is restricted to the southwest part of the state. Habitat may range from arid to semi-arid land and could include river bottoms, desert flats, sand hummocks, and rocky hillsides with pockets of loose soil. Most western ground snakes in a local study were collected in or near talus or scree slopes. The snakes that were not actually in loose rock slopes appeared to be utilizing small burrows probably formed by an invertebrate in compact loess near the base of these rocky slopes (Diller and Wallace 1981). The western ground snake occurs from desert and prairie lowlands to pinyon-juniper and the oak-pine zone. Soil may be rocky to sandy; vegetation may be dense to sparse.

The longnose snake occurs in California, southern Idaho, Colorado, and Kansas southward to Baja California, Jalisco, Tamaulipas, and San Luis Potosi. In Idaho, it is restricted to the southwestern part of the state where it inhabits deserts, prairies, and rocky canyons. Longnose snakes were collected in almost all major habitats in southwest Idaho, including areas adjacent to agriculture, rocky and sandy areas, open desert lands, and riparian habitats (Diller and Wallace 1981). Although longnose snakes may be widespread and relatively common in appropriate habitat, habitat fragmentation and degradation around C.J. Strike Reservoir may be affecting the distribution of a longnose snake population (personal communication, Beck 1997).

Mojave black-collared lizards have been documented in Bruneau Canyon near Hot Creek (Klott 1996). Suitable habitat for black-collared lizards exists within at least 40,000 acres of shrub communities in and near canyons in ROI Two, as well as in smaller draws and isolated rocky areas.

BLM and ICDC databases do not contain any occurrence records for the longnose snake within ROI Two. A single ICDC record for the western groundsnake is found within ROI Two near the southern boundary of SCR (IDFG 1996a). BLM and ICDC databases do not contain any occurrence records for the longnose snake, or the western groundsnake within ROI One. Surveys conducted in 1996 did not detect either species. Suitable habitat for these species is found within all river canyons, riparian areas, and intact shrub-steppe habitat in ROI Two and ROI One.

BLM and ICDC databases do not show any occurrences of the Mojave black-collared lizard within ROI One for any alternative. Suitable habitat for this species exists, however, specifically within draws and slopes in the western portion of the Grasmere site, as well as within Juniper Draw at the Juniper Butte site.

BLM and ICDC databases do not contain any occurrence records for the longnose snake or the western groundsnake within ROI One for any alternative.

## *BIRDS*

### *Bald Eagle*

Previously listed as federally endangered in most states, the bald eagle was reclassified as threatened because of significant increases in the number of breeding pairs (USFWS 1995). This species is discussed in detail in the Biological Assessment.

Few bald eagle nesting territories are known in southwest Idaho; the closest is along the South Fork of the Boise River approximately 35 miles from the Bruneau area (Klott 1996).

In southwest Idaho, bald eagles winter along the Snake and Boise rivers. Results from the mid-winter bald eagle survey conducted annually in January show that eagle use on the Snake River between Bliss and Grandview is low. From 1986 to 1996 the number of eagles observed along this route ranged from zero to 16 birds (personal communication, Bates 1996). Several bald eagles also have been observed along the Owyhee River during the winters of 1992 and 1993 (Air Force 1993a).

Bald eagles have not been documented as nesting or wintering within ROI Two or ROI One. ROI Two does not contain suitable nesting habitat for bald eagles, and wintering habitat appears to be limited to canyon areas with adequate food supply. Winter surveys for bald eagles were conducted within ROI Two in February 1997. No bald eagles were detected during these surveys. ROI One does not contain appropriate nesting or wintering habitat for any alternative.

### *Peregrine Falcon*

Currently, the American peregrine falcon is classified as endangered. However, in 1995 the USFWS gave notice of a proposal to remove this subspecies from the list of endangered and threatened wildlife (USFWS 1995). No determination has been made to date.

Two historic nest sites located in southwest Idaho, one near the C.J. Strike Reservoir and the other on the Duck Valley Reservation, have not been occupied by birds since the mid 1970s (Bechard and Howard 1988). In 1992, a pair of peregrines was observed in the Jarbidge Resource Area, but no nest was confirmed (Klott 1996). An additional unconfirmed sighting of a peregrine falcon was reported in the same general area in 1997 (personal communication, Klott 1997). Single birds have been seen in January (1993) and in May (1992, 1993) near the Owyhee River (Air Force 1993a). Small numbers of peregrine falcons migrate along the Boise Mountains in autumn (Kaltenecker et al. 1995); however, there are no records of this species overwintering here (Stephens and Sturts 1991).

BLM data include a peregrine falcon occurrence in the Bruneau River canyon within ROI Two, but nesting was not confirmed. No additional confirmed observations of peregrines in the area have been recorded. Potential habitat for peregrines within ROI Two include 974,000 acres of canyon habitat with adjacent upland shrub-steppe communities. No breeding season surveys

of these areas have been conducted. Within this habitat, peregrines are likely to occur only in areas with adequate prey base and proximity to water.

No observations of peregrines in ROI One for any alternative have been recorded. Potential habitat for peregrines within ROI One includes limited areas of canyon habitat with adjacent upland shrub-steppe communities near the Grasmere and Juniper Butte drop areas; however, surveys of the Grasmere site in June 1996 did not detect nesting peregrines, and surveys of Juniper Butte have not been conducted.

*Ferruginous Hawk*

Ferruginous hawks are found dispersed throughout the species' breeding range, which extends from southern Alberta and Saskatchewan south into northern Arizona, New Mexico, and Texas and from eastern Washington, Oregon, and Nevada, east into the Great Plains states (Olendorff 1993). During the winter this species is primarily found in the southwestern United States and Mexico, although small numbers of hawks winter in Idaho, Colorado, North and South Dakota, and Nebraska.

At the Snake River Birds of Prey NCA, approximately 60 miles northwest of ETI, the ferruginous hawk population is believed to be relatively stable (personal communication, Carpenter 1996). Results from surveys conducted in the NCA in 1995 documented about 25 pairs of ferruginous hawks.

In southern Idaho, ferruginous hawks are found nesting in pinyon-juniper/shrub-steppe ecotones, shrub-steppe, and grassland habitats. Nesting substrates used by ferruginous hawks include trees, large shrubs, cliffs, rock outcrops, and artificial structures such as power poles and nesting platforms (Olendorff 1993). In general, the nesting stage (egg laying until fledging) covers the period from mid-March into July. Average home range size (area used for nesting and hunting) estimated for ferruginous hawks was 2.7 square miles and ranged from 1.3 - 8.4 square miles (Olendorff 1993). The ferruginous hawk Habitat Suitability Index model (Jasikoff 1982) suggests that optimal foraging habitat is found where vegetation height is between 10 and 24 inches and canopy cover is between 60 and 100 percent.

Ferruginous hawk nesting territories have been documented at 30 locations within ROI Two, 28 of which are found east of the Bruneau River (personal communication, Klott 1996; personal communication, Clark 1996). The higher number of territories east of the Bruneau River is probably due to a greater survey effort in the Jarbidge Resource Area. Suitable habitat for ferruginous hawks is found within as many as 974,000 acres in ROI Two.

Ferruginous hawk nesting territories have been documented at five locations within ROI One. Raptor surveys of ROI One in June 1996 recorded one ferruginous hawk in the Grasmere drop area, but no nest was found. A ferruginous hawk nest in the northeastern portion of the Juniper Butte 12,000-acre training range has been active since at least 1995 (personal communication, Klott 1997).

*Mountain Quail*

The mountain quail is a year-round resident from southwestern British Columbia through portions of Washington, Idaho, California, Baja California, and Mexico (IDFG 1992). Historically, the distribution of the mountain quail is believed to include central and southwest Idaho (IDFG 1990). Remaining populations are concentrated along the lower Little Salmon River and Salmon River, as well as along Hells Canyon. Additional populations have been reported along the Boise River and in Elmore and Owyhee counties (IDFG 1990). In 1992 and 1993, mountain quail were heard during surveys in the Jarbidge Resource Area (Klott 1996).

Mountain quail migrate altitudinally by foot between the higher elevation breeding areas to lower wintering sites (Johnsgard 1973). Quail habitat is quite variable and includes dense undergrowth on mountainsides, coniferous forests, forest and meadow edges, open forest, and logged or burned over forests (Terres 1991). In arid environments, mountain quail can be found in riparian areas adjacent to sagebrush uplands (Klott 1996). More than other quail, this species is dependent on dense shrubby vegetation, near water, during all phases of its life (IDFG 1990).

BLM and ICDC databases have no records of mountain quail occurring within ROI Two or ROI One for any alternative. Suitable habitat for mountain quail is found within 40,000 acres of canyon areas in ROI Two; little suitable habitat occurs in ROI One.

*White-faced Ibis*

The breeding range of the white-faced ibis extends from the northern Great Plains south into Texas and includes portions of the western states including Nevada, Utah, Colorado, Oregon, California, and southern Idaho. Breeding populations are also located in coastal Mexico and South America. This species migrates from its northern breeding areas south into parts of California, Texas, Mexico, and Central and South America for the winter (National Geographic Society 1987).

Across southern Idaho, white-faced ibis nesting colonies are patchily distributed and concentrated in the southeastern portion of the state (Taylor et al. 1989; Trost and Gerstell 1994). Results from surveys reported that the number of ibis nests in southern Idaho ranged from 3,280 to 4,650 in 1993 (Trost and Gerstell 1994). Over 700 of these nests were located in southwest Idaho on the Duck Valley Reservation. Ibises have been observed at reservoirs in the Jarbidge Resource Area, but suitable nesting habitat is not present (Klott 1996).

In the spring, white-faced ibises arrive at their breeding sites within marshes or swamps, or near ponds or rivers and construct nests on the ground or low in trees or shrubs. In addition to foraging in natural wetlands, ibises have taken advantage of irrigated agricultural fields as foraging habitat (Trost 1989).

A single white-faced was observed in July 1989 within ROI Two (BLM unpublished data 1996c). Ibises are not known to breed within ROI Two, although potential breeding habitat exists in wetland areas north of the Duck Valley Reservation.

A pair of white-faced ibises was observed within ROI One near the Grasmere drop area in late May 1996; it is not known whether the birds had nested in the area or were dispersing from nesting grounds elsewhere. Ibises have not been documented as breeding within ROI One, although limited potential breeding habitat exists in Wickahoney and China ponds immediately adjacent to the Grasmere site.

*Black Tern*

The breeding range of the black tern encompasses most of Canada and the northern United States. Black terns spend the winter along coasts in Central and South America. In Idaho, black terns are known to breed in the Panhandle region and the eastern portion of the state (Stephens and Sturts 1991; Trost and Gerstell 1994). Trost and Gerstell (1994) mentioned that a colony may exist in southcentral Owyhee County. Black terns may be found breeding in loose colonies on lakeshores, marshes, and wet meadows.

BLM and ICDC databases contain no records of breeding black terns within ROI Two or ROI One. Potential breeding habitat in ROI Two is limited to a few small wetlands north of the Duck Valley Reservation.

No breeding habitat for black terns is present in ROI One for any alternative.

*Loggerhead Shrike*

Loggerhead shrikes can be found breeding in central Canada, throughout the United States and in Mexico. Within the northern portion of its range this species migrates southward for the winter (National Geographic Society 1987). In Idaho, loggerhead shrikes breed in the southern portion of the state and some are known to winter in the southwest counties (Stephens and Sturts 1991), whereas others are migratory (Saab and Groves 1992).

Populations of loggerhead shrikes appear to be declining nationwide with the most severe declines in the central and eastern states (Fraser and Luukkonen 1986). In southern Idaho, loggerhead shrikes appear to be broadly distributed and often locally abundant throughout the remaining patches of sagebrush habitat (Woods 1994). However, continued loss of Idaho's sagebrush habitat is likely to significantly influence shrike populations as habitat loss has been correlated with shrike declines in other regions (Gawlik and Bildstein 1993; Prescott and Collister 1993).

Loggerhead shrikes are found breeding in a variety of habitats including sagebrush, open woodlands, and fields with scattered trees. In southwest Idaho, shrikes can be found occupying territories in late March and fledging young from May through August (Woods

1994). Shrikes construct nests primarily in sagebrush and less frequently in bitterbrush and greasewood (Woods and Cade 1996) and sometimes in western juniper (Klott 1996).

Loggerhead shrikes are known to breed in eight locations within ROI Two (IDFG 1996a). Suitable shrike nesting habitat is found in shrubs that are greater than 3.5 feet tall within the 282,125 acres of big sagebrush located within ROI Two. No surveys have been conducted and it is likely that the number of shrikes nesting in the area is higher.

Loggerhead shrikes were detected at four locations within the proposed Grasmere 12,000-acre training range in June 1996. Suitable shrike nesting habitat is found in shrubs that are greater than 3.5 feet tall within the 2,651 acres of big sagebrush located within ROI One at the Grasmere 12,000-acre withdrawal area.

*Northern Goshawk*

The northern goshawk breeds in a variety of mature forest types in Canada, Alaska, the western United States, and portions of the Great Lakes states and New England. In some breeding areas, goshawks are year-round residents but may emigrate if prey populations are low (Doyle and Smith 1994).

Goshawks can be found nesting in coniferous forests of mountains in southern Idaho (including the Boise National Forest) and also in aspen forests just south of the Idaho-Nevada border (Younk and Bechard 1994). This species is also known to migrate during autumn along the Boise Mountains (Kaltenecker et al. 1995) and is an infrequent winter visitor to Idaho's deserts and canyons.

Northern goshawks are not known to occur in ROI Two except during migration. No suitable nesting habitat for goshawks is present in ROI Two.

Northern goshawks are not known to occur in ROI One except during migration. Suitable nesting habitat for goshawks in ROI One is limited to small pockets of aspen at the proposed Grasmere training range, which comprise approximately 2 acres of the area.

*Burrowing Owl*

The western burrowing owl can be found breeding in grasslands, deserts, agricultural fields, and near human-occupied sites such as golf courses and vacant lots, in southern Canada and western United States (National Geographic Society 1987; Ehrlich et al. 1988). Other subspecies occur in Central and South America and Florida. Burrowing owls breeding within the northern portion of this species range are migratory and probably winter in southwestern United States or Central America (Marti and Marks 1989).

In some western states where burrowing owls once commonly occurred, populations have declined (Marti and Marks 1989). Burrowing owl populations appear to be stable in Idaho, Montana, and Nevada (Marti and Marks 1989). Breeding owls are found in most counties in

southern Idaho (Stephens and Sturts 1991) and are locally abundant in some areas (Rich 1986; King 1996).

Burrowing owls arrive on their breeding territories in southern Idaho in mid-March and April. Burrows, previously excavated by badgers or yellow bellied-marmots, are modified for use as nesting chambers (Rich 1986; King 1996). Upon fledging (leaving the nest), young owls move around to multiple satellite burrows within 500 meters of the natal burrow (King 1996). Home ranges of adult and juvenile owls range from 35 to 82 acres and 114 to 1,720 acres, respectively (King 1996). Juveniles disperse from natal territories in late July and August (King 1996), but have been observed near natal burrows in mid-September (Rich 1986).

Nesting habitat of burrowing owls in southern Idaho can be typically described as flat, open grasslands, that are dominated by cheatgrass and other exotic vegetation and located near agricultural fields (Rich 1986; King 1996).

Five records of nesting burrowing owls were found in BLM and ICDC databases for ROI Two. Additional burrowing owl habitat is found within as many as 406,000 acres of grassland and agricultural habitats within ROI Two.

One record of nesting burrowing owls was found in BLM and ICDC databases for ROI One. Surveys of ROI One conducted in June 1996 also reported four observations of burrowing owls at Grasmere and Clover Butte, and a burrowing owl nest burrow at Juniper Butte was active in 1997 (personal communication, Klott 1997). Additional burrowing owl habitat is found within approximately 10,000 acres of grassland vegetation within ROI One for Alternative B, 6,000 acres for Alternative C, and 11,000 acres for Alternative D.

*American White Pelican*

The American white pelican breeds primarily in eastern Washington, southern and northern California, western Nevada, southern Idaho, northern Utah, Montana, Wyoming, North Dakota, South Dakota, western Michigan, and coastal Texas (IDFG 1992). These pelicans winter in southwest Idaho but there has been no confirmation of breeding in this region (Stephens and Sturts 1991). Breeding colonies have a low tolerance for disturbance and are highly susceptible to predation. The white pelican is sensitive to contamination and is threatened by loss of breeding and feeding areas. Pelicans thought to breed in Utah and Wyoming forage throughout the summer on reservoirs along the Snake River in Idaho. The white pelican usually nests on islands in brackish or freshwater lakes (IDFG 1992).

American white pelicans are not known to nest in southwest Idaho.

American white pelicans are not known to occur within ROI Two except as migrants in the spring and fall. Neither ROI Two nor ROI One for any alternative contain breeding habitat for pelicans. A single pelican that had been fitted with a satellite radio transmitter at NAFR in Nevada

apparently traveled through the area in late summer 1996, suggesting that reservoirs in the area may be used by dispersing juveniles (personal communication, Schueck 1996).

*Long-Billed Curlew*

Long-billed curlews are ground-nesting birds that breed in grasslands and prairies in southern Canada and in the west and central United States. This large shorebird migrates to coastal areas, marshes, and grainfields in the southwestern United States and Central America for the winter.

Although the distribution and abundance of breeding long-billed curlews is not well known, populations in southwest Idaho are stable (Jenni et al. 1982; Klott 1996). The curlew population at Black Canyon Planning Unit near Caldwell, Idaho, is probably the most important breeding area west of the Rocky Mountains (Jenni et al. 1982).

The breeding phenology of long-billed curlews in southwest Idaho has been well described (Jenni et al. 1982). Long-billed curlews arrive on the breeding grounds in late March. After hatching the young immediately leave the nest and eventually form large flocks with other juveniles. By mid-August all long-billed curlews have migrated from the area.

Long-billed curlews nest and forage in vegetation that is relatively open and less than 12 inches in height (Jenni et al. 1982). Curlew nesting areas in the Jarbidge Resource Area can be found in annual grasslands and grazed crested wheatgrass seedlings (Klott 1996). Grazing by cows and sheep can maintain vegetation height and density required by nesting curlews (Jenni et al. 1982).

Occurrence records for long-billed curlews in ROI Two and ROI One do not exist; however, surveys for this species have not been conducted in this area. Suitable habitat for curlews is found within 59,437 acres of grasslands in ROI Two and 741.94 acres of ROI One.

*Columbian Sharp-Tailed Grouse*

The historic range of the Columbian sharp-tailed grouse included British Columbia and portions of the Great Plains and the western states (Johnsgard 1983). This subspecies has been extirpated from much of its historic range in the United States because of conversion of sagebrush steppe and fescue-wheatgrass to cropland (Johnsgard 1983).

Columbian sharp-tailed grouse are year-round residents of Idaho and are known to breed in some southeast and west-central counties (Stephens and Sturts 1991). Sharp-tailed grouse are believed to have been extirpated from the Jarbidge Resource Area over 50 years ago (Klott 1996) and none are known to breed in Owyhee County (Stephens and Sturts 1991).

Nesting habitat of Columbian sharp-tailed grouse is variable depending on geographic location. Habitat types include grassland with scattered woodlands, sagebrush, brushy hills, and oak savanna (IDFG 1992). In Wyoming sharp-tailed grouse broods use mountain shrub

and sagebrush-snowberry habitats (Klott and Lindzey 1990). During the winter flocks of sharp-tailed grouse in west-central Idaho are closely associated with mountain shrub and riparian habitats for food and cover (Marks and Marks 1988).

A population of sharp-tailed grouse in the Jarbidge Resource Area has been extirpated (Klott 1996). A few areas in the southern portion of the resource area with mountain shrub and aspen may be suitable for reintroduction of this species (Klott 1996).

BLM and ICDC databases do not contain records for Columbian sharp-tailed grouse and no suitable habitat is present within ROI Two and ROI One for any alternative.

*Trumpeter Swan*

The breeding populations of trumpeter swans are highly disjunct and are located in Alaska, Alberta, and within the Greater Yellowstone Ecosystem (GYE), which includes parts of Idaho, Montana, and Wyoming (Bellrose 1980). Swans that breed within the GYE overwinter on available open water in the general area. After trumpeter swans were relocated to the C.J. Strike Wildlife Management Area in the early 1990s, swans were sighted along the Snake River downstream of Glenns Ferry and near the Hagerman Wildlife Management Area the following winters (Klott 1996). Swans build their nests in dense vegetation on the margins of marshes, ponds, and lakes.

Trumpeter swans are not known to breed or winter in ROI Two but probably migrate through the area in spring and fall. Suitable breeding or wintering habitat is not found in ROI Two or ROI One for any alternative.

*Northern Harrier*

Northern harriers nest on the ground in grassland, shrub-steppe, or marsh habitats and can also be found wintering in southwest Idaho. Few marshes are found within ROI Three, but harriers may be found nesting in grasslands, shrub-steppe, and near agricultural areas throughout the uplands of ROI Three. In the Snake River Birds of Prey NCA, harriers were the most common raptor species in every season through 4 years of point counts in a variety of vegetation types (Watson et al. 1994). In 1996, northern harriers were observed in sagebrush or crested wheatgrass vegetation types at each of the 12,000-acre training range sites.

*Prairie Falcon*

Prairie falcon breeding range extends from southern British Columbia to southern Arizona and New Mexico. The species is found in open habitats such as grasslands and shrub-steppe and is usually associated with canyons, cliffs, or rock outcrops. In southwest Idaho, prairie falcons are abundant or common during the breeding season in appropriate habitats and uncommon in the winter. Prairie falcon nesting habitat is found within approximately 39,000 acres of canyons in ROI Two, as well as in smaller draws and cliffs. Although no prairie falcons were observed at the Clover Butte site, it may be used as foraging habitat for prairie falcons nesting in the East

Fork Bruneau Canyon. Prairie falcons were observed at the Grasmere and Juniper Butte sites, where potential nesting habitat is abundant.

*Sage Grouse*

Associated with sagebrush communities in the Great Basin and Great Plains, sage grouse may be declining in southern and eastern Idaho due to loss of sagebrush vegetation. Sage grouse are highly dependent on sagebrush habitat during most of the year. From autumn to spring, sagebrush is the sole food source for sage grouse (Braun et al. 1977). Sagebrush habitat is also used for courtship activities and sagebrush provides protective cover for nesting. During brood rearing, sagebrush is consumed to a lesser extent as females and their broods move to habitats that contain insects and forbs critical to developing young. Distances of sage grouse movements between winter, breeding, and summer ranges may be influenced by elevation and available suitable habitat.

Within ROI Three, sage grouse lek sites, nesting, brood rearing, and winter areas have been identified (unpublished data, BLM 1996c). In a 46-square-mile area north of Murphy Hot Springs and east of the Jarbidge River, observed numbers of wintering sage grouse declined from 1,500 birds in 1991 to 100 birds in 1995 (personal communication, Williams 1996).

The loss of sagebrush habitat in southern Idaho has increased in recent years as expanding annual grasslands increase fine fuel loads and, consequently, fire frequency and size. The BLM estimates that 20 percent, or two million acres, of shrub-steppe communities in Idaho have burned in the mid-1980s and early 1990s (Saab and Groves 1992), and approximately 100,000 acres of rangeland in the Jarbidge Resource Area burned in 1996. As shrub habitats have been lost due to wildfire, agricultural conversion, overgrazing, or other developments, sage grouse distribution has become more restricted (IDFG 1992).

The Idaho Sage Grouse Management Plan (IDFG 1997) lists the goal and objectives of the IDFG to form a Idaho Sage Grouse Task Force to develop a strategy to improve sage grouse populations in Idaho. This is not a recovery plan and does not establish funding sources or criteria for sage grouse recovery. Rather, the management plan illustrates the recent statewide decline in sage grouse populations in broad categories; however, the plan does not provide specific actions to reverse the trend. The plan speculates on possible causes of the sage grouse decline and suggests that if implemented, this plan may increase the number of sage grouse in Idaho.

Sage grouse lek sites, nesting, brood rearing and winter areas in ROI Two have been identified by the BLM (BLM 1996f). Vegetation analysis has identified approximately one million acres, or 67 percent of ROI Two, as potential sage grouse nesting or wintering habitat.

Within ROI One, sage grouse habitat is found in 6,500 acres of sagebrush vegetation at Grasmere and 4,200 acres at Clover Butte. Suitable habitat for leks or nests does not exist at Juniper Butte, although historic lek sites were found in the area prior to fires in the 1980s. Sage

grouse, including a group of 33 individuals, were observed at Clover Butte during wildlife surveys conducted in June 1996. Sage grouse sign were also observed at the emitter sites BD and AQ. An aerial survey of appropriate wintering habitat at proposed training range, no-drop target, and emitter sites conducted in February 1997 did not detect sage grouse in the area.

During spring lek surveys (personal communication, Klott 1997), an active lek consisting of 12 males and 2 females was observed in the southwest corner of the Clover Butte Alternative on April 3, 1997. Another lek, with 4 males, was observed on the east side of the East Fork Bruneau Canyon on April 15, approximately 2.5 miles east of the Juniper Butte Alternative.

Use of the powerline corridor and new road rights-of-way by sage grouse is probably limited because stands of sagebrush are small and few.

*Passerines*

Three BLM Sensitive passerine species are found primarily in shrub-steppe habitats: Brewer's sparrow, sage sparrow, and gray flycatcher. These habitats comprise over 1 million acres or 70 percent of ROI Two. Big sagebrush comprise 4,197 acres of Clover Butte, 5,345 acres of Grasmere, and approximately 10 acres of the no-drop target areas.

Bobolinks and grasshopper sparrows are found in grasslands or near agricultural lands. Bobolinks typically breed in marshy areas or farmlands, and are likely rare within ROI Two. Grasshopper sparrows have been documented in extensive perennial grasslands, including seedings near SCR in ROI Two (personal communication, Klott 1996).

BLM Sensitive passerines that may be found in riparian areas or higher-elevation woodlands in ROI Three include Swainson's thrush, solitary vireo, yellow warbler, Townsend's warbler, MacGillivray's warbler, black-throated gray warbler, Wilson's warbler, yellow-headed blackbird, yellow-billed cuckoo, calliope hummingbird, rufous hummingbird, Lewis' woodpecker, red-naped sapsucker, cordilleran flycatcher, dusky flycatcher, willow flycatcher, and Hammond's flycatcher. In addition, green-tailed towhee may be found in riparian areas, woodlands, or in mountain shrub habitats. These species would be found primarily in dense riparian vegetation in major river canyons or near permanent ponds, which comprise 4 percent of ROI Two. Woodlands are limited to 249 acres of aspen stands in the southern portion of ROI Two along the Jarbidge River.

*MAMMALS*

*Spotted Bat*

The spotted bat's range includes western North America from the southern border of British Columbia, south through the southwestern United States to central Mexico. This species is found in various habitats from desert to mountain coniferous forest (IDFG 1992) but always in association with nearby high cliff faces.

Spotted bats have been observed in caves near Fossil Butte and Deer Flat National Wildlife Refuge near Marsing (IDFG 1992). Individuals collected in Idaho, Oregon, Montana, and Canada are members of resident breeding populations, rather than post-breeding wanderers (Keller 1992). Spotted bats have been collected in desert pinyon-juniper woodlands near sandstone cliffs and over streams and water holes in a mixed coniferous forest with rock cliffs nearby (Keller 1992).

The spotted bat is nocturnal and feeds primarily on noctuid moths and beetles. The spotted bat roosts singly and, although apparently solitary, these bats may hibernate in small clusters (IDFG 1992). Feeding altitude is generally 30-40 feet AGL in open ponderosa pine, cottonwoods, and over riparian areas, sagebrush, and water (personal communication, Cannings 1993).

Spotted bats have been recorded at several locations within ROI Three, including the Owyhee River area (Keller 1992).

Two records of spotted bats have been documented in the Bruneau River Canyon within ROI Two (personal communication, Klott 1996). In addition, BLM biologists recorded additional occurrences of spotted bats in the Marys Creek area in 1996 (Doering and Keller, in preparation).

Bat surveys conducted in July and August 1996, detected the presence of three of the six protected and sensitive species within and adjacent to the Grasmere 12,000-acre training range. At four of the seven sampling sites, spotted bat echolocation calls were recorded or were aurally detected.

In the 640-acre target area, spotted bats were heard in August 1996.

In the Clover Butte 12,000-acre training range, two ephemeral ponds were present in June 1996. A subsequent visit in July found the ponds dry and no bats were detected.

***Townsend's Big-Eared Bat***

The Townsend's big-eared bat is found throughout western North America from British Columbia south through Mexico and east to West Virginia (IDFG 1992). This species occasionally uses buildings and tree cavities for night roosts. Maternity and hibernation colonies occur exclusively in caves and mine tunnels. Hibernacula are usually cool and damp (IDFG 1992).

The Townsend's big-eared bat is found throughout Idaho. This species is considered sedentary with a high degree of site attachment. The Townsend's big-eared bat feeds on various flying insects near the foliage of trees and shrubs and may feed primarily on moths. This bat uses caves and cracks as day roosts and commonly feeds over water (Keller 1992). Occasional sightings of Townsend's big-eared bats have been reported for the Birds of Prey Area in Idaho (BLM 1979); other observations of this species include a recent sighting near McKinney Butte and a 1963 record near Boise (IDFG 1992).

Townsend's big-eared bats have been recorded in the Bruneau/Jarbidge River canyon complex in ROI Two (Doering and Keller, in preparation) but are not known to occur in ROI One.

### *Fringed Myotis*

The geographic distribution of fringed myotis bats extends from southern British Columbia south into Southern Mexico, encompassing most of the western United States. This species' range extends into the western and southern portions of Idaho.

Fringed myotis bats have been found in desert scrub, shrub-steppe, oak/pinyon woodlands, and coniferous forest habitats. O'Farrell and Studier (1980) noted that desert and shrub-steppe habitats were within one hour of flight time from forested or riparian areas. Fringed myotis bats roost in caves, mine tunnels, rock crevices, and buildings. Maternity colonies, consisting of adult females and their young, can contain several hundred individuals (Barbour and Davis 1969).

Fringed myotis have been recorded in the Bruneau/Jarbidge River canyon complex in ROI Two (Doering and Keller, in preparation) but were not found in ROI One for any alternative.

### *Long-Eared Myotis*

Long-eared myotis bats are found in southern British Columbia, Alberta, and Saskatchewan, and throughout most of the western United States except for southern Arizona and New Mexico. Throughout its range, the long-eared myotis occurs primarily in forests but also in sage and chaparral habitats (Manning and Jones 1989). Roost sites include fissures in cliffs, hollow trees, caves, mines, and buildings (Manning and Jones 1989). Maternity colonies are small, and males and non-breeding females may roost separately or in small groups (Manning and Jones 1989).

Long-eared bats are known to occur in river canyons within the Jarbidge Resource Area (Doering and Keller, in preparation) and have been documented in western Owyhee County (Keller 1992). This species was also documented at two sampling sites at the Grasmere 12,000-acre training range in 1996.

### *Long-Legged Myotis*

The range of the subspecies of long-legged myotis present in southern Idaho includes most of the western United States (east of the Cascade Range) and northern Mexico (Warner and Czaplewski 1984). Long-legged bats are typically associated with montane forests but have been found in riparian and desert habitats (Warner and Czaplewski 1984). Roost sites used by long-legged bats include crevices in cliff, cracks in the ground, behind loose bark on trees, and buildings (Barbour and Davis 1969; Warner and Czaplewski 1984). Maternity colonies are large and contain several hundred bats (Barbour and Davis 1969).

Long-legged myotis are believed to occur in the Bruneau/Jarbidge River canyon complex in ROI Two and were recorded at two sampling sites at the Grasmere 12,000-acre training range in 1996.

*Yuma Myotis*

The subspecies of Yuma myotis, which occurs in Idaho, has a comparatively small geographic distribution. Its range extends from southern British Columbia south to northeastern California, and from the Cascade Range in Washington and Oregon east into western Montana. Yuma myotis has been found in areas with trees adjacent to open water (Barbour and Davis 1969). Caves, tunnels, and buildings can be used as roost sites (Burt and Grossenheider 1980).

Yuma myotis are present in western Owyhee County (Keller 1992) and have been recorded in the Bruneau/Jarbidge River canyon complex in ROI Two (Doering and Keller, in preparation).

*Western Small-Footed Myotis*

The western small-footed myotis is found throughout western North America from British Columbia east to the Great Plains and south to central Mexico (Hall 1981). This species is known to roost with other species in small groups of usually less than 20 individuals around rocky environments (Calif. Wild. Relat. Database n.d.; Zeveloff 1988). Roost sites are primarily in caves, buildings, mines, or crevices (Calif. Wild. Relat. Database n.d.).

The western small-footed myotis occurs in a variety of habitats, but is most common in arid uplands (Calif. Wild. Relat. Database n.d.; Zeveloff 1988). This species feeds on insects by flying low in wooded or brushy areas, usually over water (Calif. Wild. Relat. Database n.d.). They appear to require water in proximity to roost sites where they drink immediately after emergence (Calif. Wild. Relat. Database n.d.).

The western small-footed myotis occurs throughout ROI Three and ROI Two, and also was detected in ROI One at the Grasmere 12,000-acre training range in 1996.

*Dark Kangaroo Mouse*

The dark kangaroo mouse is restricted primarily to Nevada, with portions of its range extending into southeastern Oregon, western Utah, and the extreme southwestern corner of Idaho (Zeveloff 1988, Burt and Grossenheider 1980). This species prefers sandy to fine gravely soils in sagebrush and alkali scrub habitats from 3,900 to 8,000 feet (Calif. Wild. Hab. Relat. Database n.d.; Zeveloff 1988).

Dark kangaroo mice are nocturnal granivores and can be locally abundant in their preferred habitat (Calif. Wild. Hab. Relat. Database n.d.; Zeveloff 1988). In Nevada, the mean annual home range of males was found to be 1.7 acres, while the range of females was considerably smaller (1 acre) (Calif. Wild. Hab. Relat. Database n.d.; Zeveloff 1988).

The dark kangaroo mouse appears to have specialized habitat requirements and probably occurs only within limited areas of ROI Three. This species was not encountered during small mammal surveys of Grasmere and Juniper Butte in 1996.

*Pygmy Rabbit*

The pygmy rabbit is the smallest of North America's leporids with a distribution in the Intermountain West, primarily around the Great Basin. Habitat includes sagebrush communities where stands are dense, and alluvial habitat is preferred. This species is crepuscular, feeding almost entirely on sagebrush during the winter. Clumps of brush smaller than 14,900 square feet are probably not permanently occupied by this species. They prefer tall (3.2 to 4.9 feet) sagebrush often found in ravines (Cooperrider et al. 1986).

Few occurrences of this species are known from southwest Idaho.

Pygmy rabbits are not known to occur within ROI Two or ROI One; however, no surveys for this species have been conducted in the area. Potential pygmy rabbit habitat is found within the 282,125 and 2,651 acres of big sagebrush located within ROI Two and ROI One, respectively, that contain areas of soft soil with stands of big sagebrush that are greater than 3.2 feet tall.

*California Bighorn Sheep*

Bighorn sheep, perhaps more than any other North American ungulate, require relatively specific habitat components (Wakelyn 1984) and exhibit a high tenacity to traditional ranges (Geist 1971). In southwest Idaho, California bighorn sheep forage on Wyoming big sagebrush/bluebunch wheatgrass vegetation communities during most seasons. However, during the spring, rams switch to low sagebrush/Idaho fescue and low sagebrush/basin sagebrush/bluebunch wheatgrass/Idaho fescue (Taylor et al. 1993).

California bighorn sheep breed in October and November. Although the lambing period is generally from April 15 to June 15, the critical lamb rearing period continues into early July (personal communication, Bodie 1992).

California bighorn sheep are altitudinally non-migratory in the Idaho high desert and are closely associated with steep river canyons. All bighorn sheep habitat must contain escape terrain. Escape terrain is defined as areas with cliffs and steep slopes that have occasional rock out-croppings where bighorn sheep can outmaneuver predators and find secure bedding areas (Smith et al. 1991). Cliffs used for bedding and escape must be at least 26 feet high and 456 feet long. Bedding, escape, and lambing cliffs are usually no smaller than 260 feet by 593 feet. Lambing areas are at least five acres and occur in the most precipitous, rugged, isolated areas of bighorn range (Smith et al. 1991). Ideally, water and forage are nearby. Ewe-lamb groups stay in lambing areas for about one month after lambing before venturing into adjoining, less rugged parts of their range. Because bighorn sheep are specialized for leaping and climbing, rather than for running on flat terrain, they seldom venture farther than one mile from escape terrain. The exception is during winter, when bighorn sheep will occupy large open grassy windswept ridgetops up to 1.9 miles from escape terrain. This shift is apparently related to forage availability. Windswept ridgetops have less snow cover and more exposed forage.

California bighorn sheep historically occupied the canyon and mountain habitats in the Owyhee and Bruneau river drainages of southwest Idaho. Between 1880 and 1930, populations declined drastically as settlers encroached on historic bighorn range (Buechner 1960). Between 1920 and 1940, the California bighorn sheep disappeared from Idaho (Davis 1939, Cowan 1940). California bighorn sheep were reintroduced into Owyhee County beginning in 1963 when 19 bighorns from British Columbia were released near the East Fork of the Owyhee River just downstream from the Battle Creek confluence.

Another 57 California bighorn sheep from British Columbia were released into southwest Idaho between 1965 and 1992. These transplants were the nuclei for the herds along portions of the Owyhee River, Little Jacks Creek, and the Bruneau and Jarbidge rivers.

From 1980 to 1993, California bighorn sheep have been transplanted on a yearly basis, with the exception of 1983, from Owyhee County to other areas of the Great Basin region (Table 3.8-15). The Owyhee County bighorn sheep herds provided the only potential source of transplant stock for this subspecies since export of California bighorn sheep from British Columbia was discontinued in 1991.

The Owyhee River bighorn sheep herd experienced excellent growth rates during the late 1980s and early 1990s. IDFG has conducted spring sightability surveys for California bighorn sheep along the Owyhee River from 1990 to 1996 to generate a population estimate. In 1993, IDFG classified 669 bighorn sheep for a population estimate of 858 California bighorn sheep in the Owyhee River herd. The June 1993 survey indicated a reduced lamb ratio (the number of lambs per 100 adult ewes) compared to the 1992 survey. The number of lambs observed was significantly lower than the number of lambs observed in June 1992. This was probably due to an increased lamb mortality during the unusually wet winter of 1992/1993 and spring of 1993 (personal communication, Bodie 1993).

During the June 1994 population survey, only 347 bighorn sheep were classified in the Owyhee River system (Table 3.8-16). The survey indicated such a dramatic decline from 1993 survey results that IDFG conducted another survey in July 1994. The results of the second survey were similar; only 336 sheep were classified. The July survey was expanded to include the Little Jacks Creek herd and a similar decline was observed for that herd. Due to the effects of conducting two surveys in 1994, surveys were not conducted in 1995.

California bighorn sheep in adjacent areas experienced a similar decline. ODFW personnel were contacted and they reported a decline, though not as dramatic, of California bighorn sheep in southeast Oregon in 1994. ODFW classified 138 California bighorns in southeast Oregon in March 1993 and only 94 in March 1994 (personal communication, Van Dyke 1997). This herd has apparently stabilized with recent survey results ranging from 92 in 1995, to 101 in 1996, to 95 in 1997.

In 1996, survey results for the Owyhee River herd indicated a slight increase in ewe and lamb numbers from 1994 (Table 3.8-16). Surveys of the Little Jacks herd in 1993 also indicated a

**Table 3.8-15. California Bighorn Sheep Transplants in Idaho Department of Fish and Game Region 3 (Nampa) From 1963 to 1993**

| *Date* | *Capture site* | *Release site* | *Adult* | | *Juvenile* | | *Total* |
|---|---|---|---|---|---|---|---|
| | | | *M* | *F* | *M* | *F* | |
| Oct 1963 | Chilcotin, B. C. | E. F. Owyhee R. | 5 | 14 | - | - | 19 |
| Nov 1965 | Chilcotin, B. C. | E. F. Owyhee R. | 2 | 7 | - | - | 9 |
| Nov 1966 | Chilcotin, B. C. | E. F. Owyhee R. | 2 | 8 | - | - | 10 |
| Oct 1967 | Chilcotin, B. C. | Little Jacks Cr. | 4 | 8 | - | - | 12 |
| Mar 1980 | Little Jacks | Granite Mt, NV | 1 | 4 | - | - | 5 |
| Feb 1981 | Little Jacks | Jarbidge R., NV | 3 | 9 | - | - | 12 |
| Dec 1982 | E. F. Owyhee | Bruneau/Jarbidge | 2 | 10 | - | - | 12 |
| Mar 1984 | Chilcotin, B. C. | Bruneau/Jarbidge | 2 | 10 | - | - | 12 |
| Dec 1984 | E. F. Owyhee | Bruneau/Jarbidge | 2 | 9 | - | - | 11 |
| Jan 1985 | Little Jacks | Bruneau/Jarbidge | 1 | 0 | - | - | 1 |
| Jan 1985 | Little Jacks | S. F. Owyhee | 2 | 7 | - | - | 9 |
| Dec 1986 | E. F. Owyhee | Snowcloud Mt, NV | - | - | - | - | 7 |
| Dec 1986 | E. F. Owyhee | Cottonwood Cr. | 4 | 11 | - | - | 15 |
| Dec 1987 | Little Jacks | Cottonwood Cr. | 3 | 11 | - | - | 14 |
| Feb 1988 | Chilcotin, B. C. | Big Jacks Cr. | 3 | 11 | - | - | 14 |
| Mar 1988 | E. F. Owyhee | Big Jacks Cr. | 2 | 0 | - | - | 2 |
| Nov 1988 | Shoofly Cr. | Cottonwood Cr. | 5 | 9 | - | - | 14 |
| Nov 1988 | Shoofly Cr. | Nevada | 2 | 11 | - | - | 13 |
| Nov 1988 | Battle Cr. | Duncan Cr. | 9 | 15 | - | - | 24 |
| Dec 1989 | Little Jacks | W. F. Bruneau | 3 | 9 | - | - | 12 |
| Nov 1990 | E. F. Owyhee | W. F. Bruneau | 5 | 11 | 0 | 0 | 16 |
| Nov 1990 | E. F. Owyhee | North Dakota | 6 | 17 | 0 | 0 | 23 |
| Nov 1991 | E. F. Owyhee | E. F. Dry Cr. | 3 | 10 | 2 | 1 | 16 |
| Nov 1991 | E. F. Owyhee | North Dakota | 5 | 28 | 3 | 2 | 38 |
| Nov 1991 | E. F. Owyhee | Nevada | 4 | 31 | 1 | 2 | 38 |
| Dec 1993 | E. F. Owyhee | Nevada | - | 22 | - | - | 25 |
| Dec 1993 | E. F. Owyhee | Oregon | - | 30 | - | - | 35 |
| Dec 1993 | E. F. Owyhee | Bruneau/Jarbidge/Big Cottonwood | - | 38 | - | - | 45 |

Source: IDFG 1996b

**Table 3.8-16. Classification Results of California Bighorn Sheep Observed During Helicopter Surveys in Region 3 (Nampa) and Region 4 (Jerome) from 1983 to 1996**

| Year | Ewes | Lambs | ------RAMS---- Sublegal | Legal | Unclassified | Total | Lambs:100 ewes |
|---|---|---|---|---|---|---|---|
| **Little Jacks Creek** | | | | | | | |
| 1983 | | | 17 | 25 | - | 115 | 53 |
| 1985 (Aug) | 30 | 16 | 26 | 13 | 0 | 85 | 53 |
| 1985 (Nov) | 40 | 18 | 22 | 16 | 0 | 96 | 95 |
| 1987 (Jun) | 84 | 49 | 26 | 25 | 0 | 184 | 58 |
| 1987 (Aug) | 102 | 35 | 19 | 8 | 0 | 164 | 34 |
| 1988 | 73 | 29 | 56 | 26 | 0 | 184 | 40 |
| 1989 | 105 | 43 | 33 | 22 | 0 | 202 | 41 |
| 1990 | 78 | 32 | 54 | 33 | 5 | 202 | 41 |
| 1991 | 99 | 55 | 43 | 37 | 7 | 241 | 56 |
| 1992 | 81 | 42 | 35 | 36 | 0 | 194 | 52 |
| 1993 | 142 | 36 | 51 | 41 | 0 | 270 | 25 |
| 1994 | 107 | 40 | 41 | 16 | 0 | 204 | 37 |
| 1996 | 95 | 33 | 39 | 14 | 0 | 181 | 38 |
| **Owyhee River** | | | | | | | |
| 1983 | 135 | 76 | 76 | 46 | 1 | 334 | 56 |
| 1985 | 124 | 71 | 57 | 21 | 0 | 273 | 57 |
| 1987 | 140 | 70 | - | - | 0 | 329 | 50 |
| 1990 | 339 | 183 | 71 | 46 | 0 | 639 | 54 |
| 1991 | 400 | 175 | 60 | 114 | 4 | 753 | 44 |
| 1992 | 323 | 142 | 101 | 54 | 0 | 620 | 44 |
| 1993 | 406 | 81 | 125 | 57 | 0 | 669 | 20 |
| 1994 (June) | 179 | 73 | 51 | 42 | 2 | 347 | 41 |
| 1994 (July) | 177 | 63 | 61 | 35 | 0 | 336 | 36 |
| 1996 | 202 | 96 | 52 | 51 | 0 | 401 | 48 |
| **Big Jacks Creek** | | | | | | | |
| 1990 | 14 | 10 | - | - | - | 38 | |
| 1993 | 46 | 19 | 17 | 8 | 0 | 90 | 41 |
| **Bruneau-Jarbidge Rivers** | | | | | | | |
| 1990 | 51 | 12 | 8 | 13 | 0 | 84 | 24 |
| 1993 | 51 | 8 | 39 | 16 | 0 | 114 | 16 |
| 1994 | 76 | 24 | 15 | 17 | 0 | 132 | 32 |
| 1996 | 98 | 33 | 32 | 15 | 0 | 163 | 34 |

Source: IDFG 1996b

dramatic decline in lamb:ewe ratios. Total numbers of sheep observed in this herd has declined since 1993 while lamb:ewe ratios have increased from 1994 levels. A distinction between the two herds is that military training overflights do not occur over the Little Jacks Creek herd. Surveys for bighorn sheep in the Bruneau and Jarbidge rivers indicated a rising population since 1990. However, 45 sheep were released into this area during the transplanting operations of 1993 and there has been an insufficient time lapse for the effects of this introduction to have merged into the herd.

A number of environmental and external factors may have contributed to the decline of the Owyhee River bighorn sheep herd. Effects from harvest and transplant programs between 1980 and 1996 on California bighorn sheep are listed in Table 3.8-17. One possible factor is the December 1993 transplant of 105 bighorn sheep, of which 90 were adult ewes, that were captured from the East Fork herd and released in Nevada, Oregon, and eastern Idaho to establish or supplement herds of California bighorn sheep. The 1993 transplant followed similar transplants in 1990 and 1991 in which 136 bighorn sheep (of which 97 were adult ewes) were relocated from the Owyhee River herd to other areas. The effects of the removal of such a large number of ewes on long-term population trends is uncertain. Removal of 105 animals, however, probably does not account for a nearly 50 percent reduction in sheep sightings between the 1993 and 1994 surveys.

Another factor that may have contributed to the decline was the low lamb ratios from the spring 1993 survey. Lamb ratios are defined as the number of lambs per 100 adult ewes. Lamb:ewe ratios decreased from 44 in 1992 to 20 in 1993 for the East Fork herd and from 52 in 1992 to 25 in 1993 for the Little Jacks Creek herd. Harsh weather conditions, drought during the summer of 1992 followed by deep snow in the winter of 1992-1993, probably contributed to the poor lamb ratios for spring 1993. A lamb:ewe ratio of 25-30 is indicative of a stable or declining population (Thorne et al. 1979). The low lamb:ewe ratios in June 1993 dictated low recruitment into the herd by winter 1993-1994. The number of lambs that survived the winter of 1993-1994 probably was less than the number of sheep that died during 1993 resulting in a decline in the total population for 1994. Again, low lamb ratios probably do not account for the entire decline in the herd, but contributed to the decline.

Density dependent population regulation could also have contributed to the decline in 1994. Poor forage or habitat conditions most affect the juvenile age class and would be indicative of declining lamb:ewe ratios. Predation and disease affect all age classes (lambs, yearlings, adult ewes, and rams) and would be represented by all-age die-offs, rather than reductions in particular age-classes.

All-age die-offs of bighorn sheep elsewhere in North America have been attributed to bacterial and/or viral infections associated with the lungworm-pneumonia complex (Wishart et al. 1980, Festa-Bianchet 1988) and bronchopneumonia (Ryder et al. 1992). However, disease does not appear to have been a problem for the Owyhee River herd. Blood samples from the 105 sheep captured in 1993 tested negative for disease-causing pathogens.

**Table 3.8-17. California Bighorn Sheep Population Effects from Harvest and Transplant Programs (1980-1996)**

| | Little Jacks Creek[2] | | | Owyhee River[3] | | | Bruneau-Jarbidge Rivers | | | Outside of Idaho |
|---|---|---|---|---|---|---|---|---|---|---|
| *Year* | *Net Trans-plants* | *Harvest* | *Total Observed* | *Net Trans-plants* | *Harvest* | *Total Observed* | *Net Trans-plants* | *Harvest* | *Total Observed* | *Net Trans-plants* |
| 1980 | -5 | | | | | | | | | +5 |
| 1981 | -12 | | | | | | | | | +12 |
| 1982 | | | | -12 | | | +12 | | | |
| 1983 | | | 115 | | | 334 | | | | |
| 1984 | | | | -11 | | | +23 | | | -12 |
| 1985 | -10 | | 96 | +9 | | 273 | +1 | | | |
| 1986 | | 5 | | -22 | 8 | | +15 | | | +7 |
| 1987 | -14 | 4 | 184 | | 10 | 329 | +14 | | | |
| 1988 | +13 | 5 | 184 | -26 | 9 | | +14 | | | -1 |
| 1989 | -12 | 5 | 202 | | 9 | | +12 | | | |
| 1990 | | 6 | 240[1] | -39 | 13 | 639 | +16 | | 84 | +23 |
| 1991 | | 6 | 241 | -92 | 19 | 753 | +16 | 2 | | +76 |
| 1992 | | 5 | 194 | | 21 | 620 | | 2 | | |
| 1993 | | 12 | 360[1] | -105 | 21 | 669 | +45 | 6 | 114 | +60 |
| 1994 | | 14 | 204 | | 24 | 347 | | 2 | 132 | |
| 1995 | | 13 | | | 9 | | | 3 | | |
| 1996 | | | 181 | | | 401 | | | 163 | |

Notes:
1. Survey includes Big Jacks and Little Jacks Creeks.
2. Survey includes Shoofly Creek and Duncan Creek.
3. Survey includes Battle Creek.

The apparent decline of the Owyhee River bighorn sheep herd is another example of the classic bighorn sheep population pattern. That is, irruptive population growth rates interrupted by severe all-age die-offs. This pattern has occurred throughout bighorn range in North America (Buechner 1960; Stelfox 1971). Bighorn sheep herds experienced extensive population declines, loss of habitat, and increased competition with domestic livestock as settlement of the west progressed (Buechner 1960). Bighorn sheep were abundant in the western United States during the early to mid 1800s (Goodson 1980). However, sheep populations declined during the late 1800s due to overhunting and scabies (Goodson 1980). By 1915, many sheep herds had recovered and populations were increasing (Goodson 1980). But during the 1920s, sheep populations began another decline with all-age die-offs occurring in many herds (Goodson 1980). Possible causes for this decline were competition for forage with domestic livestock and disease such as the lungworm-pneumonia complex (Buechner 1960; Goodson 1980). Natural resource agencies in the western states began extensive transplanting operations and implemented conservative harvest regimes to reintroduce bighorn sheep into historic range and to limit harvest. These efforts helped increase bighorn sheep distribution and populations during the 1960s and 1970s (Northern Wild Sheep and Goat Council [NWSGC] 1985). During the 1980s and 1990s, all-age die-offs have occurred in Alberta (Onderka and Wishart 1984), Oregon (Coggins and Matthews 1992), and Wyoming (Ryder et al. 1992), indicating yet another period of bighorn sheep population declines.

Military overflights have occurred over the Owyhee Canyonlands since World War II; however, supersonic training flights, authorized for above 10,000 feet AGL, have been occurring over southwest Idaho only since 1992. Annual supersonic events have increased from 1992 to 1997. Nonetheless, the Owyhee River California bighorn sheep herd continued to expand and grow in the presence of military overflights prior to 1994. To date, proximate causes of the Owyhee River bighorn sheep decline have not been determined.

A current (1997) population estimate for all of ROI Three south of the Snake River including the Bruneau-Jarbidge, Owyhee River, Little Jacks Creek, and Big Jacks Creek herds, is unavailable. Results from IDFG/BLM surveys conducted in 1996 for bighorn sheep in ROI Three indicated the herds at Owyhee and Bruneau/Jarbidge rivers increasing, and the Little Jacks Creek herd declining (Table 3.8-16). Surveys for the Bruneau/Jarbidge rivers herd in 1996 yielded counts of 163 bighorn sheep. Bighorn sheep survey results for the Owyhee River herd range from highs of 753 in 1991 to 669 in 1993, with counts of 347 in 1994 and 401 in 1996. Surveys for the Little Jacks herd yielded counts of 241 sheep in 1991 and 181 sheep in 1996. Surveys for the Big Jacks Creek herd have not been conducted since 1993, when 90 bighorn sheep were counted.

Within ROI Two, IDFG information shows a count of 163 California bighorn sheep in the Bruneau and Jarbidge river canyons in 1996.

BLM, ICDC, and IDFG information does not show any occurrences of bighorn sheep within ROI One. However, during raptor and large mammal surveys conducted of ROI One in June, July, August, and September 1996, two bands of California bighorn sheep totaling 14 animals were observed in and near the Grasmere drop area on multiple occasions.

*Kit Fox*

Historically, the kit fox occurred throughout the southwestern United States to Baja California and the central mainland of Mexico. The current range is greatly reduced and not completely known (IDFG 1992).

Kit fox habitat consists of open, flat desert or semi-arid areas with shadscale, greasewood, and sagebrush. Light-textured soils are necessary for digging the dens used by the foxes throughout the year (Zeveloff 1988). Kit fox are known to occur in isolated pockets in extreme southern Idaho, but may be distributed more widely, based on trapper surveys (IDFG 1992). Historically, kit foxes were thought to be widespread in the desert areas south of the Snake River; however, one skull found 20 miles south of Grand View and a few reliable sightings are the only records of kit foxes in Owyhee County (Davis 1939; Larrison 1967).

According to ODFW (Olson 1989), there are three sensitive wildlife habitat areas for kit fox in Malheur County, Oregon. Each of these areas is located in western Malheur County, more than 40 miles west of the Idaho/Oregon border.

No kit foxes or their tracks were seen during kit fox surveys conducted at SCR in 1994 (Air Force 1996a), and BLM and ICDC records do not indicate the presence of kit fox within ROI Two.

Kit fox are not known to occur in ROI One. Suitable habitat is not present in ROI One for any alternative because soft soils necessary for denning are absent.

## 3.8.6 Large Mammals

The affected environment of the ETI proposal in southwestern Idaho contains a diverse array of interspersed vegetation communities and geomorphic features that produce suitable habitat for large mammals. Table L-3, Appendix L, contains a list of large mammal species that may occur in the affected environment. Pronghorn antelope, mule deer, and less common large mammals such as elk and black bear are discussed in this section. Other mammals, which include the furbearing and small carnivore species (Table L-4, Appendix L), also may occur within the affected environment and are discussed in this section. Special status species such as California bighorn sheep and kit fox are discussed in section 3.8.5, Protected and Sensitive Wildlife Species. Large mammals are managed and regulated by IDFG, as mandated by legislative action, to "preserve, protect, perpetuate and manage" wildlife within the State of Idaho (Idaho Code, Section 36).

### 3.8.6.1 ROI Three

Large mammals are highly mobile and may have home ranges up to hundreds of square miles. Many of the large mammals in southwestern Idaho use different habitats on a seasonal basis. Mule deer, pronghorn antelope, and elk winter in low elevation areas to escape deep snow conditions. These animals then migrate to higher elevations to spend the spring and summer.

Seasonal and altitudinal migrations allow large mammals access to high quality forage during periods of physiological stress such as various phases of reproduction (e.g., mating, fawning/calving, lactation).

***PRONGHORN ANTELOPE***

According to IDFG (Crenshaw 1991), pronghorn antelope numbers in Idaho increased from 1,500 in 1924 to 21,000 in 1985. Pronghorn antelope are highly dependent on sagebrush for year-round food and cover (Crenshaw 1991). Pronghorn antelope diets identified in southeastern Oregon, which has similar habitats as southwestern Idaho, consisted largely of woody sagebrush in fall and winter, and a mixture of forbs in spring and summer (McInnis and Vavra 1987). Big sagebrush, rabbitbrush, and bitterbrush have been identified as being particularly important winter food sources for pronghorn antelope in the Great Basin (Allen et al. 1984). When forage quality is poor, pronghorn antelope may feed on agricultural crops, especially alfalfa.

Although migration routes are traditional, seasonal movement may be affected by snow conditions, water availability, vegetation condition, land development, and livestock grazing (Crenshaw 1991). Snowfall may influence the distance pronghorn antelope migrate and the location of their winter range (Hoskinson and Tester 1980). Habitats dominated by sagebrush and other shrubs appear to be a key component of pronghorn winter ranges. Wintering pronghorn antelope in south central Wyoming preferred habitat complexes with steep slopes and irregular topography with abundant big sagebrush and greasewood (Ryder and Irwin 1987). Pronghorn have been reported to select microhabitats in winter that offer more favorable conditions (e.g., lower wind velocities and less snow) such as drainages and southern exposures (Allen et al. 1984). Once snow melts from the winter range, pronghorn antelope begin spring migration.

Aerial surveys for pronghorn antelope were conducted during winter and spring in 1993, and during spring 1994 and 1995 for the western half of ROI Three in southwestern Owyhee County. Winter surveys in 1993, when conditions were above average snowfall, did not detect pronghorn use of the area. Line transect surveys in June 1993 detected 191 antelope in 69 groups and yielded a density estimate of 6.6 antelope per square mile and a population estimate of 2,221. The size of the study area was expanded in 1994 and resulted in a density estimate of 1.9 pronghorn per square mile and a population estimate of 4,947. In 1995, the line transect survey yielded a density estimate of 2.3 pronghorn per square mile and a population estimate of 5,963.

These estimates indicate an increasing population of nearly 6,000 animals summering near the East Fork of the Owyhee River. Comparison of the 1993 and 1995 estimates suggest that the summer population west of Highway 51 has increased 120 percent since 1993; however, fawn:doe ratios from data collected in 1993 and 1994 would indicate a declining population (personal communication, Patterson 1995). This discrepancy may be a result of inappropriate timing of the fawning surveys. These surveys were conducted in June when many fawns may

not have been visible. Therefore, the fawn:doe ratios were underestimated. The wintering area for the herd of nearly 6,000 pronghorn is unknown.

### *MULE DEER*

Mule deer use meadow-riparian, aspen, sagebrush, and mixed grass/shrub vegetation types in southwestern Idaho. Bisected drainages in these vegetation types with slopes > 6 percent are utilized by mule deer. Specific habitat characteristics include aspen with abundant herbaceous understory > 25 percent, sagebrush shrub height of 1.6 feet with a herbaceous cover of 20 - 25 percent (Loft et al. 1991), and mixed grass/shrub with a shrub cover up to 75 percent.

Mule deer populations that summer in the Jarbidge Mountains of Nevada and winter in the Jarbidge River canyon breaks of northern Nevada and southern Idaho peaked in 1988 at approximately 42,000 animals (personal communication, Williams 1996). In 1996, that population had declined to 19,000 (personal communication, Williams 1996). The estimated number of mule deer that winter in Idaho from the confluence of the Jarbidge-Bruneau rivers south to Murphy Hot Springs and the Nevada state line is 7,500-8,000 (personal communication, Williams 1996). During February 1997, an aerial survey of north-south transects spaced 2.3 miles apart was conducted over the southwestern third of ROI Two. Estimates for the 300 miles of aerial transects yielded one mule deer per mile. The trend of reduced mule deer abundance mirrors western United States trends that have been continuing for over ten years.

### *ELK*

Habitat use by elk varies seasonally and also altitudinally. In the summer, elk are primarily associated with mountain meadows and coniferous forests. With the onset of winter, elk move to lower elevations of adjacent foothills, valleys, and shrublands. Elk forage on grasses, sedges, conifer needles, serviceberry, mountain mahogany, sagebrush, rabbitbrush, and other plant material (Hoffmeister 1986).

Elk have been introduced into the Jarbidge Mountains of northern Nevada by NDOW, and the herd currently numbers over 100 animals (personal communication, Williams 1996). Radio collars have been placed on nine elk in this herd and NDOW conducts 6-9 flights annually to monitor these individuals. During the winter of 1996-97, NDOW is planning to release an additional 92 elk into the Jarbidge Mountains of which at least nine will carry radio collars (personal communication, Williams 1996).

### *COUGAR*

In Idaho, cougars can be found in rugged mountains and semi-wooded canyon habitat (IDFG 1992). Mule deer are the primary prey for cougars, although other species of big game and a wide variety of small mammals are consumed (Crowe 1986).

Potential cougar habitat is located in the mountains of the western and southeastern regions of ROI Three, as well as in the Bruneau/Jarbidge and Owyhee River canyon complexes.

***BLACK BEAR***

Black bears are primarily associated with forested mountains and wooded areas in Idaho, and rarely venture into open terrain (Zeveloff 1988). Throughout their range, prime habitat is characterized by relatively inaccessible terrain, brushy vegetation, and food sources in the form of fruits and nuts (Crowe 1986). Black bears also consume insects, tubers, small mammals, and eggs (Burt and Grossenheider 1980).

Potential black bear habitat is located in the mountains of the western and southeastern regions of ROI Three.

***FURBEARING MAMMALS AND SMALL CARNIVORES***

This section includes a diverse assemblage of smaller mammals that are referred to as furbearers (mink, otter, beaver, muskrat, bobcat, red fox, raccoon, and badger), and small carnivores (coyote, skunks, and weasels). Most of these mammals are harvested for their pelts and are managed by IDFG. Fourteen furbearing and small carnivore species may potentially occur within ROI Three and are year-round residents with some seasonal migration occurring during juvenile dispersal in the fall (Table L-4, Appendix L).

Coyotes are likely to use many different types of habitat, but are most numerous in the uplands of southwest Idaho (IDFG 1992). Badgers also use the shrub-steppe uplands in southwest Idaho. The beaver, river otter, muskrat, and mink are associated with river environments and, therefore, have the potential to occur in the major river systems in ROI Three, the Bruneau, Jarbidge, and Owyhee. Bobcats and weasels are most likely to occur on canyon slopes. The raccoon, skunk, red fox, and coyote all utilize agricultural lands.

Relative abundance levels for furbearers in Idaho are based on IDFG (1995) harvest results for seven regions of the state. Region 3 (Ada, Adams, Boise, Canyon, Elmore, Gem, Owyhee, Payette, Valley, and Washington counties) includes the Idaho portion of ROI Three. Results for Region 3 indicate that coyotes are more abundant in southwest Idaho than any other region in the state. Bobcat levels in southwest Idaho are average relative to the other regions in the state. Harvest levels for red fox, weasel, and raccoon in southwest Idaho are average relative to other parts of the state, whereas muskrat levels are high relative to the rest of the state.

### 3.8.6.2 ROI Two

***PRONGHORN ANTELOPE***

Aerial surveys for pronghorn were conducted in winter 1997 in portions of ROI Two adjacent to proposed target areas to assess wintering population levels. Observations of pronghorn

antelope have been recorded in ROI Two during raptor and large mammal walking surveys conducted from May through October 1996.

Population estimates for pronghorn wintering east of the Jarbidge River and south of Juniper Butte (the southeastern portion of ROI Two) were 800-1,000 animals prior to 1993 (personal communication, Williams 1996). In 1995, the population estimate was 400 (personal communication, Williams 1996). These estimates were based on incidental observations and are more variable than the line transect survey methodology used in surveys of the western portion of ROI Three. During the winter of 1997, the line transect survey methodology was applied to the pronghorn antelope populations occurring in the southeastern portion of ROI Two. Using the results of this survey conducted in February, it was estimated that this population has a density of 5.3 animals per square mile and a total size of 3,419 animals (95 percent confidence interval 1,086-10,764).

Pronghorn surveys in eastern Owyhee County conducted annually in August by IDFG from 1988 to 1996 indicate a stable population ranging from 202 to 352 animals (personal communication, Smith 1996). Aerial line transect surveys conducted in June in western Owyhee County (includes portions of ROI Two) from 1993 to 1995 indicate an increasing population of nearly 6,000 animals (Air Force 1996c).

### *MULE DEER*

Aerial surveys for mule deer were conducted in winter (February) 1997 in portions of ROI Two adjacent to proposed target areas to assess wintering population levels. Aerial surveys were conducted on five days from February 4-21, 1997. Fifty-seven parallel transects, spaced approximately 2 miles apart, were flown in ROI Two. The transects varied in length from 12.7 to 16.1 miles and totaled 797.1 miles. In addition, five transects were flown over the Sheep Creek, Bruneau River, and Jarbidge River canyons. The canyon transects varied in length from 15 to 25 miles and totaled 102.1 miles.

A total of 659 mule deer were observed during winter 1997 aerial surveys in ROI Two. Mule deer frequency per linear mile of transect flown was 0.73.

Observations of mule deer have been recorded in ROI Two during raptor and large mammal walking surveys conducted from May through October 1996; however, IDFG does not conduct annual aerial surveys to estimate mule deer populations in southeastern Owyhee county.

### *ELK*

During winter (February) 1997 aerial surveys, 51 elk were observed in ROI Two. Elk frequency per linear mile of transect flown was 0.06. The majority (47) of elk observed during the winter surveys were located approximately 12 miles southeast of the Grasmere 12,000-acre alternative.

There are no other recent records of elk occurring within ROI Two. NDOW does not anticipate that elk released in the Jarbidge Mountains of northern Nevada (in ROI Three) will migrate into ROI Two (personal communication, Williams 1996).

#### *COUGAR*

Available habitat for cougar is limited to the canyon complexes associated with the major river systems and some of the smaller canyons within ROI Two.

#### *BLACK BEAR*

Suitable habitat does not exist for black bears within ROI Two.

#### *FURBEARING MAMMALS AND SMALL CARNIVORES*

No specific surveys have been conducted for furbearing and small carnivore species within ROI Two. Incidental sightings in 1996 included coyotes and badgers.

Much of ROI Two could be considered potential habitat for furbearer and small carnivore species due to the variety of habitats available and the diversity of habitats used by these animals. Fourteen species have the potential to occur in ROI Two (Table L-4, Appendix L).

### 3.8.6.3 ROI ONE

#### *CLOVER BUTTE*

##### *Pronghorn Antelope*

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. Winter pronghorn surveys by IDFG in 1987 and 1988 indicated that nearly 900 pronghorn used the area south of Clover Butte. However, due to alteration of the vegetation communities from fire, pronghorn winter use of this area has declined (personal communication, Smith 1996).

Fifteen pronghorn were observed within the 12,000-acre Clover Butte Alternative during the winter aerial surveys conducted between February 4-21, 1997.

##### *Mule Deer*

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. IDFG does not conduct annual mule deer surveys in the Clover Butte area due to low numbers (personal communication, Smith 1996). During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed on the 12,000-acre Clover Butte Alternative.

### *Cougar*

Cougars are unlikely to occur at Clover Butte because no canyons or similar habitat are present or proximal to the 12,000-acre training range.

### *Furbearing Mammals and Small Carnivores*

No specific surveys have been conducted for furbearing and small carnivore species within the Clover Butte 12,000-acre training range. Badgers and coyotes are the most likely species to occur at Clover Butte (Table L-4, Appendix L).

## *GRASMERE*

### *Pronghorn Antelope*

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no pronghorn were observed within the 12,000-acre Grasmere Alternative.

### *Mule Deer*

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed within the 12,00-acre Grasmere Alternative.

### *Cougar*

Numerous canyons within and proximal to the Grasmere 12,000-acre training range provide suitable habitat for cougars. During field surveys in 1996, cougar tracks were seen in a canyon bottom within the 12,000-acre Grasmere Alternative.

### *Furbearing Mammals and Small Carnivores*

No specific surveys have been conducted for furbearing and small carnivore species within the Grasmere 12,000-acre training range. Of the nine species that have the potential to occur there (Table L-4, Appendix L), four have been detected: badger, coyote, red fox, and long-tailed weasel.

## *JUNIPER BUTTE*

### *Pronghorn Antelope*

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. IDFG does not consider the Juniper Butte area good pronghorn habitat due to alteration of the vegetation community by recent fires (personal communication, Toweill 1996). However, during the aerial surveys conducted between

February 4-21, 1997, 70 pronghorn were observed within the 12,000-acre Juniper Butte Alternative.

### *Mule Deer*

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. IDFG does not consider the Juniper Butte area good mule deer habitat due to alteration of the vegetation community by recent fires and topography (personal communication, Toweill 1996). During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed within the 12,000-acre Juniper Butte Alternative.

### *Cougar*

Cougars have the potential to occur at Juniper Butte because of the proximity of the East Fork Bruneau River Canyon.

### *Furbearing Mammals and Small Carnivores*

No specific surveys have been conducted for furbearing species within the Juniper Butte 12,000-acre training range. Badgers and coyotes have both been seen at Juniper Butte during field surveys in 1996. Weasels have the potential to occur because of the proximity to the East Fork Bruneau River.

## *NO-DROP TARGET AREAS*

### *Pronghorn Antelope*

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no pronghorn were observed within the no-drop target areas.

### *Mule Deer*

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed within the no-drop target areas.

### *Cougar*

Suitable habitat does not exist for cougar in the vicinity of the no-drop target areas.

### *Furbearing Mammals and Small Carnivores*

Other than badgers and coyotes, it is unlikely that other small carnivores or furbearing mammals use these areas.

### *EMITTER SITES*

#### *Pronghorn Antelope*

Aerial surveys for pronghorn were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no pronghorn were observed within the emitter sites.

#### *Mule Deer*

Aerial surveys for mule deer were conducted in winter 1997 to encompass all of ROI One to assess wintering population levels. During the aerial surveys, conducted between February 4-21, 1997, no mule deer were observed within the emitter sites.

#### *Cougar*

Suitable habitat does not exist for cougar in the vicinity of the emitter sites.

#### *Furbearing Mammals and Small Carnivores*

Other than badgers and coyotes, it is unlikely that other small carnivores or furbearing mammals use these areas.

### *POWERLINE*

#### *Pronghorn Antelope*

Very little suitable habitat exists in the powerline corridor for pronghorn.

#### *Mule Deer*

Very little suitable habitat exists in the powerline corridor for mule deer.

#### *Cougar*

Suitable habitat does not exist for cougar within the powerline corridor.

#### *Furbearing Mammals and Small Carnivores*

An October 1996 survey identifying wildlife habitat within the proposed powerline corridor located four active badger burrows. Coyotes may travel through or use the area for foraging.

### *SAYLOR CREEK RANGE*

#### *Pronghorn Antelope*

One group of 25 pronghorn antelope was detected during aerial surveys of SCR and R-3202A in January 1994. Winter use of the same area was slightly higher in 1991, when aerial surveys detected six groups of pronghorn antelope totaling 77 animals (Air Force 1993a). Based upon these surveys, winter use of the area by pronghorn antelope appears to be low. However, Air Force personnel who work on SCR throughout the winter report pronghorn as common visitors to the EUA, sometimes in herds of up to 200 animals (Air Force 1996a).

SCR provides summer and winter habitat for pronghorn. Use of SCR and R-3202A by pronghorn antelope is higher in the spring and early summer than in the winter but overall is relatively low compared to the western half of ROI Three. In March 1994, aerial surveys for sage grouse leks detected 30 groups of pronghorn antelope, totaling at least 147 animals.

Pronghorn antelope appear to concentrate in habitats with a strong shrub component in winter. Within SCR and R-3202A, available winter habitat is limited to the southwestern portion and to areas near the Bruneau River Canyon. While pronghorn antelope have been observed in disturbed grassland habitats on SCR in the winter, these areas are probably used only peripherally or during mild winters. During winters with high levels of snow cover, pronghorn antelope probably are limited to areas near the Bruneau River Canyon within and south of R-3202A, where steep slopes and southern exposures minimize snow depth.

Pronghorn antelope tend to gather in larger herds in the winter and may range over an area of 4 miles by 6 miles (Allen et al. 1984).

#### *Mule Deer*

Mule deer are present on SCR but appear to have relatively low use of the area. Results of a 1991 winter aerial survey documented five groups of mule deer totaling 61 animals on SCR (Air Force 1993b).

#### *Cougar*

Potential cougar habitat is restricted to the Bruneau River Canyon, which covers a small portion of R-3202A.

#### *Furbearing Mammals and Small Carnivores*

Diverse habitat within SCR and R-3202A (section 3.8.4, Wildlife Habitat) may potentially harbor as many as 14 furbearing and small carnivore species (Table L-4, Appendix L, ROI Two).

During wildlife surveys conducted in 1994 and 1995, only badgers and coyotes were observed (Air Force 1996a).

## 3.8.7 Bats and Small Mammals

Fourteen insectivorous bat species have the potential to occur within the affected environment (Table L-5, Appendix L) (Keller 1992). Seven of the species identified in Table L-5, Appendix L have special protection or management status and are discussed in section 3.8.5, Protected and Sensitive Species.

Thirty-seven small mammal species have the potential to occur within the affected environment (Table L-6, Appendix L) (Zeveloff 1988). This group includes small mammals such as voles, mice, squirrels, rabbits, and shrews. Only two species, the pygmy rabbit and dark kangaroo mouse, have special status designation and are discussed in section 3.8.5, Protected and Sensitive Species.

### 3.8.7.1 ROI THREE

#### *BATS*

Of the seven bat species without protected status that have potential to occur in the area, four have been documented in ROI Three by Keller (1992, 1996). Surveys conducted within selected localities in Owyhee County revealed the presence of the little brown myotis, California myotis, big brown bat, and the silver-haired bat. Considering the diversity of habitat within ROI Three, it is possible that the remaining three bat species (hoary bat, pallid bat, and the western pipistrelle) are present.

Essential habitat components for insectivorous bat populations are appropriate day roosts and foraging habitat. Day roost selection varies among species but must provide stable protection and microenvironmental conditions appropriate to the animal's physiological requirements. Bat species roost in trees, cracks in cliff faces, large boulder piles, slide rock, talus, or caves and mines. Some species, such as the California myotis, have been noted roosting in bushes and small mammal burrows on the desert floor (Barbour and Davis 1969). Foraging habitat must provide sufficient insect densities within the air column and be of some acceptable distance from day roosts so as to balance energetic input with the costs of flight, growth, and maintenance. Habitat preferences vary among species, but suitable habitat must contain adequate roosting and foraging sites.

Additionally, the presence of open water has been found to enhance bat habitat for species that live in arid environments (Carpenter 1969). Because of their small body sizes, large surface to volume ratios, and often hot, dry day roosts, water stress is a problem for many bat species. Increased water use efficiency has been noted in populations inhabiting arid environments (Bassett 1982). Despite behavioral and physiological adaptations to hot dry climates, many desert bats drink immediately following emergence in the evening and must drink prior to their return to day roosts or face potentially fatal osmotic conditions (Geluso 1975). Evaporative water loss can be particularly high during flight with desert species losing as much as 3.9 percent of their body weight per hour (Carpenter 1969). Open water also provides

habitat for insects. For these reasons, open water sources often serve as significant activity centers for bat species.

*SMALL MAMMALS*

Thirty-five small mammal species without protected status have the potential to occur in the area. Surveys conducted in western Owyhee County found that at least 11 species were present (Air Force 1993a). Surveys conducted in the fall of 1996 detected seven additional species (Table L-6, Appendix L). In both surveys, deer mice were the most common species trapped. Great Basin pocket mice were the second most common, but frequency of occurrence was much lower. All other species were trapped at very low frequencies or were not detected due to a variety of seasonal and abiotic factors.

Small mammals can be found in a diversity of habitats ranging from the desert to montane vegetation communities. The presence of vegetation for concealment, food supply, and bedding, and the composition of the soil (i.e., rocks, gravel, sand) are important microhabitat features that influence the small mammal species composition of an area.

### 3.8.7.2 ROI TWO

*BATS*

Within ROI Two, potential habitat exists for all seven bat species without special status designation. Two bat species (big brown bat and the California myotis) were detected in field surveys conducted during the summer of 1996.

During bat surveys of the Bruneau-Jarbidge River system conducted by the BLM in 1995 and 1996, four species of bats without protection status (big brown bat, little brown bat, California myotis, and western pipistrelle) were detected (Doering and Keller 1996, in preparation). All of these species were recorded within ROI Two.

*SMALL MAMMALS*

Suitable habitat exists within ROI Two for 30 of the 35 small mammal species without special status designation (Table L-6, Appendix L). Eleven of the 30 species were detected in field surveys conducted in the fall of 1996.

### 3.8.7.3 ROI ONE

*CLOVER BUTTE*

*Bats*

No bats were detected during observational and ultrasonic surveys conducted during one day in August 1996. An area of exposed rock with small cliffs and several vernal ponds occurs

within the Clover Butte area. The exposed rock may provide potential roosting sites for a very small number of bats and the ephemeral pools may be used in the spring and early summer when water is present by the seven potential bat species without special protection.

### *Small Mammals*

Based on the available habitat described in section 3.8.4.3 ROI One – Clover Butte, 26 small mammal species potentially may occur within the Clover Butte 12,000-acre training range (Table L-6, Appendix L). No field surveys were conducted at Clover Butte, but surveys conducted in October 1996 in nearby Juniper Butte detected six of the 26 potential species. An additional species, the least chipmunk, was detected in big sagebrush at Grasmere, and also can be expected to occur, based on the availability of this habitat type, at Clover Butte.

## *GRASMERE*

### *Bats*

During surveys conducted over nine days in July and August 1996, bat activity was detected at four selected direct sampling locations associated with the Grasmere escarpment. Two of the four sampling locations were adjacent to the Grasmere target boundary. Species diversity was high overall; six species were detected including three sensitive species (see section 3.8.11). At Wickahoney Pond within 0.5 mile of the northern boundary, California myotis bats were captured and big brown bats were seen and heard. Big brown bats also were captured at Wickahoney Creek Pond in addition to western small-footed bats. Along China Creek, unidentified myotis were detected during ultrasonic surveys at one site and no bats were detected during an observational survey at a second site. Big brown bats and unidentified myotis bats were detected by ultrasonic surveys at China Creek Draw. Cursory surveys of stock ponds along the base of the Grasmere escarpment revealed no bats. An exposed basalt ribbon on Poison Butte was not examined but may provide bat roosting habitat.

### *Small Mammals*

Based on the available habitat described in section 3.8.4.3 ROI One – Grasmere, 30 small mammal species potentially occur within the Grasmere 12,000-acre training range (Table L-6, Appendix L). The variety and quality of habitat at Grasmere potentially provide ample breeding, foraging, and hibernating opportunities for the most diverse assemblage of small mammals among the sites. Due to the availability of wetlands and riparian areas, large amount of lithic features, and the relative diversity and quality of the shrub-steppe and grassland vegetation communities, additional species not likely to be found in the other sites have a much higher potential to be found at Grasmere. During field surveys conducted in the fall of 1996, in Juniper Butte and Grasmere, 11 of the 30 species were detected (Table L-6, Appendix L). Total numbers caught and relative abundance per trap night between different habitat types are presented in Table 3.8-18. Nine species were detected in Grasmere, four of which were not detected in Juniper Butte. The higher diversity of species trapped in Grasmere corresponds

with the greater availability of a variety of habitat types. Many more small mammals, especially the common species of ground squirrels, may have been encountered if surveys had been conducted before the onset of hibernation.

**Table 3.8-18. Numbers and Relative Abundance per Trap Night of Small Mammals within Habitat Types in the Juniper Butte and Grasmere Drop Targets, October 1996**

| | HABITAT TYPES | | |
|---|---|---|---|
| *Species* | *Shrub-steppe* | *Grasslands* | *Wetlands/Riparian* |
| Deer Mouse | 143 (0.130)[1] | 41 (0.102) | 64 (0.111) |
| Great Basin Pocket Mouse | 0 | 0 | 5 (0.009) |
| Ord's Kangaroo Rat | 1 (0.001) | 0 | 7 (0.012) |
| Least Chipmunk | 11 (0.010) | 0 | 19 (0.033) |
| Sagebrush Vole | 5 (0.003) | 0 | 2 (0.003) |
| Long-tailed Vole | 1 (0.001) | 0 | 2 (0.003) |
| Montane Shrew | 2 (0.002) | 0 | 0 |
| **Total** | **163** | **41** | **99** |
| **Relative Abundance per Habitat** | **0.148[2]** | **0.102[3]** | **0.172[4]** |

Notes:
1. Relative abundance estimates for each species per habitat type are in parentheses.
2. Relative abundance estimates based on 1,100 trap nights.
3. Relative abundance estimates based on 400 trap nights.
4. Relative abundance estimates based on 575 trap nights.

### *JUNIPER BUTTE*

#### *Bats*

No bat surveys were conducted in Juniper Butte, but some potential habitat occurs within the area. Potential roosting habitat exists along the eastern flank of Juniper Draw. The lithic features present are discussed in detail in section 3.8.4, Wildlife Habitat. The remainder of the site could potentially be used by foraging bats, but the exotic grasses that dominate the area can be considered only marginal for such purposes. Nonetheless, all seven bat species without species status designation may occur in Juniper Butte.

### *Small Mammals*

Based on the available habitat described in section 3.8.4.3, ROI One – Juniper Butte, 21 small mammal species potentially occur within the Grasmere 12,000-acre training range (Table L-6, Appendix L). The Juniper Butte site qualitatively has the most marginal habitat among the three sites. Because the shrub-steppe vegetation is composed almost exclusively of rabbitbrush, sagebrush-obligate species are unlikely to occur at the site. Trapping was conducted in the Juniper Butte 12,000-acre training range in October 1996, to obtain relative abundance of small mammals between different habitat types (Table 3.8-18). This effort resulted in the detection of six species among three habitat types (Table L-6, Appendix L). As expected, deer mice were the most frequently trapped species in each habitat type. Great Basin pocket mice and Ord's kangaroo rats only were found in draw habitats and sagebrush voles only were found in shrublands. A woodrat and a mountain cottontail were observed at the draw sites within the survey area.

## *NO-DROP TARGET AREAS*

### *Bats*

The 5-acre no-drop target areas did not appear to contain appropriate bat foraging and roosting habitat; surface water or potential roosting sites were not present. Therefore, bat surveys were not conducted within these areas. Basalt exposures associated with nearby canyons (minimum distance approximately 1 kilometer), however, may provide suitable habitat for the seven potential bat species.

The 640-acre no-drop target area is relatively flat with a low hill near the eastern margin and a slope rising to the north. The area is located approximately 2.5 miles to the west of Bruneau Canyon and is dominated by crested wheatgrass. Sonic surveys and observations of the 640-acre no-drop target area revealed active bat use. Heavy foraging by an unidentified bat species was observed; however, analysis of recorded calls could not positively identify the species. Seven bat species have the potential to occur in the area.

### *Small Mammals*

The majority of the 5-acre no-drop target areas are composed of exotic grasslands with one containing low sagebrush. Based on the available habitat, 21 small mammal species have the potential to occur at these sites. Because the 640-acre no-drop target area is composed of seedings of crested wheatgrass, as many as 15 grassland associated species have the potential to occur on the site.

## *EMITTER SITES*

### *Bats*

The emitter sites did not appear to contain appropriate bat roosting or foraging habitat.

*Small Mammals*

Habitat at emitter sites is primarily composed of exotic grassland communities with a few placed in shrub-steppe. As many as 30 species have the potential to occur at these sites. However, based on the small size and dispersed placement of the emitter sites, over half of the potential species would be unlikely or very rarely encountered.

***POWERLINE***

*Bats*

Potential bat foraging and roosting habitat (e.g., water and rock outcrops) were not present within the proposed powerline corridor.

*Small Mammals*

As many as 30 species have the potential to occur at these sites. However, because the majority of these corridors are composed of grasslands, 15 species are more likely to occur. This species list is based on the results from a visual survey identifying habitat types within the powerline corridor and from small mammal trapping conducted in similar habitat types on the Juniper Butte and Grasmere target areas.

***SAYLOR CREEK RANGE***

*Bats*

Suitable bat roosting habitat occurs within the Bruneau and Pot Hole Canyon areas, and potential foraging habitat is available for as many as seven bat species. In August 1996, the BLM captured two pallid bats, three western pipistrelle bats, and one little brown myotis within the Bruneau Canyon section associated with SCR.

*Small Mammals*

Based on the available wildlife habitat at SCR described in section 3.8.4, Wildlife Habitat, as many as 30 species may occur in the area. The presence of canyon habitat within SCR adds to potential small mammal diversity, but the marginal grasslands that dominate the site probably provide suitable habitat for fewer species than would otherwise be expected to occur.

## 3.8.8 Upland Game Birds

Upland game birds such as quail, partridge, and grouse have the potential to occur within the affected environment (Table L-7, Appendix L). Three of the species identified in Table L-7, Appendix 7 (sage grouse, Columbian sharp-tailed grouse, and mountain quail), have special protection or management status and are discussed in section 3.8.5, Protected and Sensitive Species.

### 3.8.8.1 ROI THREE

Upland game birds known to occur within ROI Three include one native species, the mourning dove, and four introduced species: chukar and gray partridges, ring-necked pheasant, and California quail. All of the gallinaceous species nest on the ground, are somewhat gregarious, and are year-round residents. Mourning doves nest primarily in shrubs and trees and are migratory.

Gray partridge and ring-necked pheasant are primarily associated with cultivated farmland such as corn or hay fields, which have some component of vegetative cover. Sagebrush-grass dominated habitats are also used by gray partridges (IDFG 1990). California quail can be found in farmlands, brushy foothills, and deserts, which contain riparian areas or some type of water source with appropriate cover. Chukars prefer rocky and brushy canyons with annual and perennial grasslands and scattered sagebrush. Chukar populations in the Jarbidge Canyon in 1995 were very high due to suitable habitat and difficult access resulting in low hunting pressure (personal communication, Williams 1996). Mourning doves occupy a variety of habitats including grassy meadows, cultivated fields, woodlands and sagebrush stands.

### 3.8.8.2 ROI TWO

Habitats in ROI Two (section 3.8.4, Wildlife Habitat) would be suitable for gray partridge, chukar, California quail, ring-neck pheasant, and mourning doves.

### 3.8.8.3 ROI ONE

#### *CLOVER BUTTE*

It is unlikely that game birds other than sage grouse occur here because suitable habitat such as surface water, canyons, or agricultural fields are not present (section 3.8.4, Wildlife Habitat and Table L-7, Appendix 7).

#### *GRASMERE*

Within the Grasmere target area, suitable habitat exists for chukar and gray partridge, California quail, and mourning doves. Chukars and mourning doves were observed incidentally during wildlife surveys in 1996.

#### *JUNIPER BUTTE*

Within the Juniper Butte target area and adjacent canyon, suitable habitat is present for chukar and mourning doves.

*NO-DROP TARGET AREAS*

Because most of the 640-acre and 5-acre target areas are dominated by exotic grasslands (see section 3.8.4, Wildlife Habitat) and are far from water sources, it is unlikely that any game bird species occur here.

*EMITTER SITES*

Other game birds are unlikely to be present because little suitable habitat exists.

*POWERLINE/ROADS*

Some gamebirds may occur within the proposed powerline corridor and new roads where suitable habitat is present.

*SAYLOR CREEK RANGE*

The diversity of habitats present (section 3.8.4, Wildlife Habitat) provide suitable habitat for all game bird species.

## 3.8.9 Waterbirds

Waterbirds are a diverse group of species that includes ducks, swans, herons, ibises, sandpipers, plovers, gulls, terns, and many other birds that are primarily associated with aquatic environments. Aquatic environments provide nesting and foraging habitat for most of the waterbird species. Waterbirds also use temporarily flooded areas and ephemeral ponds as resting and foraging stops during migration.

Seventy-five waterbird species that have potential to occur within the affected environment (nesting, migrating, or wintering) are listed in Table L-8, Appendix L. Only four waterbird species have special protection or management status. These species are discussed in section 3.8.5, Protected and Sensitive Species.

### 3.8.9.1 ROI THREE

Habitat for nesting, migrating, and wintering waterbirds exist within ROI Three for all 75 species of waterbirds that have the potential to occur within the proposed area of action. The abundance and seasonality of each habitat type is variable. Location of known concentrations of waterbirds are presented in Figure 3.8-6. The greatest concentration of nesting waterbirds within ROI Three occurs on the Duck Valley Reservation (Trost and Gerstell 1994); over 1,000 colonial waterbird nests (primarily white-faced ibises, black-crowned night herons, and snowy egrets) have been identified.

Immediately north of ROI Three lie several important waterbird use areas. Lake Lowell, located at the Deer Flat National Wildlife Refuge (72 miles north), provides nesting habitat for

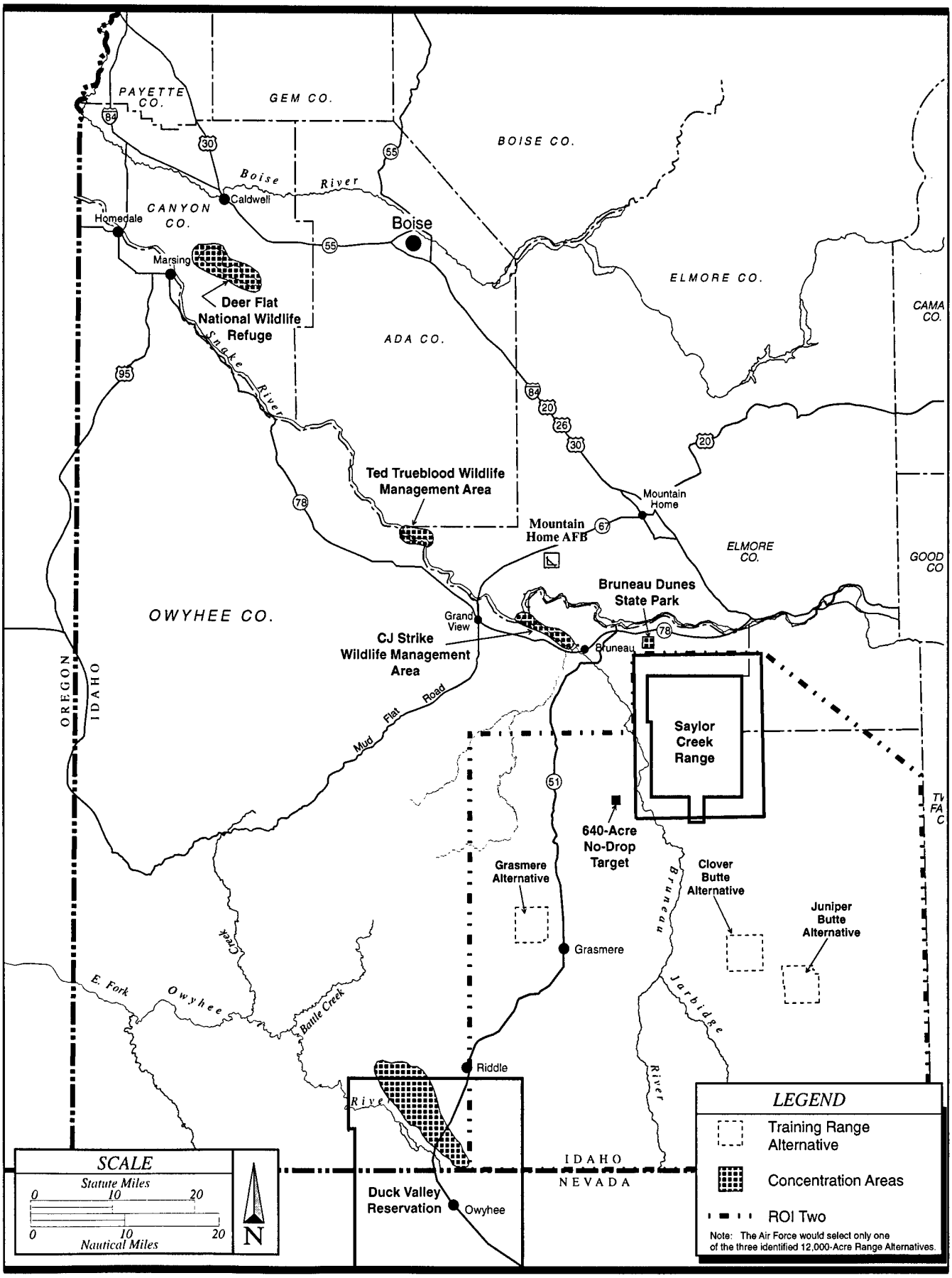



**Figure 3.8-6 Known Waterbird Concentration Areas**

waterbirds and is also a significant stopover point for ducks, geese, and shorebirds during autumn and spring migration. Fenzel (personal communication, 1996) reported that the number of ducks and geese has increased over the last several years during fall migration. Approximately 12,000 ducks, mostly mallards, and 15,000 Canada geese are present in autumn. By the first week of December, waterfowl numbers gradually decline. In the spring, waterfowl begin to arrive at Lake Lowell in late February with peak numbers occurring in late March through early April.

Band recovery data indicate that some waterfowl move from Deer Flat National Wildlife Refuge to the Umatilla National Wildlife Refuge, Oregon; Stillwater National Wildlife Refuge, Nevada; and the central valley of California (personal communication, Fenzel 1996). Although there are no known major shorebird migration corridors through Owyhee County (personal communication, Ivy 1996), large numbers (10,000 to 20,000) of migrating shorebirds stop at Lake Lowell in late July to early August and leave shortly after the first frost (mid-September through October) (personal communication, Stanley 1993).

The Ted Trueblood and C.J. Strike wildlife management areas are not only productive waterfowl breeding areas but important migration stopover points and wintering areas for over 100,000 ducks and 15,000 geese and swans (personal communication, Orcutt 1996).

Bruneau Dunes State Park also provides habitat for nesting waterbirds and wintering birds. From November through March, mostly mallard ducks and Canada geese can be found wintering there (personal communication, Whitworth 1996).

Surveys conducted in western Owyhee County identified waterbird use areas (Air Force 1993a). Hundreds of ducks, geese, and shorebirds were observed in playas, reservoirs, and stock ponds during spring migration 1993. Autumn surveys (1992) revealed low waterbird use of the survey area; most of the reservoirs were frozen over or dry and ephemeral sources had dried up. In January 1993, open water on the South Fork of the Owyhee River contained ducks, mergansers, and at least 100 Canada geese.

Water sources that have not been surveyed within other areas of ROI Three are probably important to migrating waterbirds during spring and autumn. Considering the relative small area and ephemeral nature of some of these sites, use as breeding habitat is probably limited.

### 3.8.9.2 ROI Two

Within ROI Two, aquatic habitat occurs along the Bruneau and Jarbidge rivers, perennial and intermittent creeks, marshes, reservoirs, and ephemeral pools. Roughly 5,833 acres of riparian and wetland habitats are available to waterbirds within ROI Two. Forty-three species of waterbirds potentially may breed within ROI Two.

All 75 species of waterbirds may migrate through ROI Two at some point during the year. The number of migrating waterbirds occurring in ROI Two is probably much greater in spring than

autumn because of available ephemeral wetlands during this period. Of these 75 species, 43 may breed within ROI Two. Of the 43 species that may breed within ROI Two, nine may be found within ROI Two year-round. An additional four species migrate south to potentially winter within ROI Two, making a total of 13 species that potentially may be found within ROI Two during the winter. Waterbird species that have the potential to occur within ROI Two and the seasonality of such occurrences are listed in Table L-8, Appendix L. No specific information is available on use of wetland habitats within ROI Two.

### 3.8.9.3 ROI ONE

#### *CLOVER BUTTE*

No waterbird species were observed in the Clover Butte area during surveys conducted between May and October 1996.

Available aquatic habitat for waterbirds within Clover Butte consists of a few ephemeral pools that may support a few vernal migrants for a short period of time.

#### *GRASMERE*

During wildlife surveys conducted in 1996, several waterbird species were observed. Adult killdeer with young were found in riparian areas of China Creek and Wickahoney Spring in June, and three white-faced ibises were observed in a pond on China Creek in August. Killdeer were observed in Wickahoney Canyon and in the vicinity of Wickahoney Spring. A common snipe also was observed in Wickahoney Canyon. In addition, mixed flocks composed of hundreds of snow geese and a few Ross' geese, preceded by over 150 tundra swans, were observed migrating south along the Grasmere escarpment over a period of several days.

Wickahoney Pond and perennial water sources within Wickahoney Canyon provide some aquatic habitat and concealment for nesting waterbirds within Grasmere. Several stock ponds also may provide adequate foraging habitat for some migrating waterbirds. In general appearance, waterbird habitat in and around the Grasmere alternative site exceeds that which is available at the other alternative sites.

#### *JUNIPER BUTTE*

Available aquatic habitat for waterbirds within Juniper Butte is as scarce as it is at Clover Butte. In general, the habitat within Juniper Butte is inadequate for nesting waterbirds. Nevertheless, seeps and temporarily flooded areas within the target area may provide adequate foraging habitat for sandpipers and other wading birds during spring.

#### *NO-DROP TARGET AREAS*

The no-drop target areas were purposefully located to avoid wetlands. It is unlikely that any waterbird species are present on no-drop target areas. No-drop targets that have aquatic

habitat within several hundred feet of one of the no-drop targets may support some foraging waterbirds species.

*EMITTER SITES*

The emitter sites were purposefully located to avoid wetlands and are located at higher elevations. It is unlikely that the wetland habitat required for most of the waterbird species is present at any of the emitter sites. Eleven of the emitter sites are within one mile of wetland habitat where some waterbirds could be found.

*POWERLINE/ROADS*

Waterbird habitat does not exist within or proximal to the proposed powerline corridor. The placement of new roads and the upgrading of existing roads would occur near or through intermittent or perennial streams (refer to section 3.8.2, Wetlands) that are potential waterbird habitat.

*SAYLOR CREEK RANGE*

The wetland and riparian habitat within the range consists of standing water and several canyons (Bruneau and Pot Hole) and might support both foraging and nesting waterbirds. Several miles of riverine habitat exists and 0.5 acre of standing water may support the most disturbance-tolerant waterbirds.

### 3.8.10 Raptors and Other Birds

Raptors, also known as birds of prey, include hawks, eagles, falcons, vultures, and owls. Raptor species that may be present in the affected environment are listed in Table L-9, Appendix L. Species identified in Table L-9, Appendix L as having special protection or management status are discussed in greater detail in section 3.8.5, Protected and Sensitive Species.

Raptors have statutory protection from indiscriminate killing under the Federal Migratory Bird Treaty Act and under Idaho Code Section 36-1102. Eagles are also protected under the Federal Bald and Golden Eagle Protection Act.

Raptors present in the affected environment include resident species, which are present in the area year-round; nesting species, which occur in the area during the breeding season but winter elsewhere; wintering species that nest elsewhere but are found in the area in the winter; and transient species that occur in the area only as migrants. Some species, such as golden eagles, may have individuals that are resident and others that occur in the area only during the nesting or wintering seasons. Species that are present in the area in more than one season often utilize different types of habitat in different seasons.

In addition to raptors, this section addresses other nongame avian species that may occur in the affected environment (Table L-10, Appendix L). The majority of other nongame species are passerine or perching birds (e.g., sparrows, warblers, thrushes, and wrens), but other groups of birds such as nighthawks, swifts, hummingbirds, and woodpeckers are also included in this section. Sensitive nongame species (e.g., loggerhead shrike) are discussed in section 3.8.5, Protected and Sensitive Species.

All birds are protected under the Federal Migratory Bird Treaty Act, and Idaho Code Section 36-1102 protects "Game, Song, Insectiverous, Rodent-killing, and Innocent Birds" except for English sparrows and starlings.

Like raptors, many passerine and other species are neotropical migrants, or birds that breed in North America then migrate to the tropics for the winter. Approximately 119 of the 248 bird species known to nest in Idaho are considered to be neotropical migrants (Saab and Groves 1992). Of these species, some are found in southwest Idaho only during migration, while others occur in the area only during nesting season. Other passerine species are year-round residents.

#### 3.8.10.1 ROI THREE

***RAPTORS***

Diversity of vegetation communities within ROI Three provides suitable nesting and foraging habitat for many raptor species. Raptors that are likely to be year-round residents and utilize canyon walls for nesting include golden eagles, prairie falcons, red-tailed hawks, American kestrels, great horned owls, western screech owls, and barn owls. Turkey vultures are known to nest in caves on cliffs in parts of southern Idaho but are generally not present in the area in the winter. Suitable nesting habitat for these species in ROI Three is found within the canyons of the Bruneau, Jarbidge, and Owyhee rivers; canyon and cliff areas of Sheep, Cat, Marys, Battle, Deep, Dickshooter, Red Canyon, Big Jacks, and Little Jacks creeks and their tributaries; and other areas of rimrock elsewhere within the ROI.

Raptor species that nest in trees located on the uplands or in canyons include Swainson's, ferruginous and red-tailed hawks, long-eared owls, great horned owls, and western screech owls. Swainson's hawks are only in Idaho during the breeding season and spend the winter primarily in South America. Other tree-nesting species are found in the area in the winter, although some individuals may migrate. Areas with appropriate nesting habitat for these species tend to be found at higher elevations, in canyons, or along draws in upland areas.

Short-eared owls and northern harriers nest on the ground in grassland, shrub-steppe, or marsh habitats. Northern harriers can be found wintering in southwestern Idaho, whereas short-eared owls are rarely found here during winter. Few marshes are found within ROI Three, but both species may be found nesting in grasslands, shrub-steppe, and near agricultural areas throughout the uplands of ROI Three.

At higher elevations, coniferous and aspen forests provide nesting habitat for the accipiter species (northern goshawk, Cooper's hawk, and sharp-shinned hawk) and some owls (e.g., long-eared, western screech, and great horned owls).

Idaho's deserts and canyons provide not only suitable nesting habitat for birds of prey but also winter habitat as well. Rough-legged hawks migrate from the northern portions of Alaska and Canada to winter in the lower western United States, and are common winter residents of shrub-steppe habitats in southern Idaho. Cooper's and sharp-shinned hawks also winter in southern Idaho or migrate through the area en route to other wintering sites. Infrequently, merlins and gyrfalcons, which breed at more northern latitudes, may be seen hunting here in winter. Additionally, many of the raptors that nest here, such as golden eagles, prairie falcons, American kestrels, red-tailed hawks, and great horned and long-eared owls, are year-round residents.

Few surveys for raptors have been conducted within ROI Three. Surveys conducted in 1992 and 1993 in the canyons and uplands of the Owyhee River area detected nests of the following species: ferruginous hawk, red-tailed hawk, golden eagle, American kestrel, and prairie falcon (Air Force 1993a). Other species that were detected during the nesting season included turkey vulture, northern harrier, burrowing owl, peregrine falcon, great horned owl, and osprey. In addition to these species, bald eagles, northern goshawks, and rough-legged hawks were detected during winter surveys.

### *OTHER BIRDS*

Passerine and other nongame birds can be found breeding throughout all vegetation communities within the affected environment. Each type of habitat found within ROI Three generally supports an assemblage of species specific to that habitat type, although some overlap exists.

Shrub-steppe environments such as big sagebrush and salt desert scrub in southwestern Idaho provide habitat for between 9 and 16 species of nongame, nonraptorial birds, including sage sparrow, Brewer's sparrow, sage thrasher, vesper sparrow, gray flycatcher, western meadowlark, and horned lark (Saab and Groves 1992). Breeding Bird Surveys (BBS) in Idaho conducted from 1980 through 1989 showed declines during this period for loggerhead shrike, Brewer's sparrow, vesper sparrow, horned lark, and sage thrasher (Saab and Groves 1992). During the same period, western meadowlarks increased in abundance.

Riparian areas in ROI Three, especially those found in the major canyons, support between 40 and 47 species of birds (Saab and Groves 1992). In addition to game birds and raptors, canyon bird species include rock wren, canyon wren, white-throated swift, belted kingfisher, northern rough-winged swallow, Say's phoebe, rock dove, yellow-breasted chat, yellow-rumped warbler, and others. During the 1994-1996 nesting seasons, BLM biologists conducted surveys in the riparian zones of Battle Creek in western Owyhee County. Using the point count method, 50 bird species, including waterbirds and raptors, were detected.

Between 17 and 31 species of birds are found in pinyon-juniper and aspen woodlands in southwest Idaho (Saab and Groves 1992). These birds may include mountain bluebirds, Hammond's flycatcher, Swainson's thrush, pine siskin, western wood-pewee, Lewis' woodpecker, Townsend's solitaire, and spotted towhee. The coniferous forests associated with higher elevations within ROI Three also provide nesting and foraging habitat for many bird species.

### 3.8.10.2 ROI Two

#### *Raptors*

Raptor species that use cliffs and uplands for nesting or foraging (residents and winter visitors) are likely to occur within ROI Two where suitable habitat exists. Based on the available habitat described in section 3.8.4, 19 raptor species potentially occur within ROI Two (Table L-9, Appendix L).

Surveys for raptors within ROI Two have generally been limited to sensitive species such as ferruginous hawks and are discussed in section 3.8.5. However, BLM data indicate that at least six golden eagle nests are found within ROI Two, primarily along the East Fork of the Bruneau River and the Bruneau River. Two additional golden eagle nests are known to be found in the Bruneau River Canyon near SCR (Air Force 1996a). Swainson's hawks were known to have nested in at least four historical ferruginous hawk nests in 1996 (personal communication, Klott 1996).

Aerial surveys for wintering raptors were conducted in February 1997, by flying one-mile wide transects across ROI Two and flying the major canyons within ROI Two. The species and number of raptors observed are as follows: golden eagle (5), rough-legged hawk (4), red-tailed hawk (4), prairie falcon (4), northern harrier (1), unidentified buteo (1), and unidentified falcon (1).

#### *Other Birds*

No surveys are known to have been conducted for passerines and other birds within ROI Two. Based on the available habitat described in section 3.8.4, Wildlife Habitat, 93 bird species potentially occur within ROI Two (Table L-10, Appendix L).

### 3.8.10.3 ROI One

#### *Clover Butte*

#### *Raptors*

During walking surveys of the Clover Butte target area conducted in June 1996, several raptors species, as well as raptor nesting and foraging habitat, were found to be present. Eleven raptors of four species and two active nests were found (Table 3.8-19). Northern harriers and a

golden eagle were observed hunting. A short-eared owl exhibited possible nesting behavior, but no nest could be located in the immediate vicinity.

**Table 3.8-19. Numbers of Raptors Observed and Nests Found during Raptor Surveys at Clover Butte Target Area, June 1996**

| *Common Name* | *Scientific Name* | *Number Observed* | *Number Nests* |
|---|---|---|---|
| Golden eagle | *Aquila chrysaetos* | 1 | 0 |
| Burrowing owl | *Speotyto cunicularia hypugaea* | 3 | 2 (active) |
| Short-eared owl | *Asio flammeus* | 1 | 0 |
| Northern harrier | *Circus cyaneus* | 6 | 0 |

The lack of cliffs, trees, and suitable nesting substrate such as rock outcrops, towers, or structures preclude nesting opportunities for raptors species that nest above ground. Although this area may be used as foraging habitat by raptors, few small mammals (jackrabbits or ground squirrels) were observed during the surveys.

The Clover Butte site has a high frequency of grasslands, primarily composed of exotic annual species and large patches of sagebrush (Table 3.8-12). It is likely that northern harriers and short-eared and burrowing owls are more abundant than was observed during the single survey conducted in June.

### *Other Birds*

Non-raptor bird species observed on the Clover Butte site included, in descending order of relative abundance, horned lark, western meadowlark, sage sparrow, Brewer's sparrow, sage thrasher, brown-headed cowbird, common nighthawk, and common raven.

## *GRASMERE*

### *Raptors*

Habitat within and adjacent to the Grasmere target area (Table 3.8-12) provides nesting opportunities for a diversity of raptor species. Walking surveys conducted in June 1996 identified nests and use of this area by nine raptor species (Table 3.8-20). This area is characterized by relatively flat or rolling terrain on the eastern half of the 12,000-acre site, which rises to a plateau, dissected by deep draws and canyons, on the western portion.

**Table 3.8-20. Numbers of Raptors Observed and Nests Found during Raptor Surveys at Grasmere Target Area, June 1996**

| *Common Name* | *Scientific Name* | *Number Observed* | *Number Nests* |
|---|---|---|---|
| American kestrel | *Falco sparverius* | 19 | 2 active<br>7 possible (pair present) |
| Prairie falcon | *Falco mexicanus* | 5 | 2 active |
| Red-tailed hawk | *Buteo jamaicensis* | 9 | 2 active |
| Swainson's hawk | *Buteo swainsoni* | 1 | 0 |
| Ferruginous hawk | *Buteo regalis* | 1 | 0 |
| Golden eagle | *Aquila chrysaetos* | 3 | 1 territory occupied by pair (nest active) |
| Burrowing owl | *Speotyto cunicularia hypugaea* | 3 | 2 |
| Northern harrier | *Circus cyaneus* | 1 | 0 |
| Unknown falcon | *Falco sp.* | 1 (too distant to identify) | 0 |
| Turkey vulture | *Cathartes aura* | 7 | 0 |

A variety of raptors were observed in association with the canyons located on the western end of the target area during June 1996 surveys. Two active American kestrel nests and seven likely active nests (pairs displaying defensive behavior) were observed. Two adult golden eagles were observed perching and flying in the vicinity of an inactive stick nest on two different days. Two inactive golden eagle nests also were found in a canyon 1.5 miles southeast of the above mentioned occupied territory. Two active red-tailed hawk nests and two active prairie falcon nests were found. In addition, a ferruginous hawk and a loggerhead shrike were observed within the canyons but no nests were located.

On the eastern portion of the site, two ground nesting raptor species were observed during the survey: a northern harrier was seen hunting and two burrowing owl nests were found. Suitable nesting habitat for short-eared owls and northern harriers was present, but nests for these species were not detected.

Within the sagebrush stands three loggerhead shrikes were seen but no nest searches were conducted. An American kestrel was observed hunting within a disturbed area adjacent to extensive sagebrush stands.

### *Other Birds*

Passerines associated with the sagebrush steppe habitat included sage thrasher, sage sparrow, Brewer's sparrow, gray flycatcher, and Brewer's blackbird. Relative abundance of sage

thrashers and sage and Brewer's sparrows (all shrub-obligate species), and gray flycatchers, appeared to be greater here than in sagebrush stands at the Clover Butte site. Differences in the degree of fragmentation and disturbance of the sagebrush habitat may explain these differences in abundance (Knick and Rotenberry 1995). Horned larks and meadowlarks were more commonly observed in the seeded grasslands and on the edges of the sagebrush stands.

Mourning doves were found in riparian areas near China Creek in the south and Wickahoney Spring in the north. Species associated with the canyons and/or nearby benchlands included cliff swallow, violet-green swallow, American robin, common poorwill, rock wren, mountain bluebird, yellow-breasted chat, and common nighthawk. Common ravens were observed flying throughout the area.

### *JUNIPER BUTTE*

#### *Raptors*

Several raptors were seen during field visits. During a brief field visit in August 1996, a northern harrier and a red-tailed hawk were observed flying in the northeast section of the zone. Also, a ferruginous hawk nest located in Juniper Draw was visited. A short-eared owl and a prairie falcon were observed during a field visit in September 1996.

Habitat within Juniper Butte site is comprised mostly of exotic grasslands (Table 3.8-12).

Paralleling the eastern boundary of the Juniper Butte is the East Fork of the Bruneau River. Cliffs within this canyon may provide suitable nesting substrate for cliff nesting raptors. In August 1996, an adult golden eagle was observed soaring low above the canyon rim.

#### *Other Birds*

The abundance of exotic grasslands at Juniper Butte greatly limits bird diversity. Bird species likely to occur here include western meadowlarks and horned larks.

### *NO-DROP TARGET AREAS*

#### *Raptors*

The 640-acre no-drop target area, primarily covered with crested wheatgrass, was surveyed for raptors on June 25, 1996.

Seven raptors belonging to four species were observed. Four short-eared owls were flushed from a patch of sagebrush by an observer walking a transect. One red-tailed hawk was seen perched on a rock outcrop. Other sightings included a turkey vulture soaring and a northern harrier flying low over ground; both were probably foraging. No suitable nesting substrates exist for cliff- or tree-nesting raptors. Suitable nesting habitat for northern harriers and burrowing owls was present, but no nests were found.

The six 5-acre no-drop target areas may provide habitat for ground nesting and foraging raptors. No raptors, however, have been observed during brief visits.

### *Other Birds*

Western meadowlarks and horned larks were the only passerines observed in the 640-acre no-drop target area. Habitat within the 5-acre no-drop target areas may be used by birds that prefer open habitats for nesting and foraging.

## *EMITTER SITES*

### *Raptors*

No raptors were observed at any of the emitter sites surveyed in May 1996.

The emitter site habitats, consisting mostly of exotic grasslands and some of low and big sagebrush with native grasses (section 3.8.4, Wildlife Habitat), may be used by ground nesting and foraging raptors.

### *Other Birds*

Habitat within most of the emitter sites (section 3.8.4, Wildlife Habitat) may be used by birds that prefer open habitats for nesting and foraging. Emitter sites dominated by big sagebrush may provide nesting habitat for shrub-obligate passerines.

## *POWERLINE/ROADS*

### *Raptors*

The proposed powerline corridor and new roads, which consists of almost equal amounts of native and non-native vegetation (section 3.8.1, Vegetation), may provide nesting habitat for ground nesting raptor species. No suitable nesting substrate (e.g., cliffs, rocky outcrops, or trees) exists for other raptor species.

Depending on prey availability, raptors may use the areas within the proposed powerline corridor and new roads as foraging habitat. No raptors were observed in the proposed powerline corridor during a survey conducted in October 1996.

### *Other Birds*

It is likely that horned larks, meadowlarks, sage sparrows, Brewer's sparrows, and sage thrashers nest within the powerline corridor and new roads where suitable habitat exists. During the survey conducted in October 1996, only horned larks, meadowlarks, and ravens were seen in the proposed powerline corridor.

### *SAYLOR CREEK RANGE*

#### *Raptors*

Surveys for nesting and wintering raptors were conducted in 1994-95 within the SCR and associated airspace R-3202A, which included a portion of the Bruneau Canyon (Air Force 1996a).

In March and April 1994, 80 raptors of nine species were observed during the nesting surveys. Six active nests and seven possible nests (i.e., birds exhibiting territorial defense behavior) were recorded for golden eagles, prairie falcons, and red-tailed and ferruginous hawks. Other raptors observed included northern harriers, American kestrels, one sharp-shinned hawk, one merlin, and turkey vultures. Additionally, one burrowing owl nest is located just outside the SCR boundary (personal communication, Klott 1996). It is probable that a higher number of raptor nests are present on SCR than were located during the 1994 nesting survey, which provided only a single complete survey of the area.

During the winter survey conducted in January 1994 and February 1995, 56 raptors of the following species were observed: golden and bald eagles, northern harrier, prairie falcon, American kestrel, gyrfalcon, burrowing owl, and rough-legged and red-tailed hawks.

SCR contains nesting habitat for both canyon- and ground-nesting raptors (refer to section 3.8.4, Wildlife Habitat). The Bruneau River Canyon within R-3202A provides abundant nesting strata for species such as peregrine and prairie falcons, golden eagles, red-tailed hawks, and American kestrels. Areas of rimrock and smaller canyons are found in the eastern portion and northwestern corner of SCR and provide additional nesting terrain for species such as prairie falcons and ferruginous hawks.

Mixed grass-sagebrush communities within SCR offer suitable nesting habitat for ground-nesting raptors such as northern harriers and short-eared owls, as well as providing foraging habitat for canyon-nesting and wintering species. Stands of mixed grass-sagebrush stands in good condition are generally limited to the southeastern portion of SCR and to areas near the rim of the Bruneau River canyon.

#### *Other Birds*

BBSs, a method used to assess trends in landbird populations throughout the United States and southern Canada, have been conducted annually within SCR since 1991 (personal communication, Klott 1996). Observers on this BBS route, which extends from Hot Spring south through SCR along Clover-Three Creek Road to 10 miles south of SCR, have sighted 53 species: chukar, golden eagle, red-tailed hawk, northern harrier, American kestrel, ring-necked pheasant, sage grouse, killdeer, long-billed curlew, spotted sandpiper, common snipe, rock dove, mourning dove, great horned owl, burrowing owl, short-eared owl, common nighthawk, red-shafted flicker, white-throated swift, western kingbird, eastern kingbird, horned lark, bank swallow, barn swallow, cliff swallow, violet-green swallow, black-billed magpie, American

crow, common raven, rock wren, American robin, sage thrasher, loggerhead shrike, yellow warbler, Audubon's warbler, yellow-breasted chat, lazuli bunting, green-tailed towhee, chipping sparrow, Brewer's sparrow, grasshopper sparrow, lark sparrow, black-throated sparrow, sage sparrow, savannah sparrow, song sparrow, fox sparrow, vesper sparrow, red-winged blackbird, western meadowlark, Brewer's blackbird, brown-headed cowbird, and Bullock's oriole.

## 3.8.11 Amphibians and Reptiles

Seven species of amphibians (frogs and toads) and 18 species of reptiles (lizards and snakes) potentially occur within the affected environment (Tables L-11 and L-12, Appendix L). Nineteen species of reptiles and amphibians (excluding the six special status species) potentially occur in the proposed area of action.

Six of the 25 species identified in Table L-11 and L-12, Appendix L have special protection or management status and are discussed in section 3.8.5, Protected and Sensitive Species.

### 3.8.11.1 ROI Three

The amphibians and reptiles present in the affected environment are year-round residents, and exhibit seasonal variations in activity and habitat use. Normally, amphibians are restricted to moist habitats, whereas reptiles have a greater tolerance for a variety of dry and wet habitats. During the winter, all of the amphibian and reptile species in the proposed area of action hibernate. Many reptiles gather in communal overwintering sites known as hibernacula. A single overwintering site may contain many individuals of several different species from a large area (58 square miles) (Cobb, unpublished data). Conserving these rare hibernacula is essential in maintaining a significant proportion of the reptile population in a given area.

*Amphibians*

Four non-protected amphibian species are known to or have the potential to occur within the proposed area of action. These species require some type of wetland habitat (temporary or permanent rivers, ponds, marsh, lake, or agricultural ditches) to reproduce, and the majority of the species' life histories are closely associated with moist environments. Except for canyon slopes, all habitats within the proposed area of action might contain some amphibian species.

The bullfrog and Pacific tree frog are to some extent aquatic and are mostly limited to riverine systems in canyon bottoms or permanent wetlands in the uplands. Although all toad species require some form of water for breeding, the Great Basin spadefoot, and to a lesser extent the Woodhouse's toad, are adapted to arid conditions and might occur in both wetland and upland environments in their adult stage.

*REPTILES*

Fifteen non-protected reptile species (seven species of snakes and eight species of lizards) potentially occur within the proposed area of action. Several species including gopher snake, racer, western fence lizard, sagebrush lizard, side-blotched lizard, and western rattlesnake are widespread and would be fairly common throughout all habitats within ROI Three. Other species have limited distributions but are locally abundant. The western terrestrial garter snake is limited to riparian or wetlands. The western whiptail lizard, long-nosed leopard lizard, and desert horned lizard are commonly found in sandy or sandy loam soils. Other reptiles including the night snake, striped whipsnake, western ground snake, rubber boa, western skink and short-horned lizard are more limited in their distributions and would be considered locally uncommon or rare.

### 3.8.11.2 ROI TWO

*AMPHIBIANS*

Amphibian surveys were conducted in early June 1996 throughout selected sites within ROI Two. Although surveys were not conducted during the breeding season, one amphibian species, the Pacific tree frog, and several potential amphibian breeding sites were located. Suitable habitat (e.g., rivers, ponds, irrigation ditches, and reservoirs) for several of the amphibian species is present within ROI Two (Table L-11, Appendix L), especially the aquatic habitat associated with the Bruneau Canyon complex and the East Fork Bruneau Canyon.

*REPTILES*

Suitable habitat for 15 of the reptile species potentially occurring in the affected environment is present within ROI Two (Table L-12, Appendix L). Racers, western terrestrial garter snakes, western rattlesnakes, desert horned lizards, side-blotched lizards, western fence lizards, and sagebrush lizards are common species throughout several habitats within ROI Two (e.g., grassland, sagebrush flats, talus slopes, rocky streams, rock outcrops, and sandy areas). Other species would be expected to be found less commonly and only in more specific habitat types.

### 3.8.11.3 ROI ONE

*CLOVER BUTTE*

*Amphibians*

Two potential breeding sites for amphibians were identified within the southwestern portion of the Clover Butte Alternative site during the June 1996 survey. The Clover Butte Alternative site is primarily dominated by grasslands comprised of non-native species. Wetland habitat is also present in small quantities in the form of ephemeral pools. Common amphibian species such as the Pacific tree frog would be expected to inhabit any wetland habitat present within this

alternative site. The more drought-tolerant toads also might occur within the site. Other amphibian species that are not as common and require permanent water are unlikely to be present within this alternative site.

### *Reptiles*

The Clover Butte Alternative site is primarily grasslands dominated by non-native, seeded species. This habitat would support several common reptile species including sagebrush lizard, side-blotched lizard, western rattlesnake, racer, striped whipsnake, and gopher snake. The general lack of exposed rocky areas within Clover Butte might exclude certain species that are dependent on such features.

## *GRASMERE*

### *Amphibians*

Most of the habitat in the central portion of the Grasmere Alternative site is characterized by non-native grassland and would support few amphibian species. However, the perennial streams, depression wetlands, and springs that are present within this alternative site, especially those associated with the escarpment canyons such as China and Wickahoney creeks, support several amphibian species. Amphibian species expected within these wetlands habitats include Pacific tree frog, bullfrog, and Woodhouse's and spadefoot toad.

### *Reptiles*

The grassland within the central portion of the Grasmere Alternative site would support reptile species similar to those described for the Clover Butte Alternative. In addition, the low ridges and drainages within the eastern portion and the deep canyon in the western portion of this alternative site would provide the outcrops and talus slopes used by other reptile species including western fence lizard, western skink, rubber boa, and night snake. The eastern exposure afforded by the escarpment also may provide local reptiles with important hibernacula sites. The wetland habitat associated with China and Wickahoney creeks would provide suitable habitat for the western terrestrial garter snake.

## *JUNIPER BUTTE*

### *Amphibians*

The Juniper Butte Alternative site is primarily non-native vegetation and much of the area has been recently burned. Amphibian species require some form of wetland habitat during their life history. Therefore, it is unlikely that most of the amphibian species potentially occurring in the proximity of the project will be present within the Juniper Butte Alternative site. The presence of the little aquatic habitat could support some of the more common amphibian species similar to those described in the Grasmere Alternative.

### *Reptiles*

The Juniper Butte Alternative site is primarily non-native grassland that has been routinely altered by fires. Reptiles likely to occur within this alternative site include species that are associated with open grassland habitats and would include sagebrush lizard, side-blotched lizard, racer, striped whipsnake, western rattlesnake, and gopher snake. The rocky cliffs, boulder piles, and slide rock associated with Juniper Draw, might provide sufficient rocky habitat for reptiles that might not be found at Clover Butte. These lithic features might also furnish reptiles with adequate hibernacula. Proximity to the East Fork Bruneau Canyon might facilitate dispersion of reptiles into suitable habitats within the target area.

## *NO-DROP TARGET AREAS*

### *Amphibians*

The no-drop target areas were purposefully located to avoid wetlands. It is unlikely that many amphibian species are present on target areas. No-drop targets that have wetlands within several hundred feet may support those amphibian species that are occasionally observed in upland areas (Woodhouse's toad and spadefoot toad).

### *Reptiles*

The majority of the no-drop target areas have vegetation types comprised of non-native grassland species. Two of the seven sites have vegetation types comprised of native vegetation including low sagebrush. Both of these vegetation types would support common reptile species associated with open grassland habitats similar to those described for the Clover Butte Alternative site.

## *EMITTER SITES*

### *Amphibians*

The emitter sites were purposefully located to avoid wetlands and are located at higher elevations. It is unlikely that the wetland habitat required for most of the amphibian species is present at any of the emitter sites. Eleven of the emitter sites are within one mile of wetland habitat. Common amphibian species that are occasionally observed in upland habitat (Woodhouse's toad and spadefoot toad) may be present at a few emitter sites.

### *Reptiles*

All of the proposed emitter sites are located in non-native grassland or habitat comprised of native plant species including low sagebrush. Both of these vegetation types would support common reptile species associated with open grassland habitats similar to those described for the Clover Butte Alternative site. Hibernacula sites used by several reptile species are often located in areas of higher elevation and may be present at some of the emitter sites.

*POWERLINE/ROADS*

*Amphibians*

New roads may cross or abut wetland habitat that could support common amphibian species such as Pacific tree frog. Other amphibian species potentially occurring near the construction of roads in the area of disturbed grassland and native sagebrush vegetation would include Woodhouse's and spadefoot toads.

*Reptiles*

New roads required for all alternatives would traverse through several habitat types including disturbed grassland, native sagebrush, and various forms of wetlands. All of the reptile species potentially occurring within the proposed area of action may occur near areas of road construction.

*SAYLOR CREEK RANGE*

*Amphibians*

Most of the habitat within the SCR located outside of the drop target is heavily disturbed by fires, grazing, and reseeding programs and is characterized by non-native grassland. No amphibians are expected to occur in the upland areas. The wetland and riparian habitat within the range consists of standing water and several canyons (Bruneau and Pot Hole), and may support common amphibian species including Pacific tree frog, bullfrogs, and Woodhouse's and spadefoot toads. Habitat within the boundaries of the drop target is heavily disturbed and is unlikely to support any amphibian species.

*Reptiles*

Most of the habitat within the SCR located outside of the drop target is characterized by grassland disturbed by fires, grazing, and reseeding programs. Canyons and wetlands provide additional habitat for additional reptiles. These habitats would support the common reptile species such as those discussed for the Grasmere Alternative site. Habitat within the boundaries of the drop target is heavily disturbed and would support few reptile species.

## 3.8.12 Shoshone-Paiute Issues Concerning Biological Resources

Like all natural resources, plants and animals are considered by the Shoshone-Paiute to be essential to the maintenance and practice of their traditional culture. They are important not only as sources of food and for making clothing and other items, but also have roles in the spiritual realm. Animals are central actors in Shoshone-Paiute traditions. All animals are believed to be spiritual beings that deserve to be treated with respect at all times. Plants are also believed to have a spiritual component. Many plant species are used as medicine and

some are used in ceremonies. Like animals, plants are believed to be intimately connected to the spirit world and deserve respectful treatment by humans.

Members of the Shoshone-Paiute Tribes have expressed the concern that past aircraft overflights and other military activity in southwest Idaho may have contributed to a decline in the populations of bighorn sheep, sage grouse, and other native species. These species are very important to the Tribes and are considered traditional cultural resources (see section 3.9 for additional information). While a cause-and-effect relationship between overflights and the decline of some game species has not been demonstrated scientifically, many Shoshone-Paiute believe that the decline may be related to disturbance of a more spiritual nature.

As part of an on-going effort to work with the Tribes on a variety of issues, the Air Force is supporting a study of ethnobotanical and ethnozoological resources in southwest Idaho and adjacent areas. The Tribes and the Air Force have agreed that the results of the study remain confidential.

Bighorn sheep historically occupied the canyon and mountain habitats in the Owyhee and Bruneau River drainages of southwest Idaho. IDFG/BLM surveys conducted in 1996 for the Bruneau and Jarbidge rivers above their confluence obtained counts of 163 bighorn sheep. These results are similar to 1994 counts of 132 sheep. Bighorn sheep survey results for the Owyhee River herd range from highs of 753 in 1991 to 669 in 1993, with counts of 347 in 1994 and 401 in 1996. Surveys for the Little Jacks Creek herd yielded counts of 241 sheep in 1991 and 181 sheep in 1996. Big Jacks Creek has not been surveyed since 1993, when 90 bighorn sheep were counted. For more information, refer to section 3.8.5.

Sage grouse have been declining in southern Idaho. This decline appears to be the result of a loss of sagebrush vegetation in the region. Sage grouse are highly dependent on sagebrush as a food source, as habitat during courtship activities, and as protective cover for nesting. However, thousands of acres of shrub habitat has been lost to wildfire, agricultural conversion, grazing, and other developments. For example, estimates of wintering sage grouse from the Nevada border to Poison Butte (12 miles north of Murphy Hot Springs) have declined from 1,500 birds to only 100 birds since 1991 (personal communication, Williams 1996). As a consequence of the loss of habitat, sage grouse distribution in southern Idaho has become more restricted (IDFG 1992). For more information, refer to section 3.8.5.

# CULTURAL RESOURCES

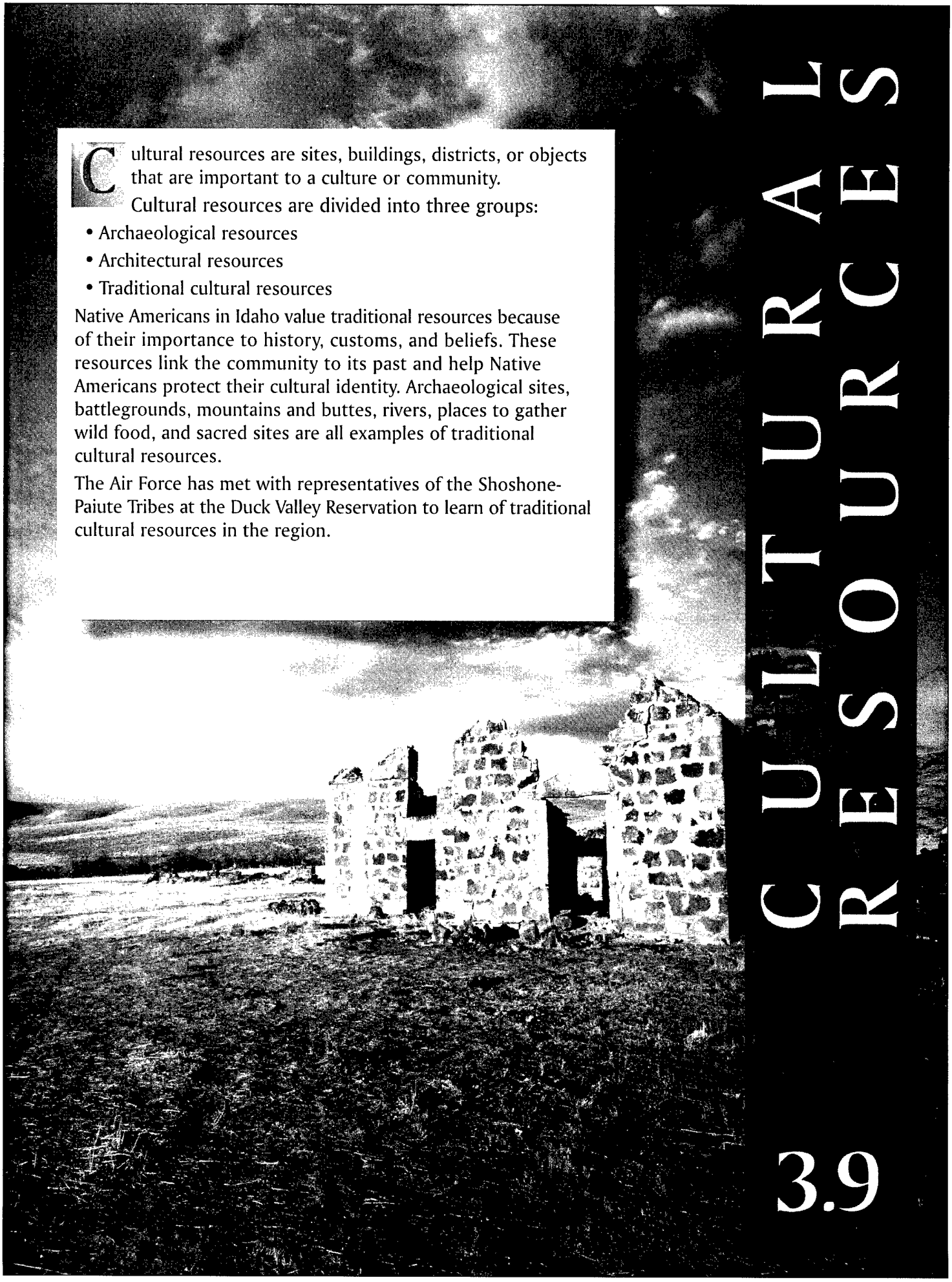
Cultural resources are sites, buildings, districts, or objects that are important to a culture or community.

Cultural resources are divided into three groups:

- Archaeological resources
- Architectural resources
- Traditional cultural resources

Native Americans in Idaho value traditional resources because of their importance to history, customs, and beliefs. These resources link the community to its past and help Native Americans protect their cultural identity. Archaeological sites, battlegrounds, mountains and buttes, rivers, places to gather wild food, and sacred sites are all examples of traditional cultural resources.

The Air Force has met with representatives of the Shoshone-Paiute Tribes at the Duck Valley Reservation to learn of traditional cultural resources in the region.



3.9

Archaeological resources are places where people changed the ground surface or left artifacts ranging from arrowheads to farming equipment, and usually must be at least 50 years old.

Native Americans have a long history in Idaho. Early Native American archaeological resources found in Owyhee County include isolated stone flakes and tools, scatters of stone artifacts, rock art, village sites, stone mounds and circles, and rock shelters.



The people of European and Asian ancestry who settled and lived in Idaho during the 1800s and 1900s left many of the state's historic sites. Other historic sites were created by Native Americans. Some of these are roads, fences, trash dumps, mines, fallen buildings, and camps. Historic resources also include battlegrounds, bottle fragments, spent ammunition, piles of old cans, and trails. Architectural resources are standing buildings, bridges, and other structures such as churches and ranch buildings. In southwest Idaho, these are always historic in age.

Federal law protects cultural resources if they meet the government's criteria for being listed on the National Register of Historic Places. Archaeologists, Native Americans, historians, and Federal Preservation Officers work with the Idaho State Historic Preservation Officer in Boise to decide which resources are eligible for listing. Native American tribal leaders and elders can decide that traditional resources are significant even if they do not meet National Register criteria.



Historic resources, such as farming equipment, and early American resources are found during field surveys.

# 3.9 CULTURAL RESOURCES

## DEFINITION OF RESOURCE

Cultural resources are districts, sites, buildings, structures, or objects considered to be important to a culture, subculture, or community for scientific, traditional, religious or any other reason. For this EIS, cultural resources are divided into three major categories: archaeological resources, architectural resources, and traditional cultural resources.

*Archaeological resources* are locations where human activity measurably altered the earth or left deposits of physical remains (e.g., arrowheads, bottles). Federal acts and regulations (e.g., the National Historic Preservation Act [NHPA] and its regulations, 36CFR part 800) use the term "prehistoric" to refer to archaeological resources associated with Native Americans, particularly before contact with Euroamericans. This term is also generally understood to mean cultural resources that predate the use of written records for an area. In southwest Idaho, they range from isolated stone tools to village sites and rock art.

Balancing "prehistoric" is "historic", a term generally meant to include any cultural resource that postdates Euroamerican contact with Native Americans. Historic archaeological resources in Idaho include campsites, roads, fences, trails, dumps, battlegrounds, mines, and a variety of other features. The distinction between prehistoric and historic is now viewed as somewhat arbitrary since members of the Shoshone-Paiute Tribes report that, while performing some traditional activities, they may still create artifacts and features that archaeologists might unintentionally label as prehistoric. Furthermore, the Shoshone-Paiute do not distinguish "prehistoric" from "historic" but instead, based on their oral traditions, see one long continuous history.

For the purpose of this EIS, the term "early Native American" is used rather than prehistoric, except in cases where the language of a law or regulation is quoted. The term "historic" will be retained for all archaeological sites that clearly post-date Euroamerican contact with Native Americans. Most of these date to the late 19th and 20th centuries.

Archaeological resources are usually further classified as either sites or isolates on the basis of quantity, density, and type of cultural material. For this EIS, early Native American sites typically have more than four artifacts with no more than 30 meters separating them. Exceptions include resources that have at least two diagnostic artifacts or finished tools (e.g., projectile points, choppers, manos, spokeshaves), one or more rock art figures, or one or more rock features (e.g., rock alignments, rock circles). Historic sites are defined as three or more historic rock cairns, five or more historic artifacts greater than 50 years old, or remains of historic structures (e.g., a collapsed ranch house). Artifacts less than 50 years old were not recorded.

Isolates are smaller and less dense than sites, having four or fewer early Native American artifacts separated by 30 meters or less, a single diagnostic early Native American artifact or finished tool, fewer than five historic artifacts greater than 50 years old, or fewer than three historic cairns.

*Architectural resources* are standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. In Idaho architectural resources are all historic in age.

*Traditional cultural resources* are resources associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. In Idaho, these are usually associated with modern Native American groups. Only tribal members can determine the importance of traditional cultural resources. Traditional Native American resources may include archaeological resources; locations of historic events; sacred areas; sources of raw material used to produce tools and sacred objects; traditional hunting or gathering areas; and native plants or animals. Native Americans may consider these resources essential for the persistence of their traditional culture. Shoshone-Paiute concerns, including those related to traditional cultural resources, are discussed in detail throughout this EIS.

Under federal regulation (36 CFR part 800), only significant cultural resources warrant consideration with regard to adverse impacts resulting from a federal undertaking. Significant archaeological, architectural, and traditional resources include those that are eligible or are recommended as eligible for inclusion in the National Register of Historic Places (National Register). The significance of archaeological resources and architectural resources must be evaluated according to National Register eligibility criteria (36 CFR 60.4), in consultation with the State Historic Preservation Officer (SHPO). According to these criteria, "significance" is present in districts, sites, buildings, structures, and objects that:

a) are associated with events that have made a significant contribution to the broad patterns of our history; or

b) are associated with the lives of persons significant in our past; or

c) embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction; or

d) have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

An archaeological or architectural resource that is eligible to the National Register is called a historic property, regardless of its period of occupation or use. To be listed on or determined eligible for listing on the National Register, a cultural resource must meet at least one of the above criteria and must also possess integrity. Integrity is defined as the authenticity of a

resource's historic identity as evidenced by the survival of physical characteristics that existed during the resource's occupation or use. The National Register recognizes seven aspects or qualities that, in various combinations, define integrity: location, design, setting, materials, workmanship, feeling, and association. Integrity of location means that the cultural resource has not been moved. Integrity of design, materials, and workmanship means that the resource's original building materials, plan, shape, and design elements remain intact. Integrity of setting means that the surrounding landscape remains largely as it was during the resource's period of significance. Integrity of feeling and association means that the resource retains a link to an earlier time and place and is able to evoke that era.

The determination of significance is made in consultation with the SHPO. Significant historic resources usually must be at least 50 years old; however, certain structures associated with more recent, exceptionally important historic events (e.g., the Cold War) also may be considered eligible for the National Register. Archaeological isolates, because of their small size and limited information potential, are not considered eligible for the National Register by the Idaho SHPO.

The archaeological resources identified during the cultural resource surveys for this EIS were all evaluated using the National Register criteria presented above. Eligibility determinations for each resource were recommended by the Idaho SHPO for concurrence. Determinations of eligibility presented in this document are based primarily on criterion "d." However, it should be noted that National Register eligibility of a specific resource could change as new information about the resource becomes available.

Certain categories of tangible Native American resources, such as ancestral settlements or petroglyph and pictograph sites, may be protected through their eligibility to the National Register. On the other hand, traditional cultural resources such as natural features and spiritual locations may not be addressed in historic preservation legislation if their historic use cannot be documented; if the resource does not have an integral relationship to traditional cultural practices and beliefs; if the present condition is such that the relationships no longer survive; if the resource's boundaries cannot be delineated; or if the resource does not meet National Register criteria. For this EIS, a traditional cultural resource that is eligible for the National Register is called a traditional cultural property, or TCP.

The Air Force is supporting ongoing ethnographic studies in southwestern Idaho that are unrelated to ETI. The initial results of these confidential studies suggest that there could possibly be traditional cultural resources eligible to the National Register that have not been identified as part of the ETI environmental impact analysis process (EIAP). It must also be emphasized that the ethnographic studies represent only a sampling of various types of TCPs and are by no means an exhaustive listing of potential sites anywhere within the Shoshone-Paiute homeland.

Even though a traditional cultural resource may not be considered significant according to National Register criteria, it may still have importance as a traditional cultural resource to a

particular tribe. In this case, traditional cultural resources may be protected according to the consultation provisions of the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA), and E.O. 13007. For example, the California bighorn sheep and the sage grouse do not have qualities that make them eligible for listing on the National Register, but they are still important to members of the Shoshone-Paiute Tribes as traditional cultural resources.

Also, a single traditional cultural resource may be significant for more than one reason. For example, an outcrop of an unusual type of chert may be important to a tribe as (1) a source of raw material for making tools; (2) a source of medicine; (3) a spiritual location; (4) a link to the group's ethnic identity; (5) a location to teach children about traditional beliefs and practices; and (6) a former living site.

### METHODS

The Air Force employed investigative methods appropriate for each ROI. For ROI Three, an intensive records search identified previously recorded cultural resources under the existing and proposed airspace for each alternative. This entailed research at the federal and state agencies in Idaho, Nevada and Oregon that are the repositories for such information. In Idaho, the SHPO at the Idaho State Historical Society (ISHS) in Boise has records for all cultural resources and cultural resource surveys within the state. Relevant records were examined, including site records, files, maps, monographs, and reports, and an extensive database of all known cultural resources within Owyhee County was created. The Oregon SHPO in Salem is the repository for all cultural resource and survey data in that state. Site and survey records were obtained from the Oregon SHPO and appropriate information was entered into the database. In Nevada, the records manager for the Nevada State Museum indicated that the relevant records were located at the BLM and U.S. Forest Service (USFS) offices in Elko and Winnemucca. Cultural resource and survey data were collected from each office. Information from Idaho, Oregon, and Nevada was then used in a GIS mapping process to quantify cultural resources included in each alternative. The database includes information on over 3,000 cultural resources within ROI Three.

Potential impacts within ROI Two were considered only for traditional cultural resources. For architectural and archaeological resources, potential impacts within ROIs Two and Three are identical. Information regarding traditional cultural resources in the project area, including ROIs One, Two, and Three, has been solicited from the Shoshone-Paiute Tribes of the Duck Valley Reservation in Idaho and Nevada and the Shoshone and Paiute Tribes of the Fort McDermitt Reservation in Oregon and Nevada.

Investigations of ROI One consisted of an intensive background records search, examination of the results of recent cultural resource surveys in the area, and on-the-ground survey by the Air Force of affected areas. The surveys were conducted during 1996. All one-quarter-acre and one-acre emitter sites, five-acre no-drop targets, the 640-acre no-drop target, powerlines, and access roads that would require improvement or construction were completely and intensively

Archeology and Historic Preservation, Professional Qualifications Standards". The three alternative 12,000-acre training ranges received sample surveys. Different samples were selected for each alternative, reflecting local conditions and the level of existing knowledge for each area; the samples for each alternative are briefly described in section 3.9.3.1. All of the 1996 field investigations involved an intensive and comprehensive pedestrian (walking) survey of the areas under consideration, with 30 meters or less between each surveyor. Upon finding a cultural resource, more intensive survey of the immediate vicinity was conducted to fully characterize the size and contents of the resource. This included recording artifacts, mapping, and photography. No artifacts were removed from the field, nor was there any excavation or subsurface sampling. Cultural resources were characterized as either sites or isolates (see previous discussion), and recorded on the appropriate State of Idaho or Intermountain Antiquities Computer Survey (IMACS) forms. Personnel and methods employed for these studies met the criteria embodied in the Secretary of the Interior's Guidelines and those established by the Idaho SHPO. Surveys were performed under BLM permit number ID-I-31311; the methods were reviewed by the BLM before initiation of field work.

The methods and results of the background research and surveys are detailed in a Cultural Resources Technical Report submitted to the BLM. This report has been prepared in support of the environmental impact analysis and to address the requirements of the Section 106 process of the NHPA. The technical report contains information on all cultural resources identified during the survey, including resources found on non-BLM lands.

## 3.9.1 ROI Three Regional Overview

### CULTURAL BACKGROUND

#### *EARLY NATIVE AMERICAN HISTORY*

Southwest Idaho and adjacent parts of southeastern Oregon and extreme northern Nevada are in a region that was culturally transitional between the Northern Great Basin and the Columbia Plateau. The earliest archaeological evidence of human occupation in the region comes from south central Idaho north of the Snake River, where sites were occupied as early as 12,000 years ago. During this period, climatic conditions were cooler and moister than at present, and large fauna such as bison, mammoth, and camel inhabited the Snake River Plain. Tools over 10,000 years old have been recovered in southwest Idaho at a number of locations, including the Bruneau River area (Titmus and Woods 1990, 1992).

About 7,000 years ago, archaeological sites in southern Idaho become more varied, and there was a shift toward the use of a wider range of plants and animals. Native Americans constructed rock alignments at higher elevations (Young 1984) and established larger campsites along rivers (Green 1982). By about 4,000 years ago, there was an increase in the frequency of groundstone and bone tools.

Between 1,000 and 700 years ago, Native Americans in Idaho made pottery for the first time; smaller projectile points suggest they used the bow and arrow. Subsistence along the Snake River probably focused on late spring/early summer salmon runs, in addition to the exploitation of other animals and plants. South and west of the Snake River, Native Americans appear to have followed a Great Basin subsistence pattern, collecting a broad variety of plants and hunting game in both upland and lowland settings.

### *RECENT NATIVE AMERICAN HISTORY*

Southwest Idaho was home to the Shoshone and the Paiute at the time of European contact (Berremen 1937; Liljeblad 1957). Although they spoke different languages, both groups belonged to the larger Numic language family. Shoshone and Paiute groups had similar material culture and social organization, and sometimes intermarried. They were hunters and gatherers living in small bands of extended family members who survived by frequent travel over seasonal routes, which provided them with game and plant foods in the variable upland desert environment (Walker 1978). Groups of families often settled in villages on the Snake River during the winter, spring, and fall and dispersed into the uplands to collect and process camas during the summer. Along the Snake River north of the project area, groups focused on salmon fishing as their chief means of subsistence, but also gathered roots and seeds and hunted pronghorn antelope, deer, and waterfowl (Murphy and Murphy 1960; Steward 1938, 1943; Stewart 1941). Trade with distant groups was also important.

As Euroamericans moved westward along the Oregon Trail, Native American lands were heavily impacted. Gold discoveries in the Owyhee Mountains in 1859 brought in still more emigrants (Fowler 1986). Initially, Native Americans in the region responded to the growth of settlements by retreating to more remote areas (Gehr et al. 1982). Although isolated attacks on emigrants occurred in the late 1840s through the 1850s, hostilities were limited. However, the settlement and expansion forced groups of Native Americans to occupy areas with marginal resources. This led to hostilities, culminating in the Snake Indian War (1866-1868). In 1878, another series of skirmishes, known as the Bannock War, occurred in southwest Idaho. The Bannock War represented the last major effort by Native Americans to resist settlement of the region.

In the 1870s, Captain Sam, a charismatic leader, suggested that the traditional territory of the Shoshone would be an ideal reservation because it had good potential for agriculture, fishing, hunting, and timber production and was located far from areas used by whites. In 1877, President Rutherford B. Hayes signed an executive order establishing the Duck Valley Reservation for the Western Shoshone. A number of Shoshone and Paiute bands moved to the Reservation and took up ranching and farming, all without the help of the federal government. When federal agents finally arrived, they found the two tribes had already built a diversion dam and irrigation canals. In the 1880s, the Shoshone and Paiute Tribes continued to develop their economic base by constructing a new flour mill and additional irrigation ditches. In 1884, the Bureau of Indian Affairs stepped in to thwart Euroamerican efforts to move the Duck Valley people to Fort Hall and thereby open the Reservation to settlement (Duck Valley Planning

Commission 1972). The Reservation was enlarged in 1886 by President Grover Cleveland, and again in 1910 by President Taft.

Water was necessary for successful farming due to a short growing season, but as early as 1889 homesteaders upstream from the Reservation were diverting water. The United States Government rationed food which the people supplemented with native food they gathered. In 1915, after numerous requests and years of struggle on the Reservation, the federal government decided that the Duck Valley Reservation had prior rights to water from the Owyhee River. Construction of Wildhorse Reservoir was not undertaken for more than 20 years, and substantial areas of the Reservation were abandoned due to lack of water.

In 1924, Native Americans were given United States citizenship without having to sever Tribal affiliations. The Shoshone-Paiute Tribes developed and adopted a constitution and bylaws for the Duck Valley Reservation in 1936.

The Shoshone and Paiute Tribes continue to claim lands in southwest Idaho that fall outside of the Duck Valley Reservation. Three treaties form the basis for their claims.

**Treaty of Ruby Valley (1863).** The Treaty of Ruby Valley was negotiated on October 1, 1863 by the western Shoshone and a special commission appointed by President Lincoln, ratified by the U.S. Senate on June 26, 1866, and proclaimed on October 21, 1869. In this treaty, the United States recognized that the Shoshone homeland included extensive lands stretching from northern Nevada to the Snake River. While the treaty indicates that non-Indians had rights to use and occupy land and resources, it did not cede Shoshone lands to the federal government. Since that time, these lands have been claimed by the United States and, for the most part, managed by the BLM.

In 1951, the Western Shoshone Tribe sought compensation for the loss of aboriginal title to these lands. The Indian Claims Commission later held that aboriginal title had been extinguished, and the Tribe was awarded $26 million in compensation. The Tribe refused the money, and it was placed in a trust account. In 1985, after several lower court rulings, the U.S. Supreme Court held that monies deposited into the trust account for the Western Shoshone as compensation for the treaty land constituted payment and, therefore, full discharge of all claims and demands (United States v. Dann 470 U.S. 39 [1985]). Despite the ruling, many Shoshone continue to assert ownership of the lands based on their interpretation of the 1863 Treaty.

**Boise River Treaty (1864).** On October 10, 1864, Caleb Lyon, governor and superintendent of Indian Affairs for Idaho, negotiated a treaty at Fort Boise with the Boise Shoshone. This treaty stated that all land within 30 miles of the Boise River and its tributaries would be relinquished by the Boise Shoshone and that in return they would be given hunting rights in the area in addition to a reservation. However, because of pressure from miners and homesteaders for greater access to land, this treaty was never ratified by the United States. Lands within 30 miles of the Boise River fall outside of ROI Three.

**Bruneau Treaty (1866).** On April 12, 1866, the Bruneau Treaty was signed between the Bruneau Shoshone Nation and Caleb Lyon. The treaty was signed at the confluence of the Bruneau and Snake rivers. The treaty provided for Tribal cessions to the United States of the mines in the Owyhee Mountains and of lands south of the Snake River between the Owyhee River and Goose Creek. In return, the Shoshone were to receive land for a large reservation, annual payments, and other guarantees. Upon his return to Boise with the signed treaty, Governor Lyon was dismissed from office because of his unpopular Indian policies. Lyon's successor as governor, D.W. Ballard, rejected the reservation proposal and ultimately moved the Bruneau and Boise Shoshone to Duck Valley and to the Fort Hall Reservation in southeastern Idaho.

A signed original of the treaty was sent to Washington, DC, but the treaty was never ratified by the United States. Despite the failure to ratify it, the Tribes believe the Bruneau Treaty is a basis for long-standing Tribal claim to this region.

The Shoshone-Paiute Tribes still consider the southern portion of Idaho to be their homeland and do not recognize the 1985 U.S. Supreme Court decision regarding the Treaty of Ruby Valley. They believe that aboriginal title to southern Idaho was never extinguished because the Bruneau and Boise treaties were never ratified by Congress, nor was it extinguished by the Executive Order of 1877 establishing the Duck Valley Reservation.

The Fort McDermitt Reservation was established in 1892 along the Nevada-Oregon border. It is also home to Shoshone and Paiute groups. Fort McDermitt was one of a number of forts established in southern Oregon and northern Nevada in 1864 and 1865 to ensure safe passage to Euroamerican miners headed to the Idaho mines (Utley 1988). First called Quinn River Camp No. 33, the fort protected the Virginia City–Quinn River Valley–Oregon Road (Nevada Historic Preservation Office no date [n.d.]). Fort McDermitt was an operations base and supply station for troops during the Modoc campaign (1866-1868) and the Bannock and Paiute uprising of 1878 (Inter-Tribal Council of Nevada 1976).

Paiute from Oregon and from Pyramid Lake, Nevada settled around Fort McDermitt in the mid-1860s, preferring to deal with the military rather than with corrupt U.S. Indian agents (Nevada Historic Preservation Office n.d.). In 1868, J.W.P. Huntington's Treaty (not ratified) was signed with the Northern Paiute bands living near Fort McDermitt, Burns and Camp Smith. This treaty addressed peace, reservation status, and annuities (Clemmer and Stewart 1986).

Conflict between native groups resisting Euroamerican incursion and the U.S. Army continued in the northwest until the late 1870s and the end of the Bannock Uprising (Utley 1988). At the end of the conflict, more than 300 of the Fort McDermitt Paiute, including many who had assisted the military, were sent on a forced march to Yakima, Washington, more than 400 miles away. By 1883, most of the Paiute people who had been sent to Yakima returned to the area and settled in the vicinity of Fort McDermitt and at other locations in Nevada (Inter-Tribal Council of Nevada 1976).

The Fort McDermitt allotments in Oregon and Nevada consisted of 34,787 acres (Clemmer and Stewart 1986) set aside in 1892 for the Paiute and Shoshone groups who were living around the

fort after the military post was dissolved in 1889. These allotments were often parceled out to non-Indian homesteaders, resulting in Indians being restricted to farming plots that were too small to support them (Clemmer and Stewart 1986). By 1910, 345 Indians on the reservation held only 300 acres of irrigable land and were unable to raise sufficient crops.

The allotment practice ended in 1934 with the Indian Reorganization Act (IRA) and the beginning of what was called the Indian New Deal (Clemmer and Stewart 1986). Former reservation lands that had not been homesteaded were returned to tribal ownership and the tribal council system was introduced. The constitution of the Fort McDermitt Paiute and Shoshone Tribe was approved in 1936 (Rusco and Rusco 1986).

### *EUROAMERICAN HISTORY*

In 1811, members of Astor's Pacific Fur Company followed the Snake River to the west, ushering in an era of fur trapping. By the end of the 1830s, competition among fur companies had caused a severe decline in the beaver population. Accounts of the expeditions suggest that the trappers worked mainly near the Snake River, although Captain Bonneville explored the Bruneau River in 1833. The Bruneau River was named for Pierre or Baptiste Bruneau, a hunter who crossed the area in the 1830s (Conley 1982)

In 1836, the Whitman-Spalding missionary party followed the same route along the Snake River, beginning the era of westward migration (Hutchison and Jones 1993). By 1843, this route along the north and south sides of the river had become firmly established as the Oregon Trail. Throughout the remainder of the 1840s and into the 1850s, thousands of wagons and pioneers used this trail. Emigrants generally passed through southwest Idaho to more inviting locations, and little settlement occurred in the region. The Oregon Trail, including the South Alternate, is located well to the north of ROI Three.

Discovery of gold in the Owyhee Mountains and Boise Basin in the 1860s finally provided the stimulus for settlement. This discovery spurred a rapid population increase and the appearance of boom towns. Population growth and settlement centered around the mines in the Owyhees and the Boise Basin. Freight roads and stage lines, linking southwest Idaho to California, Nevada, and the Plains, were developed.

Owyhee County was the first county created by the Idaho Territorial Legislature, which convened in Lewiston in 1863. The county was divided in 1864 to create Oneida County, and again in 1879 to create Cassia County (Adams 1986).

To provide food to the mining communities, sheep and cattle ranching developed in the region. After the Shoshone and other Native Americans moved to the reservations at Duck Valley, Fort McDermitt, and Fort Hall, cattlemen settled the valleys of the Owyhees. Most of the ranches and farms clustered in more fertile, well-watered locations, but the upland plateaus provided extensive grazing areas. The region soon became a vast rangeland for thousands of cattle. The need to link the farms and ranches to the mines led to the creation of a network of roads.

During the 1870s, the cattle industry in southwest Idaho continued to grow because of the accessibility of railroad shipping points at Winnemucca and Elko, Nevada.

Sheep ranching was slower to develop in Idaho than cattle ranching. The most successful early operations tended to center around Boise (Yensen 1980). In the early 20th century, Elmore and Owyhee counties were home to some of the largest sheep companies, some comprising numerous bands with as many as 3,000 sheep to a band. Mountain Home became the largest wool shipping center in the United States.

Shortly after 1900, a large number of Basque settlers immigrated to Owyhee County from the Pyrenees Mountains on the Spanish-French border. Although their native occupations tended to be fishing, not ranching, many Basque immigrants became sheepherders. After working as herders for other ranchers, they were often able to establish their own herds.

World War II brought a change to the region with the designation and construction in 1942-1943 of what was to become Mountain Home AFB. The opening of the base and the creation of SCR brought an influx of servicemen to the area.

#### 3.9.1.1 ARCHAEOLOGICAL RESOURCES

Data sources for cultural resources under existing airspace include previous surveys in the area. No additional field studies were conducted in ROI Three for this EIS. The sources of information used in developing the cultural resource database for ROI Three were described previously under *Methods*. Because of the frequent surveys in the area and the large number of recorded sites, the database is appropriate for identifying the expected levels of impacts associated with the proposed action.

The Idaho portion of the existing airspace overlies a total of thousands of recorded archaeological resources, of which most are early Native American. Some of the historic sites could possibly be architectural resources as well, although site forms are often unclear about this. Almost 200 cultural resource surveys have been conducted in the area beneath the existing MOA airspace in Idaho (Air Force 1990a).

There are relatively few known archaeological resources beneath the proposed addition to the Owyhee MOA and the proposed northern addition to the Jarbidge MOA. A greater number of archaeological resources (mostly early Native American) are currently recorded underneath the Jarbidge East Expansion Area. Several hundred sites under Idaho's existing and expansion airspace are currently listed on the National Register, most because they are within the Pole Creek and Camas Creek Archaeological District. The other National Register-listed cultural resource under the Idaho portion of ROI Three is the burned remains of a historic post office/stage station known as Wickahoney Station. Of the remaining thousands of cultural resources, including those with both early Native American and historic components, under the combined airspace in Idaho, about 100 are eligible or recommended as eligible to the National Register.

Beneath portions of the existing Paradise East and West MOAs overlying Elko and Humboldt counties, Nevada, 164 cultural resource surveys have been conducted and hundreds of resources have been recorded. The surveys were on USFS and BLM lands. Very few cultural resources are known for the area under the proposed expansion of the Paradise East MOA. This area has had two cultural resource surveys.

Beneath the Paradise West MOA in southeastern Malheur County, Oregon, relatively few archaeological resources have been recorded and approximately 12 cultural resource surveys have been conducted. These were surveys on USFS and BLM lands. There are no cultural resources beneath the Oregon portion of the affected airspace listed on the National Register, and only one has been recommended as eligible for listing on the National Register. The low number of known cultural resources is a consequence of the infrequency of surveys in this area and not a reflection of the actual resource density.

### 3.9.1.2 Historic Architectural Resources

A small number of architectural resources have been recorded within ROI Three. Because of the low population density beneath the airspace in Owyhee, Elko, Humboldt, and Malheur counties, the density of standing historic buildings and structures is also low. Concentrations of significant historic buildings, such as Silver City, Idaho, are not located underneath the existing airspace. One architectural resource under ROI Three in Idaho (Wickahoney Station), none under the Nevada portion of the existing airspace, and none under the Oregon portion are listed on or determined eligible for listing on the National Register. As mentioned above, some documented historic archaeological sites could possibly also be architectural resources.

### 3.9.1.3 Traditional Cultural Resources

The Air Force has requested information from the Shoshone-Paiute Tribes at the Duck Valley Reservation and the Shoshone and Paiute Tribes at the Fort McDermitt Reservation regarding the relative sensitivity of various portions of ROI Three with respect to traditional cultural resources. Also, the Air Force has funded multi-year ethnographic studies at the Duck Valley Reservation. Specific information about the studies is confidential, as requested by the Tribes and agreed to by the Air Force.

One goal of the ethnographic research is to learn about traditional cultural resources in the region. Shoshone-Paiute representatives have identified various types of traditional cultural resources that are known to exist in southwest Idaho, including the lands within ROI Three. These include

- Vision quest sites;
- Burial areas and cemeteries;
- Ceremonial structures;
- Points to observe the movement of the sun and moon;

- Sweat bath sites;
- Points of mythic importance (e.g., locations of ethnic origin, migration routes);
- Medicine trees and medicine rocks;
- Monumental geological features that have sacred meaning (e.g., certain mountains, high ridges, buttes, waterfalls, deep canyons, or unusual formations);
- Sites of historical significance (e.g., battlefields, treaty signing sites, pilgrimage routes);
- Sources of water (e.g., springs, rivers, lakes);
- Rock art sites (i.e., petroglyphs, pictographs);
- Abandoned living sites;
- Gathering areas (e.g., for stone or sacred plants);
- Hunting and fishing areas; and
- Particular native plant and animal species (e.g., California bighorn sheep, sage grouse).

As discussed at the beginning of section 3.0, the Shoshone-Paiute regard the land, people, plants, animals, spirits, and other elements of their cosmos as an interconnected and interdependent whole. All aspects of the natural environment are important to their religion and to their culture. Also, many other features of the natural environment besides those listed above are considered traditional cultural resources by members of the Shoshone-Paiute Tribes.

Information regarding the nature, location, or sensitivity of specific resources provided to the Air Force by the Tribes is treated as confidential. Collecting and presenting information about traditional cultural resources must take into consideration the extreme sensitivity with which this information is regarded by the Shoshone-Paiute Tribes. Traditional cultural resources are often isolated or in very remote locations, they are often in pristine condition, and they usually have very few non-Indian visitors. Unfortunately, some traditional resources in the region have been disturbed or destroyed in the past. It is also possible that in the future, traditional resources could be harmed or that religious activities could be disrupted by unwanted visitors. For these reasons, there is an understandable reluctance by the Shoshone-Paiute to reveal some details about the nature or location of traditional cultural resources.

Five traditional cultural resources in southwest Idaho were recently recommended as eligible for listing in the National Register as traditional cultural properties (TCPs). It is likely that other resources in the area could also qualify as TCPs. Two of the TCPs are located underneath existing MOA airspace within ROI Three. For this EIS, these are designated TCP-A and TCP-B. In the interests of confidentiality, these two locations are not named or described in detail. In both cases, the TCPs are sacred locations containing archaeological sites and are also of historic

importance. They are in isolated areas and are regularly visited by members of the Shoshone-Paiute tribes for ceremonial purposes.

In addition to these two TCPs, there are many archaeological sites and natural features within ROI Three that the Shoshone-Paiute may consider traditional cultural resources. As mentioned previously, the ongoing ethnographic studies represent only a sampling of various types of TCPs and will not provide an exhaustive list of potential sites anywhere within the Shoshone-Paiute homeland.

## 3.9.2 ROI Two

### 3.9.2.1 Early Native American and Historic Archaeological Resources

As defined for cultural resources, ROI Two applies only to traditional cultural resources, including those archaeological sites that are considered traditional cultural resources by Native Americans (see section 4.9.7). Refer to sections 3.9.1 and 3.9.3 for discussions of archaeological resources within the affected airspace and within areas of potential ground disturbance.

### 3.9.2.2 Historic Architectural Resources

As defined for cultural resources, ROI Two applies only to traditional cultural resources (see section 4.9.7). It is unlikely that architectural resources would be considered traditional cultural resources. The only significant architectural resource in ROI Two is Wickahoney Station, discussed previously.

### 3.9.2.3 Traditional Cultural Resources

Representatives of the Shoshone-Paiute Tribes have reported that a number of traditional cultural resources could exist within the area defined as ROI Two. These include

- Vision quest sites;
- Archaeological sites;
- Topographic features with spiritual significance; and
- Other spiritual places.

Tribal representatives have chosen not to reveal the specific locations of most of these traditional cultural resources. General characteristics of traditional cultural resources are described in section 3.9.1.3.

## 3.9.3 ROI One

ROI One for cultural resources is defined as the areas that would or potentially could be directly affected by the alternatives as a result of ground disturbance, i.e., the training range for each alternative, no-drop target areas, emitters, powerlines, and access roads directly associated with each alternative.

### 3.9.3.1 Early Native American and Historic Archaeological Resources

*Alternative B — Clover Butte*

The Clover Butte Alternative would include an 11,840-acre training range, 30 emitters (discussed under "Emitters," below), and five no-drop target areas (discussed below). Approximately 44 percent of the Clover Butte range has been surveyed for cultural resources - sufficient acreage to characterize the number and density of archaeological resources within the entire training range.

Prior to the 1996 field season, several archaeological resources had been documented within the Clover Butte Alternative. Most of these were recorded during a fire rehabilitation survey conducted by the BLM in 1995. This survey covered approximately 2,540 acres, or 22 percent of the proposed Clover Butte training range. Although not a random sample, the BLM survey used the same basic methods used during the 1996 Air Force survey of the Clover Butte area. Cultural resources recorded by the BLM include early Native American sites, an historic site, early Native American isolates, and historic isolates.

In 1996, as part of the environmental analysis for ETI, a 25 percent sample of the Clover Butte training range was selected by the Air Force. Because the Clover Butte range is characterized by fairly uniform, open, rolling terrain, a simple random sample was used. The sample consisted of 19 160-acre quadrats (3,040 acres). Four of these quadrats had been partially surveyed during the BLM investigation in 1995, and one was completely surveyed. This information was incorporated into the Air Force analysis. The Air Force surveyed 2,660 acres.

Several additional early Native American and historic archaeological resources were located in the course of the 1996 survey of the Clover Butte training area. These included early Native American sites, historic sites, sites with both early Native American and historic components, early Native American isolates, and historic isolates.

Most of the cultural resources in the Clover Butte survey area are early Native American. The early Native American sites are almost all small lithic scatters, some with formed tools such as bifaces. The historic sites are trash scatters, possibly dating to the late 1800s. The isolates located within the Clover Butte range are both early Native American and historic. The early Native American isolates typically consist of one to three chipped stone flakes, with an occasional formed tool. The historic isolates include cans, glass fragments, and a wagon wheel fragment.

All but two of the archaeological resources found at Clover Butte have been formally evaluated for National Register eligibility. Of the remaining archaeological resources on the range, most of the sites and none of the isolates are eligible for the National Register. The Idaho SHPO concurs with these determinations of eligibility.

Using the randomly sampled quadrats, it is estimated that the overall cultural resource density for the Clover Butte range is moderate. Since the Clover Butte area is relatively uniform

topographically, the density of archaeological resources found during the Air Force and BLM surveys should be representative of the density for the entire 11,840 acres. However, the BLM survey area included part of a playa with variable site density (personal communication, Ross 1996), so there is a possibility that overall densities could be higher or lower than estimated.

### *ALTERNATIVE C — GRASMERE*

The Grasmere alternative includes an 11,000-acre training range, 30 emitters (discussed under "Emitters," below), and five no-drop target areas (discussed below). Prior to the 1996 field season, a few sites and isolates had been located within the proposed range, but there had been no systematic, intensive survey of the area. Most of these resources fall within the Air Force sample survey blocks and are discussed below. The previously recorded sites outside the survey quadrats are considered eligible for the purposes of this analysis.

A 25 percent stratified random sample was intensively surveyed for cultural resources during the 1996 field season. Unlike the Clover Butte training range, the Grasmere range is characterized by varied topography. The survey quadrats were therefore selected according to a stratified random sample. Sixteen 160-acre quadrats and two of 120 acres each (2,800 acres total) were chosen based in part on landform. Each quarter section within the proposed training range was characterized as either (1) dominated by a major intermittent stream drainage, (2) having steep slopes, or (3) having open, rolling terrain. Twenty-five percent of the quadrats within each landform type were chosen for intensive survey to ensure that all landform types were inspected. The field methods employed in each quadrat were identical to those used at Clover Butte.

A moderate to high density of early Native American and historic archaeological resources were located in the course of the survey by the Air Force. These included early Native American sites, historic sites, sites with both early Native American and historic components, early Native American isolates, historic isolates, and one isolate with both historic and early Native American components. Of the previously recorded archaeological resources that lie within the Air Force's sample survey quadrats, a few were re-identified and re-recorded. Those not re-identified by the field crew are considered at this time to be not eligible. Of the resources recorded by the Air Force, about one-quarter have been determined eligible for the National Register. The Idaho SHPO concurs with these determinations.

### *ALTERNATIVE D — JUNIPER BUTTE*

A portion of this training range was included in a recent BLM burn rehabilitation survey in which intensive pedestrian techniques similar to those at Clover Butte and Grasmere were used. As part of the BLM survey, approximately 24 percent of the Juniper Butte range (about 2,880 acres) was surveyed during 1995. This was not a random sample; instead the northern and northwestern portions of the Juniper Butte training area fell within the survey area, which was determined by the pattern of the wildfire. Both early Native American and historic diagnostic artifacts were collected by the BLM, with the exception of cans. Archaeological resources included early Native American sites, historic sites, and cairns. None of these

resources were determined eligible for the National Register by the BLM. The Idaho SHPO has concurred with these determinations of eligibility.

The BLM survey did not include the central portion of the training range, so additional acreage was surveyed by the Air Force as part of the environmental analysis. This included the 300-acre primary ordnance impact area, the 3-acre maintenance facility, and roads, all within the 11,560-acre training range. Air Force archaeologists found one historic isolate in this area. This isolate is not eligible.

Combining the BLM and Air Force data, very few archaeological resources were found in 3,180 acres, for a very low overall density. The density is much lower than at Clover Butte and Grasmere.

Like Clover Butte, the terrain at Juniper Butte is relatively uniform. Assuming that the non-random sample surveyed by the BLM is representative of the range as a whole, one can argue that a few additional resources might be found in the unsurveyed portion of the Juniper Butte Alternative (8,380 acres). Most of these would probably be very low density sites or isolates and it is possible that none would be determined eligible for the National Register, based on the absence of eligible recorded sites.

### *No-Drop Targets*

Five no-drop target areas are proposed for each alternative. Four consist of 5-acre quadrats, and one is a 640-acre section. Seven potential no-drop target areas were intensively (100 percent) surveyed for cultural resources, using transects no more than 30 meters apart and the project's standard field methods. One potential no-drop target area had been previously surveyed.

A few early Native American isolates were located within one no-drop target area. Most no-drop target locations contained no cultural resources. None of the isolates is eligible for listing in the National Register. The Idaho SHPO concurs with these determinations.

Access roads to the no-drop target areas were also surveyed. A historic isolate and an early Native American isolate were recorded by the Air Force. A National Register-eligible early Native American site and an isolate were previously recorded but could not be relocated during the Air Force's 1996 survey of access roads. However, the site is still considered to be eligible for the National Register, whereas none of the isolates is eligible. The Idaho SHPO has concurred with these determinations.

### *Emitter Sites*

The cultural resource survey for each emitter site encompassed an area larger than the emitter itself would occupy in order to identify cultural resources nearby that might be indirectly affected by emitter construction and use. For both the one-quarter-acre and one-acre locations,

10 acres surrounding the sites were surveyed by an archaeologist to determine whether any cultural resources lay close to the emitter locations.

Thirty emitter sites are associated with alternatives B, C, and D. Twenty-eight were intensively surveyed for the ETI baseline studies and two had been examined for cultural resources for another project. An early Native American isolate was recorded within the 10-acre area surrounding an emitter site. Because this is an isolate, it is not eligible for listing in the National Register.

All proposed access roads leading to the emitter site locations that would require construction or improvement (e.g., placing gravel on dirt roads) were also surveyed intensively for cultural resources. No cultural resources were found along the roads.

#### *OTHER FACILITIES*

The proposed powerline was surveyed for cultural resources. No cultural resources were found.

Near the location of a proposed bridge reconstruction and road realignment, there are a site and an isolate. The site has been determined eligible for the National Register; the isolate is not eligible for the National Register.

#### *SAYLOR CREEK RANGE/R-3202A*

SCR was not surveyed as part of the ETI environmental analysis. However, since 1991, portions of SCR have been surveyed for a number of other projects. All of the EUA (12,000 acres) and about 16 percent of the buffer zone surrounding the EUA (15,650 acres) have been surveyed for cultural resources.

In total, the SCR restricted area overlies hundreds of currently documented archaeological resources. These consist of early Native American sites, early Native American isolates, historic sites, historic isolates, and archaeological resources with both historic and early Native American components. A preliminary evaluation of the early Native American resources according to National Register criteria concluded that most of the sites were eligible, while none of the isolates was deemed eligible. The Idaho SHPO has not yet completed review of all these recommendations.

### 3.9.3.2 HISTORIC ARCHITECTURAL RESOURCES

One architectural resource was identified within ROI One during background research and field studies at Clover Butte, Grasmere, Juniper Butte, the no-drop target areas, the emitter sites, access roads, other facilities and SCR. At the location of a proposed bridge reconstruction and road realignment, there is a small bridge that had been substantially modified during the past 20 years, a metal and concrete weir that was reportedly rebuilt during the past decade, and a

wooden irrigation flume that dates to the early 20th century. This architectural resource is eligible for the National Register.

### 3.9.3.3 TRADITIONAL CULTURAL RESOURCES

Shoshone-Paiute representatives have stated that all archaeological resources created by their ancestors may be significant traditional cultural resources. Archaeological sites and artifacts are considered sacred by many Shoshone-Paiute regardless of the resources' scientific or historic value. They believe that archaeological sites and artifacts belong to and are protected by the spirits of the persons who made and used them. These ancestors are centrally important in many spiritual activities. Therefore, the Shoshone-Paiute believe that sites and artifacts should be left undisturbed in their original resting places. According to these beliefs, disturbance may elicit negative reactions from the spirits who are associated with the sites and artifacts, such as illness, death, or other misfortune. These negative reactions may befall the perpetrator, the community, or the environment.

One should not assume that the number of traditional cultural resources in an area would be the same as the number of early Native American archaeological sites and isolates. Some Shoshone-Paiute question the ability of professional archaeologists to identify all classes of cultural resources. They feel that many resources do not have physical features or other characteristics that would be apparent to the non-Indian. Also, traditional cultural resources may include physical features of the environment, such as springs and caves, or biological features, such as sage grouse leks, that would typically not be recorded by archaeologists. Furthermore, Shoshone-Paiute representatives have said that the significance of an archaeological resource, as measured by an archaeologist using National Register criteria, will not necessarily correspond to the resource's spiritual significance to the Tribes.

Given these limitations, for the purposes of this EIS, the summaries of the traditional cultural resources within ROI One are based on the numbers of early Native American sites and isolates found in the surveyed areas and on the projected numbers for the training ranges as a whole (see section 3.9.1.1). It should be understood that these numbers reflect only an approximation of the number of likely traditional cultural resources in these areas.

#### *ALTERNATIVE B — CLOVER BUTTE*

A moderate number of early Native American sites and isolates were identified during the archaeological survey of a sample of the quadrats at Clover Butte, as well as during an earlier BLM survey. Based on the density of different classes of resources, it is projected that a moderate density of early Native American sites and isolates may exist within the entire proposed training range. These could potentially all be traditional cultural resources according to Shoshone-Paiute representatives.

### *ALTERNATIVE C — GRASMERE*

A greater number of early Native American sites and isolates were identified during the archaeological survey of a stratified sample of quadrats at Grasmere. Based on the density of resources in different sampling strata, it is projected that a moderate to high density of early Native American sites and isolates may exist within the proposed training range. Each of these could potentially be a traditional cultural resource to the Shoshone-Paiute.

### *ALTERNATIVE D — JUNIPER BUTTE*

Very few early Native American sites and isolates were recorded during an archaeological survey by the BLM of a portion of the Juniper Butte target area and during a later survey by the Air Force of the 300-acre impact area. Based on the density of resources in the surveyed areas, it is projected that a very low density of early Native American sites and isolates may exist within the entire proposed training range at Juniper Butte. Each of these could potentially be defined as a traditional cultural resource by the Shoshone-Paiute.

### *NO-DROP TARGETS*

A few early Native American isolates or sites were identified during the archaeological survey of the proposed no-drop target areas and access roads. These areas were completely surveyed. These resources could potentially be identified as traditional cultural resources by the Shoshone-Paiute.

### *EMITTER SITES*

An early Native American isolate was identified during the archaeological survey of the proposed emitter sites and access roads. These areas, including the surrounding 10 acres and access roads slated for improvement, were completely surveyed. The isolate might be considered a traditional cultural resource by the Shoshone-Paiute.

### *OTHER FACILITIES*

The proposed powerline was surveyed for cultural resources; no cultural resources were found.

A few early Native American resources were identified at the location of a proposed bridge and road realignment. These might be considered traditional cultural resources by the Shoshone-Paiute.

### *SAYLOR CREEK RANGE/R-3202A*

Based on previous survey of SCR, a few hundred early Native American sites and isolates have been recorded. Only 27,650 acres out of the total 110,000 acres at the range have been surveyed. However, all of the EUA has been surveyed. Some or all of the early Native American

resources could potentially be identified as traditional cultural resources by members of the Shoshone-Paiute Tribes.

# 3.10 LAND USE AND TRANSPORTATION

Land Use refers to both natural uses and those that reflect human modification. The dominant land use in Owyhee County is ranching. The ETI EIS addresses:

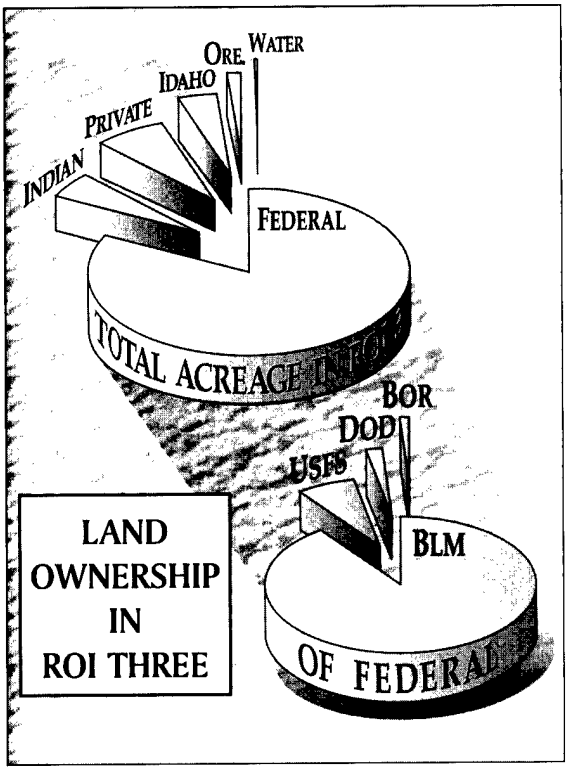
- Land ownership and land use patterns
- Resource areas and management plans
- Special Use Areas
- Transportation resources

Land use includes all lands under existing and proposed military airspace, with special focus on land within and immediately surrounding the training range development alternatives and emitter and no-drop sites.

## Land Ownership and Use

Lands considered for the ETI alternatives are federally or state owned and are primarily used for grazing. The federal agency responsible for management of the majority of these lands is the BLM. Within ROI Three, BLM manages the majority of the land and the DOD and the USFS manage relatively small portions. The Duck Valley Reservation, the State of Idaho, and the State of Oregon also own land within ROI Three. Some private land is located in small communities and private ranches. Figure 3.10-1 presents land status throughout the region.






## Land Management Plans

The BLM, the major land manager in the region, groups Idaho lands into administrative units known as resource areas. ROI Three encompasses eight BLM resource areas. The BLM is currently upgrading management techniques with the use of integrated Resource Management Plans (RMPs) for these areas.

## Other lands are managed according to who owns them

- The USFS manages its lands using a Land and Resource Management Plan.
- The states manage their lands in order to maximize benefits to school endowments.
- County lands are managed under guidelines established in county comprehensive plans.

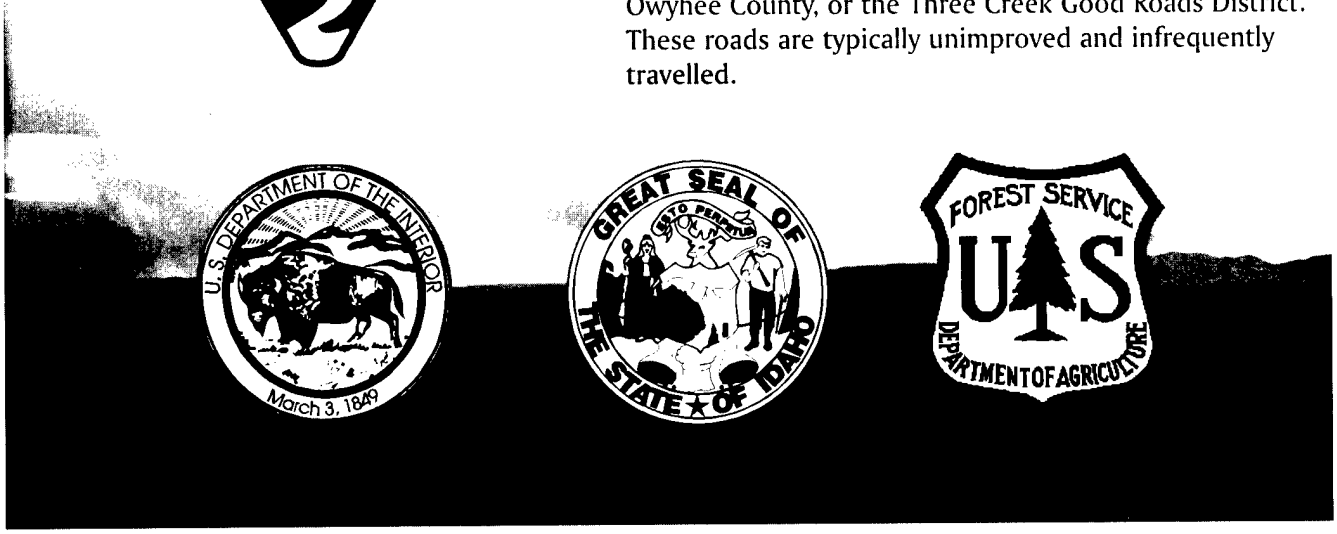
## Special Use Areas

Special use areas are units of land within BLM districts or resource areas given special consideration. Within the area being studied for this proposal, there are:

- Wilderness Study Areas
- Wild and Scenic Rivers
- Areas of Critical Environmental Concern
- Special Recreation Management Areas
- A National Conservation Area
- Other identified areas

## Transportation Resources

Transportation resources include the road and highway network that provides access to ROI One training range alternatives, including emitter sites and no-drop targets. These roads are under the jurisdiction of the BLM, Owyhee County, or the Three Creek Good Roads District. These roads are typically unimproved and infrequently travelled.



# 3.10 LAND USE AND TRANSPORTATION

Land use refers to both natural uses and uses that reflect human modification. Natural land use classifications include wildlife areas, desert, rangeland, and other open or undeveloped areas. Human land uses include residential, commercial, industrial, agricultural, recreational, and other developed uses. Also, the Shoshone-Paiute use the land for traditional cultural practices.

The attributes of land use addressed in this section include land ownership or status and general land use patterns, land management plans, and special use areas. Land ownership is a categorization of land according to type of owner. The major land ownership categories in the region include federal, tribal, state, and private. Federal land is further described by status, which is determined by the managing agency. These include BLM, Bureau of Reclamation (BOR), DoD, and USFS. Land uses are regulated or influenced by management plans, policies, ordinances, and regulations that determine the types of uses allowed in particular areas and which protect specially designated areas and environmentally sensitive uses. Special use areas are identified by BLM or other groups or are designated by Congress as requiring particular management attention.

Transportation resources refer to the infrastructure and equipment required for the movement of people and materials. Particular emphasis for this analysis is given to the road and highway network in the region. Airport facilities are discussed in section 3.1, Airspace.

For the land use analysis, ROI Three is used to address general land use issues (such as land management plans) and BLM management units that affect the larger region in which the proposed alternatives lie. Although ROI Three includes lands underlying the Saddle MOA, the figures in this section depict only the features underlying the contiguous airspace consisting of the Bruneau, Paradise, Owyhee, Sheep Creek, and Saylor MOAs that overlies the proposed alternatives. As part of the analysis of current conditions, the interaction of ongoing sortie-operations in the airspace overlying these lands with existing land uses was considered (refer to Table 3.0-2).

ROI Two is comprised of the region immediately encompassing the three proposed 12,000-acre training ranges (Clover Butte, Grasmere, and Juniper Butte), the existing SCR, and the land and transportation network associated with the proposed no-drop and emitter sites. Analysis of ROI Two provides a more detailed description of the immediate region and its associated land use patterns, with particular emphasis on the BLM resource areas and special use areas that are most likely to be affected by the proposed alternatives.

ROI One is comprised only of the three proposed 12,000-acre training ranges, the existing SCR, and the proposed no-drop and emitter sites. Analysis of ROI One provides the most specific account of land use patterns existing on the parcels associated with each alternative.

## 3.10.1 Land Status and General Land Use Patterns

### 3.10.1.1 ROI Three

ROI Three is comprised of southwestern Idaho and portions of northern Nevada and eastern Oregon where much of the land is federally held (Figure 3.10-1). Federal lands in the region are managed by BLM, BOR, DoD, and USFS. As shown in Table 3.10-1, BLM oversees the majority of land in the region, managing approximately 76 percent (4.8 million acres) of the total 6.4 million acres in ROI Three. Remaining federal land in the ROI is managed by BOR, DoD, and USFS. BOR land comprises less than 1 percent (3,206 acres); DoD land, which consists of the existing SCR, comprises 2 percent (103,407 acres); and USFS land (portions of the Humboldt National Forest in Nevada) comprises approximately 5 percent (343,737 acres).

In addition to federal land, ROI Three consists of tribal, state school endowment, and private land. Tribal land consists of two reservations: the Duck Valley Reservation, situated on the Idaho-Nevada border, and the Fort McDermitt Reservation, located on the Oregon-Nevada border. This land makes up approximately 5 percent (312,114 acres) of the ROI.

State school endowment land makes up approximately 5 percent (307,734 acres) of land in ROI Three. Approximately 4 percent (226,560 acres) is held by the State of Idaho and 1 percent (81,174 acres) by the State of Oregon. Nevada does not claim ownership to any land in ROI Three. Private ownership of land in ROI Three accounts for approximately 7 percent (441,562 acres) of the total.

Very little developed land exists within ROI Three. Small communities dot the roadways traversing the area; these communities include Grasmere, Riddle, and Three Creek in Idaho; Mountain City in Nevada; Burns Junction, Rome, Arock and McDermitt in Oregon; and Owyhee in the Duck Valley Reservation.

**Table 3.10-1. Land Status in ROI Three**

| *Status* | *Acreage* | *Percentage of ROI Three* |
|---|---|---|
| BLM | 4,835,313 | 76% |
| BOR | 3,206 | < 1% |
| DoD | 103,407 | 2% |
| USFS | 343,737 | 5% |
| Tribal | 312,114 | 5% |
| Idaho | 226,560 | 4% |
| Oregon | 81,174 | 1% |
| Private | 441,562 | 7% |
| Water | 7,885 | < 1% |
| TOTAL | 6,354,957 | 100% |

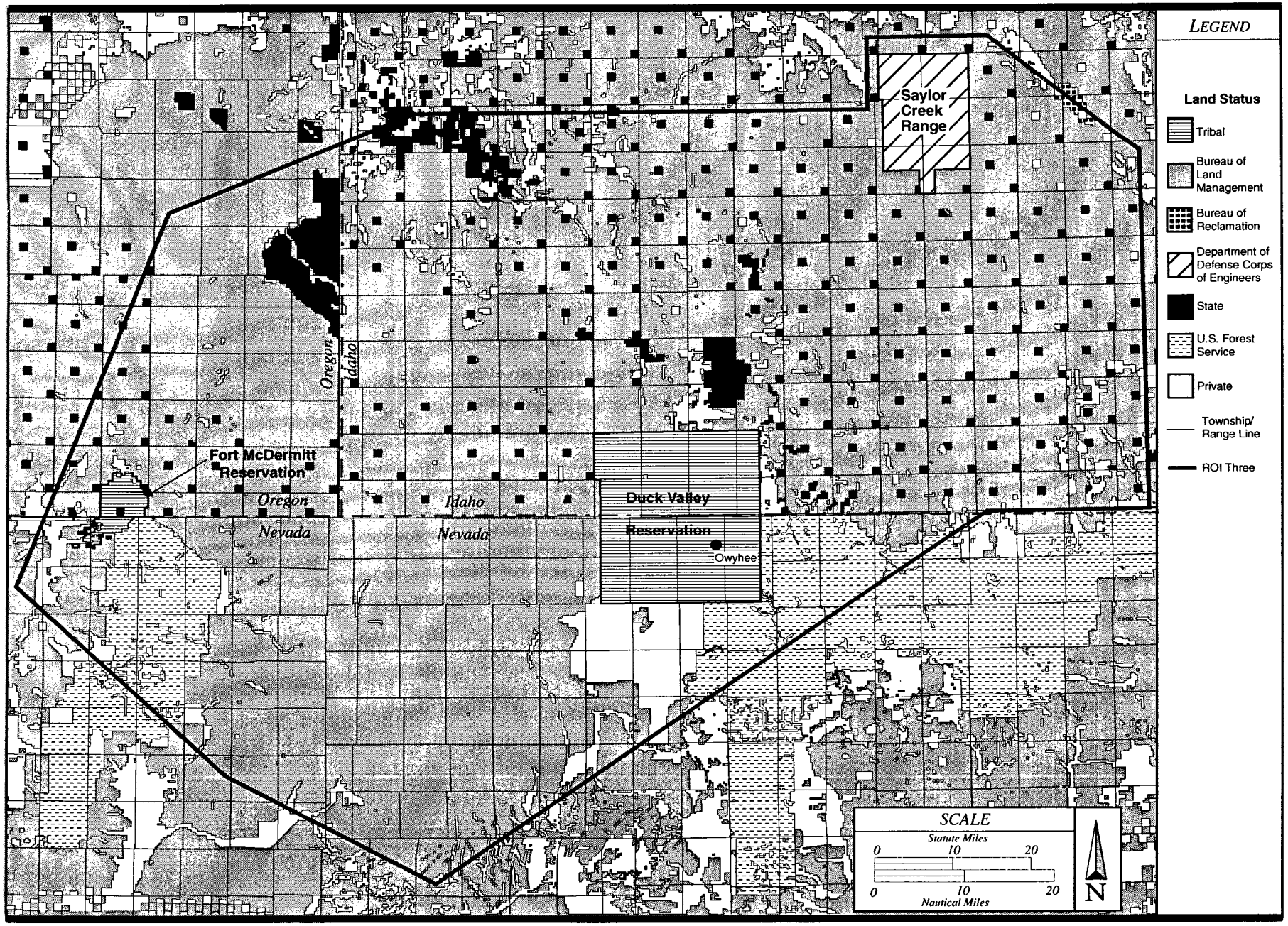



**Figure 3.10-1 Land Status in ROI Three**

Land use in ROI Three consists predominantly of grazing. BLM, the largest land-holder in the region, manages the public lands for multiple use. BLM authorizes livestock grazing on nearly all of the land under its management. Cattle and sheep grazing occurs within areas called grazing allotments shifting seasonally in accordance with BLM range management practices. BOR land in ROI Three is managed also by BLM for multiple uses and grazing is authorized. DoD land, although used for military activities, is partitioned into grazing allotments and used by livestock as well. In the Humboldt National Forest, land use consists of grazing, recreation, wildlife and wildlife habitat preservation, timber production, and mining (USFS 1985). Undeveloped Tribal lands and state school endowment lands are also used primarily for grazing.

Land uses in the region other than grazing consist mostly of mining and recreation. Various small mining claims and prospects are scattered throughout the region (refer to section 3.5.3.1 and Figure 3.5-5, Earth Resources). The area also offers primitive recreational opportunities such as hunting, hiking, camping, and float-boating (refer to section 3.11, Recreation and Visual Resources for a full description). In addition, a natural gas pipeline crosses under the Owyhee and Paradise MOAs from the northeast to the southwest (Air Force 1993d).

### 3.10.1.2 ROI Two

ROI Two is located within the sparsely populated area of Owyhee County where the approximate population density is 1.1 person per square mile (Idaho Department of Commerce 1994). Most of the population is concentrated in the various towns and settlements in the county with some scattered ranch residences throughout.

Figure 3.10-2 depicts land status within ROI Two. Land status and use patterns in ROI Two reflect those discussed in ROI Three. As listed in Table 3.10-2, BLM oversees the majority of land in ROI Two, with 82 percent (1.5 million acres) of the total 1.9 million acres in ROI Two under its management. BOR land (which is managed by BLM) consists of less than 1 percent (3,206 acres); DoD land comprises 5 percent (103,407 acres); tribal lands make up approximately 2 percent (39,058 acres); state-owned lands make up approximately 6 percent (116,642 acres); while private ownership amounts to 4 percent (83,627 acres).

Land use in the largely undeveloped area of ROI Two is consistent with the uses described above for land in ROI Three. BLM land, tribal land (the Duck Valley Reservation), and state school endowment land are used primarily for grazing. Privately held lands are also used for grazing. Various mining claims are located throughout the ROI (refer to section 3.5.3.1, Earth Resources), and the area also contains various drainages and canyons that support recreational activities such as hunting, hiking, camping, and float-boating. DoD lands, which consist of SCR and the Grasmere electronic combat site, are used for military activities. Some are used for grazing.

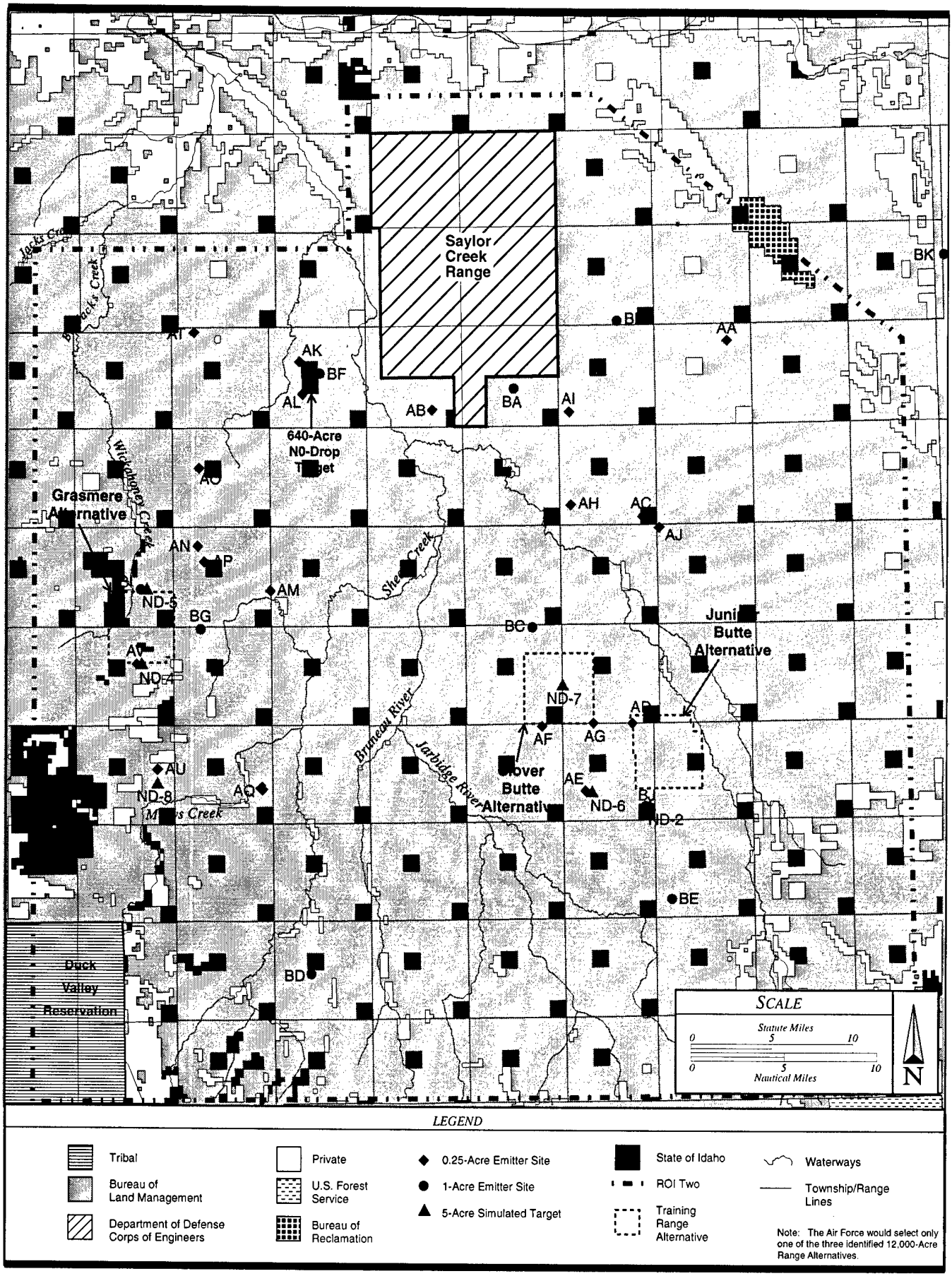



**Figure 3.10-2 Land Status in ROI Two and ROI One**

| Table 3.10-2. Land Ownership in ROI Two | | |
|---|---|---|
| *Status* | *Acreage* | *Percentage of ROI Two* |
| BLM | 1,544,882 | 82% |
| BOR | 3,206 | < 1% |
| DoD | 103,407 | 5% |
| Tribal | 39,058 | 2% |
| Idaho | 116,642 | 6% |
| Private | 83,627 | 4% |
| Water | 915 | < 1% |
| TOTAL | 1,891,738 | 100% |

### 3.10.1.3 ROI ONE

***ALTERNATIVE B — CLOVER BUTTE***

As shown in Figure 3.10-2, approximately 95 percent of the land proposed for inclusion in the training range is federal land (managed by BLM). The remaining 5 percent is State of Idaho school endowment land. None of the land within the boundaries of the proposed Clover Butte training range is privately held. Table 3.10-3 shows the acreages and percentages of federal land and state school endowment land for each of the three proposed alternatives. All of the proposed emitter sites and no-drop areas associated with the Clover Butte alternative are managed by BLM, with the exception of two one-quarter-acre emitter sites (AC and AJ) and a one-acre emitter site (BJ), which are located on state school endowment land.

| Table 3.10-3. Comparison of Land Ownership in Proposed Training Ranges | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CLOVER BUTTE | | GRASMERE | | JUNIPER BUTTE | | SCR | |
| *Land Holder* | *Acres* | *Percent* | *Acres* | *Percent* | *Acres* | *Percent* | *Acres* | *Percent* |
| Federal | 11,200 | 95% | 8,600 | 78% | 10,600 | 92% | 103,407 | 95% |
| State | 640 | 5% | 2,400 | 22% | 960 | 8% | 5,785 | 5% |
| TOTAL | 11,840 | 100% | 11,000 | 100% | 11,560 | 100% | 109,192 | 100% |

Existing land use within the proposed 12,000-acre Clover Butte training range and associated emitter and no-drop sites consists primarily of grazing, with the potential for primitive recreational use. The range lies within the Poison Creek grazing allotment and State Allotment G-7567. ND-1, the 640-acre no-drop area, lies within the West Canyon View grazing allotment.

Table 3.12-15 in section 3.12, Socioeconomics, lists the acreages of the grazing allotments located in the proposed training ranges, no-drop targets, and emitter sites.

### *ALTERNATIVE C — GRASMERE*

As shown in Figure 3.10-2, approximately 78 percent of the land proposed for inclusion in the Grasmere training range is federal land (managed by BLM). The remaining 22 percent is held by the State of Idaho for school endowments. None of the land within the boundaries of the proposed Grasmere training range is privately held. Table 3.10-3 shows the acreages and percentages of federal land and state school endowment land for each of the three proposed alternatives. All of the proposed emitter sites and no-drop areas associated with the Grasmere alternative are public lands managed by BLM, with the exception of two one-quarter-acre emitter sites (AC and AJ) and a one-acre emitter site (BJ), which are located on state school endowment land.

Existing land use within the proposed 12,000-acre Grasmere training range and associated emitter and no-drop sites consists primarily of grazing, with the potential for primitive recreational use. The range lies within portions of the China Creek, Crab Creek, and Wickahoney grazing allotments, and four state allotments. Table 3.12-5 in section 3.12, Socioeconomics, lists the acreages of the grazing allotments located in the proposed training ranges, no-drop targets, and emitter sites.

### *ALTERNATIVE D — JUNIPER BUTTE*

As shown in Figure 3.10-2, approximately 92 percent of the land proposed for inclusion in the Juniper Butte training range is federal land (managed by BLM). The remaining 8 percent is held by the State of Idaho for school endowments. None of the land within the boundaries of the proposed Juniper Butte training range is privately held. Table 3.10-3 shows the acreages and percentages of federal land and state school endowment land for each of the three proposed alternatives. All of the proposed emitter sites and no-drop areas associated with the Juniper Butte alternative are managed by BLM, with the exception of two one-quarter-acre emitter sites (AC and AJ) and a one-acre emitter site (BJ), which are state-owned.

Existing land use within the proposed 12,000-acre Juniper Butte training range and associated emitter and no-drop sites consists primarily of grazing, with the potential for primitive recreational use. The range lies within the Juniper Draw grazing allotment and two state allotments. Table 3.12-15 in section 3.12, Socioeconomics, lists the acreages of the grazing allotments located in the proposed training ranges, no-drop targets, and emitter sites.

### *SAYLOR CREEK RANGE*

SCR originally consisted of over 400,000 acres of land withdrawn by DoD for use by the Air Force (Public Land Order 1027, 9-Nov-54). In the 1960s, the Air Force returned over 300,000 acres to BLM (Public Land Order 3102, 2-Aug-63), which left 109,000 acres withdrawn as the

SCR (Figure 3.10-2). Near the center of the range lies a 12,200-acre fenced EUA that contains all existing targets. The EUA was established under Public Land Order 4902, 23-Sep-70.

As shown in Table 3.10-3, 95 percent (103,407 acres) of the land within SCR has been withdrawn by the DoD, while the other 5 percent (5,785 acres) is leased to the Air Force by the State of Idaho. None of the land within the boundaries of SCR is privately held.

Land use in SCR consists primarily of military range activities and grazing, although primitive recreational opportunities exist (refer to section 3.11, Recreation and Visual Resources). The SCR lies within the Browns Gulch, Lower Saylor Creek, Bruneau Hill, Echo, Flat Top, and West Saylor Creek grazing allotments.

## 3.10.2 Land Management Plans

### 3.10.2.1 ROI Three

In general, BLM lands are managed by districts within each state. Within Idaho and Oregon, BLM districts are further broken down into management units referred to as resource areas. ROI Three transects the Jarbidge, Owyhee, and Bruneau Resource Areas of the Lower Snake River District in Idaho; the Jordan and Malheur Resource Areas of the Vale District and Three Rivers Resource Area of the Burns District in Oregon; and the Elko and Winnemucca Districts in Nevada (Figure 3.10-3) (BLM 1986a, 1986b, 1991a).

Each BLM District or resource area is administered under either a Resource Management Plan (RMP) or a Management Framework Plan (MFP) developed specifically for that area. BLM is currently replacing MFPs with newer RMPs, which are more integrated, interdisciplinary land use planning documents. RMPs are intended to guide resource management for 15 to 20 years, addressing all relevant activities (such as grazing and recreation) and managing these activities by incorporating a balanced multiple use approach.

MFPs, BLM's older land use planning documents, establish, by district or resource area, "land use allocations, coordination guidelines for multiple use, and management objectives to be achieved for each class of land use" (BLM 1981). The MFP does not provide specific land use designations for all public properties within the study area; rather, it reflects management decisions based on considerations of the particular resource values such as minerals, range management, and wildlife, among others (Air Force 1993d).

BOR land within ROI Three is managed by BLM as part of the Jarbidge Resource Area under the Jarbidge RMP (personal communication, Lievsay 1996).

The Humboldt National Forest, a portion of which is transected by ROI Three, is managed by USFS under the *Humboldt National Forest Land and Resource Management Plan* (USFS 1985). The plan guides "all natural resource management activities and established management standards and guidelines for the Humboldt National Forest. It describes resource management

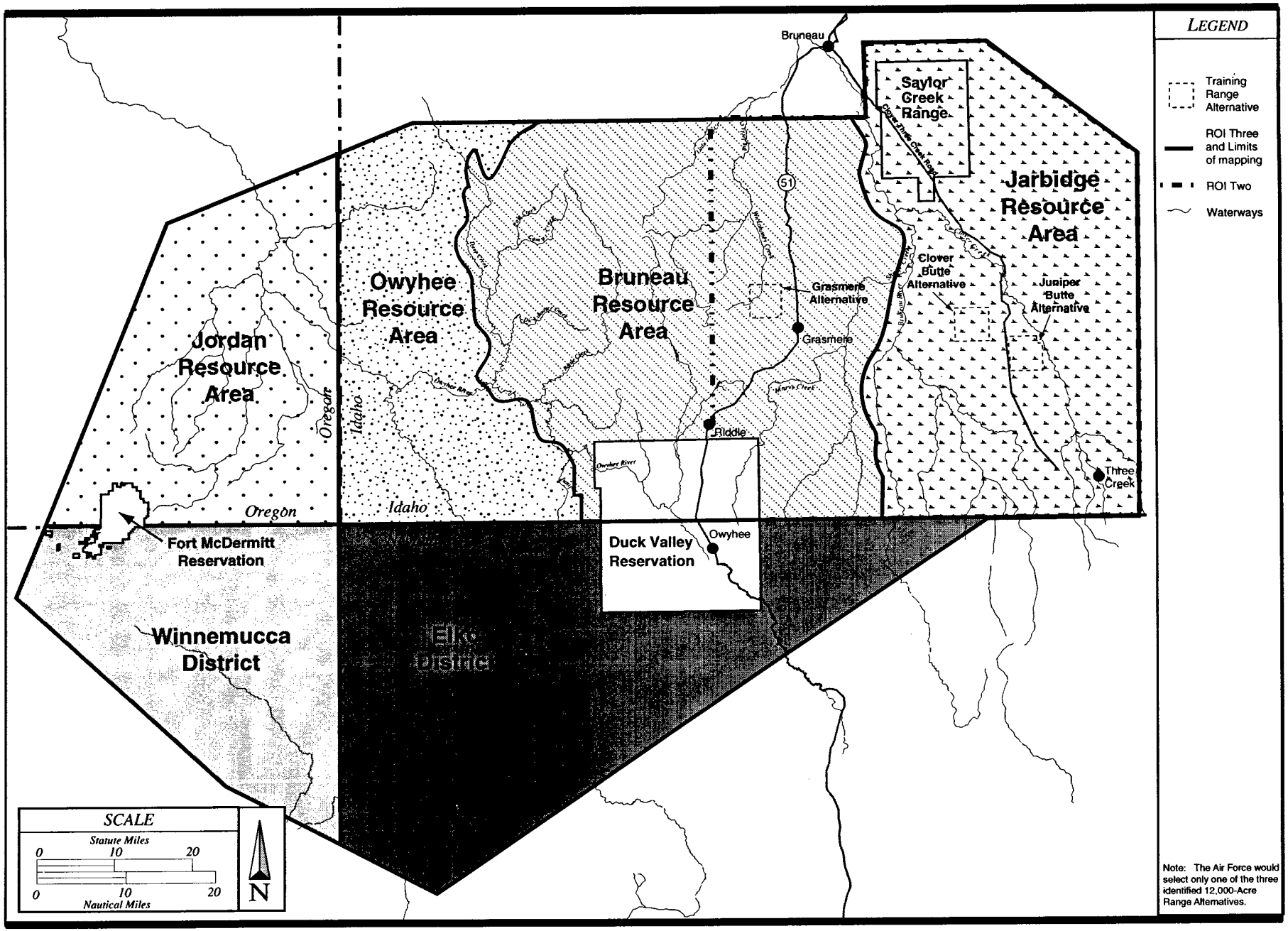



**Figure 3.10-3 Bureau of Land Management Districts and Resource Areas in ROI Three**

practices, levels of resource production and management, and the availability and suitability of lands for resource management" (USFS 1985).

The Duck Valley and Fort McDermitt tribal lands are sovereign areas, subject to federal law, whose lands are managed as determined by the reservation's tribal council or other governing body. The Bureau of Indian Affairs (BIA), a federal agency that serves in an advisory capacity for Native Americans, may sometimes be called upon to assist in management of these lands.

State school endowment lands within ROI Three are managed in a manner that maximizes benefits to school endowments. This principle, along with market conditions, guides the use of a particular parcel (Air Force 1993d).

ROI Three lies within Owyhee and Elmore counties in Idaho, Elko and Humboldt counties in Nevada, and Malheur and Harney counties in Oregon. Since public lands predominate within these counties, the principal land use plans and management documents affecting these lands are those maintained by BLM and discussed above. County comprehensive plans establish requirements and guidelines applicable to the private lands in the respective counties.

### 3.10.2.2 ROI TWO AND ROI ONE

The resource areas and management plans discussed in this section refer to the larger areas in which ROI Two and ROI One are located. Therefore, although the following discussion refers to ROI Two, it includes management of lands within ROI One.

ROI Two transects portions of the Jarbidge and Bruneau Resource Areas in southwest Idaho. The Jarbidge Resource Area includes 2.1 million acres in southwest Idaho, 81 percent of which is administered by BLM. The Jarbidge RMP was approved in 1987 and serves as a land use plan intended to guide resource management into the 21st century. The Jarbidge RMP separates these lands into 16 management units or multiple use areas (MUAs). The plan objectives for these MUAs include, among others, protecting and managing cultural resources, maintaining existing range modifications, managing big game habitat, maintaining and improving riparian habitat, and protecting scenic and recreation values (BLM 1985b; BLM 1995b).

The Bruneau Resource Area encompasses 3.1 million acres in southwest Idaho, 74 percent of which is managed by BLM. Major issues identified in the Bruneau-Kuna MFP include forage allocation to livestock and wildlife, protection of bighorn sheep habitat, and the designation of WSAs (BLM 1982, BLM 1983a, BLM 1983b).

State school endowment lands within ROI Two are managed in a manner that maximizes benefits to school endowments. This principle, along with market conditions, guides the use of a particular parcel (Air Force 1993d).

Much of ROI Two lies within Idaho's Owyhee County. The county maintains both a comprehensive plan (Owyhee County 1990, 1991) to guide management of private lands within the county, and an Interim Land Use Policy Plan (Owyhee County 1991), which is intended to also guide federal and state land management agencies in developing and managing their land use plans. Owyhee County has not adopted a zoning ordinance or map to implement its land use plans.

## 3.10.3 Special Use Areas

### 3.10.3.1 ROI THREE

Within the BLM districts and resource areas, there are also special use areas. For the purposes of this document, these are areas that require particular management attention because of their designation by Congress or by BLM. They include WSAs, Wild and Scenic Rivers, Areas of Critical Environmental Concern (ACECs), Special Recreation Management Areas (SRMAs), Wild Horse Herd Management Areas (HMAs), a NCA, and other resource-specific areas. Table 3.10-4 lists the special use areas within ROI Three, and the BLM district or resource area in which each is located.

*WILDERNESS STUDY AREAS*

BLM, in accordance with Sections 603(c) of the Federal Land Policy and Management Act (FLPMA), performed wilderness reviews on roadless public lands of 5,000 or more acres and roadless islands to determine which were suitable for wilderness designation. Wilderness designation is intended to preserve areas in a primitive state that have little evidence of human activity. The Wilderness Act of 1964 identified criteria for evaluating those areas and gave direction on how designated wilderness should be managed. Subject to certain exemptions, use of motor vehicles or other motorized equipment, landing of aircraft, and construction of structures and roads are prohibited in wilderness areas.

The result of the BLM inventory was the identification of a number of WSAs that were considered to possess some of the wilderness attributes. Wilderness attributes include naturalness, opportunities for solitude, opportunities for primitive and unconfined recreation, special features, and size.

An area is considered natural if the area appears to have been affected primarily by the forces of nature and human impact is substantially unnoticeable. Solitude refers to "the state of being alone or remote for habitation or a secluded place." Opportunities for primitive and unconfined recreation experience are defined as "activities that provide dispersed, undeveloped recreation which does not require facilities or motorized equipment" (BLM 1991b). Special features are not legally required as wilderness attributes; however geologic structures, important cultural or historic features, or unique wildlife habitat may enhance an area's overall wilderness quality. The area's overall size affects wilderness recommendation. Generally, larger areas have the capability to absorb the impacts of sights and sounds; may

**Table 3.10-4. BLM Special Use Areas in ROI Three (Page 1 of 2)**

| *Type of Special Use Area* | *Special Use Areas in ROI Three* | *BLM Unit* |
|---|---|---|
| Wilderness Study Area | See Table 3.10-5 | Jarbidge, Bruneau, Owyhee Resource Areas (RA[1]); Elko District; Winnemucca District; and Vale District |
| Wild and Scenic River | Bruneau-Jarbidge River System (eligible) | Bruneau and Jarbidge RA |
| | Owyhee River System (eligible) | Owyhee RA |
| | South Fork of Owyhee River (potentially eligible) | Elko District |
| | Fourmile Creek (potentially eligible) | Elko District |
| | North Fork Owyhee | Vale District |
| | West Little Owyhee | Vale District |
| | Owyhee River | Vale District |
| Areas of Critical Environmental Concern | Bruneau-Jarbidge River Bighorn Sheep Habitat | Jarbidge RA |
| | Triplet Butte | Bruneau RA |
| | Cottonwood Creek | Bruneau RA |
| | Owyhee River Bighorn Sheep Habitat | Bruneau and Owyhee RA, Vale District |
| | Leslie Gulch | Vale District |
| | Jordan Crater | Vale District |
| | Saddle Butte Lava Tubes | Vale District |
| Research Natural Area | Honeycombs | Vale District |
| | Mahogany Ridge | Vale District |
| | Stockade Mountain | Vale District |
| | Jordan Crater Addition | Vale District |
| Oustanding Natural Area | North Fork Juniper Woodland | Owyhee RA |
| Special Recreation Management Area | Oregon Trail | Jarbidge RA |
| | Bruneau-Jarbidge | Jarbidge RA |
| | Jarbidge Forks | Jarbidge RA |
| | Upper and Lower Deep Creek | Owyhee RA |
| | North Fork Owyhee Backcountry | Owyhee RA |
| | Owyhee Canyonlands | Owyhee RA |
| | North Fork Canyon | Owyhee RA |
| | Jacks Creek | Bruneau RA |
| | South Fork Owyhee River | Elko District |
| | Wilson Reservoir | Elko District |
| | Owyhee River System | Vale District |
| Wild Horse Herd Management Areas | Saylor Creek | Jarbidge RA |
| | Little Owyhee Desert | Winnemucca District |

**Table 3.10-4. BLM Special Use Areas in ROI Three (Page 2 of 2)**

| *Type of Special Use Area* | *Special Use Areas in ROI Three* | *BLM Unit* |
|---|---|---|
| Wild Horse Herd Management Areas (cont'd) | Snowstorm Mountain | Winnemucca District |
| | Sand Springs | Vale District |
| | Three Fingers | Vale District |
| | Jackie's Butte | Vale District |
| | Cold Springs | Vale District |
| National Conservation Area | Snake River Birds of Prey | Jarbidge, Bruneau, and Owyhee RA |

Note: 1. RA=Resource Area

have more natural and special features; and greater opportunities for solitude or primitive recreation.

BLM submitted recommendations for wilderness designation to the Secretary of the Interior for eventual Congressional action. Until the Congressional review process is completed, WSAs are managed under BLM's Interim Management Policy so as to not impair their suitability for wilderness designation. A WSA possessing the greatest number of these attributes is more likely to be recommended suitable for wilderness designation.

There are 39 WSAs encompassed by ROI Three (BLM 1987a, 1987c, 1989b, 1989g, 1991b). As depicted in Figure 3.10-4, four WSAs are located along the Bruneau, Jarbidge, and Sheep Creek river system; three are between Shoofly and Big Jacks creeks; 30 encompass the Owyhee and Deep Creek river system in Idaho, Oregon, and Nevada (11 of these underlie the Saddle MOA and are thus not depicted); and two are located along the South Fork of the Little Humboldt River in Nevada. Table 3.10-5 lists these WSAs, their attributes, and identifies those WSAs that contain areas that BLM has recommended as suitable for wilderness designation. This table also shows acreages within the WSAs that BLM has recommended not suitable for wilderness designation.

Although the issue of existing military aircraft overflights over these WSAs is evaluated for each area, the *Idaho Wilderness Study Report* concludes:

> BLM recognizes the importance of these military training operations for the national defense preparedness of this country, but did not consider the impacts of the overflights as sufficient to warrant a nonsuitable recommendation for any of the WSAs within the designated flight operation area (BLM 1991b).

### *WILD AND SCENIC RIVERS*

As part of the National Wild and Scenic Rivers System (created by Congress, Public Law 90-542; 16 USC 1271 et seq.), these rivers and their immediate shorelines are intended to be preserved and enhanced. These include rivers with natural, cultural, or recreational features in a free-flowing condition. For any river segment to be eligible for potential suitability as a designated wild, scenic, or recreational river, the river must meet certain classifications and possess one or more outstandingly remarkable values as defined by Section 1(b) of the Wild and Scenic Rivers Act, including scenic, recreation, geology, fish and wildlife, historic, cultural, or other similar value (U.S. Dept. of Interior 1990).

Wild river areas are inaccessible to the general public except by water, foot, or horse trail; the river area is primitive in nature and free of any man-made development except foot bridges. Wild rivers are generally managed in accordance with the guidelines for wilderness areas in order to protect their natural character. Scenic river areas have limited road access and are largely primitive and undeveloped or are used for dispersed human activities. Recreational

**Table 3.10-5. Wilderness Recommendations for Wilderness Study Areas in ROI Three (Page 1 of 2)**

| State | WSA | EIS | Report Number | Suitable for Wilderness (Acres) | Non-Suitable for Wilderness (Acres) | Wilderness Attributes | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Nat | Sol | Rec | Spe |
| ID/OR | Lookout Butte | Owyhee Canyonlands/ Oregon Wilderness | ID-16-48A/OR-3-194 | 0 | 99,600 | X | X | X | |
| ID/OR | Owyhee River Canyon | Owyhee Canyonlands | ID-16-48B/OR-3-195 | 187,660 | 38,660 | X | X | X | X |
| ID | Little Owyhee River | Owyhee Canyonlands | ID-16-48C | 8,650 | 16,140 | X | X | | X |
| ID | Owyhee River-Deep Creek | Owyhee Canyonlands | ID-16-49A | 70,090 | 4,250 | X | X | X | X |
| ID | Yatahoney Creek | Owyhee Canyonlands | ID-16-49D | 9,550 | 440 | X | X | X | X |
| ID | Battle Creek | Owyhee Canyonlands | ID-16-49E (ID-111-49E) | 32,520 | 80 | X | X | X | X |
| ID | Juniper Creek | Owyhee Canyonlands | ID-16-52 | 12,950 | 200 | X | X | X | X |
| ID/NV | South Fork Owyhee River | Owyhee Canyonlands | ID-16-53/NV-010-103A | 50,135 | 2,662 | X | X | X | X |
| NV | Owyhee Canyon | Owyhee Canyonlands | NV-010-106 | 13,525 | 8,350 | X | X | X | X |
| ID | North Fork Owyhee River | Owyhee MFP Amendment | ID-16-40 | 41,025 | 9,840 | X | X | X | X |
| ID | Big Willow Spring | Owyhee MFP Amendment | ID-16-41 | 0 | 6,210 | X | X | X | |
| ID | Squaw Creek Canyon | Owyhee MFP Amendment | ID-16-42 | 0 | 10,780 | X | X | X | |
| ID | Middle Fork Owyhee River | Owyhee MFP Amendment | ID-16-45 | 0 | 14,820 | X | X | X | |
| ID | West Fork Red Canyon | Owyhee MFP Amendment | ID-16-47 | 0 | 12,970 | X | X | X | |
| ID | Little Jacks Creek[1] | Jacks Creek | ID-111-6 | 34,000 | 25,070 | X | X | X | X |
| ID | Duncan Creek[1] | Jacks Creek | ID-111-7B | 8,760 | 1,245 | X | X | X | X |
| ID | Big Jacks Creek[1] | Jacks Creek | ID-111-7C | 44,525 | 10,308 | X | X | X | X |
| ID | Pole Creek | Jacks Creek | ID-111-18 | 0 | 24,509 | X | X | | X |
| ID | Sheep Creek West[1] | Jacks Creek | ID-111-36A | 11,680 | 0 | X | | X | X |

**Table 3.10-5. Wilderness Recommendations for Wilderness Study Areas in ROI Three (Page 2 of 2)**

| State | WSA | EIS | Report Number | Suitable for Wilderness (Acres) | Non-Suitable for Wilderness (Acres) | Wilderness Attributes | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Nat | Sol | Rec | Spe |
| ID | Sheep Creek East[1] | Jacks Creek | ID-111-36B | 0 | 5,050 | X | | X | |
| ID | Upper Deep Creek | Jacks Creek | ID-111-44 | 0 | 11,510 | X | | | X |
| ID | Bruneau River-Sheep Creek[1] | Jarbidge | ID-111-17 | 20,800 | 83,606 | X | X | X | X |
| ID | Jarbidge River[1] | Jarbidge | ID-17-11 | 16,740 | 58,378 | X | X | X | X |
| NV | Little Humboldt River | Elko RMP | NV-010-132 | 29,775 | 12,438 | X | X | X | X |
| OR | Cedar Mountain | Oregon Wilderness | OR-3-47 | 0 | 33,600 | X | X | X | X |
| OR | Dry Creek Buttes | Oregon Wilderness | OR-3-56 | 0 | 51,800 | X | | X | X |
| OR | Owyhee Breaks | Oregon Wilderness | OR-3-59 | 0 | 13,100 | X | X | X | X |
| OR | Blue Canyon | Oregon Wilderness | OR-3-73 | 0 | 12,700 | | X | X | X |
| OR | Upper Leslie Gulch | Oregon Wilderness | OR-3-74 | 3,000 | 0 | X | X | X | X |
| OR | Slocum Creek | Oregon Wilderness | OR-3-75 | 7,600 | 0 | X | X | X | X |
| OR | Honeycombs | Oregon Wilderness | OR-3-77A | 36,600 | 2,400 | X | X | X | X |
| OR | Lower Owyhee Canyon | Oregon Wilderness | OR-3-110 | 64,225 | 11,475 | X | X | X | X |
| OR | Saddle Butte | Oregon Wilderness | OR-3-111 | 0 | 86,300 | X | X | X | X |
| OR | Clarks Butte | Oregon Wilderness | OR-3-120 | 0 | 31,500 | X | X | | X |
| OR | Jordan Craters | Oregon Wilderness | OR-3-128 | 23,200 | 4,675 | X | X | X | X |
| OR | Upper West Little Owyhee | Oregon Wilderness | OR-3-173 | 62,500 | 0 | X | X | X | X |

Notes:

1. WSA located in ROI Two.

Nat = Natural
Sol = Solitude
Rec = Recreation
Spe = Special

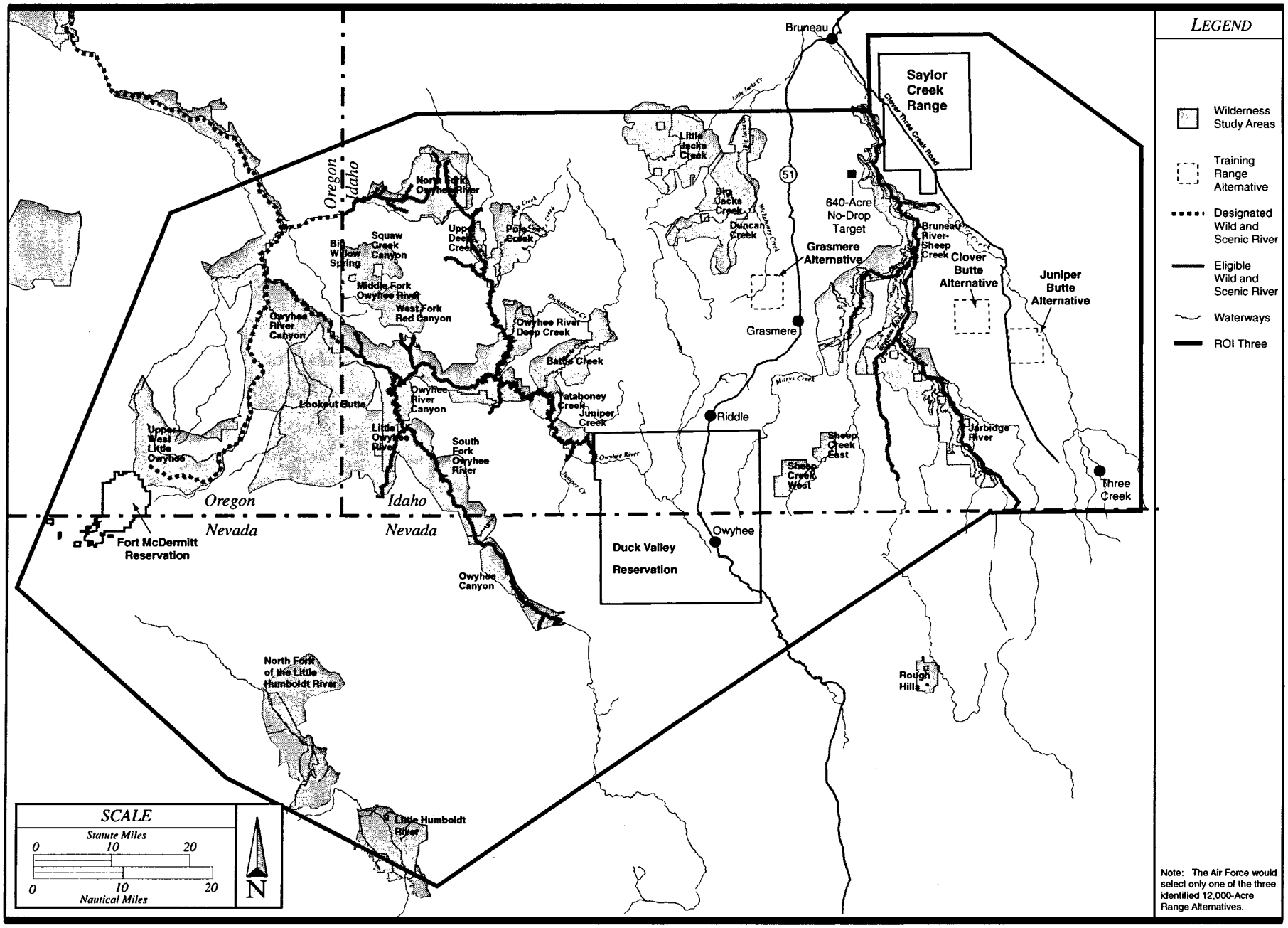



**Figure 3.10-4 Wilderness Study Areas and Wild and Scenic Rivers in ROI Three**

river areas are readily accessible by the public, contain some development, or may have undergone some impoundments or diversion in the past. BLM is required to inventory all rivers on public land to determine their eligibility for study. Those found eligible are studied within the framework of BLM planning policy to determine if they are suitable for Congressional designation as National Rivers. It is BLM's policy to protect an eligible river's outstandingly remarkable values until it is either found unsuitable by BLM's State Director or until Congress acts.

Within the Idaho portion of ROI Three, 121 miles of the Bruneau-Jarbidge River system were recommended by the president as suitable for designation as a National Wild River based on a 1976 U.S. Bureau of Outdoor Recreation study (personal communication, Ross 1996). Approximately 223 miles of streams within the Owyhee Resource Area were identified as eligible for designation as wild, scenic, or recreational rivers based on such qualities as outstandingly remarkable recreation, scenic, geologic, and wildlife values (BLM 1996d).

In the Nevada portion of ROI Three, BLM determined that 24.5 miles of the South Fork of the Owyhee River and 2 miles of Fourmile Creek (a tributary) are potentially eligible for wild and scenic designation based on their excellent scenic, recreational, and geologic values and their high wildlife potential, particularly for raptors (personal communication, Trieman 1996). In Oregon, Congress has designated the North Fork of the Owyhee, the West Little Owyhee, and the main stem of the Owyhee River as National Wild Rivers (personal communication, Wilbanks 1996).

#### *AREAS OF CRITICAL ENVIRONMENTAL CONCERN*

ACECs are public lands that BLM has determined require special management attention to protect important historical, cultural, or scenic values; fish and wildlife resources or other natural systems or processes; or people, from natural hazards (IDANG 1990). ACECs are managed for the resource or hazard involved, but not necessarily to the exclusion, or restriction, of existing uses (personal communication, Heft 1996).

ROI Three contains seven ACECs, four of which are depicted in Figure 3.10-5: the Bruneau-Jarbidge River Bighorn Sheep Habitat, Triplet Butte, Cottonwood Creek, and Owyhee River bighorn sheep habitat. The remaining three are located underneath the Saddle MOA: Leslie Gulch, Jordan Crater, and Saddle Butte Lava Tubes.

#### *Research Natural Areas*

Research natural areas (RNAs) are areas established and maintained for research and education. These lands may have typical or unusual faunistic or floristic types, associations, or other biotic phenomena; or characteristic or outstanding geologic, pedologic, or aquatic features or processes (Natural Heritage Advisory Council to the State Land Board 1988). RNAs are Congressionally mandated under authority of the FLPMA. The general public may be excluded or restricted where necessary to protect studies or preserve the area (IDANG 1990).

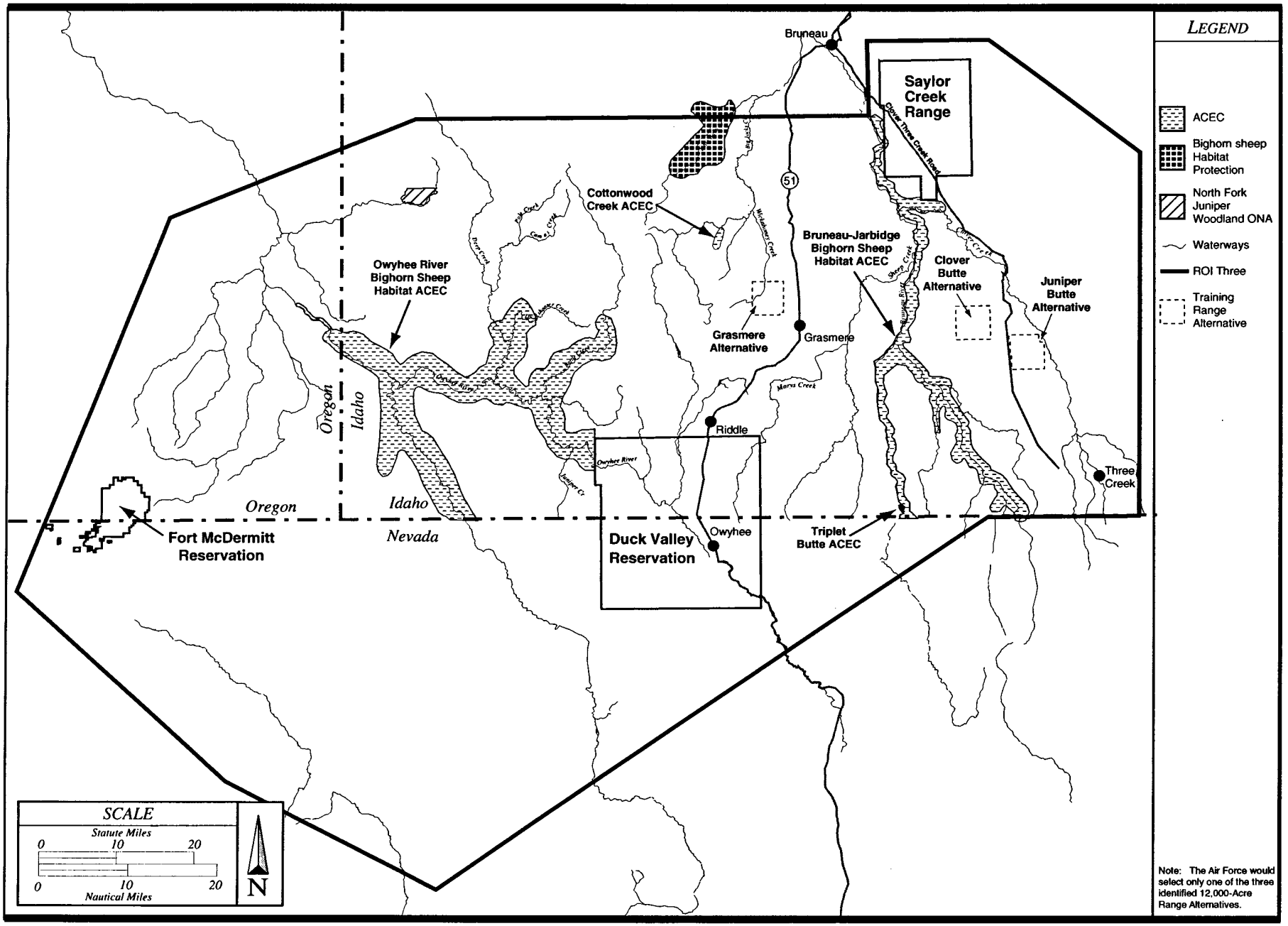



**Figure 3.10-5 ACECs and ONA in ROI Three**

By BLM definition all RNAs are ACECs, but not all ACECs are RNAs. Management of RNAs may be more restrictive than management of ACECs (personal communication, Heft 1996).

ROI Three contains four RNAs, all of which underlie the Saddle MOA: Honeycombs, Mahogany Ridge, Stockade Mountain, and Jordan Crater Addition.

*Outstanding Natural Areas*

Outstanding natural areas (ONAs) are areas determined by BLM to possess high scenic values that have been little altered by human impact. ONAs must meet the relevance and importance criteria of ACECs, and all are considered and managed as such (BLM 1996d). The North Fork Juniper Woodland ONA is located in the Owyhee Resource Area in Idaho (Figure 3.10-5). The area contains a remnant community of a mature juniper forest that represents how these juniper communities would have appeared before fire suppression and forest management techniques were introduced (personal communication, Zukert 1996).

***SPECIAL RECREATION MANAGEMENT AREAS***

SRMAs are areas identified as having a need for special management attention in order to protect sensitive recreation/natural resource values, or where recreation use is degrading natural resources or causing conflict between recreation user groups (Air Force 1993d). BLM's principal management objective for SRMAs is recreation (refer to section 3.11, Recreation and Visual Resources).

ROI Three contains ten SRMAs. Seven are in Idaho (Bruneau-Jarbidge, Jarbidge Forks, Upper and Lower Deep Creek, North Fork Owyhee Backcountry, Owyhee River Canyonlands, Jacks Creek, North Fork Canyon), two are in Nevada (South Fork Owyhee River and Wilson Reservoir), and one is in Oregon (Owyhee River System) (Figure 3.10-6). Recreational activities in these areas include whitewater boating, backpacking, camping, and wildlife viewing (refer to section 3.11, Recreation and Visual Resources). The Oregon Trail SRMA is also listed on the National Register of Historic Places which is discussed in Section 3.9, *Cultural Resources.*

***WILD HORSE HERD MANAGEMENT AREAS***

Wild horse HMAs are established by BLM to maintain populations of wild horses, pursuant to the Wild Horse and Burro Act of 1971. HMAs delimit areas within which specified numbers of wild horses are protected from overpopulation and harassment. Management tools include periodic monitoring of population numbers, water sources, distribution patterns, and the condition of adults and foals. Habitat manipulation within the HMAs is kept to a minimum (IDANG 1990).

ROI Three contains seven HMAs, five of which are depicted in Figure 3.10-6. The Saylor Creek wild horse herd is located in southwest Idaho; the Little Owyhee Desert and Snowstorm Mountain wild horse HMAs are located in Nevada; and the Sand Springs, Jackies Butte, Three Fingers, and Cold Springs wild horse HMAs are in southeastern Oregon.

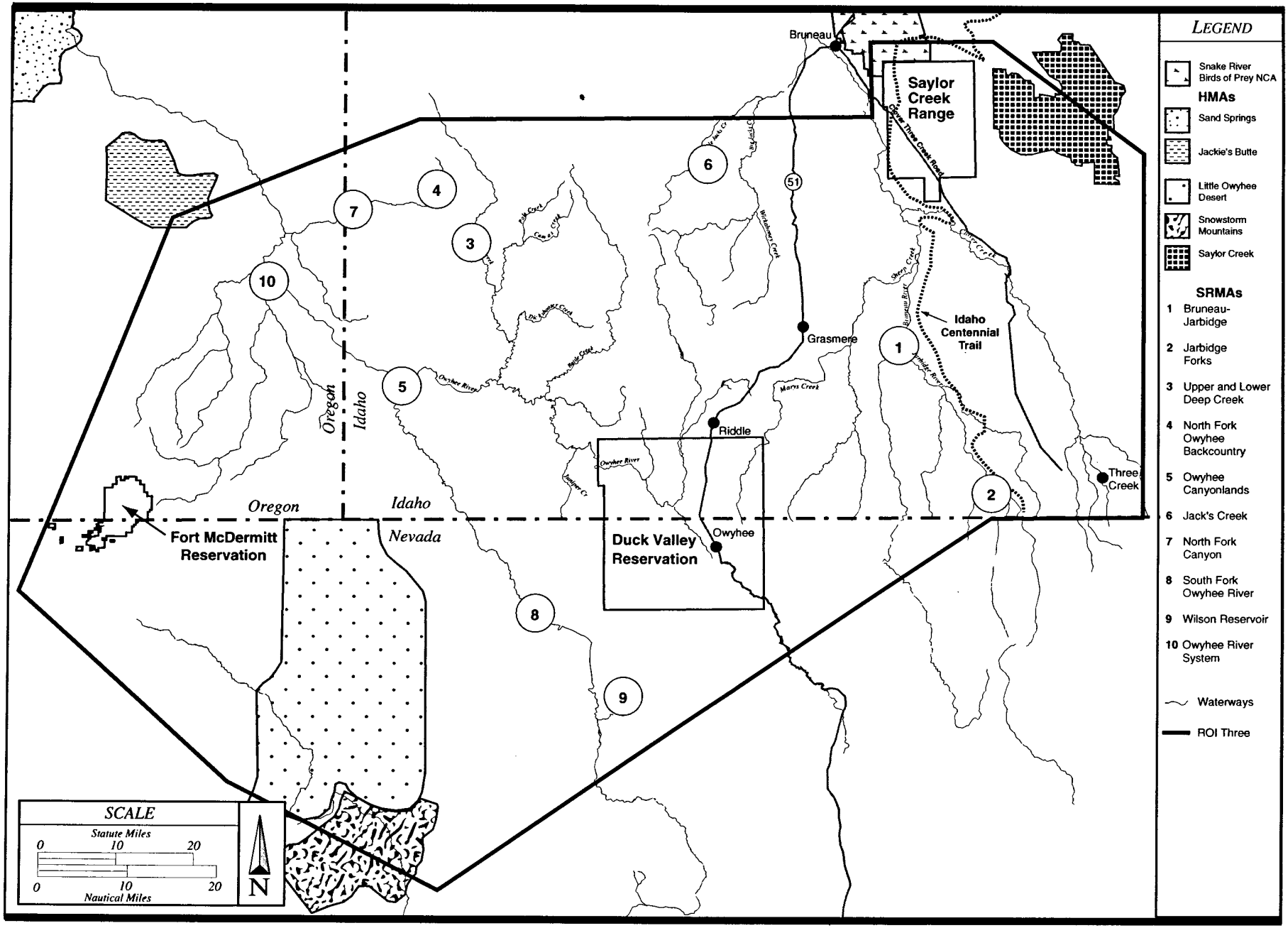



**Figure 3.10-6 SRMAs, Wild Horse HMAs, Snake River Birds of Prey NCA, and the Idaho Centennial Trail**

*NATIONAL CONSERVATION AREAS*

Congress establishes NCAs in order to protect lands containing special and significant resources. In 1994, Congress designated the already existing Snake River Birds of Prey Area as a NCA to extend special protection status to the nation's highest concentration of nesting raptors and their prey base. A small portion of the NCA lies within ROI Two as depicted in Figure 3.10-6.

*OTHER SPECIAL USE AREAS*

BLM's Bruneau-Kuna MFP (BLM 1983b) identifies a portion of land to be managed for protection of bighorn sheep habitat. This land is shown in Figure 3.10-5. Another special use area (depicted on Figure 3.10-6), not described by the categories discussed above, is the Idaho Centennial Trail, set aside in 1990 for recreation purposes.

### 3.10.3.2 ROI Two

*WILDERNESS STUDY AREAS*

ROI Two does not encompass any designated Wilderness Areas, but it does include portions of six WSAs (Bruneau River-Sheep Creek, Jarbidge River, Big Jacks Creek, Little Jacks Creek, Duncan Creek, Sheep Creek East, and Sheep Creek West) (Figure 3.10-4). The major factors evaluated for each WSA included wilderness qualities such as naturalness, size, solitude, and special features; additional wilderness quality factors included multiple resource benefits, balancing the geographic distribution of wilderness areas, diversity of natural systems, and manageability (BLM 1991b). The canyon lands of four of these WSAs and some plateau regions of Big Jacks Creek and Sheep Creek West WSAs have been recommended to Congress by the President as suitable for Wilderness Area designation. Management objectives for these WSAs are to preserve their overall wilderness qualities (such as naturalness and solitude) until their wilderness status is established. Table 3.10-5 provides a listing of these WSAs, the applicable BLM report that discusses them in detail, and the affected acreages. It is important to note that regardless of BLM's recommendations of suitability, all WSAs are managed to preclude any impairment of wilderness characteristics until the areas are either designated as Wilderness or released from further Wilderness consideration by act of Congress (Section 603(c), FLPMA).

The Bruneau River-Sheep Creek WSA consists of 104,406 acres of BLM land, 20,800 acres of which was recommended for wilderness status (BLM 1991b). The recommended lands contain 85 miles of canyons that possess outstanding opportunities for primitive recreation and solitude within a pristine setting. Limited access to the canyons mitigates potential conflict with other uses such as motor vehicle recreation, and livestock and range management; mining potential was considered low. The remaining 83,606 acres of BLM land consists of plateau areas that were not recommended as suitable because of a potential for conflict with these uses.

The Jarbidge River WSA consists of 75,118 acres of BLM land, 16,740 acres of which was recommended for wilderness status (BLM 1991b). The recommended lands contain 45 miles of canyons that possess outstanding opportunities for primitive recreation and solitude within a pristine setting. Like the Bruneau-Sheep Creek WSA, the canyon lands of the Jarbidge WSA were recommended for wilderness designation because their limited access precludes use by motor vehicle recreationists. Mining potential in the canyons was considered low, and, with the exception of two trail crossings, livestock use in the area was also low. The remaining 58,378 acres in the Jarbidge River WSA consist of plateaus not recommended for wilderness because of a potential for conflict with these uses.

Big Jacks Creek WSA lies under both an established MOA and portions of the proposed range support MOA expansion. This WSA consists of 54,833 acres of BLM land, 44,525 acres of which was recommended for wilderness status (BLM 1991b). The recommended lands contain 50 miles of exceptionally scenic canyons and surrounding plateau that possess outstanding opportunities for primitive recreation and solitude within a natural setting. Wilderness designation would also provide long-term protection to California bighorn sheep habitat.

Little Jacks Creek WSA is also located underneath portions of the proposed range support MOA expansion. Little Jacks Creek WSA consists of 58,040 acres of BLM land. BLM recommended 34,000 acres of land, including 1,030 acres adjacent to the WSA, for wilderness status (BLM 1991b). The recommended lands contain 25 miles of scenic canyons and 27,650 acres of surrounding plateau that provide outstanding opportunities for primitive recreation and solitude within a natural setting. The area also includes habitat for over 150 California bighorn sheep.

Duncan Creek WSA consists of 10,005 acres of BLM land, 8,760 acres of which was recommended for wilderness designation (BLM 1991b). The recommended land contains more than 10 miles of spectacularly scenic canyons and surrounding plateau that offer outstanding opportunities for primitive recreation and solitude within a natural setting. The area includes 4,500 acres of California bighorn sheep habitat and 5,900 acres of sagebrush and grass-covered plateau in good to excellent ecological condition. The land not recommended for wilderness contains livestock water developments and off-road vehicle routes.

Sheep Creek East WSA consists of 5,050 acres of BLM land, all recommended as non-suitable for wilderness designation (BLM 1991b). These lands do not offer outstanding opportunities for primitive and unconfined recreation. No significant wildlife species or habitats, geologic features, or scientific and educational values would benefit from wilderness designation. The alternative recommendation for the WSA was to improve and increase grazing uses of the land.

Sheep Creek West WSA consists of 11,680 acres of BLM land, all of which was recommended for wilderness designation (BLM 1991b). The area contains spectacular scenery and outstanding opportunities for primitive recreation within a natural setting. Designation would not significantly impact other resource uses. Livestock grazing would continue at existing

levels, mining potential is considered low, and rough topography and rocky soils discourage use by off-road motor vehicle users.

### *WILD AND SCENIC RIVERS*

Although Congress has not designated any rivers within ROI Two as Wild and Scenic, 121 miles of the Bruneau-Jarbidge river system have been nominated for such designation (Figure 3.10-4). Table 3.10-6 presents a breakdown of these reaches. The President has recommended to Congress that these rivers be designated as Wild and Scenic, and BLM manages these reaches to protect the values that qualify them for designation.

**Table 3.10-6. Streams of Bruneau-Jarbidge System Eligible for Wild and Scenic Designation**

| *Stream Name* | *Length* | *Potential Designation* |
|---|---|---|
| Jarbidge River | 29 miles | Wild |
| Upper Bruneau River | 11 miles | Scenic |
| Lower Bruneau River | 60 miles | Wild |
| Sheep Creek | 21 miles | Wild |

### *AREAS OF CRITICAL ENVIRONMENTAL CONCERN*

The 84,111-acre Bruneau-Jarbidge River Bighorn Sheep Habitat ACEC is located in ROI Two along the Bruneau-Jarbidge River System (Figure 3.10-5). This ACEC consists of 175,000 acres established to protect and enhance habitat for bighorn sheep, a species that prefers remote, inaccessible areas where contact with humans is minimal (refer to section 3.8, Biological Resources). Management objectives for the area also include protection and maintenance of the scenic and natural values in the area (Air Force 1993d).

### *SPECIAL RECREATION MANAGEMENT AREAS*

The Bruneau-Jarbidge River SRMA is located within ROI Two (Figure 3.10-6). Its boundaries follow that of the National Wild River recommendations and closely resembles the wilderness area boundaries recommended by the President to Congress (personal communication, Peugh 1993). This area has a reputation for challenging whitewater boating, fair to excellent fishing, and diverse hunting opportunities (refer to section 3.11, Recreation and Visual Resources).

### *WILD HORSE HERD MANAGEMENT AREAS*

The Saylor Creek wild horse herd area lies partially within the northeast corner of ROI Two. The wild horses are managed by BLM in accordance with the Wild Horse and Burro Act that recognizes the unbranded and unclaimed animals as a worthy resource. The Saylor Creek herd

area is approximately 82,000 acres in size and is managed to support 50 wild horses (Figure 3.10-6). The herd population level has been managed by BLM since the passage of the Wild Horse and Burro Act in 1971 (Air Force 1993d).

*NATIONAL CONSERVATION AREAS*

The Snake River Birds of Prey NCA includes the highest density population of eagles, hawks, and other birds of prey in North America (BLM 1995a). The NCA was established "to provide for the conservation, protection, and enhancement of raptor populations and habitats and the natural and environmental resources and values associated therewith, and of the scientific, cultural, and educational resources and values of the public lands in the conservation area" (BLM 1995a). Other management goals are to provide for public uses consistent with protection of the area, coordinate research and studies of raptors, develop new techniques to manage and enhance habitat, and enhance public appreciation of the birds and their habitat. Larger segments of the Birds of Prey Area are found further down the Snake River in the Bruneau and Owyhee Resource Areas. Figure 3.10-6 depicts the location of this special use area.

*OTHER SPECIAL USE AREAS*

BLM set aside the lands comprising the Little Jacks Creek WSA to be managed for protection of bighorn sheep habitat (shown in Figure 3.10-5) in case the WSA was determined to be ineligible for wilderness management (personal communication, Costello 1996).

The Idaho Centennial Trail bisects ROI Two from the north through Glenns Ferry and continues south to the community of Three Creek along the Idaho-Nevada border (Figure 3.10-6). This trail was established for its scenic and recreational values (refer to section 3.11, Recreation and Visual Resources).

#### 3.10.3.3 ROI ONE

No special use areas are located in the proposed 12,000-acre training ranges, the existing SCR, nor the associated no-drop and emitter locations.

### 3.10.4 Roads

The ROI for transportation includes the area comprising the proposed 12,000-acre alternative training ranges and the transportation network associated with the proposed no-drop and emitter sites, and is thus best described by ROI Two. Figure 3.10-7 illustrates the roadway networks analyzed.

#### 3.10.4.1 ROI Two

Main road access to ROI Two from the west originates from State Highway 78 or State Highway 51, while Interstate 84 and State Highway 78 provide access from the north. Access

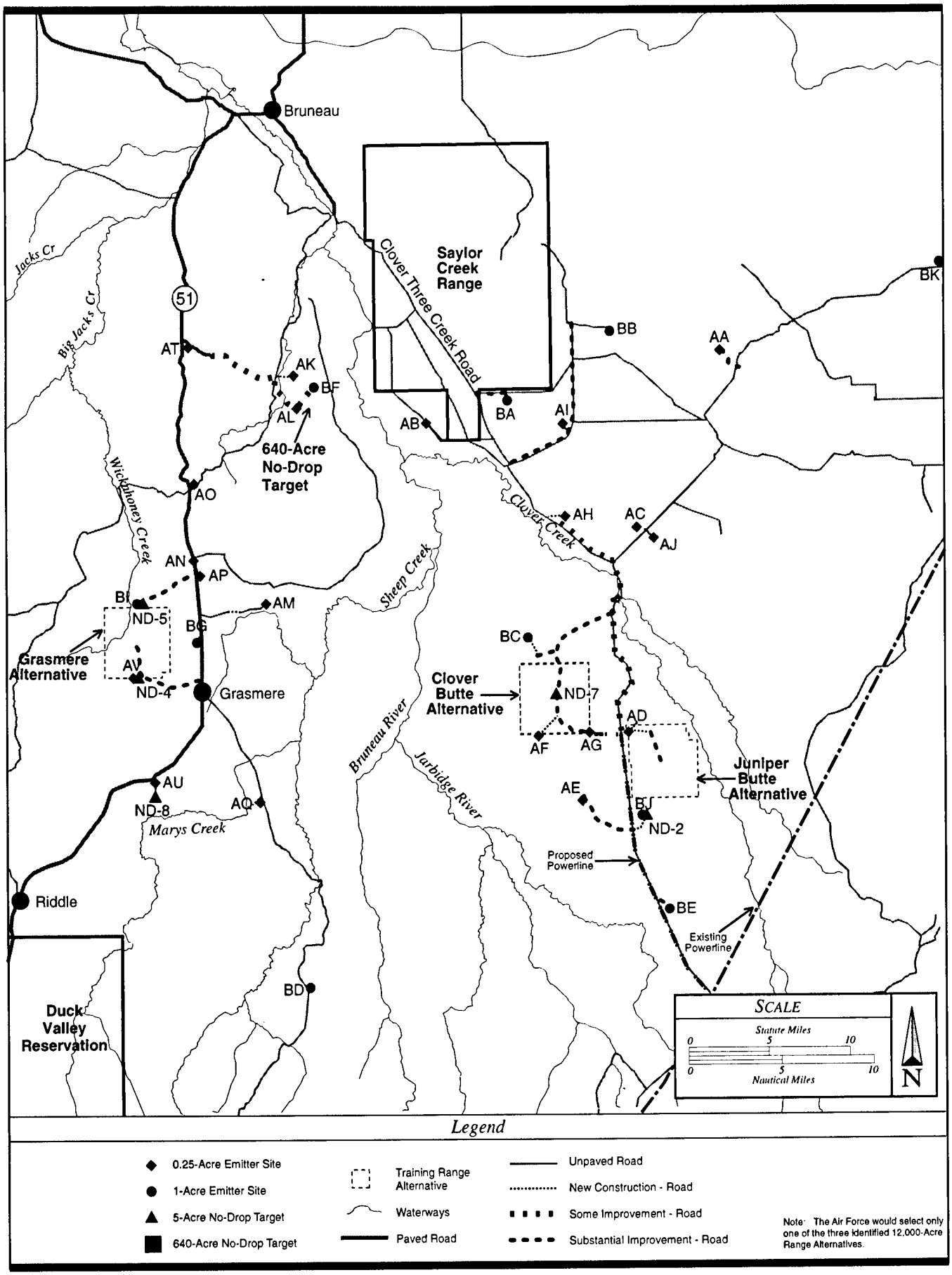



**Figure 3.10-7 Road Network Associated with Alternative Components**

from the east and south is provided by less traveled roads branching off of U.S. Highway 93, which runs north and south through Twin Falls County.

Within the ROI, most roads are either unimproved or simply graded and drained; roads exist mainly to provide access to ranchers, recreationists, and land managers. Vehicle volumes are extremely low, and travel can be slow, particularly during wet periods. Due to the lack of snow removal operations, roads remain generally unused during the winter. Roads and trails within ROI Two (Figure 3.10-7) generally fall under jurisdiction of Owyhee County, Three Creek Good Roads District, or BLM. Some private roads or easements exist in the ROI.

Owyhee County, in conjunction with the State of Idaho Transportation Department, has recently prepared and adopted the Rural Functional Classification Map for 2000. The preparation and adoption of this map are essential in meeting the Federal Highway Administration's requirements and in receiving federal funding for transportation improvements. Based on a variety of factors, the map classifies roads as interstate, principal arterial, minor arterial, major collector, and minor collector (personal communication, Young 1992). Two roads providing access to the sites were classified on the recently adopted Rural Functional Classification Map for up to the year 2000: State Highway 51 and Clover-Three Creek Road.

State Highway 51 is a two-lane highway that travels in a north-south direction in the western portion of ROI Two. The highway is classified as a minor collector on the Rural Functional Classification Map for up to the year 2000.

Clover-Three Creek Road (segments of which are also referred to as Clover Creek Road and Three Creek Road) refers to the entire segment of road from Bruneau to Three Creek. This road is a well-maintained gravel road classified as a major collector that enters SCR from the northwest and traverses the southwest portion of the range continuing on to the southeast.

Although the road does not meet some of the minimum requirements for this classification, including an average daily traffic of 100 vehicles, it was designated as a major collector because of its importance as a connection through the large, sparsely populated region of Owyhee County.

Less maintained roads also identified as providing access to the inner portions of ROI Two include Grasmere Road, Battle Creek Road, Sheep Creek Road, Clover Road, Balanced Rock Road, and Crows Nest Road. A number of unnamed unimproved roads also traverse the ROI.

### 3.10.4.2 ROI ONE

#### *ALTERNATIVE B — CLOVER BUTTE*

Access to the proposed Clover Butte training range is provided by roads from the north, south, east, and west; through-access is limited to travel in a north-south direction. To the east of the

range lies Clover-Three Creek Road, which provides main access to roads leading in to the training range. Many of the proposed no-drop and emitter sites associated with the range are currently serviced by roads.

Road conditions for the training range are similar to those described in the discussion of ROI Two. Roads are unimproved and exist mainly to provide access to ranchers, recreationists, and land managers. Vehicle volumes are extremely low, and travel can be slow, particularly during wet periods. Due to limited or lack of snow removal operations, roads remain generally unused during the winter. Roads within the proposed training range site fall under the jurisdiction of BLM.

*ALTERNATIVE C — GRASMERE*

Access to the proposed Grasmere training range is provided by roads from the north and south; through-access is limited to travel in a north-south direction. To the east of the range lies Highway 51, which provides main access to roads leading in to the training range. Many of the proposed no-drop and emitter sites associated with the range are currently serviced by roads.

Road conditions for the training range are similar to those described for the Clover Butte site.

*ALTERNATIVE D — JUNIPER BUTTE*

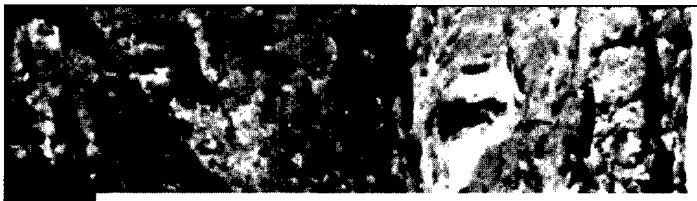
Access to the proposed Juniper Butte training range is provided by roads from the north, south, east, and west; through-access is limited to travel in a north-south direction. To the west of the proposed range lies Clover-Three Creek Road which provides main access to roads leading in to the training range. A primitive two-track road exists along the rim of the East Fork of the Bruneau river. Many of the proposed no-drop and emitter sites associated with the range are currently serviced by roads.

Road conditions for the training range are similar to those described for the Clover Butte site.

### 3.10.5 Shoshone-Paiute Issues Concerning Land Use and Transportation

As mentioned previously in section 3.10, the two reservations within ROI Three, the Duck Valley Reservation and the Fort McDermitt Reservation, together comprise 307,734 acres, or about 5 percent of the total acreage within this ROI. Both reservations are sovereign and, while subject to federal law, manage their lands as determined by the Tribal council or other governing body. The BIA sometimes assists in this management.

Southwest Idaho, southeast Oregon, and northern Nevada have been home to the Shoshone and Paiute for centuries. Members of the Shoshone-Paiute Tribes of the Duck Valley Reservation continue to use their aboriginal territory, both on and off the Reservation, for traditional food gathering and religious activities.



# 3.11 RECREATIONAL AND VISUAL RESOURCES

Recreational and visual resources were divided into two areas to identify resources and potential impacts. The first, ROI Two, consists of the region approximately from Highway 51 to the west, Twin Falls County line to the east, SCR to the north, and the Idaho/Nevada border to the south.

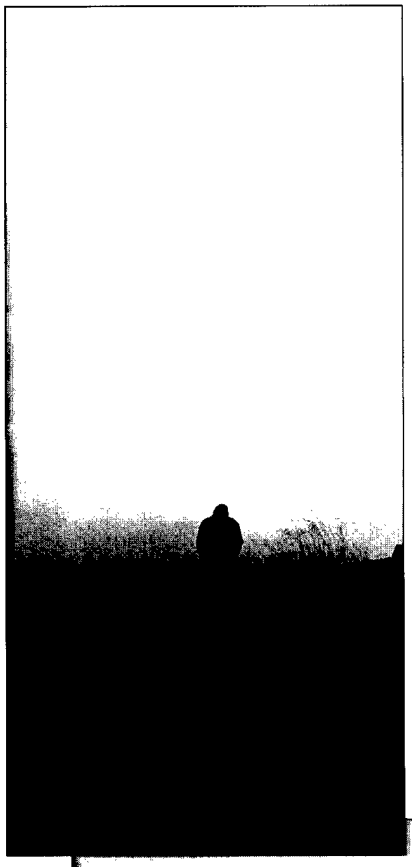
The second, ROI Three, consists of land under existing or proposed airspace in Idaho, Oregon, and Nevada. The study in this larger area takes into account aircraft activity and associated noise that may indirectly affect recreation and visual resources.

Recreational resources in both areas are widely scattered and generally undeveloped. Recreational activities include hunting, hiking, river-running, camping, nature viewing, rock-hounding, and photography.

The Bruneau-Jarbidge River system draws a number of local and national visitors with its combination of scenery, hunting, and river floating opportunities. This river system was recommended for Wild and Scenic River designation by the BLM in 1979.

The contrasting colors and unique features found in both the Bruneau-Jarbidge and the Owyhee river systems provide dramatic views. There is a designated Scenic Overlook adjacent to the SCR that provides an impressive view of steep canyons dissecting sagebrush and grassland plains.

Proposed changes in airspace will redistribute aircraft and reduce training flights over the Owyhee River in ROI Three.

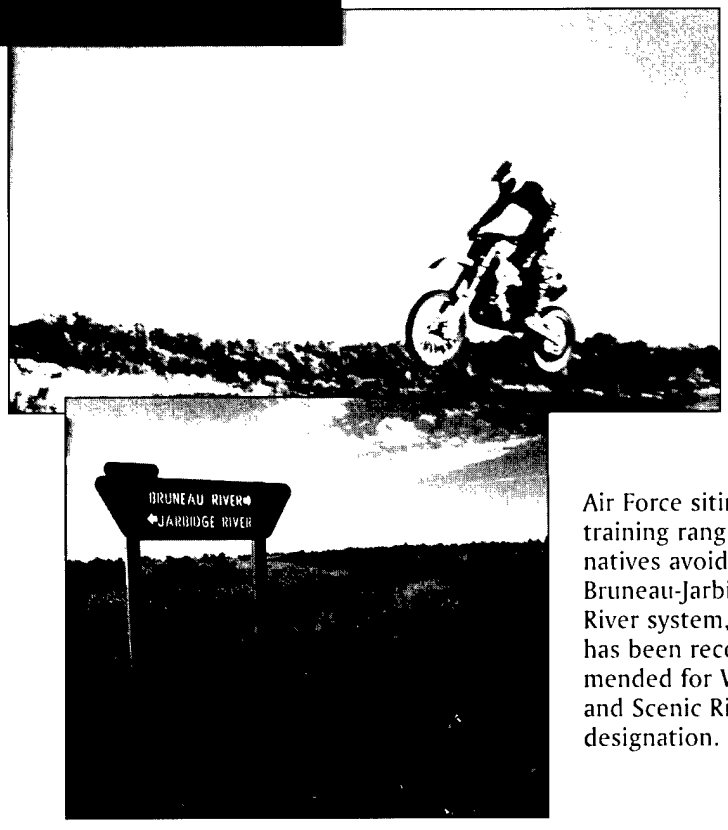


Three training range alternatives were selected to avoid the ROI Two canyon areas that are popular for hunting, hiking, and boating. The alternatives avoid the Idaho State Centennial Trail. The Juniper Butte Alternative borders the East Fork Bruneau Canyon but construction would be more than two miles from the canyon rim.

Classification of recreational opportunities is called the Recreation Opportunities Spectrum (ROS). The training range alternative areas are generally classified as ROS "roaded", which means that road or jeep trails are throughout, with limited areas classified as ROS "primitive." The Juniper Butte Alternative has the least amount of primitive land among the range alternatives. In all cases, a 12,000-acre land withdrawal would equate to a very small percentage of land compared to public lands available for recreation use on Roaded or Primitive areas in ROI Two.

The majority of improved roads will lead to emitter sites or target areas rather than to specific recreation areas. It is unlikely that recreation use would increase as a result of road improvements.

One infrequently traveled road would be closed under each of the three alternatives. Other roads are available as alternatives to access recreation destinations.




Air Force siting of training range alternatives avoided the Bruneau-Jarbidge River system, which has been recommended for Wild and Scenic River designation.



# 3.11 RECREATION AND VISUAL RESOURCES

## RECREATION

Recreation resources consider outdoor recreational activities that take place away from the residences of participants. Because the proposed action will take place in a remote area, recreation analysis will focus on primitive or wilderness recreational activity such as hiking, hunting, nature viewing, camping, float boating, etc. Visitors in this type of area seek a primitive or semi-primitive recreation, where the terrain is rugged or undeveloped and access is difficult. For these reasons, the effects of existing use of the military training airspace in the region (refer to Table 3.0-2) on a user's expectations was considered in assessing baseline conditions.

Attributes used to describe recreational use of an area include the number of users of an area, the activities available, the perceived value or benefit of the area for the users, and the uniqueness of the area as a recreational resource.

Most of the land that would be affected by the proposed action is managed by the BLM. Public lands managed by the BLM typically provide a variety of recreational experiences. To account for this variety, the BLM uses the ROS. The ROS provides a framework by which outdoor recreation environments, activities, and experience opportunities can be organized and defined. Underlying the ROS is the basic assumption that quality outdoor recreation is best satisfied through a diverse set of opportunities. Although the notion of quality is subjective, the concept depends on basic factors such as what kind of experience does an individual expect, how much of this expectation is realized, and to what degree the visitor is satisfied by the experience.

The ROS framework is arranged along a continuum and is divided into six general classes of recreational opportunities: Primitive, Semi-primitive Non-motorized, Semi-primitive motorized, Roaded Natural, Rural, and Urban. Opportunities for experiences along the continuum represent a range from a very high probability of solitude, self-reliance, and challenge to a very social experience with developed recreational amenities.

## VISUAL

Visual resources are the natural (landforms, water bodies, vegetation) and man-made features (buildings, fences, signs) that give a particular environment its aesthetic qualities. A visual impression of an area is derived from the type, arrangement, and contrast between these features. Although each viewer's perception may be slightly different, an overall landscape character can be assigned to an area and impacts to that character assessed.

When rating the visual character of an area, the shape, form, line, and color of the landscape all play an important role. As the stewards of the land in the ROI, the BLM uses the visual resource management (VRM) classification system to identify the existing visual character of the landscape and define the allowable extent and type of modification to the landscape. The

VRM Classification system rates visual character from the most sensitive (VRM Class I) to the least sensitive (VRM Class IV). Since visual classes are defined solely by the quality of visual resources of an area and not influenced by classifications of neighboring areas, the most sensitive class (VRM I) can be adjacent to the least sensitive class (VRM IV).

## 3.11.1 Recreation Use and Opportunities

The recreation and visual analysis has two ROIs due to the direct and indirect effects from the proposed action. The smaller ROI Two is used for detailed analysis, because a change in access to a recreation area or construction of support facilities for the range could affect recreation activities and visual resources directly. The area for ROI Two is shown on Figure 3.0-1. The larger ROI Three consists of the land area under restricted airspace R-3202 and the range support airspace within Idaho, Oregon, and Nevada (refer to Figure 3.0-1). ROI Three accounts for aircraft activity and associated noise that affects recreation and visual resources indirectly. The focused analysis for ROI Two includes Clover Butte, Grasmere, Juniper Butte, and SCR. The recreation analysis does not include the site specific ROI One because recreation does not occur there.

### 3.11.1.1 ROI THREE

Recreation activities occurring below the MOAs reflect the undeveloped nature of the region. These activities include hiking, hunting, camping, fishing, and nature viewing. In primitive or undeveloped areas, the evidence of human influence is negligible, and motorized vehicles are prohibited or limited to existing roads. In these areas, part of the recreation experience is the high probability for solitude.

#### *IDAHO RECREATION*

The southern Idaho desert attracts visitors to its wide spectrum of recreational opportunities. Its diverse landscapes create a variety of physical and psychological settings that provide a primitive recreational experience of natural beauty, solitude, and freedom from the regulations of structured urban areas. The desert provides a large portion of motorized and non-motorized back-country recreation in an arid environment.

While dispersed recreation activities occur throughout the ROI, areas that have a special designation that may attract visitors include SRMAs, ACECs, and WSAs. These areas provide a variety of recreational activities, such as fishing, hiking, camping, hunting, whitewater boating, off-highway vehicle (OHV) use, horseback riding, rock climbing, rock collecting, nature study, and photography. Special designation was granted to these areas due to their outstanding resource values such as scenery, geology, recreation, and wildlife. WSAs and ACECs are described in section 3.10.3.

SRMAs are areas identified as having a need for special management attention in order to protect sensitive recreation/natural resource values, or where recreation is degrading natural

resources or causing conflict between recreation user groups. Recreation is considered the principal management objective in an SRMA. Seven SRMAs are located in the Idaho portion of ROI Three: North Fork Owyhee Backcountry, Deep Creek, North Fork Canyon, Owyhee River Canyonlands, Jacks Creek, Jarbidge Forks, and the Bruneau-Jarbidge. These seven SRMAs have outstanding scenic qualities, float boating opportunities, and fishing resources. The generalized region of the SRMAs are shown on Figure 3.11-1.

Twenty-two WSAs are located within ROI Three in Idaho. Four of these are located along the Bruneau-Jarbidge River system and Sheep Creek; three more are between the Shoofly and Big Jacks creeks. The remaining WSAs encompass the Owyhee River system and Deep Creek. WSAs provide outstanding opportunities for solitude and primitive recreation in a pristine setting. They are managed by the BLM to maintain their suitability for preservation as wilderness. Rivers and canyon areas are the focus of recreation within the WSAs. These areas provide a primitive and rugged recreational experience in a natural setting. No road development or OHV use is permissible in WSAs. WSA designation is further discussed in section 3.10.3.

Hunting, hiking, float boating, camping, and nature viewing take place within the ROI. Other recreational activities include fishing, horseback riding, rock collecting, and photography. These activities occur predominantly near rivers and associated canyon areas.

Hunting occurs extensively throughout ROI Three. Game management units 40, 41, 42, 46, and 47 are located within the ROI in Idaho (Figure 3.11-2). Bighorn sheep, deer, antelope, and upland game are hunted throughout this widespread region. Although mule deer is the most predominant game animal hunted here, the area receives little hunting use compared to the rest of the state. In 1995, approximately 3,048 people hunted for mule deer within these game management units (personal communication, Cook 1997). This represented only about two percent of total hunters throughout the state. The average days per hunt was about five days for general hunting (personal communication, Cook 1997). Game management unit 47 was used for a controlled hunt for mule deer and antelope in 1995.

California bighorn sheep are the premier trophy hunt within ROI Three. Six controlled hunts occur in the state and all within this ROI. In 1995, 39 permits were issued to hunt bighorn sheep. The average success rate was 64 percent. The average days per hunter, 7.5, was longer than for other big game hunted in the region. Tags for bighorn sheep are obtained through a lottery system. Controlled hunts for bighorn sheep are held in the fall. For the 1995 season, controlled hunts were held from August 30 to October 14.

The hunting season varies by animal and equipment used. For general deer hunting, including bow hunting, the season runs from August to the end of October. For antelope, the season runs from the last week in September to the last week in October. For upland game birds the season generally runs from mid-September through December.

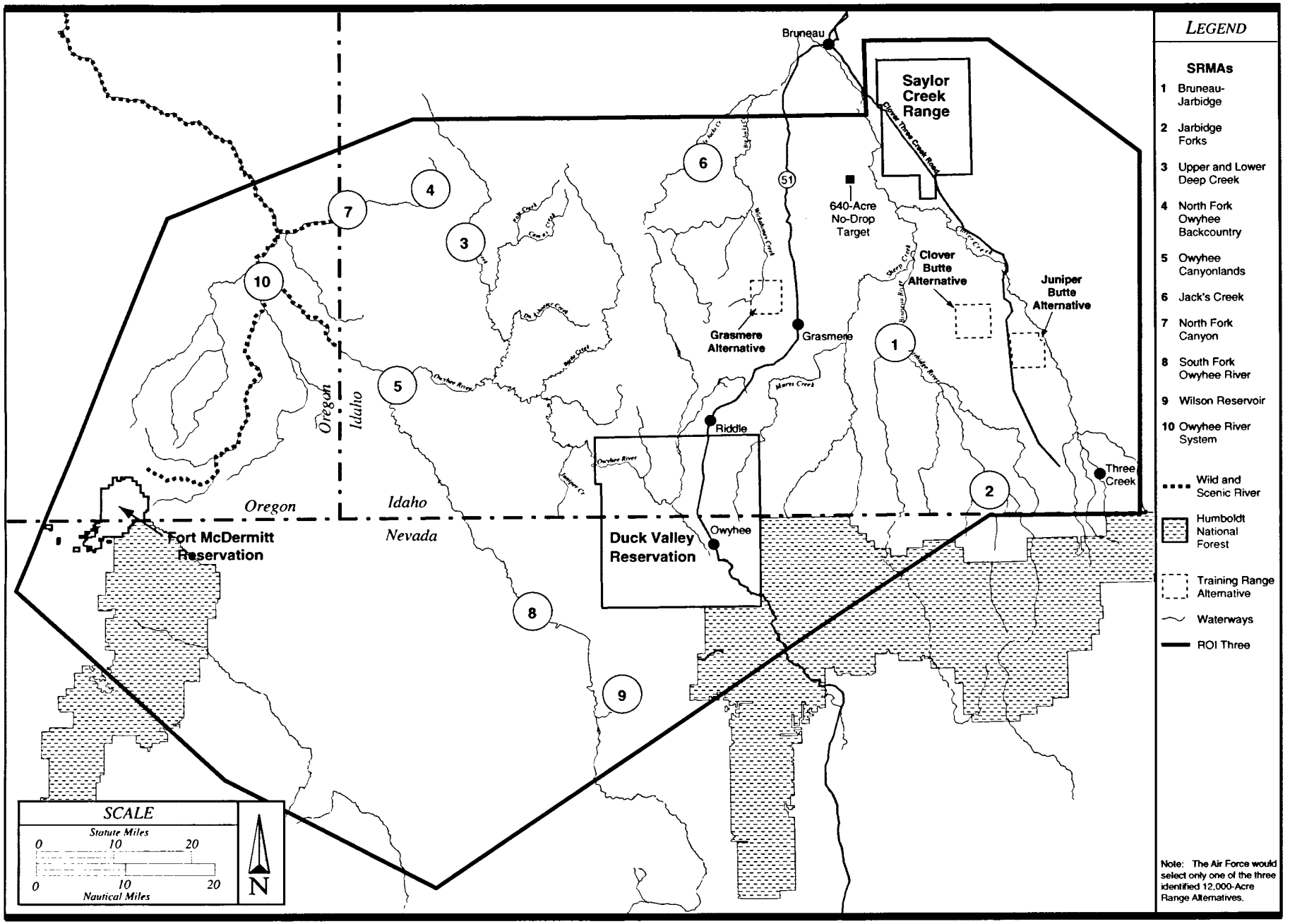



**Figure 3.11-1 Special Recreation Management Areas, Designated Wild and Scenic Rivers, and the Humboldt National Forest**

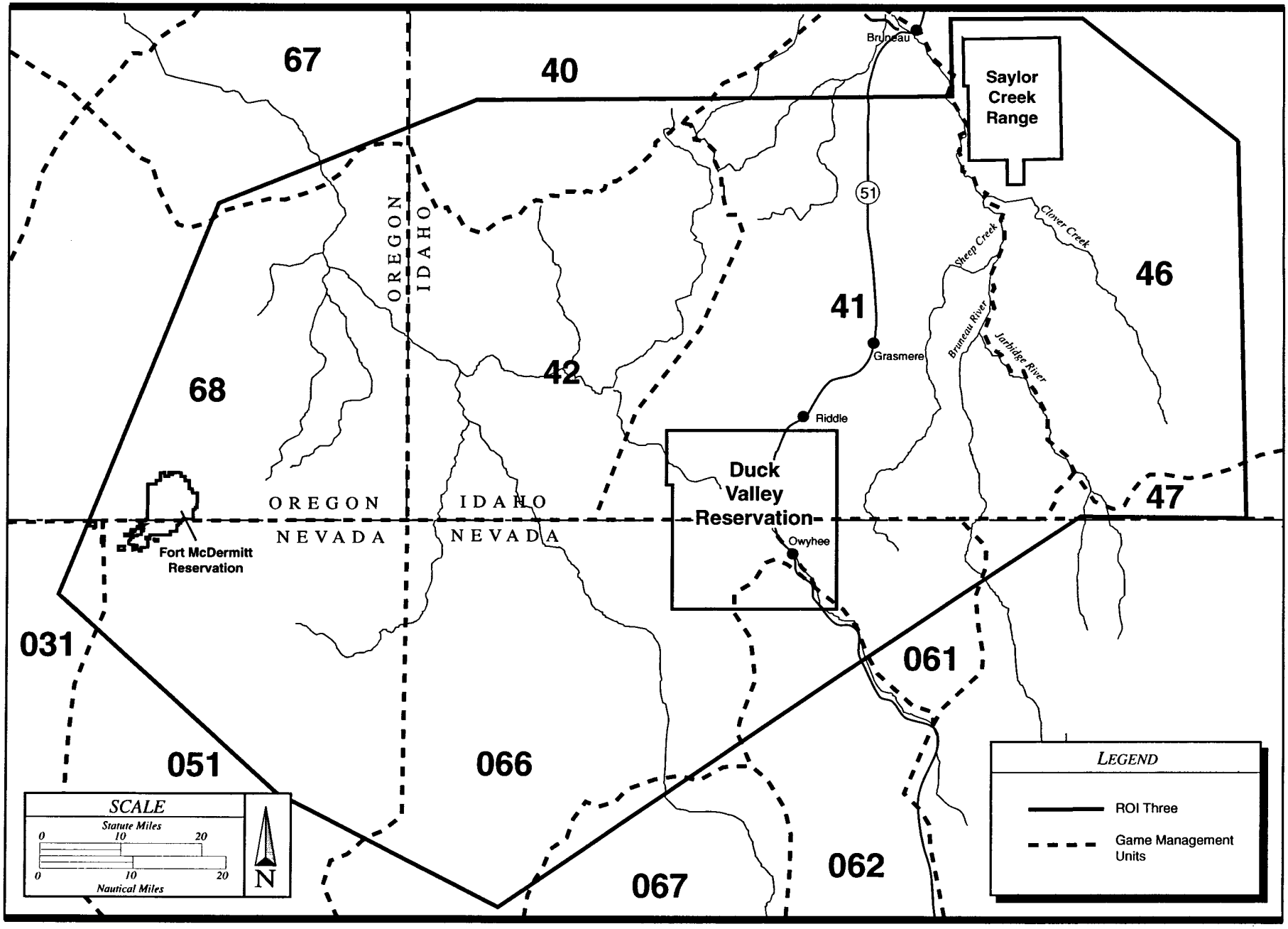



**Figure 3.11-2 Game Management Units in Oregon, Idaho and Nevada**

River running is also a popular recreation activity in ROI Three. The rivers available to float boat include the Owyhee River system, Deep Creek, and the Bruneau and Jarbidge River system. The float season generally runs from March through June; however, this can vary depending on the weather and runoff levels (Moore and McClaran 1989). The peak use season occurs in May for the Owyhee River (personal communications, Wilbanks 1996) and mid-May to mid-June for the Bruneau-Jarbidge river system (personal communications, Jenks; Ross 1996).

Camping occurs throughout ROI Three and is usually associated with other activities such as hiking, hunting, and float boating. While much of the public land provides numerous opportunities for primitive or undeveloped camping, developed recreation is minimal. Only one developed camping area exists within ROI Three in Idaho: the North Fork Recreation Site, which includes a 7-unit campground. The North Fork Crossing serves as the only road-accessible boating launch area and trailhead for trips into the Owyhee River Canyonlands system from the North Fork Drainage.

The dispersed nature and undeveloped area makes recreation use figures difficult to estimate. Recreational use figures are not available for the total land area under ROI Three; however, in portions of the Owyhee MOA, which includes the East and South Forks of the Owyhee River, and Deep, Battle, Pole, Camas, and Nickel Creeks, estimated visitor use was about 18,807 people in 1991 (Boise State University [BSU] 1993). Estimated visitor use under the Jarbidge MOA, which included the areas of the Bruneau and Jarbidge Rivers, and Sheep, Saylor, and Clover Creeks, was about 22,500 people in 1991 (BSU 1993).

Recreational activities such as hiking, hunting, and fishing under the proposed airspace expansion are similar to those in the surrounding area. This additional area, located in the Bruneau Resource Area, includes two WSAs: Little Jacks Creek WSA and a portion of Big Jacks Creek WSA. Approximately 75 miles of scenic river canyons traverse this area. These WSAs were established for their primitive recreation and solitude opportunities. They also provide habitat for 150 California bighorn sheep. Areas not recommended for WSA designation and outlying areas provide recreation for OHV use and other types of less primitive recreation.

Within ROI Three, ROS classifications range from Primitive (such as the Owyhee River, Bruneau River, Jarbidge River) to Rural (such as Grasmere and Riddle). Although not all areas under the ROI have been given an ROS classification, some areas, such as WSAs and ACECs, would most likely be classified as Primitive or Semi-primitive Non-motorized. Along primitive or graveled roads, the ROS would most likely be Semi-primitive Motorized or Roaded Natural.

#### *OREGON RECREATION*

Recreation in eastern Oregon in the ROI is similar to the activities found in Idaho. Hunting, hiking, river running, camping, and OHV use occur in WSAs, ACECs, and SRMAs as well as in non-designated public lands. WSAs and ACECs that support recreation activities are shown on Figure 3.10-4 and 3.10-5; SRMAs are shown on Figure 3.11-1.

In Oregon, the Owyhee River, Owyhee Reservoir, and the accompanying canyonlands and WSAs receive heavier visitor use than on the Idaho side. In 1995, the Owyhee reservoir received an estimated 109,000 visitor-days per year (one visitor-day is equivalent to one person visiting an area for one day [personal communication, Bammann 1996]). All but 14 miles of the Owyhee River between Owyhee Reservoir and the Oregon/Idaho border is designated a National Wild River (Figure 3.11-1). Whitewater boating within a scenic area is the primary recreational activity. The whitewater boating season, depending on climate, winter snowpack, and runoff rates, extends from February through June, with the greatest use occurring from mid-April to mid-June. This limited season, combined with difficult access, rugged terrain, and state restrictions, has kept boating activities low. In 1996, estimated user days of the Owyhee River above Three Forks (including the East and South forks of the Owyhee River in Nevada and Idaho) was 1,400 (personal communication, Zukert 1996). The Owyhee River in Oregon has also been designated as an SRMA.

There are three WSAs located under the Paradise MOA (in Oregon) and 11 WSAs under the Saddle MOAs. These WSAs were established for their unique geological features, recreational opportunities, and wildlife habitat values. Most the WSAs receive light recreational use, but a few, such as Upper Leslie Gulch, Honeycombs, and Owyhee Breaks, which are associated with the Owyhee Canyon Reservoir, receive heavier use. Blue Canyon and Slocum Creek WSAs are also popular with recreation visitors. Dispersed recreation activities vary depending on the WSAs. River running, hunting, hiking, general sightseeing, photography, and camping are all popular activities occurring within the WSAs.

Game Management Units located in ROI Three in Oregon include the Whitehorse and Owyhee Game Management Units (refer to Figure 3.11-2). Both big game (bighorn sheep, mule deer, antelope) and a variety of upland game (sage grouse, chukar, and quail) are hunted throughout these units. Severe drought and associated poor fawn survival caused a sharp decline in mule deer population in 1995. Historical harvest for mule deer is 820 compared to 147 in 1995. Nine permits were issued for bighorn sheep controlled hunts. A 100 percent success rate was achieved in 1995 for this big game.

As in Idaho, ROS classifications range from Primitive to Rural. WSAs and ACECs would most likely be classified as Primitive or Semi-primitive Non-motorized. SRMAs and high use areas such as the Owyhee Reservoir would most likely be Semi-primitive Motorized or Roaded Natural.

### *NEVADA RECREATION*

A wide range of topography within ROI Three in Nevada provides diverse opportunities for recreation. The desert interior portion of the ROI dissects the rugged Bull Run and Santa Rosa Mountain Ranges. Predominant recreational activities are fishing, hunting, camping, sightseeing, boating, and OHV use.

Besides undeveloped or private recreation areas, recreational resources include two SRMAs, the Humboldt National Forest, and two WSAs (SRMAs and Humboldt National Forest are shown on Figure 3.11-1; WSAs are shown on Figure 3.10-4). The Wilson Reservoir SRMA is used predominantly by fishermen, boaters, and campers. Use of the area, which peaks from May through July , is heavily dependent on fishing quality, which in turn is dependent on water levels, snowpack conditions, and irrigation demand. Use has also been affected by increased travel costs and other recreational development in the area. The Wilson Reservoir has one developed campground.

The South Fork Owyhee River SRMA is used primarily for river-running, which is also heavily dependent on water levels. Water levels were so low in seven of the last nine years as to preclude such use. The season lasts only from March to mid-June at the latest. Conditions are very primitive and visitor use is very low (personal communications, Trieman 1996). Chukar hunters are known to visit the area in the fall season. Some fishing occurs in this river as well.

Mountain ranges in the Humboldt National Forest include the northern portion of the Santa Rosa Range and the Bull Run Mountains. Recreational uses in the Mountain City Ranger District, which manages the Bull Run Mountains, include camping, hunting, fishing, snowmobiling, horseback riding, and mountain biking. Fishing use is expected to increase with the addition of a fish hatchery on the Bull Run River. One developed campground and one picnic area can be found in the Santa Rosa Range district. The Bull Run Mountains have two developed campgrounds. Most of the usage of the developed facilities occurs during the summer and fall hunting season.

Game management units located within ROI Three in Nevada include 031, 051, 066, 067, 062, and 061 (refer to Figure 3.11-2). Both big game (bighorn sheep, mule deer, antelope) and a variety of upland game (sage grouse, chukar, and quail) are hunted throughout these units. Unit 051 is the highest used area for deer hunting of those listed above. In 1995, there were 3,357 hunter days within this unit as compared to 4,908 for combined units of 061, 062, 064, 066, 067, and 068 (personal communication, Gray 1996).

### 3.11.1.2 ROI Two

Noise levels have fluctuated over the past 50 years due to different aircraft and types of flying performed. Noise disturbance from military aircraft has been identified as an issue; however, military training has not precluded opportunities for solitude, decreased the visitor use of the area, or prevented nomination of areas for wild and scenic designation (BSU 1993; Bureau of Outdoor Recreation 1976). Due to the subjective nature of defining a quality recreational experience, some visitors have commented through the public involvement process that their recreational experience has diminished due to the startle effect of military aircraft overflights. However, others, on the other hand, did not find aircraft overflight intrusive to their recreation experience and return to the same area with the knowledge that aircraft overflight may occur in the area.. There are many cases when visitors are not overflown by military aircraft due to different training scenarios.

As discussed in section 3.11.1, ROI Two is used for detailed analysis of recreational resources, since a change in access to a recreation area or construction of support facilities for the range could directly affect recreation activities and visual resources.

Recreation activities in ROI Two are similar to those discussed for ROI Three, i.e., hunting, hiking, camping, OHV use, and nature viewing, among others. SRMAs, WSAs, and ACECs are located throughout ROI Two. The two SRMAs located in ROI Two, Bruneau-Jarbidge and Jarbidge Forks, were identified to manage sensitive recreation and natural resource values related to float-boating and the Bruneau-Jarbidge River system. SRMAs are shown on Figure 3.11-1. Wilderness areas that attract visitors seeking primitive recreation experiences are associated with the river system dissecting ROI Two. Potential areas within Idaho that exhibit wilderness characteristics were studied and identified by the BLM (BLM 1991d). WSAs are managed to protect their wilderness qualities until their designation. Of primary importance in the establishment of WSAs are opportunities for solitude and primitive and unconfined recreation in a pristine setting. WSAs are shown on Figure 3.10-4 and discussed in section 3.10.3. WSAs along the Bruneau-Jarbidge River system were established for their primitive recreation and solitude opportunities in a natural setting.

The deep scenic canyons and river system that traverse the ROI draw the majority of recreation visitors. The most popular area is the Bruneau-Jarbidge River system. Shown on Figure 3.11-3, this river system has cut deep scenic canyons that dissect grass and sagebrush-covered plateaus. The rivers and canyon provide visitors with an opportunity to hike rugged terrain, boat/kayak along river rapids, and hunt big game in a remote spectacular canyon setting. Public comments received during the scoping process of this EIS attest to the character of the area. "Solitude," "wilderness setting," "spectacular scenery," "remote," and "unique" were all used to describe the area.

The combination of scenery and floatboating opportunities draw visitors locally as well as nationally. The Bruneau River system flows northward from Nevada through southern Idaho to the Snake River. The river has cut two principal canyons in the plateau: the Jarbidge River and the West Fork Bruneau River canyons. The Jarbidge carries the majority of the water flow and merges with the West Fork into the Bruneau River about 24 miles north of the Nevada border (Figure 3.11-3).

The Bruneau-Jarbidge River system was recommended for Wild and Scenic River designation by the National Park Service (NPS) in 1979. It is currently managed by the BLM so as to not impair its designation as a wild and scenic river. The Bruneau-Jarbidge rivers have a reputation for challenging whitewater boating that includes rafting, kayaking, and canoeing in a primitive setting. While no permits are required for the general public for running the river, the BLM has increased its management responsibilities in the last year due to the increase in use (personal communication, Jenks 1996). The East Fork Bruneau Canyon is not used for float boating, but some hiking and hunting occurs in the area.

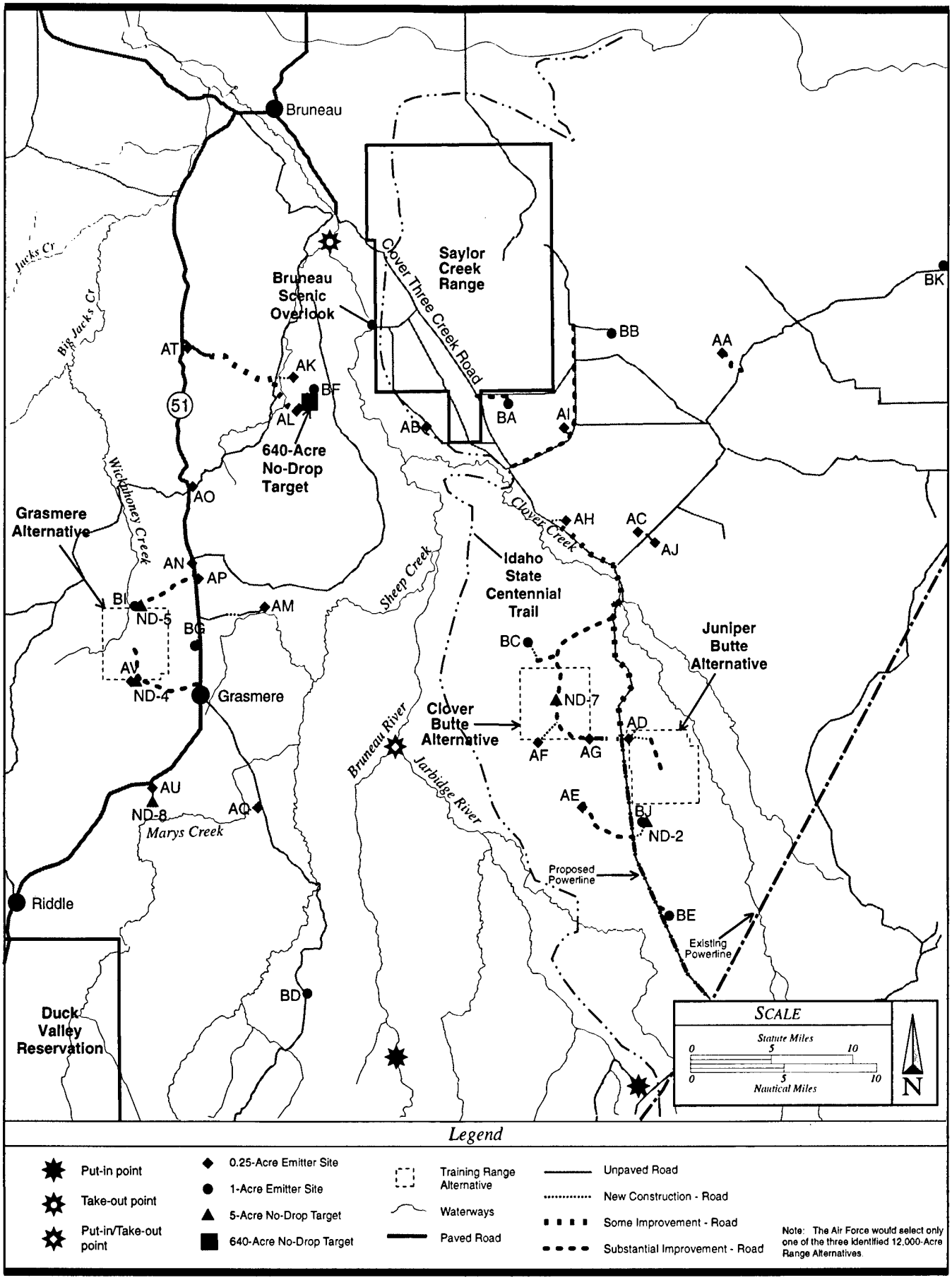



**Figure 3.11-3 Bruneau-Jarbidge River System and the Idaho State Centennial Trail**

There are four access points or put-in/take-out points for river runners along the Bruneau-Jarbidge River system. These access points and their relationship to the proposed target areas are shown on Figure 3.11-3. The limited accessibility to the river and canyon area has been attributed to keeping visitor use low and opportunities for solitude high. It takes about 5 to 6 hours to reach the put-in point at Murphy Hot Springs from Boise. Heaviest visitor use is on the weekends when the visitor can stay for more than one day (personal communication, Jenks 1996).

Access for hunting, hiking, camping, etc., for the most part takes place along rough dirt roads. While most of these roads are accessible by two-wheel drive vehicles, four-wheel drive is often recommended. Although unpaved, the road network forms important access routes for ranchers, recreation visitors, residents, and land managers. Clover-Three Creek Road is the main access road into and through SCR. A dirt road off the Clover-Three Creek Road provides the access to the Bruneau River take-out point for float boaters of the Bruneau-Jarbidge River system. The road network within the ROI is discussed in section 3.10-4.

Upland game hunting occurs extensively throughout the ROI. Upland game includes sage grouse, chukar, quail, pheasants, and rabbit. Big game, such as bighorn sheep, mule deer, and antelope are also hunted within the ROI. Table 3.11-1 shows mule deer hunting statistics for game management units 41, 46, and 47, which are located within the ROI. Controlled hunts for antelope are also held in these units. In 1995, 163 hunters participated in controlled hunts. This represents approximately 5 percent of antelope hunters within the state.

**Table 3.11-1. 1995 Mule Deer Hunting Data for Units 41, 46 and 47**

| *Unit* | *Hunters** | *Days/Hunter* | *Total Days** |
|---|---|---|---|
| 41 | 411 | 5.1 | 2,083 |
| 46 | 475 | 6.2 | 2,968 |
| 47 | 146 | 3.6 | 530 |
| Statewide | 139,800 | 8.8 | 1,224,800 |

*includes general and controlled hunts.

In 1995, four controlled hunts for California bighorn sheep occurred within ROI Two. Table 3.11-2 shows the summary of hunter activity and harvest for each unit as well as statewide. Controlled hunts for bighorn sheep are held in the fall. For the 1995 season, controlled hunts were held from August 30 to October 14.

The hunting season varies by animal and equipment used. For general deer hunting, including bow hunting, the season runs from August to the end of October. For antelope, the season runs

| Table 3.11-2. Hunting Statistics for California Bighorn Sheep in 1995 | | | | | | |
|---|---|---|---|---|---|---|
| *Unit* | *Permits Sold* | *Harvest* | *Hunters* | *% Success* | *Days/ Hunter* | *Total Days* |
| 41-1 | 5 | 5 | 5 | 100 | 8.5 | 35 |
| 41-2 | 5 | 5 | 5 | 100 | 3.8 | 32 |
| 41-4 | 3 | 3 | 3 | 100 | 7.5 | 19 |
| 46 | 6 | 3 | 6 | 50 | 10.5 | 38 |
| Statewide | 39 | 25 | 39 | 64 | 7.5 | 293 |

from the last week in September to the last week in October. For various upland game birds, the season generally runs from mid-September through December.

Other recreational opportunities under ROI Two include rock hounding, recreational mining, nature viewing, camping, photography, and hiking. The Idaho State Centennial Trail dissects this area (refer to Figure 3.11-3). Designated in 1990, this trail extends about 1,200 miles from Nevada to the Canadian border. The trail was designed using existing game and cattle trails and back-country roads. No new trail improvements have occurred as yet. The trail is open for a variety of uses including horseback riding, hiking, mountain biking, and motorized trail-biking. Presently only portions of the trail have signs posted. No visitor use data for the trail is available (personal communication, Seibert 1996).

The Idaho Department of Commerce, however, estimates that tourism is Idaho's third largest industry (Idaho Department of Commerce 1995). The demand for outdoor recreation reflects this trend. In the 1980s, visitors using outfitters and guides in Idaho increased 9.6 percent annually (JML2 Consulting 1987). The increase in popularity has been attributed to several factors: (1) nationwide recognition of Idaho as a state for whitewater rafting, and (2) the Bruneau-Jarbidge river system offers a different type of boating experience. Many float boaters have run the more popular and easily accessible rivers. The Bruneau-Jarbidge river, located in a remote desert environment, with a moderately difficult shuttle, offers a more primitive and less crowded whitewater boating experience (personal communication, Simonds 1996).

The Lower Snake River District of the BLM have attempted to capture the change in recreation activity on the Bruneau-Jarbidge River systems by comparing estimated floater use on the Bruneau in the years 1983 to 1985 with floater use in the years 1995 to 1997. In the earlier period, estimated floater use ranged from a high of about 300 persons in 1983 (a good water year), to a low of about 100 persons in 1985 (a low water year). In 1995, estimated boater use was 3,114 persons; in 1996, 3,262 persons; and, in 1997, an estimated 3,176 persons floated the Bruneau (BLM 1997). Recreation use on these rivers has increased significantly in recent years, reflecting national trends on similar rivers throughout the west.

As discussed previously, the dispersed nature and undeveloped area makes recreational use figures difficult to determine. While no recreational use figures were available for the total land area under the ROI, estimated visitor use under the MOA airspace associated with SCR, which included the areas of the Bruneau and Jarbidge Rivers, and Sheep, Saylor, and Clover Creeks, was about 22,500 people in 1991 (BSU 1993). The primary activities occurring were fishing, hiking, sightseeing, hunting, camping, and river running. Most recreation activities take place predominantly near rivers and associated canyon areas. While no designated campsites are located within ROI Two, primitive campsites are found along river canyons, drainages, and escarpments.

A steady increase in using guides for river running has also occurred in the 1990s (personal communication, Simonds 1996). However, the BLM limits the number of outfitters and size of party allowed on the Bruneau-Jarbidge River system. Coupled with low water, the river system will vary from year to year on use of commercial outfitters. From 1991 to 1996, 126 guests participated in 15 commercially-led trips on the Bruneau River (personal communication, Ross 1997).

Since the early 1990s, non-commercial river use has grown extensively. The BLM has a volunteer permit system for non-commercial users of the river; however, it is expected that only a very low percentage of users actually fill out the volunteer registration (personal communications, Ross and Jenks 1996). In 1996, estimated non-commercial visits to the river was 2,782 (personal communication, Jenks 1996).

The ROS within ROI Two is predominantly classified into two broad categories: Semi-primitive Motorized/Roaded and Primitive/Semi-primitive Non-motorized. Due to the numerous dirt roads created by hunters and other recreation visitors, Roaded areas predominate the ROI. Figure 3.11-4 shows the ROS classification for the proposed range components of the Clover Butte Alternative.

## 3.11.2 Visual Resources and Setting

### 3.11.2.1 ROI Three

ROI Three is characterized by broad rolling upland plains cut by numerous drainages and mountainous terrain. In many areas, the relatively flat landscape allows for a broad view to distant mountains. In other areas expansive views are screened by low intervening features (e.g., vegetation) and undulating terrain. Other portions of the ROI contain mountainous forests that offer extremely limited views, or extensive lava flows that provide unique geologic and vegetative variations in the landscape.

A number of visually unique areas are located within the ROI. Views from and of the deeply incised Bruneau, Jarbidge, and Owyhee canyons are valued because of the dramatically winding character of their respective rivers. From within the canyons, boaters, hikers, and anglers have extraordinary views of steep stratified volcanic cliffs. Views from the rims of

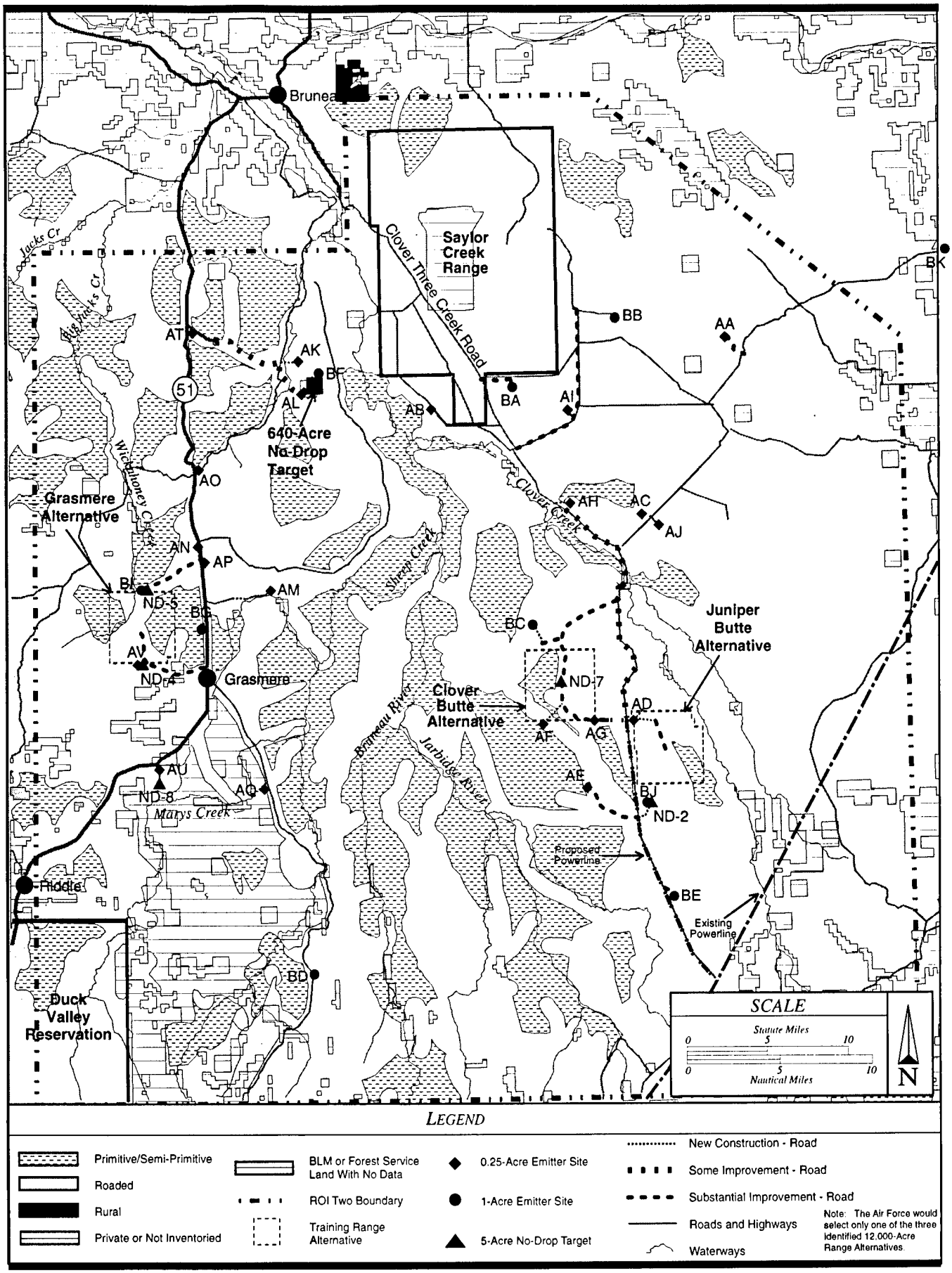



**Figure 3.11-4 Recreational Opportunity Spectrum (ROS) in ROI Two**

these canyons reveal the impressive contrast between the vast sagebrush plains and the deep river canyons.

Few developed areas exist under ROI Three. Rural communities are located along the major roadways traversing the area. Land uses consist primarily of grazing, and, to a lesser extent, mining, agriculture, and recreation. Structures that support these activities are scattered throughout the ROI. Structures associated with land use activities include fences, gates, water troughs, ranches, telephone poles, and mining operations. In addition, a natural gas pipeline crosses the ROI under the Owyhee and Paradise MOAs from the northeast to the southwest.

In Oregon, segments of the Owyhee, West Fork of the Little Owyhee, and the North Fork of the Owyhee are designated as Wild Rivers. The contrasting colors and unique features found in these deep river canyons provide for dramatic views. The reddish-brown canyon walls reach up to 1,000 feet above the dusty beige sagebrush slopes that define the river's edge. A variety of eroded features such as towering spires or perched rock formations can be found in the main and side canyons.

Small communities located along major highways are also located in Oregon. Land uses and the structures associated with them are the same as those in Idaho. Campgrounds, boat launches, and developed picnic sites are located around the Owyhee River reservoir. Duck Valley Reservation, located on the Idaho-Nevada border, and Fort McDermitt Reservation, located on the Oregon-Nevada border, are both located within ROI Three. Both of these communities have structures and buildings found in a typical agricultural desert environment.

The southern part of the airspace ROI, which extends into Nevada, includes a portion of the Humboldt National Forest. The forest is characterized by outstanding scenery that provides hikers and campers unique visual experiences. Land uses that affect the viewshed include small rural communities and structures associated with timber production, grazing, recreation, and mining.

Due to the extensive nature of ROI Three, not all areas have been classified with a VRM classification. However, some general assumptions can be made. In the canyon areas such as the Owyhee River and Deep Creek, the VRM would most likely be Class I or Class II. On the flat expansive plateau areas, the VRM would most likely be Class III or Class IV.

### 3.11.2.2 ROI Two

A number of visually unique and sensitive areas are located within ROI Two. Views from and of the deeply incised Bruneau and Jarbidge canyons are valued because of the winding character and unique geologic features. Both the Bruneau and Jarbidge river canyons plus the tributary canyon of Sheep Creek have been recommended for Wild and Scenic River designation by the NPS. From within the canyons, whitewater boaters, hikers, and anglers have extraordinary views of the steep stratified volcanic cliffs. Views from the rims of these canyons reveal the impressive contrast between the vast sagebrush plains and the deep river

canyons. A designated scenic overlook adjacent to the SCR offers such a view of the Bruneau River Canyon.

Few developed areas exist under ROI Two. Three rural communities are located in the ROI: Grasmere, Riddle, and Three Creek. These communities are very small and consist of a few buildings that support the agricultural economic base. The majority of land uses under ROI Two consist of grazing and primitive recreation. Activities that support these uses are dispersed throughout the area. Structures associated with these activities include fences, gates, roads, water troughs, ranches, telephone poles, and transmission lines. The Grasmere EC emitter site is located along Highway 51. This military development consists of several buildings, radar emitters, fuel and water tanks, and an 85-foot-tall radio tower with platform. The site has four diesel generators and several 40-foot tall area lighting poles. The entire compound lies on about 5 acres and is fenced and graveled. An 1,800-foot gravel road provides access to the site.

Other developments under the ROI include five active mining claims or leases. These areas are the Hot Springs limestone quarry located south of Bruneau, the Bruneau jasper mine located at the confluence of the Bruneau and Jarbidge rivers, Cat Creek Claims located just south of the confluence of Sheep Creek and Cat Creek, the Guano Claims located on the east side of Clover Creek, and a sand and gravel pit located next to the Clover-Three Creek Road on SCR. For further discussion of mining activity refer to section 3.5, Earth Resources.

Two former Pershing missile sites are also included in the analysis. One site is located within ROI Two near the proposed Grasmere site. The other site is located near Hagerman, Idaho. Currently no structures are located on either area. Both sites are fenced and have been graveled.

As discussed, the BLM uses the VRM classification system to identify the existing visual character of the landscape and define the allowable extent and type of modification to the landscape. The VRM system rates visual character from the most sensitive (VRM Class I) to the least sensitive to change (VRM Class IV).

Figure 3.11-5 shows the VRM classes within ROI Two. VRM Class I areas are attributed to the canyon areas of the Bruneau and Jarbidge rivers, the lower reaches of Clover Creek, and WSAs. From within the canyons, boaters, hikers, and anglers have extraordinary views of the steep stratified volcanic cliffs. Views from the rims of these canyons reveal the impressive contrast between the vast sagebrush plains and the deep river canyons. Visual resource management Class I settings are the most scenic and highly sensitive to change. In terms of shape, form, and color, this class is the most complex, filling the visual landscape and drawing the viewer's attention. The majority of the ROI is classified as VRM Class III and IV. Class III areas may include roads and developed areas. The East Fork of the Bruneau Canyon has also been assigned this rating. The visual resources of areas in this class tend to be homogeneous in terms of shape, form, and color, or have been modified by development (e.g., roads). Changes

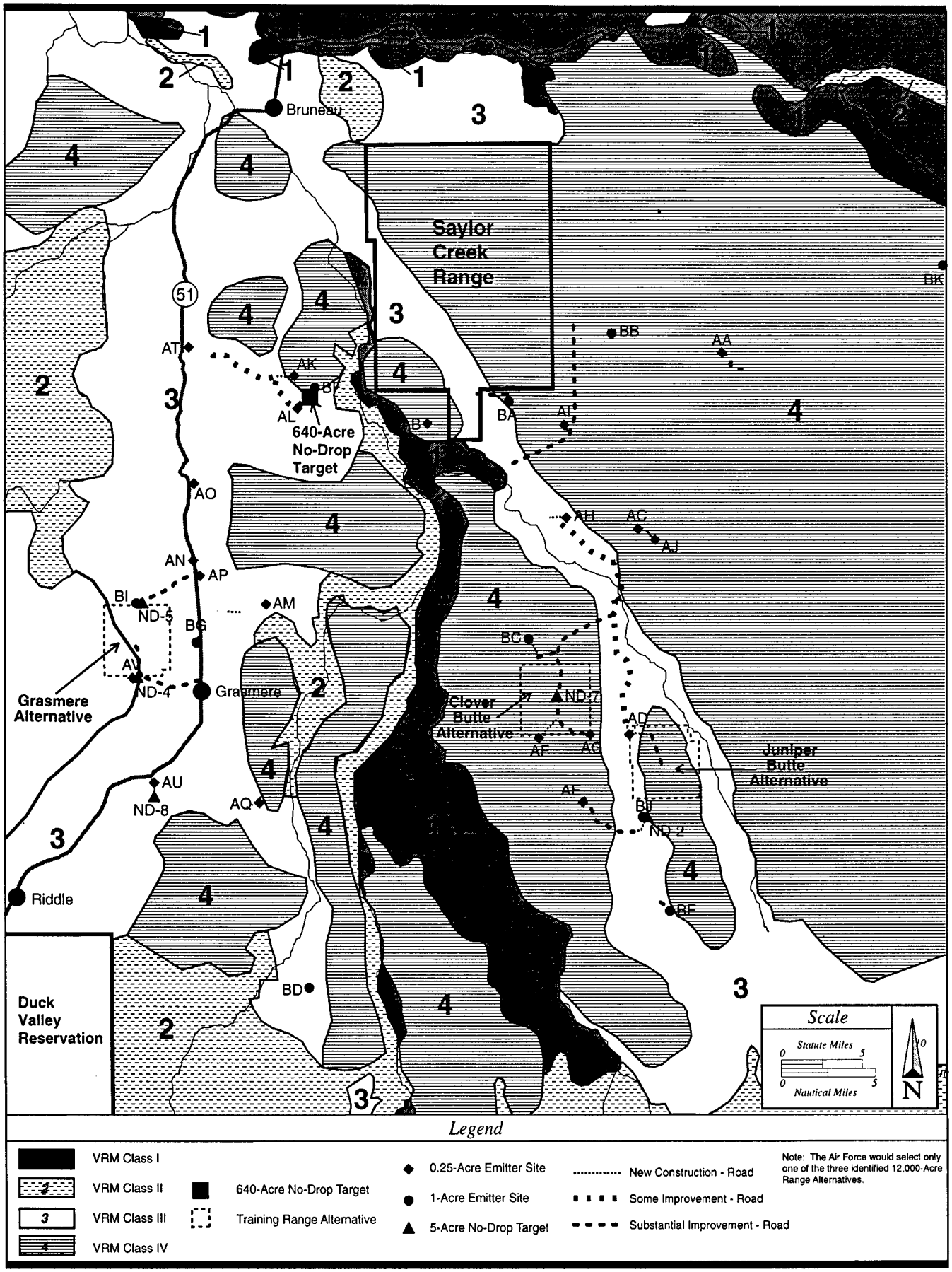



**Figure 3.11-5 Visual Resource Management Classes in ROI Two**

in the landscape (e.g., grazing) are allowed but they should remain subordinate to the existing landscape.

Class IV areas represent those areas that have previously been modified or are the least sensitive to changes in the landscape. Developments and structures may dominate the landscape. Areas around SCR exemplify the characteristics of visual resource management Class IV areas. In this area, the complexity is low with expansive views of the flat fields of unvaried sagebrush.

The visual analysis also includes a line-of-sight analysis that looks at various viewpoints within the ROI that focus on the proposed range structures. Viewpoints were selected along existing roads and trails because most people use these areas while recreating or passing through. The viewpoints are used to determine whether the proposed targets can be seen by an average traveler. Except for viewpoint 14 and 17, these viewpoints do not represent a specifically designated area, but rather a common or typical vista. Viewpoint 14 is the Bruneau Scenic Overlook, which was designated as a scenic overlook for the view of the spectacular canyon area of the Bruneau River. Viewpoint 17 is located within the Bruneau River-Sheep Creek WSA. Viewpoints, selected by the BLM, are shown on Figure 3.11-6.

### 3.11.3 Shoshone-Paiute Issues Concerning Recreation and Visual Resources

Representatives of the Shoshone-Paiute Tribes have expressed concerns regarding some forms of recreational use of the region and existing visual intrusions.

A few recreational users in Owyhee County have reportedly disturbed archaeological sites and other cultural resources important to the Shoshone-Paiute. Often this disturbance is unintentional, but willful vandalism does occur and is of great concern to the Tribes. Such purposefully destructive vandalism can include "pot hunting" (unauthorized excavation and artifact theft); defacement of rock art; and driving off-highway vehicles over fragile cultural resources.

In a study of vandalism on archaeological sites in southwestern Colorado, Nickens et al. (1981) found that proximity to unpaved roads was a predictor for rates of vandalism. Familiarity with an area and ease of access were important factors, as well. Under much of ROI Two, access is primarily along rough dirt roads that are accessible by two-wheel drive vehicles, but four-wheel drive vehicles are recommended. During the ETI environmental analysis, field archaeologists observed evidence of previous artifact collecting on some cultural resources, especially those located near roads.

Representatives of the Shoshone-Paiute Tribes have identified various unwanted visual intrusions near the Duck Valley Reservation today. These include both commercial and military facilities, such as the Air Force's existing five-acre Grasmere EC emitter site and the small town of Grasmere on Highway 51. Visual intrusions can potentially degrade the solitude and naturalness that are important to certain Shoshone-Paiute ceremonial activities. Many Shoshone-Paiute also believe that such intrusions may have negative effects on spirits, plants, and animals that are important to their traditional culture.

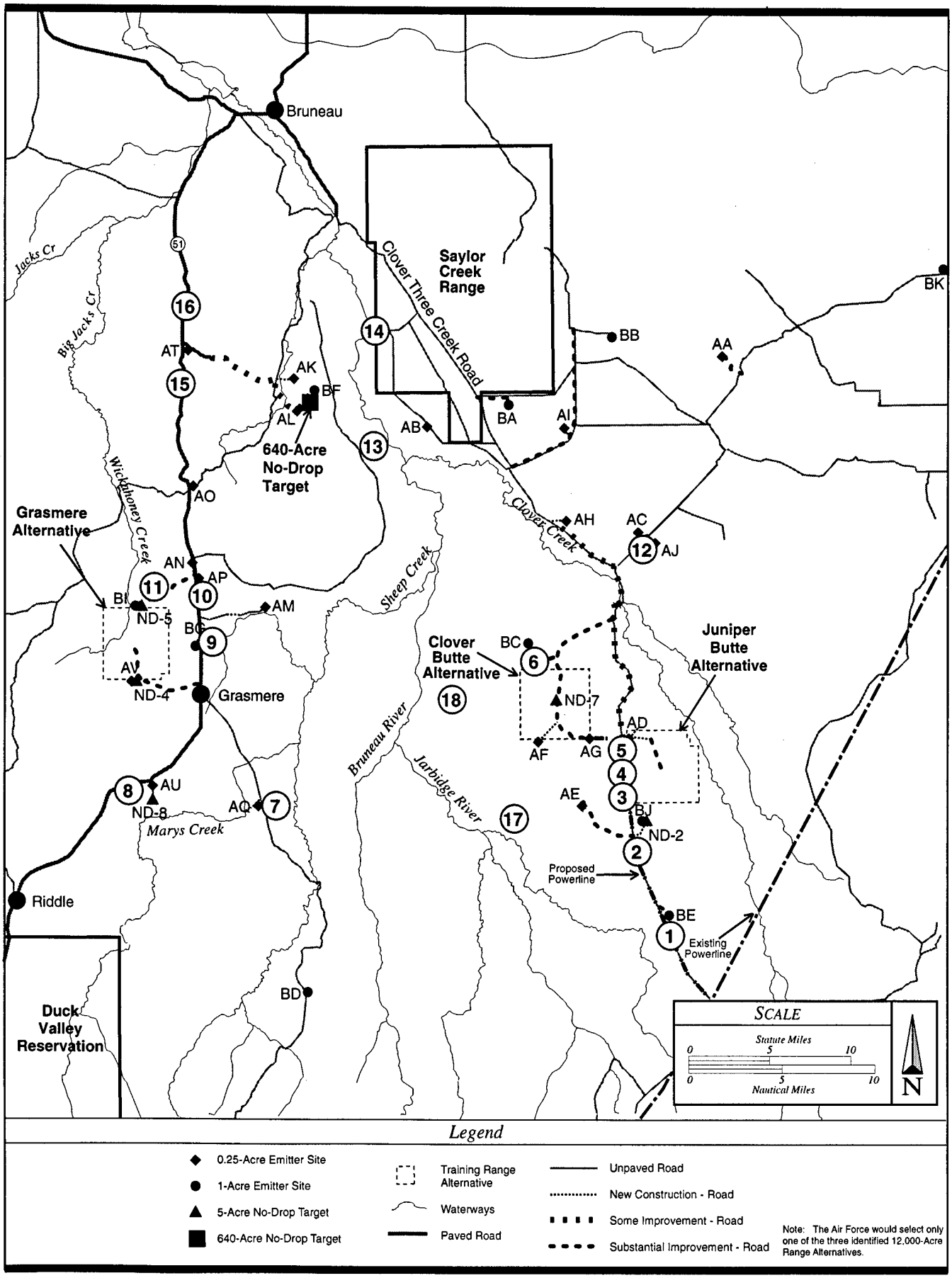
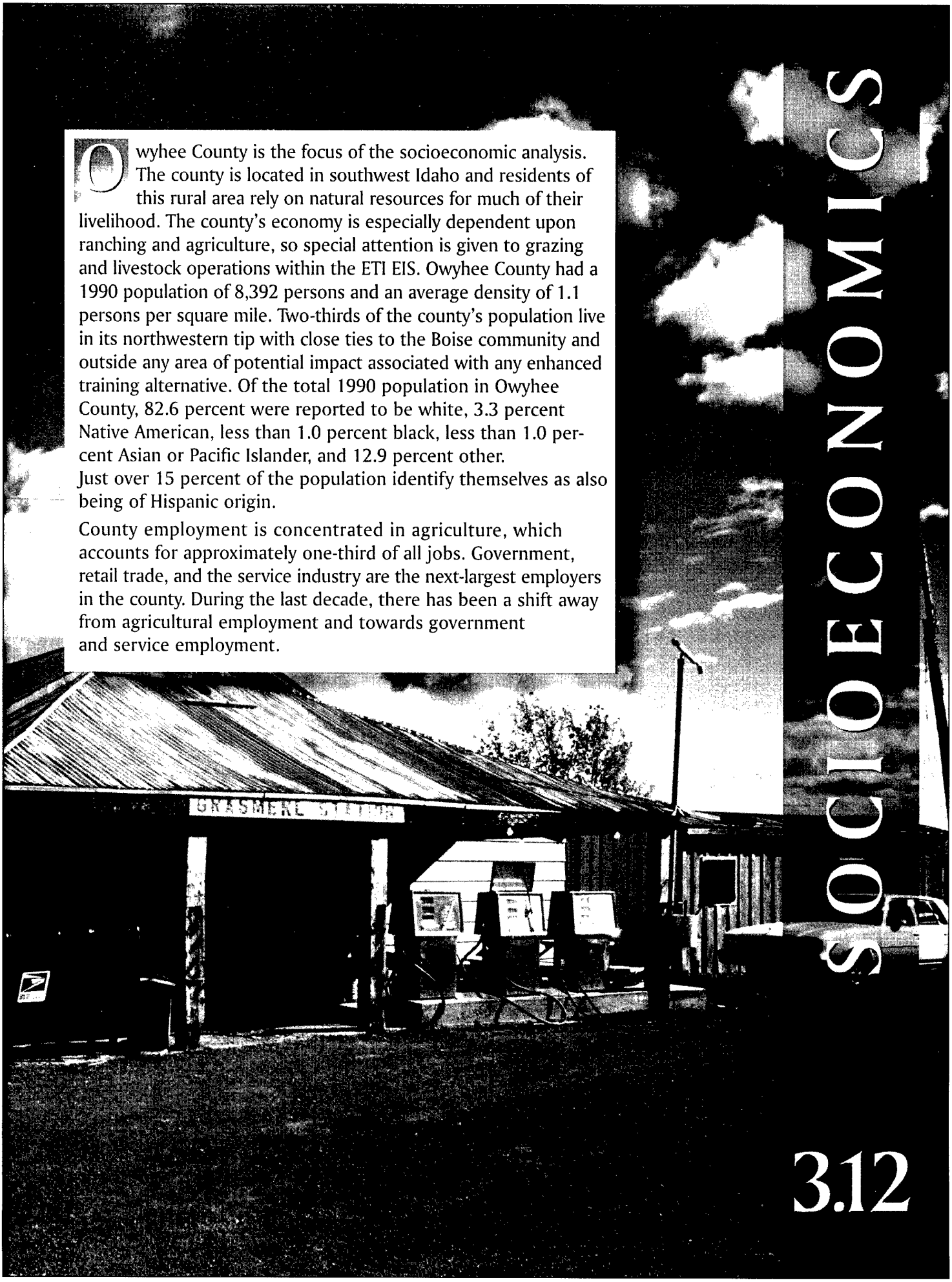



**Figure 3.11-6 Representative Viewpoints for Visual Analysis**



# SOCIOECONOMICS

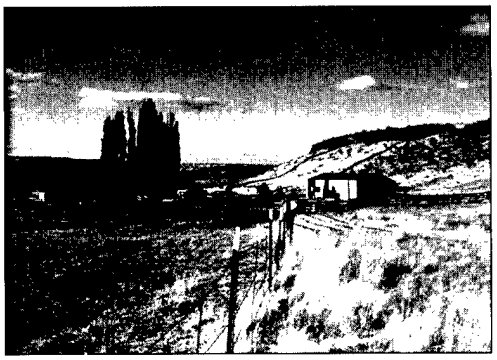
Owyhee County is the focus of the socioeconomic analysis. The county is located in southwest Idaho and residents of this rural area rely on natural resources for much of their livelihood. The county's economy is especially dependent upon ranching and agriculture, so special attention is given to grazing and livestock operations within the ETI EIS. Owyhee County had a 1990 population of 8,392 persons and an average density of 1.1 persons per square mile. Two-thirds of the county's population live in its northwestern tip with close ties to the Boise community and outside any area of potential impact associated with any enhanced training alternative. Of the total 1990 population in Owyhee County, 82.6 percent were reported to be white, 3.3 percent Native American, less than 1.0 percent black, less than 1.0 percent Asian or Pacific Islander, and 12.9 percent other. Just over 15 percent of the population identify themselves as also being of Hispanic origin.

County employment is concentrated in agriculture, which accounts for approximately one-third of all jobs. Government, retail trade, and the service industry are the next-largest employers in the county. During the last decade, there has been a shift away from agricultural employment and towards government and service employment.

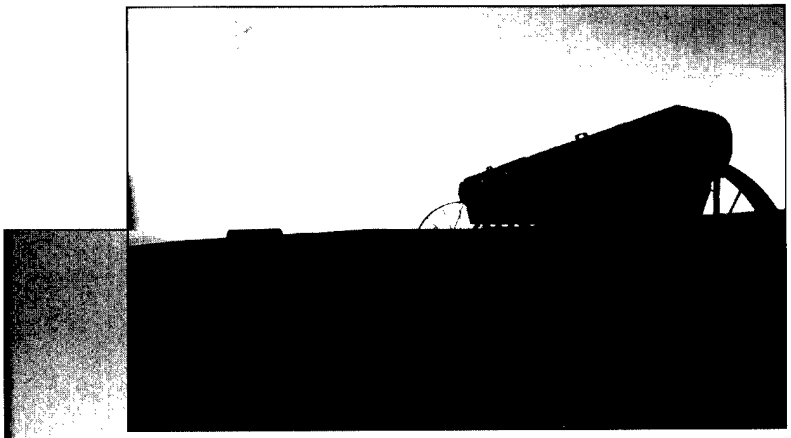
3.12

## SOCIOECONOMICS

Environmental Justice considers the potential for disproportionate environmental impacts incurred by ethnic or economic minorities as a result of a federal action subject to environmental review. Environmental Justice applies to all environmental resources, not just socioeconomics.



Socioeconomic information about the Duck Valley Reservation is included because the Reservation lies under the MOAs and Shoshone-Paiute traditional resources have been identified in the vicinity of range alternatives. Additional data regarding the Air Force outreach program to learn Native American concerns and take actions in response to those concerns are contained in the EIS.





# 3.12 SOCIOECONOMICS

Socioeconomics is defined as the social and economic activities associated with the human environment. Economic activity typically includes employment, personal income, and population, as well as housing availability and public services. For Owyhee County, socioeconomics has been dominated by agricultural and ranching way of life.

The range alternatives are located on Owyhee County grazing land. ROI Two was used for the socioeconomics analysis when possible because this is the principal area affected by implementation of a range alternative. Much of the data used for the analysis, however, was available only at the county level, so a modified ROI Three, which encompasses the counties most likely to be affected, was also used for the analysis. State school endowment and BLM lands within the project area are primarily used for grazing. Some land proposed to be withdrawn by the Air Force will place some limitations on grazing and recreation within the 12,000-acre withdrawal. Land use outside direct construction areas will remain unchanged. The potential change in land use for any tactical training range is small, relative to the total land area within the county currently dedicated to grazing. The direct impacts from the proposed action and alternatives are limited to Owyhee County. Duck Valley Reservation is in both Owyhee County, Idaho and Elko County, Nevada. The majority of administrative, commercial, and residential development and activity associated with Duck Valley Reservation occurs in the portion of the reservation located in Elko County; therefore, socioeconomic data regarding Elko County are also presented. Section 4.9.7 contains a more detailed discussion of the socioeconomic conditions and impacts on the Duck Valley Reservation.

Socioeconomic data are presented at the county, state, and national level so that baseline socioeconomic conditions can be analyzed in the context of regional, state, and national trends. Data have been collected from previously published documents issued by federal, state, and local agencies (e.g., annual county financial reports and previously prepared environmental planning documents); from state and national databases (e.g., U.S. Bureau of Economic Analysis' *Regional Economic Information System*); and from interviews with representatives from relevant agencies (e.g., BLM and Owyhee County). Much of the data pertaining to the Duck Valley Reservation is from the *1990 Census of Population and Housing* (particularly from the census' "Social and Economic Characteristics" volumes) and from information that the Shoshone-Paiute Tribes compiled and provided to the Air Force. Although these data were collected six years ago, general characteristics are still considered indicative of the reservation's population due to the continuity and consistency of the reservation's internal social, economic, and political structure (refer also to section 4.9.7).

## 3.12.1 Population and Housing

The most recently compiled and extensive statistics that address population and housing were published after the 1990 decenniel census by the U.S. Bureau of the Census. Subsequently, estimates for population have been prepared by the Bureau of the Census on an annual basis

for states, counties, and metropolitan areas. These data provide the basis for the following discussion of population and housing.

### 3.12.1.1 OWYHEE COUNTY

*POPULATION*

Based on the 1990 Census of Population and Housing (U.S. Bureau of the Census 1991a), Owyhee County had a total population of 8,392 people, or 0.8 percent of the state of Idaho total. The U.S. Bureau of the Census classifies all population in the county as rural, with averages of 1.1 and 1.2 persons per square mile for 1990 and 1995, respectively. The county's average household size was 2.84 persons, as compared to a statewide average of 2.73 (Table 3.12-1). The majority of the county's population is concentrated in its northern tip, which maintains closer interaction with population centers in neighboring Ada and Canyon counties than with the sparse population in the remainder of Owyhee County.

**Table 3.12-1. Owyhee County Population by Census Area, 1990**

| *Census Area* | *Total Population* | *Households* | *Household Size* |
|---|---|---|---|
| Bruneau Division | 609 | 216 | 2.63 |
| Grand View Division[1] | 928 | 272 | 2.83 |
| Grand View City | 330 | 141 | 2.34 |
| Homedale Division[2] | 1,116 | 376 | 2.74 |
| Homedale City | 1,963 | 732 | 2.63 |
| Marsing Division[3] | 1,483 | 389 | 2.99 |
| Marsing City | 798 | 304 | 2.63 |
| Murphy Division | 974 | 342 | 2.82 |
| Western Shoshone Division | 191 | 48 | 3.98 |
| Totals for Owyhee County | 8,392 | 2,820 | 2.84 |

Notes: 1. Does not include population count for Grand View City.
2. Does not include population count for Homedale City.
3. Does not include population count for Marsing City.

Source: Bureau of the Census 1990

The majority of Owyhee County's population, 64 percent, lives in the Marsing and Homedale cities and census divisions, located in the far northwestern portion of the county (Table 3.12-1). The Grand View Division and Grand View City together contain 1,258 people, or 15 percent of the county population. Approximately 7 percent (609 people) of county population resides in the Bruneau Division, which contains the majority of sites associated with the range alternatives. The Murphy Division has approximately 12 percent of county population, and the

Western Shoshone Division (the Idaho half of the Duck Valley Reservation [see section 4.9.7]) comprises less than 1 percent of the county population.

Between 1994 and 1995, total county population increased by 13.4 percent, to 9,520 people, or less than 1 percent of the state's total population. Of this 1,128-person increase, about 31 percent (or 350 people) reside in Homedale, 4 percent reside in Grand View, and 4 percent reside in Marsing. The remainder of this increase is distributed throughout the county.

*HOUSING*

In 1980, housing supply in Owyhee County totaled 3,015 units; by 1990, this number had grown to 3,332 (an increase of 10.5 percent). Of the 1990 total housing supply, 2,820 units (or 84.6 percent) were occupied. Of that total, 57.9 percent were owner-occupied; median value of these units was $39,900. Median rent of the 892 rental units in the county was $172 per month. In 1990, about 79.7 percent of occupied housing units were single-family, detached units; nearly 32 percent were mobile homes or trailers. County vacancy rates in 1990 were 3.0 percent for owner-occupied units and 6.9 percent for rental units. Approximately 375 units in the county were vacant as held for seasonal, recreational, or occasional use; for migrant workers; or other vacant, including boarded up.

### 3.12.1.2 ELKO COUNTY

*POPULATION*

Elko County reported a total 1990 population of 33,350 people, or less than 3 percent of the Nevada total (Table 3.12-2). The county is subdivided into 8 census divisions; nearly 75 percent of the county's population resides in the Elko Division, which encompasses the city of Elko (the county seat and commercial center of the region) and surrounding urban area. The remainder of the county is sparsely populated, with isolated communities, none exceeding populations of 2,500 people (U.S. Bureau of the Census 1993). The Mountain City Division contains the Nevada portion of the Duck Valley Reservation; all resident population associated with the reservation in Nevada is contained within the Owyhee Census Designated Place (CDP) (see section 4.9).

Between 1990 and 1994, total county population has increased by 20.5 percent, based on estimates prepared by the U.S. Bureau of the Census (1996), to 40,400 people. Recent estimates by the Elko County Manager's Office place the county's 1996 population at about 45,000 (personal communication, Elko County Manager's Office 1996).

*HOUSING*

Total housing supply in Elko County was 13,461 in 1990; of this total, 11,177 units (or 83 percent) were occupied. Of that total, 64.5 percent were owner-occupied; median value of these units was $80,400. Median rent of the 4,185 rental units in the county was $358 per month. In 1990, about 44.3 percent of all housing units were single-family, detached units; more than 36

| Table 3.12-2. Elko County Population by Census Area, 1990 | |
|---|---|
| *Census Area* | *Total Population* |
| Carlin Division | 2,300 |
| Elko Division | 24,246 |
| Elko City | 14,736 |
| Jackpot Division | 1,159 |
| Jarbidge Division | 113 |
| Montello Division | 213 |
| Mountain City Division | 1,333 |
| Owyhee CDP | 908 |
| Wells Division | 1,992 |
| West Wendover Division | 2,174 |
| Totals for Elko County | 33,530 |

Source: Bureau of the Census 1990

percent were mobile homes or trailers. County vacancy rates in 1990 were 2.4 percent for owner-occupied units and 11.5 percent for rental units. Approximately 775 units in the county were vacant as held for seasonal, recreational, or occasional use; for migrant workers; or other vacant, including boarded up.

## 3.12.2 Economic Activity

### 3.12.2.1 Owyhee County

#### *Employment*

The economy of Owyhee County slowed during the 1980s but was largely unaffected by the nationwide recession of the early 1990s during which time total jobs, average earnings per job, and per capita personal income continued to increase (Table 3.12-3). Between 1980 and 1990, total employment in the county decreased by nearly 300 jobs as compared to increases of nearly 90,000 statewide. During the 15 years between 1980 and 1994, total employment growth in the county expanded very slightly at 0.1 percent per year (or by a total of 1.3 percent), which was greatly outpaced by Idaho as a whole (2.6 percent job growth per year, or 39.9 percent growth overall) and the rest of the nation (1.9 percent job growth per year, or 27.0 percent job growth overall). During the recession of 1990-1991, job growth continued to increase in both the county and state while total employment decreased for the nation. By 1992, total jobs exceeded the

**Table 3.12-3. Economic Indicators, Owyhee County, State of Idaho, and United States, 1980 and 1990-1994 (in 1994 dollars)**

| | *1980* | *1990* | *1991* | *1992* | *1993* | *1994* | *Average Annual Change 1980-94* | *Total Change 1980-94* |
|---|---|---|---|---|---|---|---|---|
| Owyhee County | | | | | | | | |
| Total Jobs | 3,464 | 3,195 | 3,330 | 3,474 | 3,599 | 3,510 | 0.1% | 1.3% |
| Civilian Jobs | 3,410 | 3,141 | 3,279 | 3,422 | 3,549 | 3,453 | 0.1% | 1.3% |
| Military Jobs | 54 | 54 | 51 | 52 | 50 | 57 | 0.4% | 5.6% |
| Military Jobs/Total Jobs | 1.6% | 1.7% | 1.5% | 1.5% | 1.4% | 1.6% | 0.3% | 4.2% |
| Average Earnings per Job | $19,031 | $23,200 | $21,746 | $20,474 | $23,169 | $19,601 | 0.2% | 3.0% |
| Civilian Earnings per Job | $19,253 | $23,474 | $21,974 | $20,676 | $23,389 | $19,818 | 0.2% | 2.9% |
| Military Earnings per Job | $5,022 | $7,271 | $7,088 | $7,209 | $7,553 | $6,421 | 1.9% | 27.9% |
| Mil/Civ Earnings per Job | 26.1% | 31.0% | 32.3% | 34.9% | 32.3% | 32.4% | 1.7% | 24.2% |
| Per Capita Personal Income | $11,427 | $13,948 | $13,640 | $13,256 | $14,137 | $13,401 | 1.2% | 17.3% |
| State of Idaho | | | | | | | | |
| Total Jobs | 462,989 | 552,435 | 571,801 | 597,300 | 620,691 | 647,497 | 2.6% | 39.9% |
| Average Earnings per Job | $22,418 | $22,975 | $22,547 | $22,983 | $23,734 | $23,578 | 0.4% | 5.2% |
| Per Capita Personal Income | $14,660 | $17,165 | $17,089 | $17,581 | $18,139 | $18,272 | 1.7% | 24.6% |
| United States | | | | | | | | |
| Total Jobs | 113,725,800 | 138,981,300 | 137,737,500 | 138,473,400 | 140,817,500 | 144,390,500 | 1.9% | 27.0% |
| Average Earnings per Job | $25,700 | $27,153 | $27,210 | $28,115 | $28,121 | $28,291 | 0.7% | 10.1% |
| Per Capita Personal Income | $17,280 | $20,939 | $20,721 | $21,154 | $21,299 | $21,696 | 1.8% | 25.6% |

Notes: Jobs are average annual full- and part-time jobs, by place of work. Average earnings per job and per capita personal income were converted to constant 1994 dollars using the implicit price deflator for gross domestic product, personal consumption expenditures.

Source: U.S. Bureau of Economic Analysis 1996; U.S. Council of Economic Advisors 1996.

1980 employment level for the county. Based on economic forecasts for non-agricultural employment, the economic outlook for Owyhee County calls for continued job growth through 2005, with non-agricultural employment alone projected to increase to 2,044 jobs, or a 2.4 percent overall increase over the 1995-2005 period. Agricultural employment, on the other hand, has experienced recent losses due to declines in livestock-related markets.

### *UNEMPLOYMENT RATES*

Since 1988, unemployment rates in Owyhee County (which have remained consistently lower than both the state and nation averages) have had greater variation than those for the State of Idaho and the nation as a whole (Figure 3.12-1). Unemployment rates peaked most recently during the nationwide recession in 1991 (at 5.9 percent); since reporting an unemployment rate of 5.6 percent in 1993, county unemployment rates have decreased significantly to 2.8 percent in June 1996 (as compared to 5.2 percent for the state and 5.3 for the nation) (Idaho Department of Employment 1996).

### *JOB COMPOSITION*

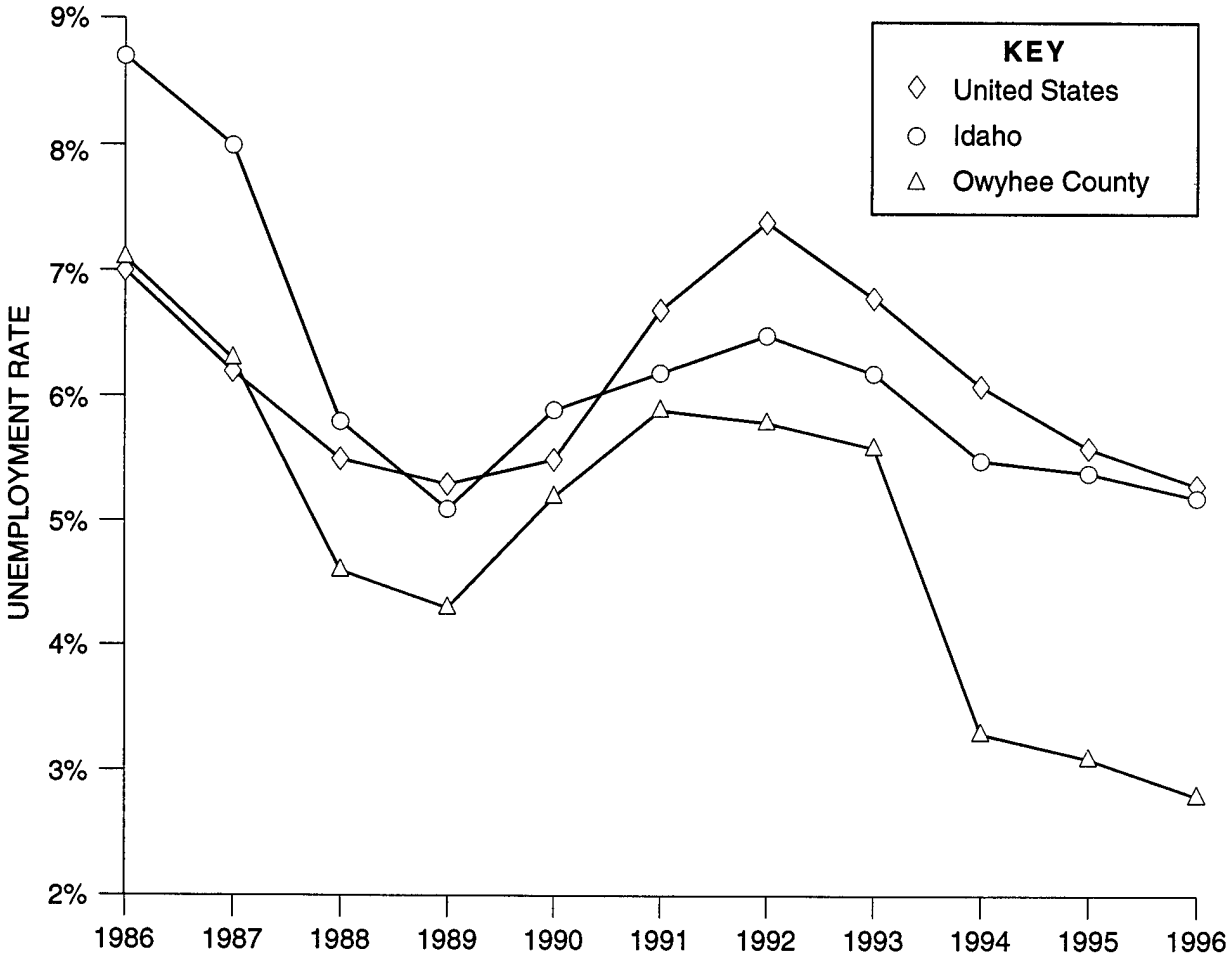
Figure 3.12-2 shows the distribution of jobs by employment sector in the county for 1980, 1990, and 1994. In 1980, agriculture (with 1,291 jobs, or 37.3 percent of all jobs) was overwhelmingly the largest employment sector. Government and government enterprises (15.1 percent of county jobs), retail trade (9.6 percent), and services (7.9 percent) were the next-largest employment sectors of the regional economy (U.S. Bureau of Economic Analysis 1996).

Between 1980 and 1990, job losses in the agriculture sector and increases in the government, services, and agricultural services sectors somewhat shifted the regional employment pattern. During that decade, agricultural services gained 96 jobs (a 53 percent increase), services gained 116 jobs (a 42 percent increase), and government gained 50 jobs (a 10 percent increase). During the same period, employment in agriculture decreased by 323 jobs (a 25 percent decrease).

In 1994, agriculture, despite continued job losses, remained the largest employment sector in the county with 945 jobs (26.9 percent of all jobs). Government (18.1 percent of all jobs), retail trade (12.7 percent), services (11.8 percent), and agricultural services (10.3 percent) were the next-largest sectors in the county economy. Since 1980, the mining, manufacturing, wholesale trade, finance-insurance-real estate, and construction sectors all experienced overall job losses.

### *EARNINGS*

Although total employment expanded during the early and mid-1990s, the regional economy did not correspondingly expand. Total earnings in the ROI (Owyhee County) in 1994 was $68.8 million, a 15.6 percent decrease from the previous year ($81.5 million) yet more in line with the $67.7 million reported for 1992. (The peak in 1993 earnings is attributed to numerous factors, including increases in total wages and salaries and in farm proprietors' incomes.) The greatest earnings (nearly one-third of the ROI total) were reported for the agriculture (farm) sector




*SOURCE:* Idaho Department of Employment, Research and Analysis Bureau 1996.

**Figure 3.12-1 Unemployment Rates for Owyhee County, State of Idaho, and United States, 1986-1996**

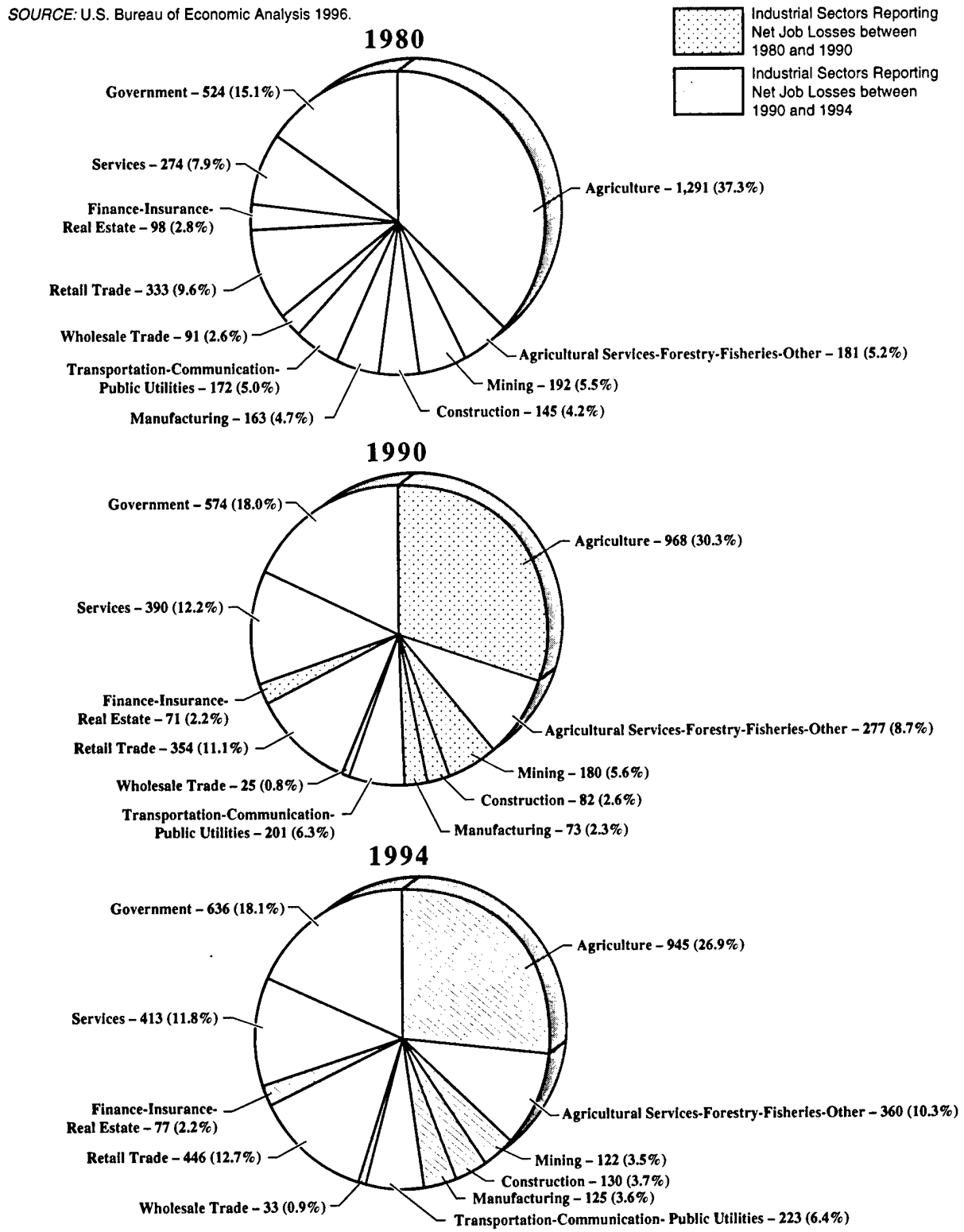



**Figure 3.12-2 Jobs by Industrial Sector Owyhee County, 1980, 1990, and 1994**

($22.8 million), followed by government and government enterprises ($12.9 million), mining ($6.9 million), and retail trade ($5.9 million). Included within the government sector are military, federal civilian, and state and local categories, which reported 1994 earnings in the ROI of $0.4 million, $2.8 million, and $9.8 million, respectively (U.S. Bureau of Economic Analysis 1996).

Per capita personal income in Owyhee County for 1994 was $13,401, substantially less than the per capita personal income for Idaho ($18,272) and for the United States ($21,696). Per capita personal income in the county increased less (17.3 percent) and at a slower rate (1.2 percent per year) from the 1980 level (adjusted to 1994 dollars) as compared to the per capita personal income growth recorded for the state (24.6 percent total growth, or 1.7 percent per year) and the nation (25.6 percent total growth, or 1.8 percent per year) for that same period (U.S. Bureau of Economic Analysis 1996; U.S. Council of Economic Advisors 1996).

Median family income for Owyhee County in 1990 was $17,600 according to the 1990 Census, which was approximately 35 percent less than the statewide median income of $27,200. Based on 1990 Census and Idaho Department of Employment statistics, more than 41 percent of the population in Owyhee County would be considered economically disadvantaged, including 29 percent who would be considered under the poverty level.

#### 3.12.2.2 ELKO COUNTY

##### *EMPLOYMENT*

The economy of Elko County sustained steady growth during the 1980s and through the nationwide recession of the early 1990s. Between 1980 and 1990, total employment in the county increased by about 8,700 jobs; since 1990, total employment in the county has continued to expand. Overall, job growth between 1980 and 1994 more than doubled (from 10,810 in 1980 to 21,796 in 1994), growing at a robust average annual rate of 5.5 percent (U.S. Bureau of Economic Analysis 1996).

##### *UNEMPLOYMENT RATES*

Unemployment rates in Elko County have paralleled state averages fairly closely since 1985. Unemployment rates peaked most recently in 1993 at 7.1 percent, as compared to a state unemployment rate peak of 7.2 percent that year. Since 1993, the county unemployment rate decreased to 5.2 percent (seasonally adjusted) as of October 1996 (Nevada Department of Labor 1996).

##### *JOB COMPOSITION*

In 1980, services (with 3,301 jobs, or 30.5 percent of all jobs) was overwhelmingly the largest employment sector; retail trade (15.6 percent of county jobs) was the next-largest employment sector of the regional economy (U.S. Bureau of Economic Analysis 1996).

Between 1980 and 1994, every industrial sector in the county experienced employment growth, with the greatest gains occurring in the services sector; most job growth within this industrial sector has been attributed to the county's (and state's) expanding entertainment and gaming industry. During that decade, services gained 5,578 jobs (a 169 percent increase) and retail trade gained 1,505 jobs (an 89.5 percent increase). In 1994, services remained the largest employment sector in the county with 8,879 jobs (40.7 percent of all jobs) (U.S. Bureau of Economic Analysis 1996).

#### *EARNINGS*

As total employment expanded during the early and mid-1990s, so did the regional economy. Total earnings in the county in 1994 was $558 million, a 7.9 percent increase from the previous year ($516 million). The greatest earnings (more than one-third of the county total) were reported for the services sector ($190 million), followed distantly by government ($98 million), mining ($78 million), and retail trade ($53 million) (U.S. Bureau of Economic Analysis 1996).

Per capita personal income in Elko County for 1994 was $21,785, less than the per capita personal income for Nevada ($23,817) but very close to that of the U.S. ($21,696). In the county, the greatest average annual earnings per job were reported in the mining sector ($60,489), followed distantly by transportation ($37,690), construction ($36,205), and wholesale trade ($36,071). Annual earnings per job averaged $121,507 in the services sector, the industrial sector with the largest number of county jobs. Median family income for Elko County in 1990 was $38,900 according to the 1990 Census, which was approximately 8.5 percent greater than the statewide median income of $35,837.

## 3.12.3 Public Services and Public Finance

### 3.12.3.1 OWYHEE COUNTY

#### *PUBLIC SERVICES*

Public services within Owyhee County include fire suppression, law enforcement, highway maintenance, search and rescue, and public education and libraries. The following discussion focuses on those public services (public education, law enforcement, and search and rescue) that may potentially be directly affected by changes in land ownership associated with the proposed action.

#### *Public Education*

Eight school districts with nine elementary and seven secondary schools provide public education to school-age children in Owyhee County (Idaho Department of Education 1996). Of these eight districts, four have schools located within the county; the other four serve residents of the county from schools located in neighboring counties. The area containing the sites of the proposed action and alternatives is primarily served by the Bruneau-Grand View Joint District

(District 365) and the Pleasant Valley District (District 364). During the 1995-1996 school year, school enrollment totaled 4,346 students in all eight school districts. Total enrollment for school districts 364 and 365 was 656 pupils in 1995. The majority (more than 95 percent) of these students attended the Bruneau-Grand View Joint School District.

### *Law Enforcement and Search and Rescue*

Law enforcement and search and rescue services for most of Owyhee County are provided by the County Sheriff's Department, which employs one full-time sheriff, seven full-time deputies, and 11 administrative support personnel. The Sheriff's Department is augmented by an additional 30 or more civilian volunteers for search and rescue activities. The Sheriff's Department is also occasionally supported by the Rimrock Rescue Mission, a 10-person volunteer organization located in Elmore County (personal communication, Owyhee County Sheriff's Office 1996).

According to the Owyhee County Sheriff's Office, an average of six life-threatening search and rescue missions occur per year, approximately half of which are accomplished by advance scouts sent before a full-scale search is initiated. In cases where a more extensive search is required, up to 100 person-hours may be required (Air Force 1993c).

## *PUBLIC FINANCE*

The following subsections focus on the revenues and expenditures of Owyhee County, its road districts, the County Sheriff's Department, and the Bruneau-Grand View and Pleasant Valley School Districts. Revenue sources for the county government include property taxes, payments in lieu of taxes (PILT), bond sales, revenue sharing from sales taxes, and other state and local taxes and fees.

In 1976, Congress passed the PILT Act (PL 94-565) which provides payments to local governments (e.g., counties) containing certain federally owned (or entitlement) lands. Entitlement lands include those in the National Forest System and the National Park System, those administered by BLM, National Wildlife Reserve areas withdrawn from the public domain, and inactive and semi-active Army installations used for non-industrial purposes. Active military installations (e.g., Air Force bases and training ranges) are not considered entitlement lands. Owyhee County currently records 3,623,670 entitlement acres; all but 27 acres are administered by BLM.

PILT is designed to supplement other federal land payments that local governments may be receiving. Payments to local governments may be calculated using two different formulas; in either case, total acreage of entitlement land within a designated local government jurisdiction is a calculation component. In fiscal year (FY) 1995, Owyhee County received $423,000 in PILT.

### *Revenues*

In FY 1996, total Owyhee County revenues were $3,455,559, of which 43 percent were from taxes and 29 percent were from intergovernmental transfer (including PILT funds) (Table 3.12-4) (Owyhee County 1996).

In 1996, a total of $5,464,814 in levied property taxes were collected from private landowners by various taxing districts within Owyhee County. More than $1.35 million was collected by the County Tax District, $3.43 million was collected by school districts in the county, $0.26 million was collected by cities, and $0.23 million was collected by county highway district.

**Table 3.12-4. Owyhee County Revenues by Source, 1996**

| *Revenue Source* | *Revenue* |
|---|---|
| Taxes | $1,494,929 |
| Licenses and permits | 16,376 |
| Fines and forfeitures | 47,632 |
| Charges for services | 347,168 |
| Intergovernmental | 1,005,774 |
| Interest Income | 190,995 |
| Miscellaneous | 352,682 |
| Total | $3,455,559 |

Source: Owyhee County Auditor's Office 1996

There are more than 3,600,000 total acres of federal land in Owyhee County. PILT is paid on roughly 92 percent of this land to compensate for property tax losses due to federal ownership. In 1995, Owyhee County collected $423,000 in PILT monies, roughly 12 cents per acre. PILT moneys distributed to the county enter the county's current expense fund which is used to fund county administrative costs, the Sheriff's office, and the coroner's office, among other services.

### *Expenditures*

The total Owyhee County budget for 1996 was $4,452,112 and total expenses of $3,961,952 (Owyhee County 1996). A summary of major county expenses for FY 1996 is presented in Table 3.12-5.

#### *Roads and Bridges*

In FY 1996, approximately $908,500 were spent for the construction and maintenance of roads, bridges, and highways in Owyhee County. Of this total, $190,778 were provided by county taxes, $651,379 were from state funds, $8,130 were from other county revenue, and the balance of $58,299 were allocated from other funds. County tax expenditures on roads, bridges, and highways are made from four funds: the Three Creek Good Roads Highway District, Homedale Highway District, Gem Highway District, and the County Road and Bridge Fund.

*Search and Rescue*

Search and rescue activities are largely the financial responsibility of the Owyhee County Sheriff's Department. In FY 1995, the Sheriff's Department had a total budget of $485,819. For this same year, expenditures reached $470,450 (or 96.8 percent) of the allocated budget.

**Table 3.12-5. Owyhee County Expenditures, 1995**

| *Expenditures* | *1995 Expenses* | *1995 Budget* |
|---|---|---|
| Clerk/Auditor | 166,173 | 172,925 |
| Sheriff | 470,450 | 485,819 |
| General | 481,661 | 423,589 |
| Other (under $100,000) | 904,142 | 1,053,984 |
| **Total Current Expense** | **2,022,426** | **2,116,317** |
| Road and Bridge | 908,586 | 1,076,285 |
| Indigent and Charity | 192,374 | 231,650 |
| Revaluation | 128,324 | 139,043 |
| Solid Waste | 211,928 | 298,989 |
| Other (under $100,000) | 498,313 | 589,828 |
| **Total** | **$3,961,952** | **$4,452,112** |

Source: Owyhee County Auditor's Office 1996

*Public School Districts*

Public schools in Idaho are financed from local, state, and federal sources of revenue, including property taxes and earnings from endowment lands. School districts receive earnings from public school endowment lands as part of the total revenue that they receive from the state. In FY 1995, revenues collected from property tax levies in Owyhee County totaled approximately $117,600 for the Pleasant Valley School District and $858,100 for the Bruneau-Grand View Joint School District. In FY 1995, expenditures for the Pleasant Valley School District were $241,000; the Bruneau-Grand View Joint School District reported $3,479,200 in expenditures that fiscal year. For 1995, average spending per pupil was $9,294 for the Pleasant Valley School District and $6,055 for the Bruneau-Grand View Joint School District (Idaho Department of Education 1996).

*Other Districts and Bureaus*

The State of Idaho and BLM lease grazing rights on their lands in Owyhee County by geographical areas known as allotments. Several districts rely on the collection of grazing fees from these lands for funding. Grazing fees are based on amount of forage and other factors. The State of Idaho for the school endowment maintains 179 leases for grazing in Owyhee County; in 1996, the state will collect a projected $186,762 through grazing fees. State grazing fees are scheduled to be $4.58 per AUM in 1997, down from $4.88 per AUM in 1996 and $5.15

per AUM in 1995, and federal grazing fees for FY 1997 will remain at the FY 1996 level of $1.35 per AUM.

In FY 1996, BLM grazing fees were set at $1.35 per AUM, a decrease from $1.61 per AUM in FY 1995. BLM collected an estimated $575,500 in grazing fees within Owyhee County in FY 1995; through the first 10 months of FY 1996, BLM had collected $484,500 in grazing fees for the county. (As indicated above, grazing fees on federal lands vary over time: as recently as FY 1994, BLM grazing fees had been as high as $1.98 per AUM.) BLM grazing fees are mainly used to fund rangeland improvements. The fees collected are distributed to federal, state, and county agencies. Approximately 50 percent of the fees is distributed to the BLM district where fees are collected; an additional 12.5 percent is distributed to the state of origin; and the U.S. Treasury receives 37.5 percent. Total fees collected by the state are distributed among counties, based on counties' total acreage of public land, to be used for range improvements as recommended by the Grazing Advisory Board.

## 3.12.4 Livestock Industry and Grazing

### 3.12.4.1 Owyhee County

Agriculture, the major economic activity in Owyhee County, is dominated by the livestock industry. The U.S. Census of Agriculture, taken at five-year intervals, provides a detailed description of agricultural operations and provides the most recent comprehensive published data. The 1992 data illustrate the magnitude and composition of the current livestock industry. Of the 561 farms/ranches in the county in 1992, 339 farms/ranches were cattle and calves operations. Total sales for 1987 and 1992 are presented in Table 3.12-6.

**Table 3.12-6. Farm/Ranch Commodities in Owyhee County, 1987 and 1992**

| *Commodity* | Total Sales (Thousands)[1] | |
|---|---|---|
| | *1987* | *1992* |
| Grains | $5,397 | NA |
| Hay and Silage | 7,022 | $9,313 |
| Other Crops | 12,436 | 19,000 |
| Dairy | 7,286 | 8,709 |
| Cattle and Calves | 41,015 | 49,659 |
| Hogs and Pigs | NA | 78 |
| Sheep, Lambs, and Wool | 399 | 611 |
| Other Livestock | 175 | 685 |
| Total Sales | $74,998 | $88,055 |

Note: 1. Sales figures are presented in then-year dollars

Source: Bureau of the Census 1994

### *SIZE OF FARMS WITH CATTLE, CALVES, AND SHEEP*

The 1992 Census of Agriculture identified a total of 561 farms/ranches in Owyhee County containing about 752,032 acres of land; comparatively, in 1987, there were 573 farms/ranches operating on 716,637 acres in Owyhee County. This change is indicative of a shift toward consolidation of operations, with fewer owners controlling larger plots of land. There were 339 farms/ranches with cattle and calves, and 32 farms/ranches with sheep and lambs in 1992. Of the 339 cattle and calf operations, 244 farms/ranches were classified as beef cattle operations (Table 3.12-7). In 1992, the 339 cattle and calves operations sold 84,326 head at a total market value of $49,659,000. The 32 sheep and lamb operations had an inventory of 12,189 animals; lamb, sheep, and wool sales grossed $611,000 in 1992.

**Table 3.12-7. Farms/Ranches by Livestock Inventory and Sales, 1987 and 1992**

| | NUMBER OF FARMS/RANCHES | | NUMBER OF ANIMALS | |
|---|---|---|---|---|
| *Livestock Inventory* | *1987* | *1992* | *1987* | *1992* |
| Cattle and Calves | 367 | 339 | 106,755 | 109,884 |
| Beef Cows | 259 | 244 | 40,430 | 40,393 |
| Sheep and Lambs | 37 | 32 | 7,710 | 12,189 |
| *Livestock Sales* | | | | |
| Cattle & Calves Sold | 363 | 339 | 78,624 | 84,326 |
| Sheep & Lambs Sold | 36 | 29 | 4,906 | NA |

Source: Bureau of the Census 1994

About 25 percent of the farms/ranches were under 50 acres, while 75 percent were under 500 acres. Only 16 percent of the farms/ranches were 1,000 acres or more in size. Table 3.12-8 presents the distribution of farms/ranches by size in 1987 and 1992.

| Table 3.12-8. Farm/Ranch Size by Acres, 1987 and 1992 | | | | |
|---|---|---|---|---|
| | 1987 | | 1992 | |
| *Farm/Ranch Size* | *Number of Farms/Ranches* | *Percent of Total* | *Number of Farms/Ranches* | *Percent of Total* |
| 1 to 9 Acres | 59 | 10% | 56 | 10% |
| 10 to 49 Acres | 84 | 15% | 99 | 15% |
| 50 to 179 Acres | 160 | 28% | 149 | 29% |
| 180 to 499 Acres | 124 | 21% | 114 | 20% |
| 500 to 999 Acres | 55 | 10% | 52 | 10% |
| 1,000 or more Acres | 91 | 16% | 91 | 16% |

Source: Bureau of the Census 1994.

In 1992, the size of livestock operations varied widely by the number of cattle and calves sold. About 69 percent of the farms/ranches selling cattle and calves (207 operations) sold less than 100 cattle or calves; 72 operations sold between 100 and 500 head; and 20 operations sold more than 500 head. The average number of cattle and calves sold per operation in Owyhee County in 1992 was approximately 227. This represents an 8 percent increase in total sales per operation when compared to 1987 data (Table 3.12-9). There were 138 farms/ranches in 1992 that sold 16,338 calves; more than half of the calves were sold by eight operations (Table 3.12-10).

| Table 3.12-9. Number of Cattle Sold by Farm/Ranch, 1987 and 1992 | | | | |
|---|---|---|---|---|
| | NUMBER OF FARMS/RANCHES | | TOTAL NUMBER OF ANIMALS | |
| *Number of Cattle Sold* | *1987* | *1992* | *1987* | *1992* |
| 1 to 9 | 67 | 63 | 297 | 278 |
| 10 to 19 | 47 | 40 | 653 | 559 |
| 20 to 49 | 72 | 60 | 2,163 | 1,879 |
| 50 to 99 | 60[1] | 44 | 10,017[1] | 3,177 |
| 100 to 199 | 57[1] | 40 | [1] | 5,272 |
| 200 to 499 | 38 | 32 | 10,843 | 9,448 |
| 500 or more | 22 | 20 | 52,651 | 47,375 |

Note: 1. Not separately disclosed
Source: Bureau of the Census 1994.

| Table 3.12-10. Number of Calves Sold by Farm/Ranch, 1987 and 1992 | | | | |
|---|---|---|---|---|
| | NUMBER OF FARMS/RANCHES | | TOTAL NUMBER OF ANIMALS | |
| *Number of Calves Sold* | *1987* | *1992* | *1987* | *1992* |
| 1 to 9 | 38 | 43 | 173 | 178 |
| 10 to 19 | 23 | 24 | 347 | 301 |
| 20 to 49 | 32 | 22 | 922 | 639 |
| 50 to 99 | 20 | 23 | 1,401 | 1,510 |
| 100 to 199 | 12 | 8 | 1,851 | 1,079 |
| 200 to 499 | 9 | 10 | 2,374 | 2,912 |
| 500 or more | 4 | 8 | 4,333 | 9,719 |

Source: Bureau of the Census 1994.

In 1992, 36 farms/ranches sold cattle valued at $22.7 million that were fattened on grain and concentrates. More than 93 percent of the fattened cattle were sold by three operations (Table 3.12-11). More than 53 percent of the farms/ranches in Owyhee County in 1992 with sheep and lambs held fewer than 25 head (Table 3.12-12).

| Table 3.12-11. Number of Fattened Cattle Sold by Farm/Ranch, 1987 and 1992 | | | | |
|---|---|---|---|---|
| | NUMBER OF FARMS/RANCHES | | TOTAL NUMBER OF ANIMALS | |
| *Number of Fattened Cattle Sold* | *1987* | *1992* | *1987* | *1992* |
| 1 to 9 | 18 | 12 | 53 | –[1] |
| 10 to 19 | 6 | 5 | 80 | 78 |
| 20 to 49 | 10 | 3 | 303 | 95 |
| 50 to 99 | 9 | 3 | 633 | 177 |
| 100 to 199 | 6[1] | 7 | –[1] | 1,104 |
| 200 to 499 | 6[1] | 3 | 2,348[1] | 1,017 |
| 500 or more | 5 | 3 | 34,797 | –[1] |

Note: 1. Not separately disclosed
Source: Bureau of the Census 1994.

| Table 3.12-12. Sheep and Lamb Inventory by Farms/Ranches, 1987 and 1992 | | | | |
|---|---|---|---|---|
| | NUMBER OF FARMS/RANCHES | | PERCENT OF TOTAL | |
| *Sheep and Lamb Inventory* | *1987* | *1992* | *1987* | *1992* |
| 1 to 24 | 21 | 17 | 57% | 53% |
| 25 to 99 | 7 | 9 | 19% | 28% |
| 100 to 299 | 5 | 4 | 14% | 13% |
| 300 to 999 | 2 | 1 | 5% | 3% |
| 1,000 or more | 2 | 1 | 5% | 3% |

Source: Bureau of the Census 1994.

### *LIVESTOCK INVENTORIES, PRODUCTION, AND CONSUMPTION*

The cattle and calf industry in Idaho is driven by national markets for beef and meat products. Nationally, beef consumption has begun to increase again, following declines in the 1980s and early 1990s. From 1987 to 1992, the number of cattle on farms/ranches in Idaho increased from 1.77 million to 1.81 million animals. However, the number of farms/ranches with cattle and calves decreased from 13,481 in 1987 to 12,527 in 1992, further evidence of the trend toward consolidation of operations (U.S. Bureau of the Census 1994).

### *PUBLIC GRAZING LANDS*

Many farming/ranching operations in Owyhee County rely on public grazing lands to meet their feeding requirements. According to the 1992 Census of Agriculture, 98 ranges and farmers held grazing permits in Owyhee County, 94 of which are administered under the Taylor Grazing Act (Table 3.12-13). Fifteen of the 98 operations have permits through USFS, and 26 ranches have grazing permits issued from an unspecified source. The 98 operations that had grazing permits controlled an additional 351,176 acres for an average size of 3,583 acres per operation; more than 57 percent of the operations had more than 1,000 acres each.

| Table 3.12-13. Grazing Permits, Owyhee County, 1987 and 1992 | | |
|---|---|---|
| | OPERATIONS HOLDING GRAZING PERMITS | |
| *Farm/Ranch Size* | *1987* | *1992* |
| Less than 100 Acres | 14 | 16 |
| 100 to 259 Acres | 15 | 17 |
| 260 to 499 Acres | 12 | 5 |
| 500 to 999 Acres | 7 | 4 |
| 1,000 to 1,999 Acres | 8 | 10 |
| 2,000 or more Acres | 42 | 46 |

Source: Bureau of the Census 1994.

The majority of public grazing land in Idaho is controlled by the BLM, which controls roughly 3.6 million acres in Owyhee County alone. The Lower Snake River District of the BLM manages grazing on its lands in Owyhee County. The Lower Snake River District controls some 5.4 million acres in four resource areas: Owyhee, Bruneau, Cascade, and Jarbidge. The State of Idaho is the second largest public grazing land owner, controlling approximately 330,800 acres of land.

As discussed earlier, the State of Idaho and BLM lease grazing privileges on their lands in Owyhee County by geographical areas known as allotments. Grazing fees are collected on an AUM basis; these fees are set based on amount of forage and other factors. The State of Idaho maintains 179 grazing allotments in Owyhee County; in 1996, the state will collect a projected $186,762 through grazing fees. (State grazing fees are scheduled to be $4.58 per AUM in 1997, down from $4.88 per AUM in 1996 and $5.15 per AUM in 1995.)

In FY 1996, BLM grazing fees were set at $1.35 per AUM, a decrease from $1.61 per AUM in FY 1995. Table 3.12-14 presents BLM grazing fees for the past ten years. The highest fee of $1.98 was realized in 1994 and the current fee of $1.35 is the lowest experienced in the last ten years. BLM collected an estimated $575,500 in grazing fees for Owyhee County in FY 1995; through the first ten months of FY 1996, BLM had collected $484,500 in grazing fees for the county.

| Table 3.12-14. BLM Grazing Fees 1987 - 1997 | |
|---|---|
| 1987 | $1.35 |
| 1988 | $1.54 |
| 1989 | $1.86 |
| 1990 | $1.81 |
| 1991 | $1.97 |
| 1992 | $1.92 |
| 1993 | $1.86 |
| 1994 | $1.98 |
| 1995 | $1.91 |
| 1996 | $1.35 |
| 1997 | $1.35 |

Source: BLM Idaho State Office.

BLM grazing fees are mainly used to fund range improvements. These federally generated fees collected are distributed to federal, state, and county agencies. Approximately 50 percent of the fees are distributed to the BLM district where fees are collected; 12.5 percent are distributed to the state of origin; and the U.S. Treasury receives 37.5 percent. Total fees collected by the state are distributed among counties, based on counties' total acreage of public land, to be used for range improvements as recommended by the Grazing Advisory Board.

### 3.12.4.2 Alternative B — Clover Butte and Vicinity

The distribution of state (Idaho) and federal (BLM) grazing allotments within Owyhee County in many cases overlap component sites of the proposed action that are considered for withdrawal. Table 3.12-15 presents a detailed account of co-occurrence between proposed project sites and grazing allotments, and identifies allotment name, number, ownership, approximate acreage, total AUMs over the entire allotment, and estimated AUMs and revenue directly associated with areas proposed for withdrawal.

Grazing allotment data were collected from BLM (1996a) and IDL (1996) and represent the most current conditions occurring at the allotments. Where current grazing data were unavailable for particular allotments, AUMs were estimated either by using historic data presented in previously prepared documents (e.g., BLM 1985a and BLM 1996d) or by assigning AUMs based on neighboring allotments.

**Table 3.12-15. Grazing Allotments, Animal Units per Month, and Estimated Revenue for Project Components, 1996 (Page 1 of 4)**

| *Project Component* | *Affected Allotment Acreage* | *Allotment Ownership* | *Allotment Name* | *Allotment Number* | *Total Allotment Acreage* | *Total Allotment Animal Units per Month (AUMS)* | *Acres per AUM* | *Allotment AUMs per Acre* | *AUMs Affected by Project Area* | *Total 1996 Estimated Revenue*[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Target Ranges** | | | | | | | | | | |
| Clover Butte | 11,200 | Federal | Poison Creek | 01050 | 185,855 | 16,448 | 11.3 | 0.09 | 991 | $ 1,337.85 |
| | 640 | State | - | G-7567 | 640 | 41 | 15.6 | 0.06 | 41.0 | $ 200.08 |
| Total | 11,840 | | | | | | | | | $ 1,537.93 |
| Grasmere | 170 | Federal | Wickahoney | 00885 | 2,800 | 200 | 14.0 | 0.07 | 12.1 | $ 16.20 |
| | 8,360 | Federal | China Creek | 00883 | 33,450 | 3,136 | 10.7 | 0.09 | 752.4 | $ 1,015.74 |
| | 110 | Federal | Crab Creek | 00841 | 15,060 | 233 | 64.6 | .02 | 1.70 | $ 2.30 |
| | 400 | State | - | G-6313 (Sec 33 and 34) | 400 | 40 | 10.0 | 0.10 | 32.0 | $ 156.16 |
| | 640 | State | - | G-6317 (Sec 36) | 640 | 65 | 9.8 | 0.10 | 65.0 | $ 317.20 |
| | 640 | State** | - | G-6496 (Sec 28) | 640 | 64 | 10.0 | 0.10 | 64.0 | $ 312.32 |
| | 320 | State** | - | G-6496 (Sec 33) | 320 | 32 | 10.0 | 0.10 | 15.3 | $ 74.66 |
| | 40 | State | - | G-6730 (Sec 10) | 40 | 5 | 8.0 | .13 | 8.0 | $ 39.04 |
| | 160 | State | - | G-6730 (Sec 11) | 160 | 16 | 10.0 | .10 | 16.0 | $ 78.08 |
| | 160 | State** | | G-6730 (Sec 16) | 640 | 66 | 9.7 | .10 | 16.5 | $ 80.52 |
| Total | 11,000 | | | | | | | | | $ 2,092.22 |
| Juniper Butte | 10,600 | Federal | Juniper Draw | 01138 | 18,717 | 1,806 | 10.4 | 0.10 | 1,022.8 | $ 1,380.78 |
| | 320 | State | - | G-7076 (Sec 36) | 640 | 64 | 10.0 | 0.10 | 32.0 | $ 156.16 |
| | 640 | State | - | G-7728 (Sec16) | 640 | 116 | 5.5 | 0.18 | 116.0 | $ 566.08 |
| Total | 11,560 | | | | | | | | | $ 2,103.02 |

**Table 3.12-15. Grazing Allotments, Animal Units per Month, and Estimated Revenue for Project Components, 1996 (Page 2 of 4)**

| *Project Component* | *Affected Allotment Acreage* | *Allotment Ownership* | *Allotment Name* | *Allotment Number* | *Total Allotment Acreage* | *Total Allotment Animal Units per Month (AUMS)* | *Acres per AUM* | *Allotment AUMs per Acre* | *AUMs Affected by Project Area* | *Total 1996 Estimated Revenue*[1] |
|---|---|---|---|---|---|---|---|---|---|---|
| **No-Drop Areas** | | | | | | | | | | |
| ND-1 | 640 | Federal | West Canyon View*** | 00811 | 4537 | - | 7.9 | 0.13 | 83.2 | $ 112.32 |
| ND-2 | 5 | State | - | G-7566 | 640 | 72 | 8.9 | 0.11 | 0.6 | $ 2.93 |
| ND-4 | 5 | Federal | Center* | 00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.6 | $ .81 |
| ND-5 | 5 | Federal | Center* | 00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.6 | $ .81 |
| ND-6 | 5 | Federal | Poison Creek | 01050 | 185,855 | 16,448 | 11.3 | 0.09 | 0.4 | $ .54 |
| ND-7 | 5 | Federal | Poison Creek | 01050 | 185,855 | 16,448 | 11.3 | 0.09 | 0.4 | $ .54 |
| ND-8 | 5 | Federal | Highway Field*** | 00848 | 14,905 | 16,448 | 25.0 | 0.04 | 0.2 | $ .27 |
| Total | | | | | | | | | | $ 118.22 |
| **Emitter Sites** | | | | | | | | | | |
| AA | 0.25 | Federal | Twin Butte*** | 01145 | 44,958 | - | 4.7 | 0.21 | 0.05 | $ 0.07 |
| AB | 0.25 | Federal | Bruneau Hill*** | 01057 | 46,789 | - | 4.7 | 0.21 | 0.05 | $ 0.07 |
| AC | 0.25 | State | - | G-7429 | 640 | 136 | 4.7 | 0.21 | 0.05 | $ .24 |
| AD | 0.25 | Federal | Juniper Draw | 01138 | 18,717 | 1,806 | 10.4 | 0.10 | 0.02 | $ .03 |
| AE | 0.25 | Federal | Poison Creek | 01050 | 185,855 | 16,448 | 11.3 | 0.09 | 0.02 | $ .03 |
| AF | 0.25 | Federal | Poison Creek | 01050 | 185,855 | 16,448 | 11.3 | 0.09 | 0.02 | $ .03 |
| AG | 0.25 | Federal | Poison Creek | 01050 | 185,855 | 16,448 | 11.3 | 0.09 | 0.02 | $ .03 |
| AH | 0.25 | Federal | Clover Crossing* | 01136 | 35,907 | 2,609 | 13.8 | 0.07 | 0.02 | $ .03 |

**Table 3.12-15. Grazing Allotments, Animal Units per Month, and Estimated Revenue for Project Components, 1996 (Page 3 of 4)**

| *Project Component* | *Affected Allotment Acreage* | *Allotment Ownership* | *Allotment Name* | *Allotment Number* | *Total Allotment Acreage* | *Total Allotment Animal Units per Month (AUMS)* | *Acres per AUM* | *Allotment AUMs per Acre* | *AUMs Affected by Project Area* | *Total 1996 Estimated Revenue[1]* |
|---|---|---|---|---|---|---|---|---|---|---|
| AI | 0.25 | Federal | Echo Group*** | 01149 | 86,173 | - | 4.7 | 0.21 | 0.05 | $ .07 |
| AJ | 0.25 | State | - | G-7429 | 640 | 136 | 4.7 | 0.21 | 0.05 | $ .24 |
| AK | 0.25 | Federal | Center* | 00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.03 | $ .04 |
| AL | 0.25 | Federal | Big Lake/Center* | 00840/00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.03 | $ .04 |
| AM | 0.25 | Federal | Big Lake/Crab Creek | 00840/00841 | 140,364 | 17,774 | 7.9 | 0.13 | 0.03 | $ .04 |
| AN | 0.25 | Federal | Center* | 00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.03 | $ .04 |
| AO | 0.25 | Federal | Center* | 00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.03 | $ .04 |
| AP | 0.25 | Federal | Crab Creek/Center* | 00841/00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.03 | $ .04 |
| AQ | 0.25 | Federal | Mary's Creek | 00849 | 19,589 | - | 10.0 | 0.10 | 0.03 | $ .04 |
| AT | 0.25 | Federal | Northwest/Center* | 00808/00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.03 | $ .04 |
| AU | 0.25 | Federal | Highway Field*** | 00848 | 14,905 | 16,448 | 25.0 | 0.04 | 0.01 | $ .01 |
| AV | 0.25 | Federal | Center* | 00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.03 | $ .04 |
| BA | 1 | Federal | Flat Top*** | 01059 | 37,464 | - | 4.7 | 0.21 | 0.21 | $ .28 |
| BB | 1 | Federal | Echo Group*** | 01149 | 86,173 | - | 4.7 | 0.21 | 0.21 | $ .28 |
| BC | 1 | Federal | Poison Creek | 01050 | 185,855 | 16,448 | 11.3 | 0.09 | 0.09 | $ .12 |
| BD | 1 | Federal | Tokum Bambi*** | 00864 | 20,577 | - | 10.0 | 0.10 | 0.10 | $ .14 |
| BE | 1 | Federal | Crawfish/Poison Creek | 01118/01050 | 185,855 | 16,448 | 11.3 | 0.09 | 0.09 | $ .12 |
| BF | 1 | Federal | West Canyon View*** | 00811 | 4,537 | - | 7.9 | 0.13 | 0.13 | $ .18 |

## Table 3.12-15. Grazing Allotments, Animal Units per Month, and Estimated Revenue for Project Components, 1996 (Page 4 of 4)

| *Project Component* | *Affected Allotment Acreage* | *Allotment Ownership* | *Allotment Name* | *Allotment Number* | *Total Allotment Acreage* | *Total Allotment Animal Units per Month (AUMS)* | *Acres per AUM* | *Allotment AUMs per Acre* | *AUMs Affected by Project Area* | *Total 1996 Estimated Revenue* |
|---|---|---|---|---|---|---|---|---|---|---|
| BG | 1 | Federal | Crab Creek*** | 00841 | 15,398 | - | 7.9 | 0.13 | 0.13 | $ .18 |
| BI | 1 | Federal | Center* | 00809 | 140,364 | 17,774 | 7.9 | 0.13 | 0.13 | $ .18 |
| BJ | 1 | State | - | G-7566 | 640 | 72 | 8.9 | 0.11 | 0.11 | $ .54 |
| BK | 1 | Federal | Twin Butte*** | 01145 | 44,958 | - | 4.8 | 0.21 | 0.21 | $ .28 |
| Total | | | | | | | | | | $ 3.51 |

Notes: 1. Revenue calculations based on 1996 federal ($1.35) and state ($4.88) grazing fees charged per AUM. Annual estimated revenue conservatively assumes AUM fees collected for a grazing season. This season varies in length, but the total number of AUMs permitted for a season on an allotment is fixed.

*Based on historic grazing allotment statistics

**State school endowment lands managed in coordination with BLM

***AUM statistics unavailable for allotment; calculations based on grazing allotment statistics for closest documented allotment.

Sources: . Personal communication, Taylor 1996. Idaho Department of Lands.
Interior Columbia River Basin Ecosystem Management Project. 1995 digital data.
Personal communication, Costello 1996. U.S. Bureau of Land Management.
Personal communication, Josie 1997. U.S. Bureau of Land Management.

The proposed site of the Clover Butte tactical training range alternative falls within two grazing allotments: one operated by BLM (Poison Creek) and one operated by the State of Idaho (G-7567). In total, the Poison Creek allotment supports 16,448 AUMs; state allotment G-7567 supports 41 AUMs. The portion of the Poison Creek allotment lying within the Clover Butte site represents about 6 percent (approximately 11,200 acres) of the allotment's total area (185,855 acres). On the other hand, all 640 acres of state allotment G-7567 lie within the proposed Clover Butte site.

Assuming that AUMs are evenly distributed over each allotment, 991 AUMs in the Poison Creek allotment and all 41 AUMs in G-7567 would be affected by withdrawal of acreage for the Clover Butte site. Based on 1996 grazing fees of $1.35 per AUM (federal) and $4.88 per AUM (state) collected over a grazing season, an estimated total of $1,538 in fees are collected for grazing rights in the area proposed for the Clover Butte training range.

#### 3.12.4.3 ALTERNATIVE C — GRASMERE AND VICINITY

The Grasmere tactical training range alternative lies within three federal (Wickahoney, Crab Creek, and China Creek) and four state (G-6313 [sections 33 and 34], G-6317[section 36], G-6496 [sections 28 and 33], and G-6730 [sections 10, 11, and 16]) grazing allotments. Total approximate allotment acreages and actual AUMs per month are shown in Table 3.12-15.

Assuming that AUMs are evenly distributed over each allotment, 766 AUMs in federal allotments and 217 AUMs in state allotments would be affected by withdrawal of acreage for the Grasmere site. Based on 1996 federal and state grazing fees collected over a grazing season, an estimated $2,092 in fees are collected for grazing rights in the area proposed for the Grasmere training range.

#### 3.12.4.4 ALTERNATIVE D — JUNIPER BUTTE AND VICINITY

The Juniper Butte tactical training range alternative lies within one federal (Juniper Draw) and two state (G-7076 [section 36] and G-7728 [section 16]) grazing allotments. Total allotment acreages and actual AUMs per month are shown in Table 3.12-14. In total, the Juniper Draw allotment supports 1,806 AUMs over its 18,717 total acres; state allotments G-7076 and G-7728 (each encompassing 640 acres) together support 180 AUMs.

Upon development of the proposed Juniper Butte training range, an estimated 10,600 acres (57 percent) of Juniper Draw, 320 acres (50 percent) of G-7076, and 640 acres (100 percent) of G-7728 would be withdrawn. Assuming that AUMs are evenly distributed over these allotments, 1,023 AUMs in federal allotments and 148 AUMs in state allotments would be affected by withdrawal of acreage for the Juniper Butte site. Based on 1996 federal and state grazing fees collected over a grazing season, an estimated $2,103 in fees are collected seasonally for grazing rights in the area proposed for the Juniper Butte target area.

#### 3.12.4.5 PROPOSED NO-DROP AREAS

As with the proposed training ranges, total revenue generated by state and federal grazing fee collections was estimated for each of the proposed no-drop areas based on co-occurring allotments, AUMs, and affected acreage (Table 3.12-15). No-drop site one (ND-1), which encompasses 640 acres of the West Canyon View federal grazing allotment, currently generates an estimated $112 in grazing fees per season. The remaining no-drop areas, all five acres in size, each generate less than $6 per season in collected fees.

#### 3.12.4.6 PROPOSED EMITTER SITES

As with the proposed training ranges and no-drop areas, total revenue generated by state and federal grazing fee collections was estimated for each of the proposed emitter sites based on co-occurring allotments, AUMs, and affected acreage (Table 3.12-15). The emitter sites, all one acre or less in size, generate less than 60 cents per season each in collected fees.

### 3.12.5 Mining Economic Activity

The mining industry maintains a significant role in the economy of Owyhee County. Based on employment and earnings information, employment directly associated with the mining sector represented 122 jobs (or 3.4 percent) of total county employment (3,510 jobs) in 1994, down from 169 jobs (or 4.8 percent of county employment) in 1992. In 1994, the mining sector recorded earnings of $6.9 million (or 10.0 percent of total county earnings), down from $8.4 million (or 12.4 percent of total county earnings) in 1992 (U.S. Bureau of Economic Analysis 1996).

### 3.12.6 Recreation Economic Activity

The Lower Snake River District of the BLM have attempted to capture the change in recreation activity on the Bruneau-Jarbidge River systems by comparing estimated floater use on the Bruneau in the years 1983 to 1985 with floater use in the years 1995 to 1997. In the earlier period, estimated floater use ranged from a high of about 300 persons in 1983 (a good water year), to a low of about 100 persons in 1985 (a low water year). In 1995, estimated boater use was 3,114 persons; in 1996, 3,262 persons; and, in 1997, an estimated 3,176 persons floated the Bruneau (BLM 1997). Recreation use on these rivers has increased significantly in recent years, reflecting national trends on similar rivers throughout the west. Most professional float providers are not headquartered in Owyhee County. Recreation, while not a major industry in Owyhee County, is an important, emerging contributor to local economies in the region.

The recreation industry represents less than 2 percent of the Owyhee County economy. Most commercial services are associated with the main population areas of Murphy, Grandview, and Marsing. Most of the recreation services, such as commercial guides, are provided from outside of the county. According to the 1990 Census of Population and Housing, an estimated total of 15 workers were directly employed in the entertainment/recreation industry which

represented less than 0.1 percent of total county employment. No new or significant increases in employment opportunities in the recreation industry have been reported in the county since 1990.

Total sales for recreation-related industries (i.e., lodging, recreation facilities, and museums and galleries) were roughly $630,500 in FY 1996, an increase from $570,400 in FY 1995 but substantially less than the five-year peak of $930,600 reported in FY 1994 (Idaho State Tax Commission 1996). In 1996, total sales for these industries represented less than 2 percent of total sales within the county. A summary of recreation industry-related sales for Owyhee County is shown in Table 3.12-16. Lodging facilities accounted for nearly 90 percent of recreation-related sales with nearly $556,500 in sales in 1996. However, the total recreational

**Table 3.12-16. Total Recreation-Related Sales in Owyhee County, 1994-1996**

| | FY 1994 | | FY 1995 | | FY 1996 | |
|---|---|---|---|---|---|---|
| *Industry* | *Total Sales* | *Percent of Total* | *Total Sales* | *Percent of Total* | *Total Sales* | *Percent of Total* |
| Lodging | $617,210 | 1.69% | $524,844 | 1.41% | $556,490 | 1.47% |
| Amusement and Recreation Services | 311,078 | 0.85% | 44,364 | 0.12% | 73,002 | 0.19% |
| Museums and Galleries | 2,291 | 0.01% | 1,176 | 0.00% | 1,006 | 0.00% |
| Totals | $930,579 | 2.55% | $570,384 | 1.53% | $630,498 | 1.66% |

Source: Idaho State Tax Commission 1996a.

impact of lodging facilities may be overstated since rooming and boarding houses are also included in this category of sales.

Total sales directly related to amusement and recreation services, including outfitter and guide services, accounted for approximately $73,000 in sales in 1996 as compared to $272,000 in FY 1992. These figures represent countywide sales. Sales in the project area are expected to be a relatively small fraction of this total since most recreational activities occur outside the immediate project areas, largely in the vicinity of Bruneau Dunes.

In 1995, more than 131,000 general hunting permits for pronghorn, bighorn sheep, and deer were issued to Idaho residents and non-residents for use statewide; the issuance of these permits generated more than $4.14 million in revenue (Table 3.12-17). The proposed project areas are located in IDFG Hunt Units 41 and 46, which support hunting for pronghorn antelope, bighorn sheep, deer, mountain lion, and upland game. An estimated total of 452 controlled hunt permits were issued by IDFG that were used for pronghorn, bighorn sheep, and deer hunting in Units 41 and 46 in 1995 (a summary of the distribution of these permits and associated revenue is presented in Table 3.12-18). Total revenue generated by the issuance of

**Table 3.12-17. Total General and Controlled Hunt Permits Issued by IDFG for State of Idaho, 1995**

| *Species* | *Permit* | *Fees* | *Total Permit Revenue* |
|---|---|---|---|
| **Pronghorn** | | | |
| Non-Resident | 51 | $226.00 | $11,526 |
| Resident | 3,093 | $27.50 | 85,057 |
| Subtotal | 3,144 | | $96,583 |
| **Bighorn Sheep** | | | |
| Non-Resident | 20 | $901.00 | $18,020 |
| Resident | 98 | $61.00 | 5,978 |
| Subtotal | 118 | | $23,998 |
| **Deer** | | | |
| Non-Resident | 12,869 | $226.00 | $2,908,394 |
| Resident | 115,306 | $10.00 | 1,115,306 |
| Subtotal | 128,175 | | $4,023,700 |
| **Total Permits Issued** | **131,437** | | **$4,144,281** |

Source: Personal communication, Glahn.

**Table 3.12-18. Estimated Total Controlled Hunt Permits Issued by IDFG for Hunt Units 41 and 46, 1995**

| *Species* | *Permit Fees* | UNIT 41 | | UNIT 46 | |
|---|---|---|---|---|---|
| | | *Permits Issued* | *Permit Revenue* | *Permits Issued* | *Permit Revenue* |
| **Pronghorn** | | | | | |
| Non-Resident | $ 226.00 | 1 | $ 226 | 4 | $ 904 |
| Resident | $ 27.50 | 44 | $ 1,210 | 200 | $ 5,500 |
| Subtotal | | 45 | $ 1,436 | 204 | $ 6,404 |
| **Bighorn Sheep** | | | | | |
| Non-Resident | $ 901.00 | 2 | $ 1,802 | 1 | $ 901 |
| Resident | $ 61.00 | 11 | $ 671 | 5 | $ 305 |
| Subtotal | | 13 | $ 2,473 | 6 | $ 1,206 |
| **Deer** | | | | | |
| Non-Resident | $ 226.00 | 40 | $ 9,040 | 50 | $ 11,300 |
| Resident | $ 10.00 | 354 | $ 3,540 | 435 | $ 4,350 |
| Subtotal | | 394 | $ 12,580 | 485 | $ 15,650 |
| **Total Permits Issued** | | **452** | **$ 16,489** | **695** | **$ 23,260** |

Note: Total permits issued provided by personal communication, Glahn. Breakdown between *resident* and *non-resident* permits based on statewide distribution of permit issuance (see Table 3.12-20).
Source: Personal communication, Glahn.

controlled hunting permits was $16,489 ($1,436 for pronghorn, $2,473 for bighorn sheep, and $12,580 for deer) for Unit 41 and $23,260 ($6,404 for pronghorn, $1,206 for bighorn sheep, and $15,650 for deer) for Unit 46.

Federal agencies have grappled with identifying suitable methods for measuring socioeconomic conditions of Native American populations. A classical economic approach does not consider non-western customs and values found in Native American cultures. On the other hand, studies that emphasize non-western economic values and activities are usually difficult to incorporate into modern economic analyses. For example, some residents of the Duck Valley Reservation still practice traditional food gathering activities that would not be accounted for in most economic reports. Therefore, the Air Force is supporting a study of the economic and social conditions on the Reservation and development of a socioeconomic and cultural characterization model. This study is still in its preliminary stages.

### POPULATION

The 1990 *Census of Population and Housing* reported that the Duck Valley Reservation, which straddles the border between Owyhee County, Idaho and Elko County, Nevada, had a total population of 1,112 people, 985 of whom were Native American (Shoshone-Paiute), 59 Hispanic, 65 white, 1 black, 1 Asian or Pacific Islander, and 1 classified as Other. The majority of the Reservation's population (908) live in the Nevada portion, which contains the Reservation's largest community, Owyhee. Median population age was reported as 23 years for the Idaho half of the Reservation and 26 years for the Nevada half. Although these data were collected 7 years ago, they are considered indicative of current conditions at the Reservation due to the relative continuity and consistency of the Reservation's internal social, economic, and political structure.

### HOUSING

In 1990, the Duck Valley Reservation had 420 housing units, comprising 339 single-family homes, 33 multiple-family units, and 48 mobile homes/trailers. Of this total, 343 (or 81.7 percent) were occupied. Homeowner vacancy rate was about 1.5 percent; rental vacancy rate was 10.6 percent. Median value of owner-occupied units ranged from $42,400 in the Reservation's Nevada portion to slightly more than $53,000 in the Idaho portion. According to the 1990 *Census of Population and Housing*, 2.6 percent of the homes on the Reservation lacked complete plumbing facilities, 12.3 percent had no available vehicle, and 37.2 percent had no telephone.

### EMPLOYMENT, UNEMPLOYMENT AND JOB COMPOSITION

In 1990, total employment of Native Americans residing at the Duck Valley Reservation numbered 265 out of a total civilian labor force of 367 people, resulting in an overall unemployment rate of 25.1 percent, as compared to 5.2 percent for Owyhee County and 5.9 percent for Idaho during that same year.

The greatest employment sector for Shoshone-Paiute residing at the Reservation is Professional and Related Services, which employs 121 people. Hospitals, health services, and educational services comprise the principal employment fields within this sector. Public administration (with 41 employees), agriculture, forestry, and fishing (29 employees), mining (20 employees), and retail trade (18 employees) represent the next-greatest employment sectors.

In 1990, 84 percent of the Reservation's Idaho workforce reported working "outside county of residence" (i.e., Owyhee County, Idaho) yet reported an average commute of only 17 minutes. Conversely, 93 percent of the Reservation's Nevada workforce reported working "in county of residence" and reported an average commute of 13 minutes. Based on this information and the relatively isolated geography of the Duck Valley Reservation, these statistics indicate that the majority of jobs held by Reservation residents are located within the Nevada portion of the Reservation, likely concentrated in the community of Owyhee, or in the nearby town of Mountain City, Nevada.

### EARNINGS

Median family income for the Idaho portion of the Reservation in 1990 was $20,750, which was 24 percent less than the statewide median income of $27,200 but 18 percent greater than the countywide median of $17,600. Median family income for the Nevada portion of the Reservation in 1990 was $15,000, less than the Owyhee County, Idaho Reservation portion, and Idaho state medians. Median income aggregated for the entire Duck Valley Reservation is not available.

Based on 1990 census statistics, 87 (or 35 percent) of the 246 Native American families residing at the Duck Valley Reservation had total annual income under the poverty level. In the Reservation's Idaho portion, 13 (or 31 percent) of the 42 families were under the poverty level as compared to an Owyhee County total of 24 percent. A total of 36.3 percent of the Reservation's Native American individuals lived below the poverty level (35.5 percent for the Idaho portion and 36.5 percent for Nevada) in 1990 as compared to 29 percent of individuals in Owyhee County.

### PUBLIC SERVICES

Within the Duck Valley Reservation, law enforcement and road maintenance are provided by the BIA. Health Services include a 15-bed inpatient clinic and emergency room, outpatient, and community health services in the community of Owyhee, Nevada.

### PUBLIC EDUCATION

Education-related statistics for Native American residents of the Duck Valley Reservation indicate that in 1990, 315 students were receiving public primary, secondary, or college education.

At that time, of all individuals between the ages of 18 and 24 years (92 people), one-third were high school graduates (or equivalent) and 28 percent had attended college or received an associate's degree. Of individuals older than 25 years (509 people), 334 (or 66 percent) were high school graduates or had achieved some form of post-secondary education (U.S. Bureau of the Census 1991b).

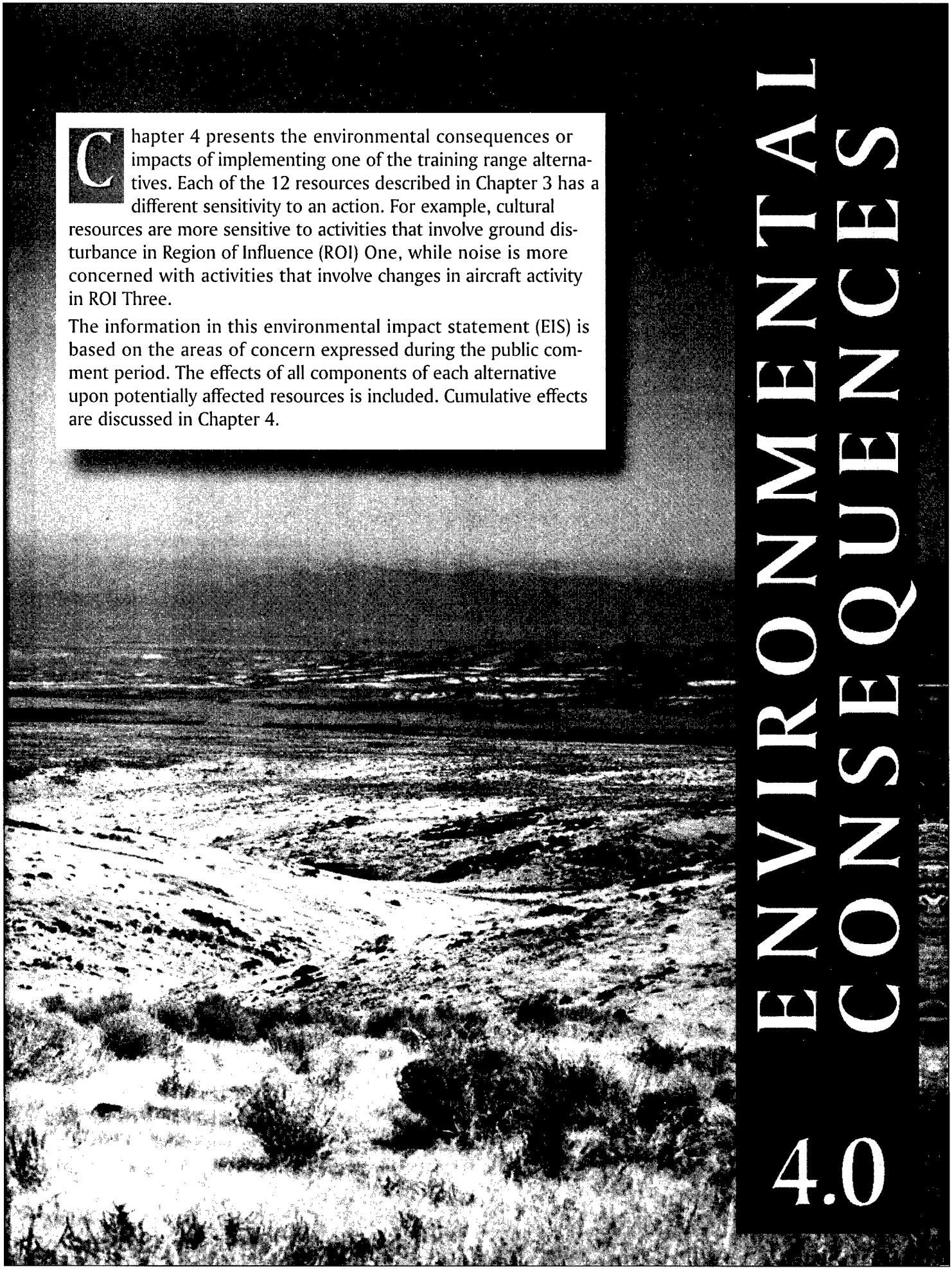
Currently, 226 students from the Duck Valley Reservation receive primary and secondary education from the Elko County School District. An additional 21 students attend a Headstart program offered by the Inter-Tribal Council of Nevada. The Shoshone-Paiute Tribe Day Care Center serves an average of 17 children per day.

### 3.12.7 Retail Trade Economic Activity

Retail trade supports all other goods and purchases made in Owyhee County. Retail trade reported 446 employees in 1994 accounting for about $5.9 million in earnings (U.S. Bureau of Economic Analysis 1996).

### 3.12.8 Shoshone-Paiute Issues Concerning Socioeconomics

Data required for describing current socioeconomic conditions on the Duck Valley Reservation were obtained primarily from the 1990 *Census of Population and Housing* and from information that the Shoshone-Paiute Tribes compiled and provided to the Air Force in October 1996.



# 4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4 presents the environmental consequences or impacts of implementing one of the training range alternatives. Each of the 12 resources described in Chapter 3 has a different sensitivity to an action. For example, cultural resources are more sensitive to activities that involve ground disturbance in Region of Influence (ROI) One, while noise is more concerned with activities that involve changes in aircraft activity in ROI Three.

The information in this environmental impact statement (EIS) is based on the areas of concern expressed during the public comment period. The effects of all components of each alternative upon potentially affected resources is included. Cumulative effects are discussed in Chapter 4.



## Environmental Consequences

The EIS presents the potential impacts to each of the 12 resource areas. A comprehensive table comparing alternatives by resource and the potential impact is provided in Chapter 2 as Table 2.4-1. The table below provides a summary for comparison of the potential effects among the three range alternatives on the 12 resources analyzed in the EIS. Alternative A, No-Action, is the baseline. This impact assesment does not include possible mitigation measures. Mitigation measures are provided in Table 2.6-1.

**POTENTIAL EFFECTS OF EACH ALTERNATIVE**

Classifications

▲ potential positive effects
■ no substantial effects
▼ potential negative effects
⁻/- = Overall effects / site or resource specific effects

| EIS Section | Resource | Alternative A No-Action | Alternative B Clover Butte | Alternative C Grasmere | Alternative D Juniper Butte |
|---|---|---|---|---|---|
| 4.1 | Airspace | ■ | ■ | ■/▼ | ■ |
| 4.2 | Noise | ■ | ▲/▼ | ▲/▼ | ▲/▼ |
| 4.3 | Safety | ■ | ■ | ■ | ■ |
| 4.4 | Hazardous Waste | ■ | ■ | ■ | ■ |
| 4.5 | Earth Resources | ■ | ■ | ■ | ■ |
| 4.6 | Water Resources | ■ | ■ | ■ | ■ |
| 4.7 | Air Quality | ■ | ■ | ■ | ■ |
| 4.8 | Biological Resources | | | | |
| | • Vegetation, Rare Plants, Wetlands | ■ | ■/▼ | ▼ | ▼ |
| | • Large Mammals | ■ | ■/▼ | ▼ | ■/▼ |
| | • Other Wildlife | ■ | ■/▼ | ▼ | ■/▼ |
| | • Protected and Sensitive Species | ■ | ■/▼ | ▼ | ■/▼ |
| 4.9 | Cultural Resources | ■ | ■/▼ | ■/▼ | ■/▼ |
| 4.10 | Land Use and Transportation | ■ | ■ | ■ | ■ |
| 4.11 | Recreation and Visual Resources | ■ | ■ | ■ | ■ |
| 4.12 | Socioeconomics | ■ | ■/▼ | ■/▼ | ■/▼ |

# 4.0 ENVIRONMENTAL CONSEQUENCES

This chapter overlays the project elements described in Chapter 2 upon the baseline or existing conditions of Chapter 3 to produce projected environmental consequences of the alternatives. In each resource discussion, the approach used to assess the environmental consequences is described first, followed by the projected results for each alternative and for each resource.

## SUMMARY OF CONCERNS

Issues and concerns raised during the Enhanced Training in Idaho (ETI) public and agency scoping process and through discussions held by the Air Force with the Shoshone-Paiute Tribes as part of government-to-government relations have been integrated into the analysis. Additional public comments and agency inputs during the Draft EIS (DEIS) review included:

| | |
|---|---|
| 1. *Airspace* | General aviation users are concerned that changes in airspace could affect flight corridors. Members of the Shoshone-Paiute Tribes and others wish to be assured that general aviation and emergency medical flights will not be restricted near the Duck Valley Reservation. |
| 2. *Noise* | Issues included measurement and interpretation of noise data. Concerns included existing noise from aircraft and any operational changes that could increase noise especially in proposed northern airspace expansion. Many Shoshone-Paiute expressed concern about existing and any increase in sonic booms and other noise in traditional lands. |
| 3. *Safety* | Fire safety was identified as a concern during public hearings. Some Shoshone-Paiute and others expressed concern about the Air Force's use of chaff and flares. |
| 4. *Hazardous Materials and Contamination* | Agencies and the public want to be assured that procedures are in place and are followed to ensure proper treatment of all hazardous materials. |
| 5. *Earth Resources* | The potential for paleontological impacts during road and facility construction and training range operations was identified as a concern by commentors. |
| 6. *Water Resources* | Concern was expressed that road improvements could impact water resources. Water for ranching and sensitive species was also raised as an issue. Water resources that may be important to Shoshone-Paiute traditions were identified as sensitive resources. |

| | |
|---|---|
| 7. *Air Quality* | Individuals questioned that aircraft and diesel generator exhaust impacts upon air quality were adequately addressed. |
| 8. *Biological Resources* | Agencies, public commentors, and members of the Shoshone-Paiute Tribes expressed concerns that continued military aircraft training and human presence in southwest Idaho have contributed to a decline in the populations of sage grouse and bighorn sheep. Citations of helicopter impacts to bighorn sheep were included in Volume 2. Concerns included weed control, habitat fragmentation, and other native species in addition to species of special concern. |
| 9. *Cultural Resources* | Commentors were concerned that solitude is a factor in the importance of cultural resources that would be directly affected by construction and use of a proposed range. Some buttes, caves, canyons, plants, and animals may be traditional cultural resources to some Shoshone and Paiute. An aircraft visible overhead may be an unwanted intrusion during ceremonies. |
| 10. *Land Use and Transportation* | Commentors expressed concern that overflights were not compatible with a Wilderness Study Area (WSA). Some Shoshone-Paiute were worried that a selected alternative may keep them from visiting certain spiritual locations. Shoshone-Paiute were concerned that improved roads may open up the area to vandals and other non-Indian visitors. Recreationalists and others were concerned that the additional 20 work day trips would impact road traffic. |
| 11. *Recreation and Visual Resources* | Commentors expressed concerns that recreational activities are now and will continue to be disturbed by low-level aircraft overflights. Of particular concern were overflights over river canyons. Members of the Shoshone-Paiute Tribes do not want emitter sites and other facilities that could intrude on the visual landscape near the Duck Valley Reservation. |
| 12. *Socioeconomics* | Ranchers and the agricultural industry are interested in the economic impacts and benefits of Air Force activities in southwest Idaho. Specific areas of concerns also included recreational activities. Some Shoshone-Paiute expressed the opinion that they may be disproportionately subject to significant adverse consequences of Air Force activities. |

In addition to integrating the issues and concerns described above into the resource analysis, numerous analytical tools were used by each analyst to ensure a complete evaluation of direct, indirect, and cumulative impacts. Some of these methods included:

**Overlay Mapping.** A series of maps of the region were used to identify potential sites for the project elements, as discussed in Chapter 2. These maps were available during scoping and the public was invited to assist in identifying various areas which may have been suitable for the proposed action. Following scoping, an automated geographic information system (GIS) was utilized to input the field surveys and other data collected for each resource using the appropriate geographic area. This allowed for a visual presentation of key areas of concern within individual and collective disciplines.

**Checklists and Matrices.** A common technique throughout the analysis has been the use of checklists and matrices which allow for a systematic presentation of information. In the early stages of the environmental impact analysis process (EIAP), the resource analysts met as a group and developed a list of project elements and their potential effects on each resource. A matrix was used to identify areas of common or overlapping concern. For example, the potential for improved roads was an issue for resources concerned with ground disturbance caused by construction activities and the potential for increased human presence. The environmental resources, including earth, water, biological, cultural, recreation, visual, land use, and transportation, applied this matrix as input to the analysis of potential consequences.

**Modeling.** Numerous resource analysts employ modeling techniques. Notably noise, safety, air quality and socioeconomics rely heavily on this analytical tool.

Analyses to determine impacts resulting from the change in sortie-operations both in terms of numbers and locations, are based on all projected users of ranges, range support military operations areas (MOAs), and other MOAs in the regional military training airspace. This includes 366th Wing aircraft as well as transient aircraft. Sortie-operations considered under each alternative are compared with baseline operations in Table 4.0-1.

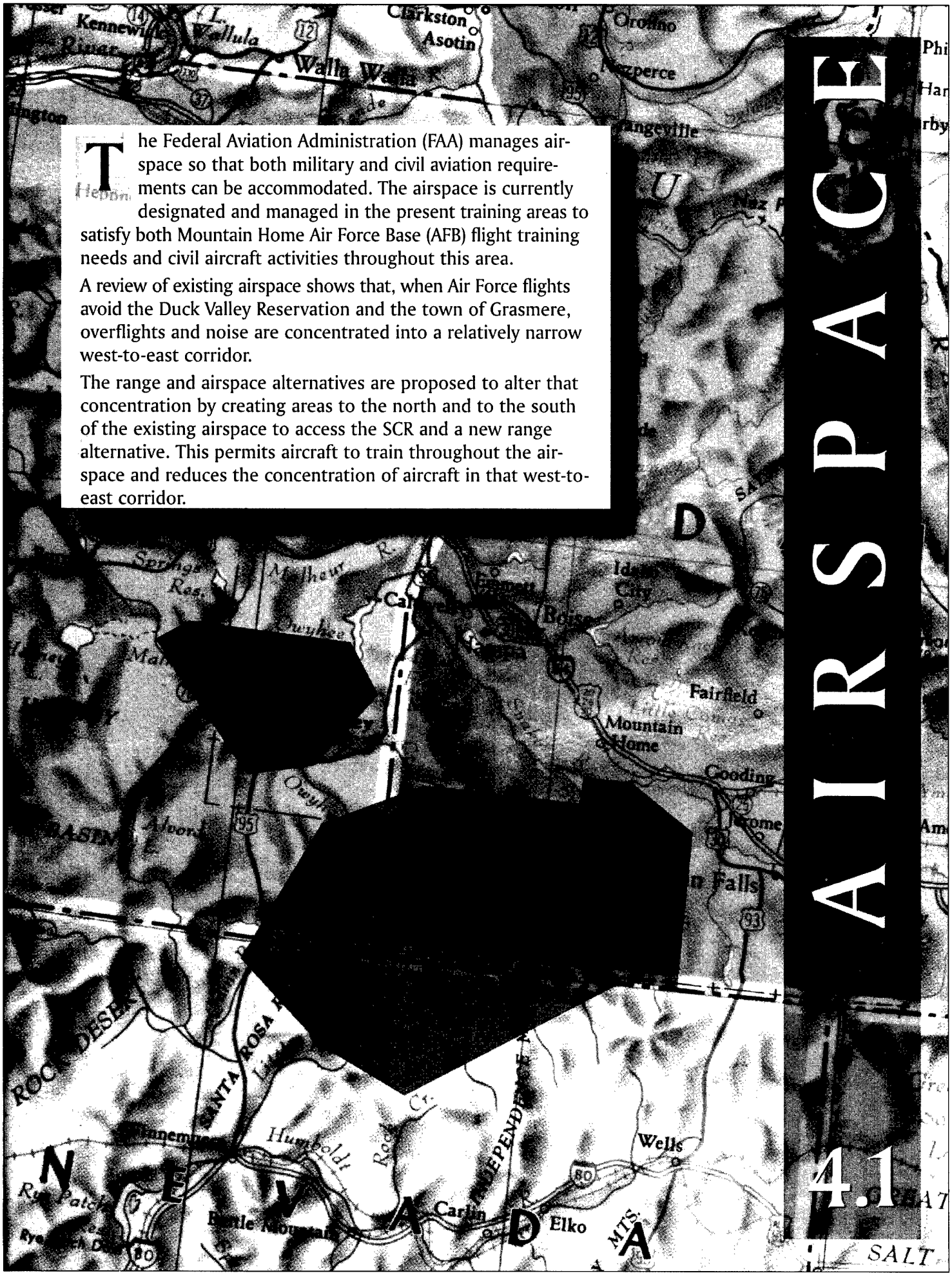
EIS Chapter 4 presents the results of the impact analysis for each of the 12 resource areas in sections 4.1 through 4.12.

**Table 4.0-1. Annual Sortie-Operations Under Alternatives**

| Aircraft | SCR[1], ETI, Range Support MOAs | | Owyhee MOA | | Paradise MOAs | | | Saddle MOA | |
|---|---|---|---|---|---|---|---|---|---|
| | *B/L Alt. A* | *Alt. B, C, D* | *B/L Alt. A* | *Alt. B, C, D* | *B/L Alt. A* | *Paradise East (Alt. B, C, D)* | *Paradise West (Alt. B, C, D)* | *B/L Alt. A* | *Alt. B, C, D* |
| A-6/EA-6B | 156 | 156 | 48 | 48 | 40 | 40 | 40 | 1 | 1 |
| AV-8 | 0 | 0 | 28 | 28 | 35 | 35 | 35 | 0 | 0 |
| A-10 | 2,401 | 2,401 | 1,632 | 1,632 | 154 | 60 | 80 | 462 | 632 |
| B-1 | 349 | 349 | 153 | 153 | 102 | 66 | 88 | 20 | 20 |
| B-2 | 0 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| B-52 | 32 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-130 | 50 | 50 | 33 | 33 | 12 | 6 | 6 | 12 | 6 |
| F-4 | 86 | 86 | 105 | 105 | 89 | 89 | 89 | 34 | 34 |
| F-14 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-15 | 2,646 | 3,045 | 3,137 | 3,572 | 2,939 | 1,996 | 2,661 | 1,041 | 1,064 |
| F-16 | 1,970 | 2,036 | 2,175 | 2,247 | 1,563 | 969 | 1,292 | 336 | 332 |
| F-18 | 24 | 24 | 20 | 20 | 16 | 16 | 16 | 0 | 0 |
| F-111 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| KC-135 | 0 | 0 | 2 | 2 | 69 | 69 | 69 | 41 | 41 |
| T-37 | 1 | 0 | 11 | 0 | 66 | 0 | 0 | 39 | 39 |
| UH-1 | 13 | 13 | 6 | 6 | 6 | 6 | 6 | 0 | 0 |

Note: 1. SCR = Saylor Creek Range

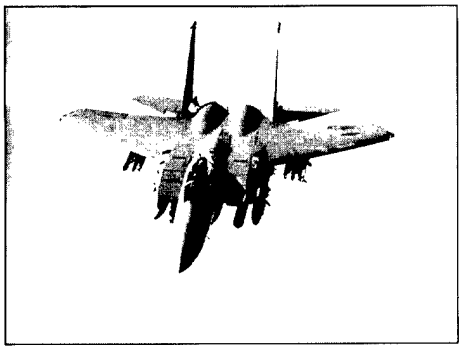
# AIRSPACE




The Federal Aviation Administration (FAA) manages airspace so that both military and civil aviation requirements can be accommodated. The airspace is currently designated and managed in the present training areas to satisfy both Mountain Home Air Force Base (AFB) flight training needs and civil aircraft activities throughout this area.

A review of existing airspace shows that, when Air Force flights avoid the Duck Valley Reservation and the town of Grasmere, overflights and noise are concentrated into a relatively narrow west-to-east corridor.

The range and airspace alternatives are proposed to alter that concentration by creating areas to the north and to the south of the existing airspace to access the SCR and a new range alternative. This permits aircraft to train throughout the airspace and reduces the concentration of aircraft in that west-to-east corridor.



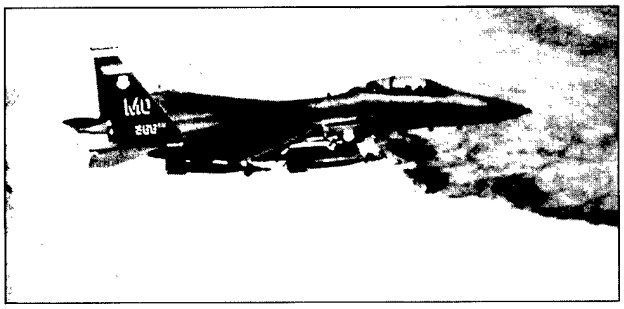
Changes to the airspace, as proposed by the Air Force, were compared to the baseline conditions to determine whether the changes may affect the use and management of airspace. No changes in design or use are proposed for the Military Training Routes (MTRs) currently supporting Mountain Home AFB flight training.

Aeronautical maps, operational data, and flight procedures were reviewed, and FAA, Idaho Transportation Department's Aeronautics Division, Bureau of Land Management (BLM), and Air Force representatives were contacted to help identify all factors having a bearing on airspace use.

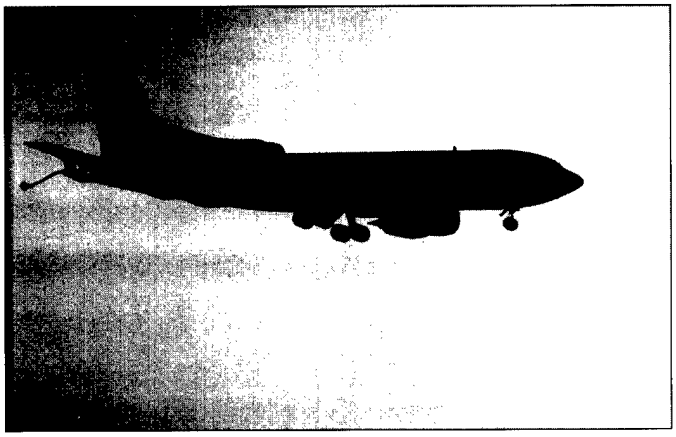
For example, Shoshone-Paiute Tribal members expressed concern that new restricted airspace could affect emergency flights. There would be no impact to emergency flights as the Air Force is required to support such flights.

The airspace assessment includes the following results:

The existing airspace configuration concentrates overflights of aircraft, such as this F-15, in a west-to-east corridor north of the Duck Valley Reservation. Airspace changes will reduce that concentration and associated noise in that corridor.



- Overall, proposed airspace modifications and projected changes in aircraft training missions would have no adverse effects on regional airspace use.
- If the Grasmere site were selected, proposed restricted airspace at the site could require rerouting of general aviation using the Route 51 north-south corridor and could place requirements on the use of the Grasmere airport. No other alternative would have the same effect.
- Current restricted airspace south of SCR would be reduced, making more airspace accessible to general aviation aircraft and facilitating west-to-east transit of southern Idaho.
- MOA airspace would expand by about 6 percent; this would not adversely affect civil aviation activities in the expanded areas.
    - Raising the airspace ceiling over SCR support MOAs to 18,000 feet is not expected to affect regional airspace.
    - Airspace modifications would not affect any rescue lifeflight operations. The Air Force is required to support such rescue activities.
    - The range development alternatives would redistribute aircraft training missions through out the training airspace.



KC-135R tankers assigned to the 366th Wing provide refueling for training and deployment.

Flights would be redistributed through the use of the new range and its supporting airspace. Training flights would be reduced in some areas, while in other areas they would increase. The EIS analysis does not anticipate that proposed airspace changes would result in environmental impacts to the airspace.

## 4.1 AIRSPACE USE AND MANAGEMENT

Effects on airspace use were assessed by comparing the proposed airspace modifications and projected military aircraft sortie-operations with the current structural and operational airspace environment in ROI Three. Sortie-operations considered are shown in Table 4.0-1. This assessment considered the compatibility of military and civil operations under current conditions and determined if the changes identified for the alternatives had the potential to cause any impacts on how airspace has traditionally been used in this region.

Each alternative compares and addresses airspace use relative to average daily sortie-operations, assuming that flight training is normally scheduled on weekdays, 260 days per year. Although exercises, safety days, holidays, and weather cancellations may affect the actual flying days and sortie-operations flown, this average provides a good representation of the number of military flights that may occur on a typical daily basis.

General trends in civil aircraft operations and discussions with FAA and ITD representatives indicate that civil aviation in the region is expected to remain relatively stable in the foreseeable future. No significant increases are anticipated for either Boise Airport operations or aircraft flights along airways, flyways, and other routes commonly flown by Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) civil aircraft throughout this region. Increased flights and some route modifications may be required to support air travel to Salt Lake City for the Winter Olympics in the year 2000. Additionally, the FAA is in the process of planning and implementing a "free flight" program that permits aircraft flying above 29,000 feet above mean sea level (MSL) to select their own routes as alternatives to published routes. In both cases, FAA representatives at the Salt Lake City Air Route Traffic Control Center (ARTCC) indicate that these future operations would not be impacted by Mountain Home AFB military training flight operations since the ARTCC would be separating this traffic from military aircraft. Because it is unlikely that future civil aviation operations or airport planning would have any notable effects on the ROI, each alternative was evaluated relative to the current ROI Three airspace use by general aviation (small private aircraft flying visually between local airstrips, ranches, and other limited flight activity); commercial aviation (private, charter, and commercial passenger aircraft flying by IFR between regional airports); and BLM and Idaho Department of Fish and Game (IDFG) flights (fire/game surveys). Current activities for each of these civil aviation interests were discussed in section 3.1, Airspace Use and Management.

Aircraft operations would not change on those MTRs supporting low-level navigation training and access to the training airspace under any of the alternatives. These MTRs were previously assessed (Environmental Assessment [EA] on Strategic Air Command Use of Saylor Creek Range 1990, EIS for Proposals for the Air Force in Idaho 1992, EA for Aircraft Conversion of the Idaho Air National Guard [IDANG] 1991, EA for the Proposed Relocation of the 34th Bomb Squadron at Mountain Home AFB 1996, EA for Aircraft Conversion of the 124th Wing, IDANG 1996) as having no adverse impacts on airspace use in this region; therefore, overall use is not reevaluated as part of this airspace assessment. However, those segments of the MTRs that

underlay existing or proposed MOA airspace are considered with regard to their potential interactions with that airspace.

### 4.1.1 Alternative A — No-Action

Under Alternative A, the current airspace configuration (refer to Figure 3.1-1) and use would remain unchanged. This use would not be expected to have any changed affect on civil aviation.

#### 4.1.1.1 Restricted Areas

Restricted airspace supporting SCR activities (R-3202A/B/C) and the surrounding Sheep Creek 1, 2, and 3, Bruneau 1 and 2, and Saylor MOAs would continue to be used and managed in the same manner as under current conditions. Flight profiles and patterns associated with weapons delivery on the SCR would remain unchanged. As discussed in Chapter 3, this airspace is clear of federal airways connecting Boise and other airport locations in the region; therefore, IFR air traffic would continue to be unaffected.

#### 4.1.1.2 MOAs

Use and management of the MOAs would be the same as described for baseline. No changes are anticipated for the MOA airspace or for Area X-Ray surrounding Mountain Home AFB that is used for aircraft transition between the base and the different training areas.

Airspace use by BLM and IDFG flights would be unchanged by Alternative A. Coordination of agency survey flights with Mountain Home AFB would continue to ensure that these flights are scheduled within Mountain Home AFB airspace, as appropriate, and that military pilots are informed of their locations. Operation of the Military Radar Unit (MRU), also known as Cowboy Control, would further enhance flight safety with its low-altitude radar coverage and enhanced radio coverage (refer to section 3.1.1).

### 4.1.2 Alternative B — Clover Butte

Airspace actions proposed under Alternative B are shown in Figure 2.3-10 and are described below as they relate to current airspace use and management.

#### 4.1.2.1 Restricted Areas

Alternative B proposes some changes to restricted areas that would have an overall beneficial effect on where civil VFR aircraft could fly in the area without the limitations imposed by restricted airspace. First, the nearly 35-mile-long block of restricted airspace (R-3202B and C) that extends southward from the SCR would be converted to MOA airspace, thereby eliminating about 200 square miles of restricted airspace. This would amount to nearly a 50 percent overall reduction in restricted airspace. This reduction could reduce some flying

distance for any VFR aircraft that must currently divert around R-3202B/C to the south when transiting through this particular area.

A higher block of airspace would be established as a restricted area (R-3202B) above R-3202A, extending the current SCR restricted airspace from 18,000 to 29,000 feet MSL. When in use, this upper block would accommodate tactics such as pop-up and high-altitude weapons deliveries. Salt Lake City ARTCC could route IFR traffic through this area as needed and maintain separation from the military aircraft. When not in use, this airspace would be returned to the Center for general unlimited use. The proposed R-3202B would have no impact on VFR air traffic since such operations are prohibited above 18,000 feet MSL.

A new restricted area, R-320X, would be established over the Clover Butte range site as described in section 2.3.3.2. This restricted area would be subdivided into three vertical segments: a rectangular area over the target area from the range surface to 100 feet above-ground level (AGL) (R-320XA), an overlying 5-nautical mile (NM) radius circular area of about 100 square miles extending from 100 feet AGL up to 18,000 feet MSL (R-320XB), and a continuation of this circular area from 18,000 to 29,000 feet MSL (R-320XC). Overall, the proposed elimination of R-3202B/C and the creation of R-320X would result in a net reduction of nearly 100 square miles of restricted airspace. The proposed circular restricted area would minimize the distance any VFR aircraft would have to fly to avoid this restricted airspace. The size and location of this restricted area would not affect IFR traffic because these aircraft would be separated from this airspace by Salt Lake City ARTCC.

On an average daily basis, it is projected that current SCR use (30 sortie-operations) would decline by 1 or 2 sortie-operations and about 16 sortie-operations would be flown within R-320X that encompasses the Clover Butte training range. Even though many aircraft would conduct operations on both SCR and R-320X, it is projected that there would be 32 daily sortie-operations (based on 260 flying days) in the proposed Jarbidge MOA that encompasses both ranges. These sortie-operations would be distributed over a wide variety of ground tracks approaching the range target areas in order to enhance realism and variety in the weapons training scenarios. Although a small portion of the range operations could occur as low as 500 feet AGL, over 65 percent of flight profile time would be above 2,000 feet AGL. IFR and VFR air traffic would be unaffected by SCR sortie-operations.

#### 4.1.2.2 MOAs

Alternative B would realign existing internal MOA boundaries and expand MOA airspace to the north and south as shown in Figure 2.3-13. The Owyhee and Paradise East MOA expansions would add about 430 and 125 square miles, respectively, to MOA airspace. This would result in an overall 6 percent increase in MOA airspace. Overall, these changes would provide more maneuverability and accessibility for the proposed training range and no-drop targets, and allow better opportunities for temporary avoidance of specific environmentally or culturally sensitive areas. Use of the proposed MOA expansions would be consistent with current training maneuvers, but would allow more efficient scheduling and use of the total

airspace environment. The floor of the Paradise East MOA and its proposed expansion is sufficiently high (14,500 feet MSL) to permit VFR operations beneath the MOA. The Owyhee MOA and its proposed expansion begin at 500 feet AGL. Expansion of either MOA would not adversely affect VFR or IFR aircraft operations. Area X-Ray would continue to support transit into the northern portions of the MOA. The relatively small amount of VFR activity in this region does not normally occur in the area of the proposed MOA expansions. Since MOA airspace is unrestrictive, VFR and military aircraft may operate jointly in this airspace using "see and avoid" flight techniques to remain clear of each other. Civil IFR flights do not normally occur in the area of the proposed MOA expansions; however, if transit became necessary through these areas, the MRU would support Air Traffic Control (ATC) in separating air traffic.

Although low in volume, civil and resource management agency VFR traffic should not be affected by the airspace modifications. The presence or absence of military activity in the airspace can be determined through coordination with Mountain Home ATC. The MRU (Cowboy Control) which will provide enhanced low-altitude radar coverage and improved communications would work in conjunction with ATC in separating air traffic and providing aviation advisories. Finally, all aircraft operation jointly in the airspace would be using "see-and-avoid" techniques. It should be noted that the responsibility for "see-and-avoid" is shared by both military and civil pilots. Furthermore, the concept of "seeing" is not limited to simple visual acquisition and identification. For example, the airborne radar in some military aircraft can "see" a small civil aircraft out to about 100 miles if the civil aircraft is equipped with a transponder. Even without a transponder, given line-of-sight capability, a fighter aircraft's radar could still detect the civil aircraft at ranges from 35 to 50 miles, allowing ample time for avoidance maneuvering.

Alternative B would reduce the 20 daily average sortie-operations in the Paradise East and West MOAs by 3 to 7 sortie-operations. About 28 daily sortie-operations are conducted in the Owyhee MOA and this would increase by about 1 to 2 sortie-operations. Such increases would not affect VFR traffic since MOA sorties are normally conducted at higher altitudes and distributed over a large expanse of airspace.

Five no-drop target areas and 30 electronic emitter sites would be established within the Jarbidge MOA as depicted in Figure 2.3-1. Aircraft simulating attacks over the target areas would fly profiles similar to those described above for the restricted areas. Under Alternative B, both no-drop target areas and emitter sites would be located near Highway 51. Military aircraft operating near these facilities would not always be able to avoid the 8,000-10,000 feet MSL altitude block currently avoided for civil VFR flights and still retain the realism desired for the ETI project. While see-and-avoid procedures continue to be the primary consideration in the MOA and air traffic advisories would be available from the MRU, the Air Force would coordinate with affected agencies, as appropriate, to establish other means of ensuring civil VFR aircraft safe access through this area. Such means may include advisories of military

operations via a toll free telephone number, an Automatic Terminal Information Service, and published VHF frequencies or identification of another visual transit route.

Alternative B airspace modifications and associated changes in flight operations would not interfere with BLM and IDFG's continuing need to coordinate and conduct agency flights throughout this area. Information on the location and altitudes of such flights are provided to military pilots during preflight briefings, and traffic advisories may also be provided by ATC, when possible, to both agency and military pilots.

### 4.1.3 Alternative C — Grasmere

Alternative C contains the same airspace proposals and projected number of sorties described for the proposed action. The only significant difference is the location of the range target area and the internal boundary separating the Owyhee and Jarbidge MOAs, as shown in Figure 2.3-14. This alternative would have some impact on use of both the Grasmere Airport and the restricted area, as discussed below. This section focuses primarily on assessment of effects associated with the restricted airspace. The distribution of sortie-operations would remain the same as in Alternative B.

#### 4.1.3.1 Restricted Areas

The restricted area considered under Alternative C would have the same dimensions as described for Alternative B. The restricted area for the Grasmere alternative would overlap the Route 51 corridor currently used by general aviation as a VFR route. This would require that private aircraft divert around the Grasmere restricted area or obtain permission to traverse the area.

Grasmere Airport, a public-use, unattended airfield, borders the northeastern boundary of the Grasmere restricted area. Due to the small size of the restricted area and the proximity of the airport to this airspace, both military and civil aviation activities could be impacted. Although very few aircraft operations are reported to occur at this airport, the operation of the MRU when the range is active would enhance flight safety associated with use of this airport.

The restricted area proposed for the training range overlaps an avoidance area of 3 NM centered on the Grasmere Airport below 1,500 feet that has been excluded from Owyhee MOA airspace. Therefore, if Alternative C is selected and Grasmere is to be maintained as an operable airfield, procedures would need to be established between the State of Idaho and Mountain Home AFB to provide continued protection for any aircraft operating in and out of this airfield. Such procedures may include a need for civil pilots planning any Grasmere airfield operations to coordinate with Mountain Home AFB ATC or range scheduling agencies in advance, when possible. This could be accomplished by phone prior to the planned flight, or by use of the common traffic advisory frequency published for this airfield, or the VHF (very high frequency) radio monitored by Cowboy Control. Use of this alternative target location may require that range aircraft exercise added caution and minimize target approaches over or

near the airport in the event a civil aircraft has to make an emergency landing. The operation of the MRU when the range is active would facilitate this coordination.

#### 4.1.3.2 MOAs

To provide sufficient supporting MOA airspace for range operations and exercises, Alternative C would require that the Owyhee-Jarbidge MOA boundary be moved farther to the west. This would also provide a larger buffer between separate missions that may be conducted in the Owyhee MOA while range operations are in progress. This boundary modification would have no impact on how operations affect airspace use in this area.

Use of the MOA airspace by VFR aircraft or BLM and IDFG flights would be as discussed under Alternative B.

### 4.1.4 Alternative D — Juniper Butte

Alternative D contains similar airspace proposals and projected number of sortie-operations described for Alternative B. The only significant difference is the location of the range target area as shown in Figure 2.3-15. This alternative would also involve extending the eastern boundary of the MOA 2 NM to the east along the Owyhee/Twin Falls County line.

#### 4.1.4.1 Restricted Areas

The restricted area that would be considered under Alternative D would have the same dimensions described for Alternative B and would be located just east of the Clover Butte location. Therefore, airspace use and management would be the same as discussed for Alternative B.

#### 4.1.4.2 MOAs

Alternative D would include the same MOA expansions and internal boundary modifications addressed in Alternative B with the exception of the additional MOA expansion to the east. Moving the MOA boundary to the east 2 NM would add about 112 square miles of supporting airspace for the target area. This narrow expansion would not affect civil VFR or IFR traffic since it contains no formal routes or airports.

VFR traffic would still be able to transit the MOA, because these aircraft do not require ATC clearance to do so. IFR traffic routes would be unaffected because they already circumvent the airspace proposed for modification.

Use of the MOA airspace by VFR aircraft or BLM and IDFG flights would be as discussed under Alternative B.

### 4.1.5 Shoshone-Paiute Concerns About Airspace Restrictions

Representatives of the Shoshone-Paiute Tribes have expressed concerns that MOA airspace currently in existence near the Duck Valley Reservation will one day be changed to restricted airspace, thus limiting access by general aviation to the Reservation for medical emergencies, visits by tourists, and other uses.

MOAs are not designated for the exclusive use of the military. Civilian aircraft operating under VFR can and do use MOAs jointly with the military, applying the see-and-avoid concept. The Air Force cannot control or prohibit civil air traffic operating under VFRs. The FAA has overall responsibility for managing the nation's airspace. This agency reviews and coordinates civil and military airspace needs to ensure that all interests are met. The FAA must approve all requests for creating new, or modifying existing, military training airspace.

None of the alternatives would involve the creation of restricted airspace other than that described in chapter 2.0. For Alternatives B and D, this restricted airspace would not be close to the Duck Valley Reservation, nor would it interfere with flights to and from the Reservation. For Alternative C, the restricted area would overlap the Route 51 corridor (north of the Duck Valley Reservation) currently used by general aviation as a VFR route. Implementation of this alternative would require that private aircraft divert around the Grasmere restricted area or obtain permission to traverse the area. Aircraft operations at Grasmere Airport would also be affected (see 4.1.3.1).

Emergency medical flights between Owyhee, Nevada and Boise, Idaho would not be adversely affected by the proposed action. These flights currently occur through MOA airspace; there would be no change in general use of the airspace under any of the alternatives except for the limited restricted airspace required over the selected training range. If an emergency flight through MOA airspace is necessary while training operations are taking place, the pilot can notify Mountain Home AFB to ensure that training activities in the vicinity are halted or redirected.

### 4.1.6 Cumulative Impacts

Cumulative impacts for airspace use and management consist primarily of past, present, and reasonably foreseeable airspace actions and operations relating to the proposed action and any other minor operational changes that are inherent to pilot training requirements. The three projects listed in section 2.6.2 would not change the pattern of use of the military airspace involved in the ETI proposal and therefore would not have a cumulative effect. Discussion with FAA and Mountain Home AFB air traffic and airspace representatives indicate that no other aviation activities are currently planned or anticipated in the foreseeable future that would significantly affect airspace use in this region. If any activities, such as airport expansion

or increased operations, are planned for this region, the FAA will continue to monitor the potential cumulative impacts such growth may have on the compatible use of airspace by all military and civil aviation interests. Appendix N provides a discussion of sortie-operations associated with historic use.

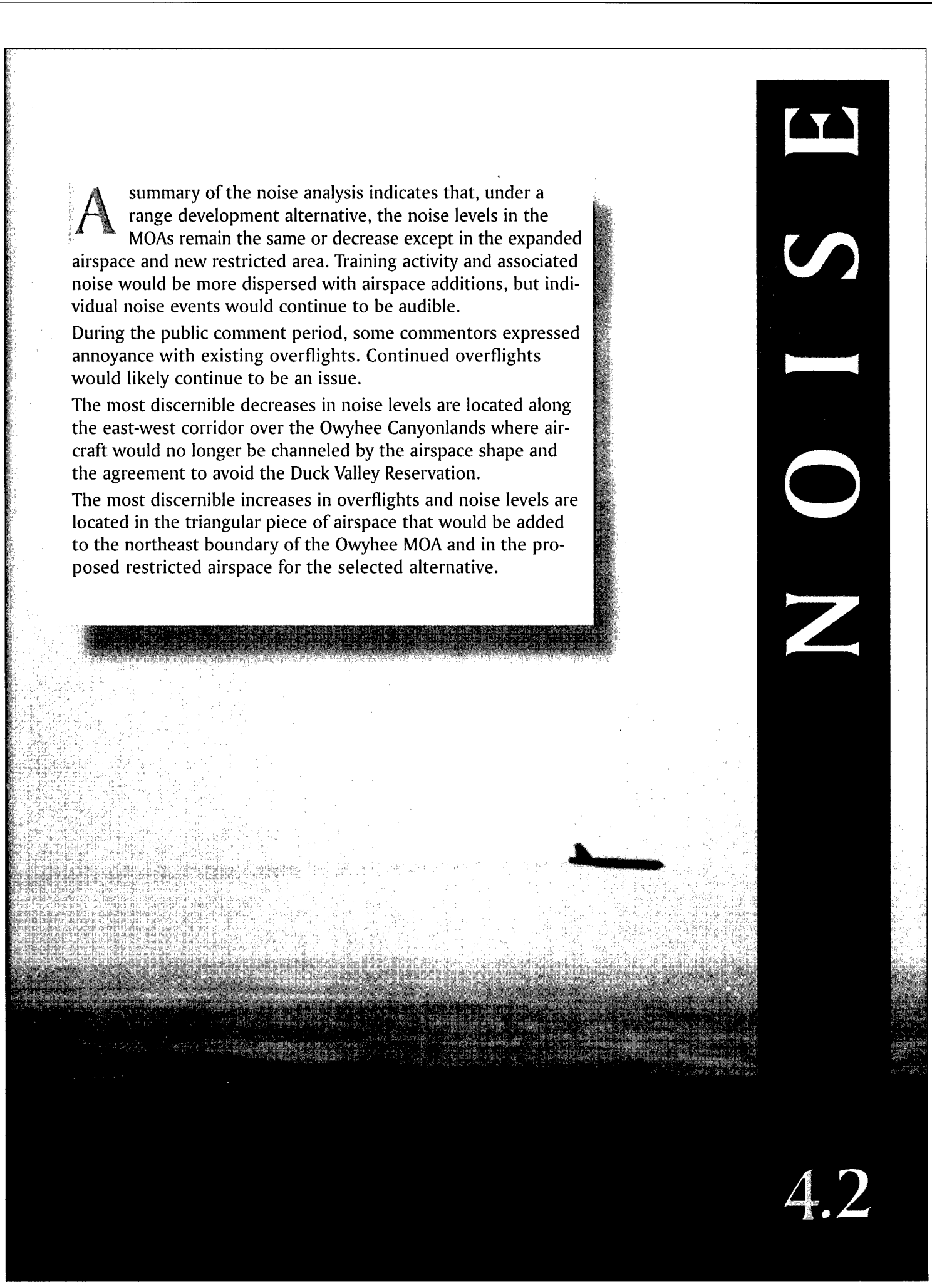
# NOISE

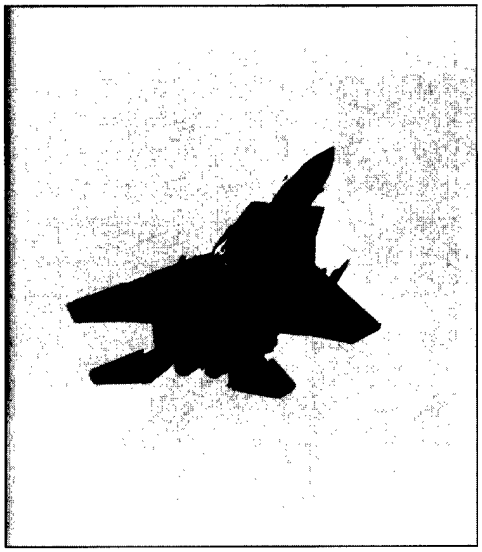
A summary of the noise analysis indicates that, under a range development alternative, the noise levels in the MOAs remain the same or decrease except in the expanded airspace and new restricted area. Training activity and associated noise would be more dispersed with airspace additions, but individual noise events would continue to be audible.

During the public comment period, some commentors expressed annoyance with existing overflights. Continued overflights would likely continue to be an issue.

The most discernible decreases in noise levels are located along the east-west corridor over the Owyhee Canyonlands where aircraft would no longer be channeled by the airspace shape and the agreement to avoid the Duck Valley Reservation.

The most discernible increases in overflights and noise levels are located in the triangular piece of airspace that would be added to the northeast boundary of the Owyhee MOA and in the proposed restricted airspace for the selected alternative.





The Air Force has restricted overflights and other activities over the Duck Valley Reservation. Restrictions include staying above 10,000 feet AGL over the reservation, not flying at supersonic speeds over the reservation, and, when notified, temporarily rescheduling or relocating aircraft operations to avoid disturbance to ceremonies.

Noise caused by military aircraft performing supersonic maneuvers was another operational concern expressed by the public and by Shoshone-Paiute representatives. All supersonic flight activity is restricted to an altitude above 10,000 feet AGL with the majority of the activity above 20,000 feet AGL. Sonic booms are usually created by F-15 and F-16 aircraft. B-1B aircraft do not fly supersonic in Mountain Home airspace. Noise levels were calculated using the most current computer program for measuring supersonic events. The model is based on extensive noise monitoring to evaluate noise in MOAs where supersonic maneuvers take place.

Each individual airspace was evaluated separately. Results from the noise analysis showed that the number of supersonic events and the maximum cumulative noise levels for the No-Action Alternative are the same as the baseline condition. The analysis also showed that the number of sonic booms and the maximum cumulative noise levels for the Clover Butte, Grasmere, and Juniper Butte airspace proposals would all be the same.

Any of the alternatives would result in some changes in supersonic noise, primarily over the SCR. Changes in air-to-air combat training increase the average frequency of sonic booms in SCR from 1 in 10 days to 4 in 10 days and, on average, increase sonic booms from 4 in 10 days to 6 in 10 days in the range support MOAs. These changes in sonic boom noise over SCR and in the MOAs are not projected to be a significant increase in noise for any one location.

**Estimated Sonic Booms**

| | Baseline Condition No-Action Alternative | Clover Butte, Grasmere, and Juniper Butte Alternatives |
|---|---|---|
| Description of Airspace | Average Number of Booms | Average Number of Booms |
| Saylor Creek Range | 1 per 10 days | 4 per 10 days |
| Range-Support MOAs Jarbidge MOA | 4 per 10 days | 6 per 10 days |
| Owyhee MOA | 10 per 10 days | 10 per 10 days |
| Paradise MOAs | 1 per 10 days | 1 per 10 days |

The following table presents a summary of cumulative noise levels by alternative. $L_{dnmr}$ is a measure of the total average sound level that can be used for comparison among alternatives. Reference points for noise level comparisons are depicted in Figure 3.2-1.

**Summary of Cumulative $L_{dnmr}$ Values (dB) by Alternative**

| Reference Points | Baseline and No-Action (dB) | Clover Butte Alternative B (dB) | Grasmere Alternative C (dB) | Juniper Butte Alternative D (dB) |
|---|---|---|---|---|
| A | 61 | 60 | 61 | 61 |
| B | 68 | 64 | 64 | 64 |
| C | 69 | 59 | 56 | 56 |
| D | 61 | **66** | 55 | 59 |
| E | 56 | **57** | **66** | 56 |
| F | 57 | **58** | 55 | **66** |
| G | 53 | 52 | 51 | 51 |
| H | 57 | 51 | 51 | 51 |
| I | 57 | 55 | 54 | 59 |
| J | 57 | 49 | 49 | 49 |
| K | 50 | 43 | 43 | 43 |
| L | 55 | 52 | 50 | 50 |
| M | 41 | **53** | **51** | **52** |
| N | 61 | 59 | 58 | 57 |
| O | 59 | 54 | 53 | 50 |
| P | 63 | 57 | 58 | 57 |
| Q | 62 | 57 | 58 | 58 |
| R | 53 | 44 | 48 | 45 |
| S | 53 | 43 | 47 | 42 |
| T | 52 | 52 | 52 | 52 |
| U | 60 | 60 | 60 | 60 |
| V | 57 | 57 | 57 | 57 |
| W | 46 | 46 | 46 | 46 |
| X | 58 | 58 | 58 | 58 |
| Y | 42 | 42 | 42 | 42 |
| Z | 42 | **43** | **43** | **43** |
| AA | 56 | 56 | 56 | 56 |
| AB | 43 | 43 | 43 | 43 |
| AC | 43 | 43 | 43 | 43 |
| AD | 50 | 50 | 50 | 50 |

Note: shaded numbers denote noise levels that increased from baseline/No-Action Alternative conditions

# 4.2 NOISE

## 4.2.1 Overview

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Although aircraft are not the only source of noise, they are readily identifiable to those affected by their noise emissions and are typically singled out for special attention and criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts on actions like those proposed. The types and numbers of aircraft considered in the noise analyses conducted regarding these proposals are summarized in Table 4.0-1.

Public concerns regarding aircraft noise relate to certain potential impacts such as hearing loss, non-auditory health effects, annoyance, speech interference, sleep interference, and effects on domestic animals and wildlife, structures, terrain, and historical and archaeological sites. A general discussion of noise and noise effects is presented in Appendix K.

Section 4.2.1.1 summarizes the noise metrics discussed throughout this report. Section 4.2.1.2 presents the methodology for interpreting the noise results. Section 4.2.1.3 briefly describes the computer noise exposure models, the noise model limitations, the reliability of the noise results, and the process of collecting and entering the operation data into the noise model. Section 4.2.1.4 summarizes the results for the four airspace alternatives and sections 4.2.2 through 4.2.5 individually describe the noise results for each of the airspace alternatives. Section 4.2.6 presents the supersonic noise modeling results.

### 4.2.1.1 NOISE METRICS

Noise metrics quantify some acoustic property of aircraft noise in a standardized manner. Most are expressed in units of decibels. The United States Environmental Protection Agency (USEPA) established a family of noise metrics useful for measuring environmental noise exposure in ways that are useful for summarizing how much noise is created in different situations, and for predicting the likely effects of such noise exposure. The noise metrics recommended by USEPA are appropriate to different levels of analyses, ranging from single noise events to daily or longer term noise exposure patterns. The noise metrics used in this section are the maximum sound level (abbreviated $L_{max}$), the Sound Exposure Level (abbreviated SEL) , and the Onset Rate Adjusted Monthly Day-Night Average Sound Level (abbreviated $L_{dnmr}$). Each of these metrics represents a level of analysis for quantifying the noise environment as discussed below.

$L_{max}$, SEL, and $L_{dnmr}$ employ A-weighted sound levels. "A-weighted" denotes the adjustment of the frequency content of a noise event to represent the way in which the average human ear responds to the noise. Unless otherwise mentioned all noise metrics are A-weighted.

### *MAXIMUM SOUND LEVEL*

$L_{max}$ represents the first level of analysis in quantifying the noise environment. It is the highest sound level measured during a single aircraft overflight. For an observer, the noise level will start at the ambient noise level, rise up to the maximum level as the aircraft flies closest to the observer and returns to the ambient level as the aircraft recedes into the distance. Table 4.2-1 lists the maximum sound levels for the five dominant aircraft types used in the noise analysis. Maximum sound level is important in judging the interference caused by an aircraft noise event with conversation, sleep, or other common activities.

**Table 4.2-1. Aircraft Maximum A-weighted Sound Levels at Various Altitudes Above Ground Level**

| | ALTITUDE IN FEET | | | | | |
|---|---|---|---|---|---|---|
| *Aircraft Type* | *500* | *1,000* | *2,000* | *5,000* | *10,000* | *20,000* |
| B-1B | 113 | 106 | 98 | 86 | 75 | 61 |
| F-15 | 114 | 107 | 98 | 86 | 73 | 57 |
| F-16 | 104 | 97 | 89 | 76 | 64 | 48 |
| A-10 | 94 | 87 | 78 | 65 | 54 | 43 |
| C-130 | 91 | 84 | 76 | 66 | 56 | 46 |

### *SOUND EXPOSURE LEVEL*

The second level of analysis is the SEL which combines the maximum level of the event and the duration of the event. The maximum sound level alone may not represent how intrusive an aircraft noise event is, because it does not consider the length of time that the noise persists. The period of time over which the noise event is heard is also significant. The SEL combines both of these characteristics into a single metric. It is important to note, however, that SEL does not directly represent the sound level heard at any given time, but rather provides a measure of the total exposure of the entire event.

In this EIS, the SEL is the primary noise metric used to evaluate the effects of a single aircraft overflight on wildlife. Startle responses have been observed in some animals when the SEL is greater than 95 decibels (dB) (Eleventh Air Force 1992). Wildlife managers feel that the most applicable noise metric for the analysis of noise on wildlife is the SEL.

Tabulated in Table 4.2-2 and plotted in Figure 4.2-1 are the SELs for the five model aircraft. Table 4.2-2 list the sound levels directly under the flight paths at aircraft altitudes of 500, 1,000, 2,000, 5,000, 10,000, and 20,000 feet. As evidenced by Tables 4.2-1 and 4.2-2 the maximum

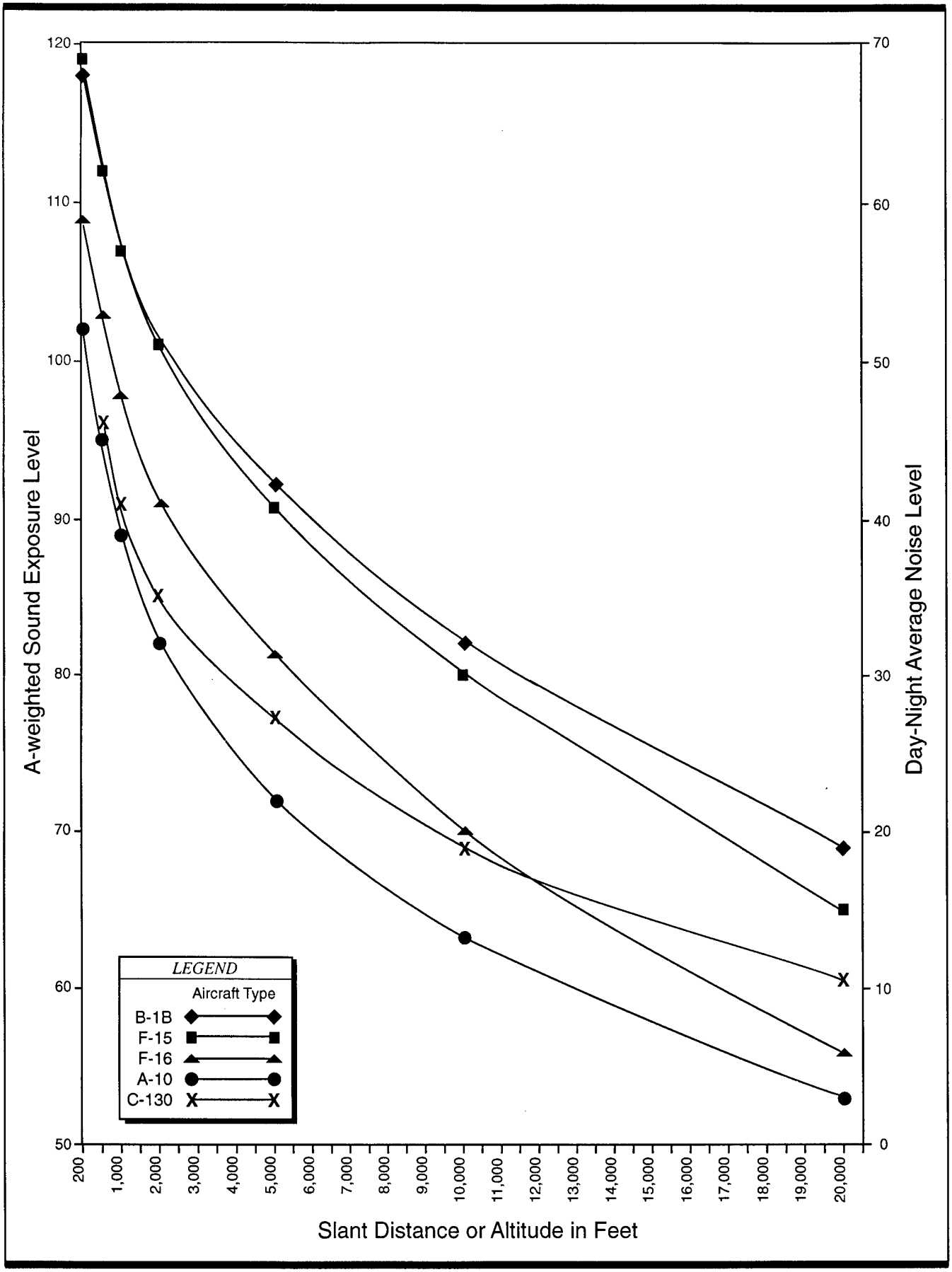



**Figure 4.2-1 Aircraft A-Weighted Sound Exposure Level at Various Slant Distances or Altitudes Right Hand Axis Converts a Single Daytime Set Value Into a DNL Value.**

instantaneous level during a noise event is typically 0 to 15 dB lower than the SEL. Aircraft sounds with SEL of 65 dB will typically have a maximum sound level in the 50 to 65 dB range.

**Table 4.2-2. Sound Exposure Levels at Various Altitudes Above Ground Level**

| | ALTITUDE IN FEET | | | | | |
|---|---|---|---|---|---|---|
| *Aircraft Type* | *500* | *1,000* | *2,000* | *5,000* | *10,000* | *20,000* |
| B-1B | 112 | 107 | 101 | 92 | 82 | 69 |
| F-15 | 112 | 107 | 101 | 90 | 80 | 65 |
| F-16 | 103 | 98 | 91 | 81 | 70 | 56 |
| A-10 | 95 | 89 | 82 | 72 | 63 | 53 |
| C-130 | 96 | 91 | 85 | 77 | 69 | 61 |

### *CUMULATIVE NOISE METRICS*

The first and second levels of analysis ($L_{max}$ and SEL) provide a description of a single aircraft overflight. But neither of these metrics describe in a single measure the overall noise impact from multiple aircraft noise events. The third level of analysis is the $L_{dnmr}$. $L_{dnmr}$ sums the individual noise events and averages the resulting level over a specified length of time. Thus it is a composite metric representing the maximum noise levels, the duration of the events, and the number of events. This cumulative metric does not represent the variations in the sound level heard. It does provide an excellent measure for comparing environmental noise exposures when there are multiple aircraft noise events to be considered.

Cumulative noise metrics like $L_{dnmr}$ are most useful for comparing the noise produced by alternate sets of operations. It is often important, for example, to quantify how much more or how much less noise a proposed action creates with respect to a "no action" condition.

$L_{dnmr}$ is an enhanced version of the widely accepted Day-Night Average Sound Level ($L_{dn}$, also denoted DNL). $L_{dn}$ is a cumulative metric that accounts for the sound level and duration of individual events, and the number of events. It includes a 10-dB penalty for events at night. $L_{dnmr}$ includes two additional factors. First, it includes an onset-rate penalty to account for increased annoyance associated with the surprise factor of high-speed, low-altitude military aircraft noise. This penalty can be up to 11 dB for low-altitude, high-speed fighter aircraft that can produce a sound that rises to its maximum noise in less than one second. This sometimes is referred to as "startle effect." Second, it is based on operations during the busiest month of the year, so that predictions are not diluted by seasonal periods of low activity.

$L_{dn}$ (and, by extension, $L_{dnmr}$) is based on decades of research on the effects of noise on communities. Dozens of metrics have been proposed, with each accounting for the magnitude,

duration, and frequency of noise events. $L_{dn}$ has emerged as the most widely accepted metric. It correlates well with community response, and is consistent with controlled laboratory studies of people's perception of noise. It was the primary metric used in USEPA's "levels document" (USEPA 1972a), and was further endorsed for aviation noise analysis by the Federal Interagency Committee on Noise (FICON) (FICON 1992). While originally developed for major noise sources such as highways and airports in populated areas, $L_{dn}$ has been shown to be applicable to infrequent events (Fields and Powell 1985) and to rural populations exposed to sporadic military aircraft noise (Stusnick et al. 1992; 1993). $L_{dn}$ works for both rural and urban settings because $L_{dn}$ accounts for the sound level and duration of the individual aircraft events, and the number of events over a stated time period.

$L_{dn}$ can be interpreted in two ways. One is as an average, its formal definition, which fits intuitive concepts when dealing with continuous noise such as that from a busy highway. Another interpretation is as a summation: an average represents a summation divided by a time period. Because $L_{dn}$ corresponds to a fixed 24-hour period, it represents the total sound energy over that period. For that reason, $L_{dn}$ is often referred to as a "cumulative" metric. For intermittent sounds, it does not represent the sound level at any given time, but represents the total sound being received; effectively, the "noise dose" for a day.

### *Relationship Between SEL and DNL*

In the same way that different sets of numbers may have the same average value, many different combinations of SEL values created by the noise of individual aircraft overflights can create the same DNL value. The right-hand scale of Figure 4.2-1 shows an approximate DNL value corresponding to the SEL created by a single daytime aircraft operation within a 24 hour period[1]. For example, the DNL value for a direct daytime overflight of a single B-1B at 500 feet AGL (with an SEL value of about 112 dB) is equivalent to a DNL value of about 63 dB. Likewise, the DNL value for a direct daytime overflight of a single F-16 at 500 feet altitude (with an SEL value of about 103 dB) is equivalent to a DNL value of about 54 dB. Because of logarithmic nature of decibel notation, this 9 dB difference in DNL value implies that a DNL value of 63 dB could be created either by a single B-1B overflight at 500 feet or by 8 F-16 overflights at 500 feet.

The only reason that the SEL and DNL values differ numerically from each other in the above examples is that the noise metric is expressed with respect to a one second period in the case of SEL, but with respect to a 24-hour period in the case of DNL. The process of normalizing to a 24-hour period neither creates nor destroys aircraft noise energy. The fact that DNL values are numerically smaller than SEL values is simply a consequence of this scaling. Since the interpretive criteria for noise exposure effects are also expressed in units of DNL (rather than units of DNL+50 dB), nothing is concealed or underestimated by the scaling itself.

[1] Because a day contains 86,400 seconds, subtracting 10 log (86,400) = 49.4 dB, converts a daytime SEL value into a DNL value.

### 4.2.1.2 INTERPRETATION OF THE NOISE RESULTS

*NOISE REGULATIONS AND POLICIES*

Interpretation of $L_{dn}$ or $L_{dnmr}$ can be based on the "Schultz curve," (see Figure K-2 of Appendix K). This curve predicts the average response of communities to various $L_{dn}$ levels. The now-classical analysis of noise exposure-response relationships was first published in 1978 by Theodore J. Schultz and was based on data from 12 major social surveys addressing community annoyance due to transportation noise. Since then, it has been updated, refined, and validated several times (e.g., Fidell et al. 1991), and the described exposure-response relationships were adopted by FICON in 1992 for use by federal agencies in assessing aircraft noise-related impacts.

More recently, in 1993, researchers reevaluated the original Schultz curve data, and added a significant number of data points from new, technically improved community annoyance studies (Finegold et al. 1994). The current version of the curve used to predict community exposure-response relationships is shown in Figure K-3 of Appendix K, which compares the original Schultz curve with the most recently developed curve fit studies (Finegold et al. 1994). As shown, variances between results are slight. The equation fit by Finegold et al. represents a good fit to the data, and is also consistent with current theory of human annoyance reaction (Fidell et al. 1988). Features represented by this model include a single inflection point – annoyance never going to zero as noise level decreases (some people are always annoyed), and annoyance never going to 100 percent as noise level increases (some people are never annoyed, or never complain). Response to $L_{dnmr}$ is obtained by applying $L_{dnmr}$ to the $L_{dn}$ axis of the Schultz curve. Since $L_{dnmr}$ is always equal to or greater than $L_{dn}$, this automatically yields the increased annoyance associated with the added penalties used with $L_{dnmr}$.

The most common point referred to on the Schultz curve is 65 dB. This is a benchmark often applied to determine residential land use compatibility around airports or highways. By extension, it is often used as a criterion in planning of airspace. For this EIS, it is recognized that affected areas are diverse and it is not appropriate to use a single criterion.

The 65 dB $L_{dn}$ value is useful to recognize as a level which, when exceeded, is normally not compatible with residential land use. The significance of other levels are as follows:

- An $L_{dn}$ of 55 dB was identified by the USEPA as a level ". . . requisite to protect the public health and welfare with an adequate margin of safety" (USEPA 1972a). Noise may be heard, but there is no risk to the public or its welfare.

- At $L_{dn}$ values below 55 dB, the percentage of annoyance is correspondingly lower. Annoyance is never zero, but at an $L_{dn}$ of 45 dB or less it is low enough to be negligible.

Sound levels greater than 70 to 75 dB represent levels at which significant impacts might be plausible. An $L_{dn}$ of 70 to 75 dB is 15 to 20 dB below levels at which hearing damage is a known risk (Occupational Safety and Health Administration [OSHA] 1983). The highest noise level calculated in this EIS was 69 dB.

### *QUANTIFYING NOISE FROM OUTDOOR RECREATIONISTS' PERSPECTIVE*

Using $L_{dnmr}$ does not necessarily help outdoor recreationists anticipate what sort of aircraft noise they may encounter on visits to overflown lands, however. When aircraft fly over outdoor recreational lands sporadically within large parcels of military training airspace (tens or hundreds of square miles), the experience of aircraft noise during a typical visit often takes the following form:

1) For much of any given visit, outdoor recreationists will be unlikely to notice any aircraft noise, because aircraft operations will be far enough away from them that their noise will be inaudible or only slightly audible, even in areas with low natural noise levels.

2) For a small part of a typical visit, noise from distant aircraft operations may intermittently come to the notice of outdoor recreationists when they are not hiking, talking, or making any other noises themselves.

3) For an even smaller part of a typical visit, noise from aircraft operating within a few miles of an outdoor recreationist, although not particularly loud, may intrude to some degree on enjoyment of natural quiet.

4) On rare occasions (once in many visits) and in certain locations, an aircraft may directly overfly a visitor at low altitude. On such occasions, a visitor will hear a very loud noise for a short period of time. This noise will probably be annoying and may be startling as well.

While these four conditions approximately describe expected aircraft noise exposure under most large areas of military training airspace, one or more may be influenced by the specific use of the airspace. For example, if a person is situated in close proximity to a training range where aircraft concentrate, conditions three and four (listed above) would be expected to occur with greater frequency. Such activity will occur in the Jarbidge MOA and the associated drop and no drop targets. Conversely, a person located under airspace where aircraft do not regularly concentrate would probably experience only conditions one and two. Such a condition will exist outside of the Jarbidge MOA where flight activity is at higher altitudes, and with less time being spent at the lower altitudes.

There can be a wide range of experiences and perceptions of experiences. Reactions vary greatly from individual to individual, depending upon individual expectations and the context in which the event occurs.

One view of a wilderness experience might be the opinion that any reminder of civilization or society, however slight or brief, completely nullifies the experience for an entire wilderness visit. In this absolute sense, reminders of civilization that nullify the experience of solitude include encounters with other solitude seekers at trailheads, hearing sounds or seeing tracks of parties of other outdoor recreationists within the wilderness, finding fire rings or other signs of prior campsite use, signs of trail maintenance or constructed stream crossings, or seeing a high flying aircraft condensation trail. In this case, solitude and naturalness are important aspects of a wilderness experience. It is likely such an expectation would be compromised by any non-indigenous noise exposure.

Conversely, a wilderness experience is not limited to a single facet or interpretation, but rather a range of expectations exists. Individuals with their own personal perceptions, may recognize or classify activities as wilderness experiences simply as a function of location, e.g., areas outside traditional urban settings, or according to the type and nature of the activity, e.g., activities undertaken for recreation or social events by individuals or groups. Solitude or the total absence of civilization may not be counted among the necessary criteria or even considered desirable in conjunction with many experiences. In these instances, non-indigenous noise exposure would unlikely infringe upon such wilderness experiences.

Although literature exists which analyzes impacts to residential areas from airports, few studies exist which analyze impacts to wilderness visitors from aircraft overflight. The *Potential Impacts of Aircraft Overflights of National Forest System Wildernesses* (U.S. Forest Service [USFS] 1992) is the vanguard large-scale study in which a concerted effort has been made to apply quantitative methods to the problem of measuring outdoor recreationists' reactions to aircraft noise exposure in wildernesses.

The circumstances of outdoor recreation and aircraft noise exposure of present interest differ sufficiently from those described by the National Park Service (NPS) and the USFS in their reports to Congress that the findings of these surveys are not fully applicable for ETI. For example, most of the NPS on-site surveys were conducted at vacation destination parks (including Grand Canyon and Hawaii Volcanoes National Parks) visited by millions of sightseeing tourists drawn by world-renown scenery and commensurate development and facilities. Outdoor recreational visits and visitors to the public lands of current interest differ substantially both in number and kind.

The nature of the aircraft noise exposure in the parks at which NPS conducted on-site surveys also differed substantially from those of the ETI proposal. Congress mandated studies in certain parks specifically because of their very high levels of air tour flights, which produced nearly-continuous audible aircraft noise in some cases. In contrast, flight activity associated with the proposed action will be far more sporadic, and hence less frequently noticeable by outdoor recreationists.

Although the frequency or number of overflights by low-altitude, high-speed aircraft was low, a greater number of respondents reported that they did not notice any aircraft at all during

their Wilderness visits than reported noticing any particular type of aircraft. In the USFS study, the single most often noticed aircraft was high-altitude jet aircraft. The next most often noticed aircraft was small private airplanes. Comparably small percentages of respondents (about 10 to 13 percent) reported noticing both helicopters and low-flying jets during their wilderness visits (cf. Tables 7 and 8, pages 2-16 and 2-17, USFS 1992). Thus, to the extent that noticing an aircraft overflight may be considered an interference with the enjoyment of solitude, low-altitude, high-speed jets were not the most frequent source of this form of interference with outdoor recreation in the USFS study.

Information contained in a NPS report to Congress (*Report on Effects of Aircraft Overflights on the National Park System* [NPS 1994]) indicates that the vast majority of park visitors enjoy and are satisfied with their outdoor recreational experiences; that only about a fifth of all park visitors recall hearing airplane noise (including visitors to parks with frequent, low-altitude commercial air tour flights); that only "2 to 3" percent of visitors consider that hearing aircraft noise had any impact on them at all (cf. page 6-2, NPS 1994); and that less than 2 percent of visitors believed that aircraft noise interfered with enjoyment of their visits or was annoying in any degree (cf. Table 6-3, page 6-5, NPS 1994). Of the small percentages of park visitors who were annoyed in any degree by aircraft noise, most were no more than slightly or moderately annoyed.

NPS found some reason to believe that reactions to hearing aircraft were stronger among people who spend more time in isolated areas and may have different expectations about solitude from those of other park visitors. When questioned by mail after their park visits, a little less than a third of these wilderness permit holders recalled any annoyance or interference by aircraft noise with their outdoor recreational experiences. These results suggest that at most, one-third of those assumed to be seeking wilderness solitude recalled any annoyance from aircraft noise.

### 4.2.1.3 METHODOLOGY FOR PREDICTING NOISE

#### *4.2.1.3.1 Description of the Noise Model*

***MOA Range NOISEMAP (MR_NMAP)***

Noise levels for the alternatives addressed in this EIS were computed using the Air Force's MR_NMAP computer program (Lucas and Calamia 1996). That model is based on the Air Force's NOISEMAP program (Moulton 1992). Within MOAs with no preferred tracks, it computes noise based on a uniform distribution of sortie-operations weighted by the percent of time the sortie-operations are within the airspace. For MTRs and similar tracks within MOAs, MR_NMAP incorporates the calculations used by the Air Force's ROUTEMAP program (Lucas and Plotkin 1988). NOISEMAP routines are also included for special conditions not represented by the MOA or route algorithms. MR_NMAP calculates noise levels at points on a regular grid within the ROI. Results may be output as levels at individual grid points.

*Entering Operation Data Into MR_NMAP*

MR_NMAP calculates the noise levels based on the operations data provided by the airspace manager and the aircrews that currently train in the ROI. The airspace manager maintains records on the number of monthly operations flown, the airspace units used, and the amount of time each aircraft is scheduled to spend in a given airspace unit. This information is used to determine the amount of use each airspace unit experienced during a given year. While the amount of time each aircraft spends in one specific airspace unit is variable, because the purpose is to maximize training, the maximum time scheduled is an excellent average for the time used for modeling purposes. Projected operations are based on the training readiness matrix for aircrews to maintain proficiency.

Operational personnel provided input on the average time an aircraft spends at different altitudes, average airspeeds, and average power settings required for that airspeed. One may choose to think of averages in terms of driving a car to the store where the average driving speed might be 45 miles per hour; however, over that distance, stop signs, traffic lights, and stretches of open road may be encountered. Therefore, "averages" are used to represent reality. The altitude profile is an average of AGL readings experienced from the time the aircraft enters the airspace unit until the time it departs that unit and is dependent on the type of aircraft and its mission. Thousands of hours of radar data have also been collected and analyzed at several range complexes (Nellis AFB, China Lake Naval Air Warfare Center, White Sands Missile Range) to study the amount of time an aircraft spends at different altitudes. This information, combined with pilot interviews, was used in estimating the average altitude profile. Again, the altitude profiles entered into the model represent annual average profiles and do not represent the profile that may be flown during a single training sortie . The average airspeeds and power settings to obtain that airspeed were based on what airspeeds were used during mission planning which are also based on both fuel and time availability.

Averages are also used to determine the spatial distribution of aircraft within an airspace unit by separating the total number of operations flown into missions that can be individually modeled. All of the operations in the ROI are described as either randomly distributed over the airspace or confined to specific tracks. The random operations were modeled when aircraft can literally fly anywhere in the entire airspace unit assigned for that particular mission. Superimposed on these randomly distributed operations are more restricted flight patterns such as ingress and egress tracks and bombing run patterns. Since all of this activity contributes to the noise environment, each element was modeled separately and summed together to develop a composite noise model.

*Reliability of the Noise Predictions*

The reliability of the noise modeling results is dependent on (1) the operations data entered into the model, (2) the measured aircraft noise data used in the calculations, and (3) the propagation algorithms contained in MR_NMAP. The operations data entered into the model are carefully reviewed by airspace personnel that are expert at the training conducted in the ROI. These data

represent the operations during the busiest month of the year so that the noise predictions are not diluted by periods of low activity and if anything, they overpredict the noise level slightly. The power and speed settings, the altitude profile, and the spatial distribution are dependent on the training syllabus.

The measured aircraft noise data used in the calculations come from the Air Force Noise Effect Branch of Armstrong Laboratories which collects and maintains aircraft noise data for the purpose of noise modeling. The acoustical data set used by the noise model is regularly updated with the latest noise measurements. Updated acoustic measurements were developed using actual dedicated overflights of F-15, F-16, and B-1 aircraft. Acoustical measurements were made using dedicated aircraft that flew under controlled conditions over a microphone array. The recordings were incorporated into a noise file data set (Omega 10) that is used by MR_NMAP.

The propagation algorithms used in the noise model account for spherical divergence (spherical spreading of noise energy), atmospheric absorption (reduction of noise as it interacts with air), and lateral attenuation (added reduction of noise as it interacts with the ground). Not included in the noise model are the effects due to wind, ground topography, and day-to-day variations in the meteorological conditions. For locations far from the aircraft, where propagation distances are greater than several thousand feet, atmospheric absorption and lateral attenuation can result in significant uncertainties in the noise levels calculated by MR_NMAP.

Because of the problems associated with the calculations of noise in mountainous areas (ROI Three includes mountainous terrain) studies are being conducted on the effect of terrain (Plotkin et al. 1993; North Atlantic Treaty Organization [NATO] 1994). These studies tentatively show that topographic features can sometimes cause momentary increases in noise levels ("reflections," potentially up to 3 dB for brief periods) and can sometimes decrease noise substantially ("shielding," often in excess of 20 dB). Preliminary studies in the Jarbidge canyon show that sound levels within the canyon do not exceed those experienced on the flat ground outside the canyon. This is due to the shielding effect and the greater distance to the bottom of the canyon. The net result is lower cumulative noise levels than predicted from flat ground. Low-altitude flight altitudes are expressed as AGL. As such, in mountainous terrain, AGL is relative to the highest local ground elevation; altitudes above low areas are correspondingly higher. By using the specified altitude AGL in the analysis, the calculations assume aircraft are at lower altitudes than they would actually fly. The net result is a conservative calculation, which tends to overpredict the cumulative noise levels.

### *Accuracy of the Noise Predictions*

The limitation of all noise models is that the accuracy of the results varies depending on the noise levels calculated. The lower the noise level (below 55dB), the greater the uncertainties. There are two reasons for these uncertainties. First, when there is a large number of aircraft operations, time-average sound levels below 55 dB will occur at relatively long distances from aircraft thus giving atmospheric propagation effects greater opportunity to cause significant

variability; all of which increase the uncertainty in the sound level of individual flights. Second, when there are a few number of operations, the time-average sound levels are generated by only a few individual aircraft noise events which may not be statistically representative of the given aircraft modeled. When the sound levels are greater than 55 dB the noise predictions are accurate to within a few decibels.

#### *4.2.1.3.2 Noise Modeling Approach*

For noise modeling purposes, the operation data entered into the model consisted of three parts: (1) an air-to-air component, (2) an initial ingress across the Owyhee MOA into the target area complex, and (3) an air-to-ground component. Each of these parts were modeled separately using MR_NMAP and the results from the model predictions were summed using NMPLOT, a program that plots cumulative noise exposure.

The air-to-air component assumed that the operations were uniformly distributed in each of the MOAs. A range of representative flight and altitude profiles, engine thrust settings, airspeeds, and the flight time in minutes in the MOAs for each of the participating aircraft were entered into the model.

The initial ingress into the target complex was modeled using a series of low-level flight tracks to represent aircraft flying across the Owyhee MOA into R-3202A and R-320X. Operations were distributed on each of the flight tracks to represent the expected number of operations under the various operation scenarios. Representative flight track widths were used to account for aircraft flying approximately 1.5 NM apart in a two-abreast formation. Other flight attributes entered into the model included a range of flight and altitude profiles, engine thrust settings, and airspeeds.

The air-to-ground component of the noise model was used to represent the aircraft that fly in the Owyhee and proposed Jarbidge MOAs while avoiding electronic emitter sites and performing air-to-ground training. The operations were modeled using a uniform horizontal distribution that is time weighted according to the amount of time the aircraft spend in different regions of the airspace. Additional factors entered into the model included representative flight and altitude profiles, engine thrust settings, and airspeeds.

Results of noise analyses are presented in tabular form. The information given in this EIS consists of cumulative and conservative analyses. Other MOAs and/or MTRs that intersect, overlap, and/or coincide with an airspace component that is being assessed are included in the analysis of noise levels for each of the four airspace alternatives. This approach results in cumulative $L_{dnmr}$ levels that account for all military training activity that would occur under the airspace boundaries for each airspace alternative. In addition, the maximum number of aircraft operations that would occur under each alternative have been used in order to obtain a conservative analysis. Aircraft operational data used for calculating noise levels for the four alternatives include aircraft types, hours of operation, power settings, speeds, duration, altitude

profiles, and sortie-operations. Thus, this approach results in the presentation of the highest $L_{dnmr}$ values for each of the four alternatives.

#### 4.2.1.4 GENERAL FINDINGS

The maximum cumulative noise levels under the baseline/no-action conditions and the three range development alternatives are presented in Table 4.2-3. Thirty reference points were chosen for analysis and comparison. Figures 4.2-2 through 4.2-5 show graphical representation of the airspace boundaries; drawn on each of the figures are the reference points used in the noise analysis. The table and figures are useful for understanding the noise-related impacts because, without them, it would be difficult to understand where the maximum noise levels would occur for the No-Action Alternative and the Alternatives B, C, and D.

The cumulative $L_{dnmr}$ can range from a low of 42 dB to a high of 69 dB for the No-Action Alternative. The highest noise level calculated for alternatives B, C, and D appears at the center of R-320X and has a noise level of 66 dB. The noise level in these areas remain the same over each of the three range development alternatives, as seen at Alternative B (reference point D), Alternative C (reference point E), and Alternative D (reference point F) in Table 4.2-3.

Under Alternative A, No-Action, the aircraft operations are concentrated along an east-west corridor north of the Duck Valley Reservation. But under Alternatives B, C, and D, the aircraft operations are more uniformly distributed, resulting in overall lower average noise levels as seen at points N, O, P, and Q.

In the Paradise MOA, represented by reference points T through AD, there are no changes in the noise levels for any of the alternatives. The component of noise due to the air-to-air training in the MOA is calculated to be 42 to 43 dB, which is nearly the same under baseline/No-Action Alternative conditions.

Table 4.2-4 shows the changes in percentage of cumulative time aircraft spend at different altitude bands between Alternative B and the No Action Alternative. Figure 4.2-6 depicts this information as well.

There would be a net decrease in the total time an aircraft spends at low altitudes, as evidenced in Table 4.2-4. Alternatives C and D would experience similar reductions in the amount of time an aircraft spends at low altitudes. The reduction in the amount of time an aircraft spends at low altitude sorties is attributed to the changes in the airspace configuration. The reconfigured airspace would accommodate higher altitude approaches to the target areas, and new types of air-to-air and air-to-ground tactics.

For example, the estimated percentage of time an aircraft spends between 500 and 1,000 feet AGL would decrease by 8 percent in the SCR, would remain approximately the same in the Owyhee MOA, and increase by 5 percent in the Jarbidge MOA. Between altitudes of 1,000 and 10,000 feet AGL, the percentage of time an aircraft would spend would decrease by 1 percent in the SCR and decrease by 39 percent in the Owyhee MOA. In the Jarbidge MOA, the percentage

**Table 4.2-3. Summary of Cumulative $L_{dnmr}$ Values (dB) by Alternative**

| *Reference Points* | *Baseline/ Alternative A, No-Action* | *B Clover Butte* | *C Grasmere* | *D Juniper Butte* |
|---|---|---|---|---|
| A | 61 | 60 | 61 | 61 |
| B | 68 | 64 | 64 | 64 |
| C | 69 | 59 | 56 | 56 |
| D | 61 | 66 | 55 | 59 |
| E | 56 | 57 | 66 | 56 |
| F | 57 | 58 | 55 | 66 |
| G | 53 | 52 | 51 | 51 |
| H | 57 | 51 | 51 | 51 |
| I | 57 | 55 | 54 | 59 |
| J | 57 | 49 | 49 | 49 |
| K | 50 | 43 | 43 | 43 |
| L | 55 | 52 | 50 | 50 |
| M | 46 | 53 | 51 | 52 |
| N | 61 | 59 | 58 | 57 |
| O | 59 | 54 | 53 | 50 |
| P | 63 | 57 | 58 | 57 |
| Q | 62 | 57 | 58 | 58 |
| R | 53 | 44 | 48 | 45 |
| S | 53 | 43 | 47 | 42 |
| T | 52 | 52 | 52 | 52 |
| U | 60 | 60 | 60 | 60 |
| V | 57 | 57 | 57 | 57 |
| W | 46 | 46 | 46 | 46 |
| X | 58 | 58 | 58 | 58 |
| Y | 42 | 42 | 42 | 42 |
| Z | 42 | 43 | 43 | 43 |
| AA | 56 | 56 | 56 | 56 |
| AB | 43 | 43 | 43 | 43 |
| AC | 43 | 43 | 43 | 43 |
| AD | 50 | 50 | 50 | 50 |

*Shading denotes noise levels that increased from baseline/No-Action Alternative condition.

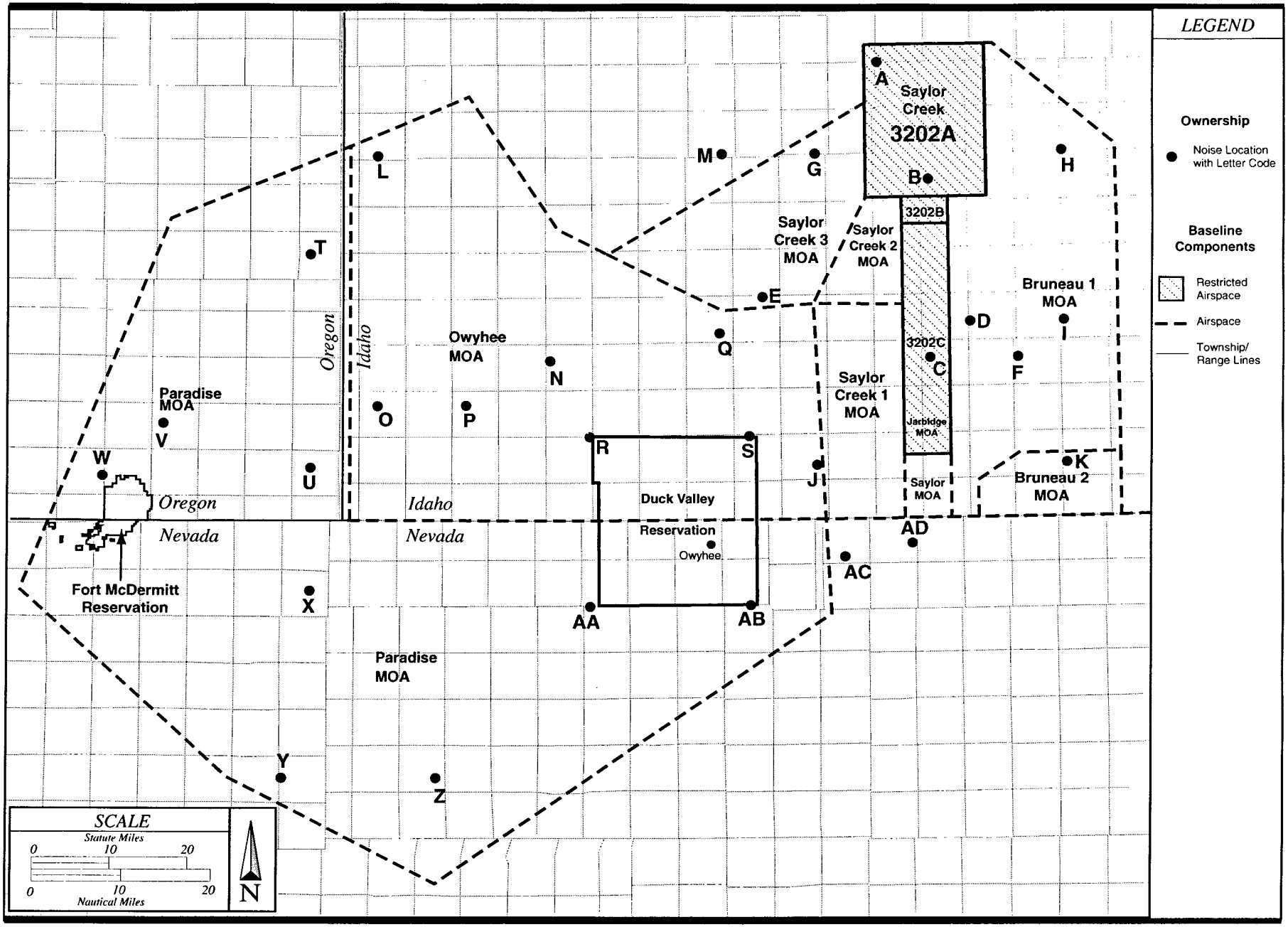



**Figure 4.2-2 Reference Points Used in the Noise Analysis. Alternative A - No-Action Alternative Airspace Configuration**

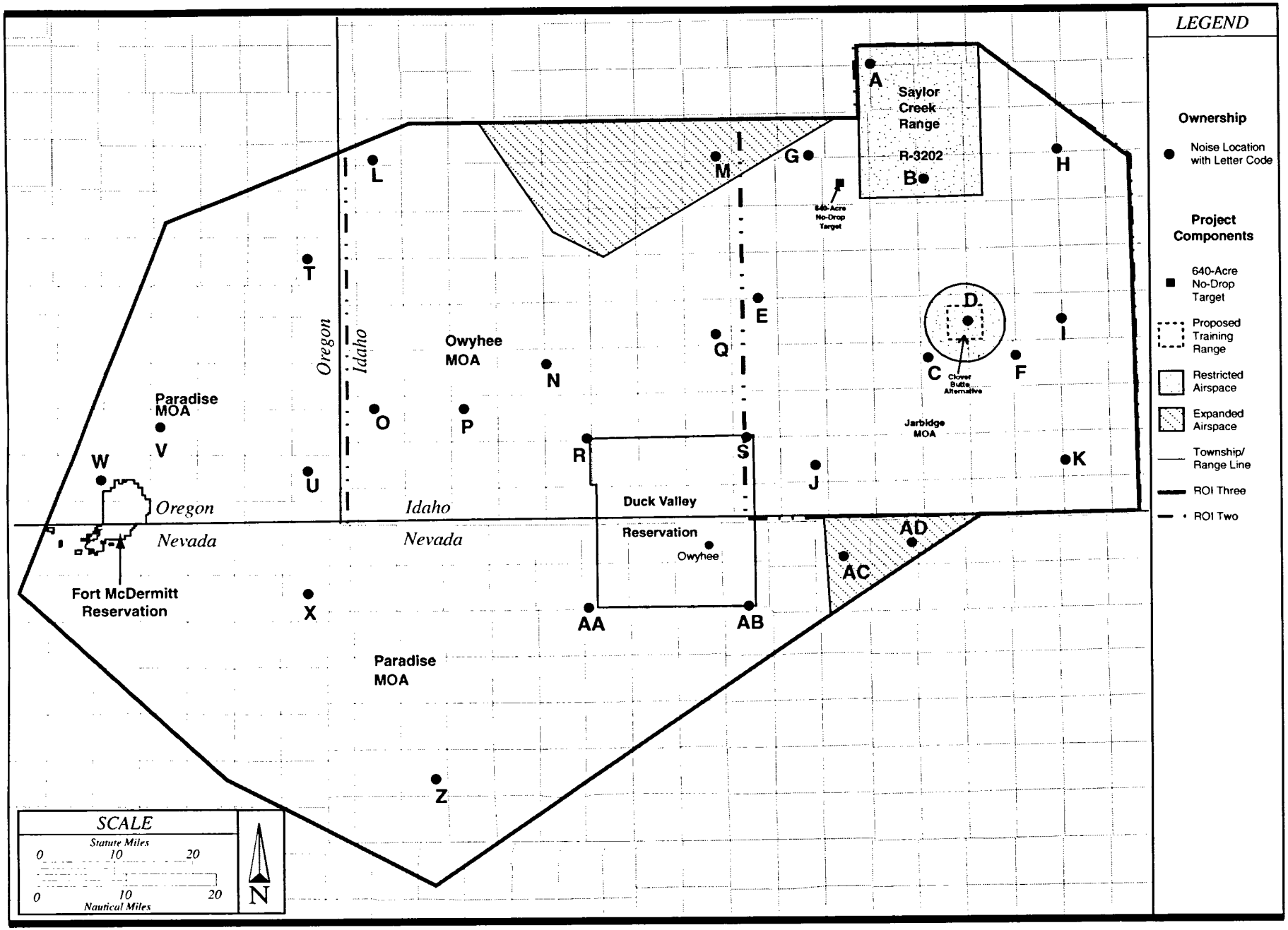



**Figure 4.2-3 Reference Points Used in the Noise Analysis. Alternative B - Clover Butte Airspace Configuration**

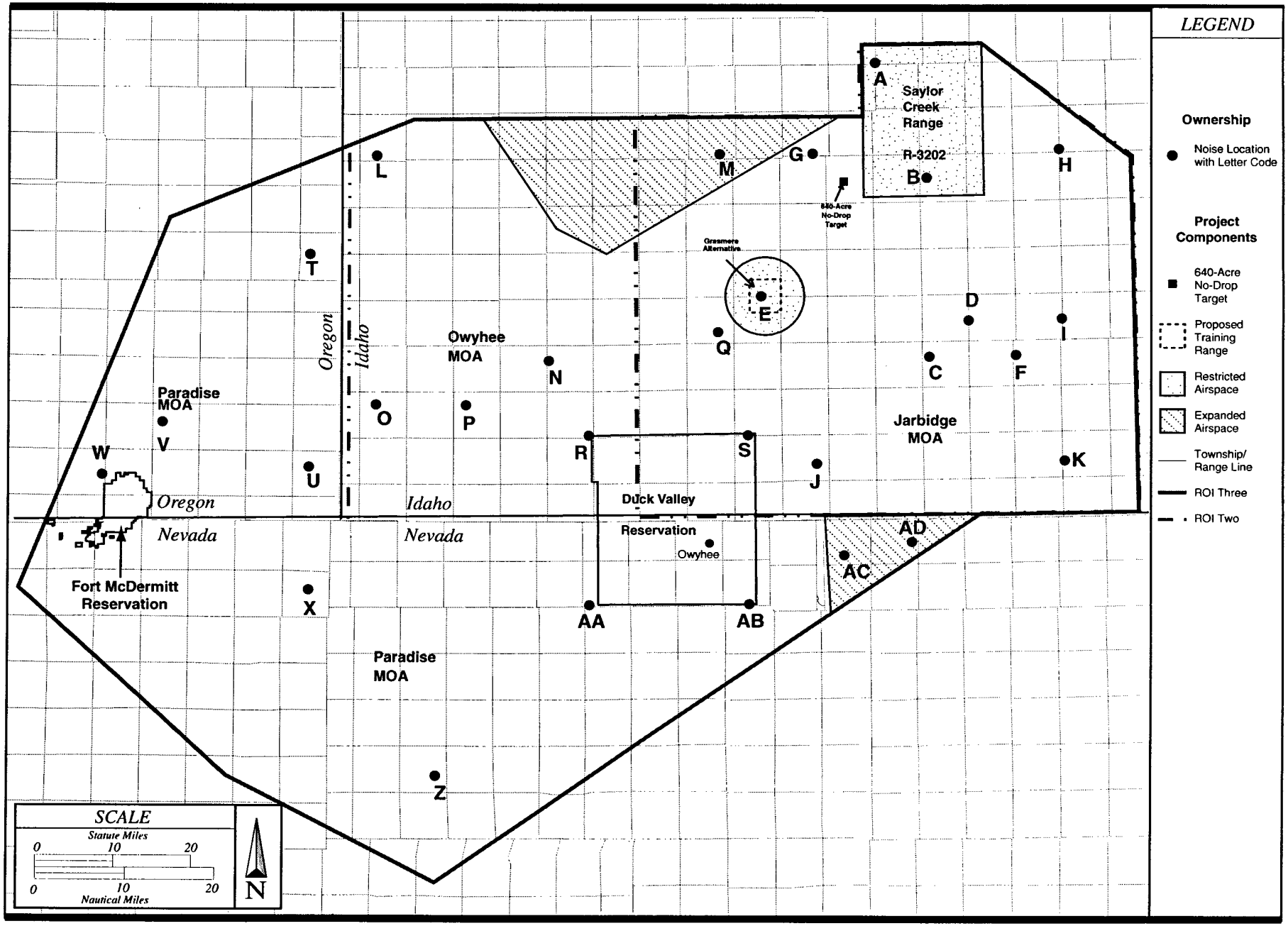



**Figure 4.2-4 Reference Points Used in the Noise Analysis. Alternative C - Grasmere Airspace Configuration**

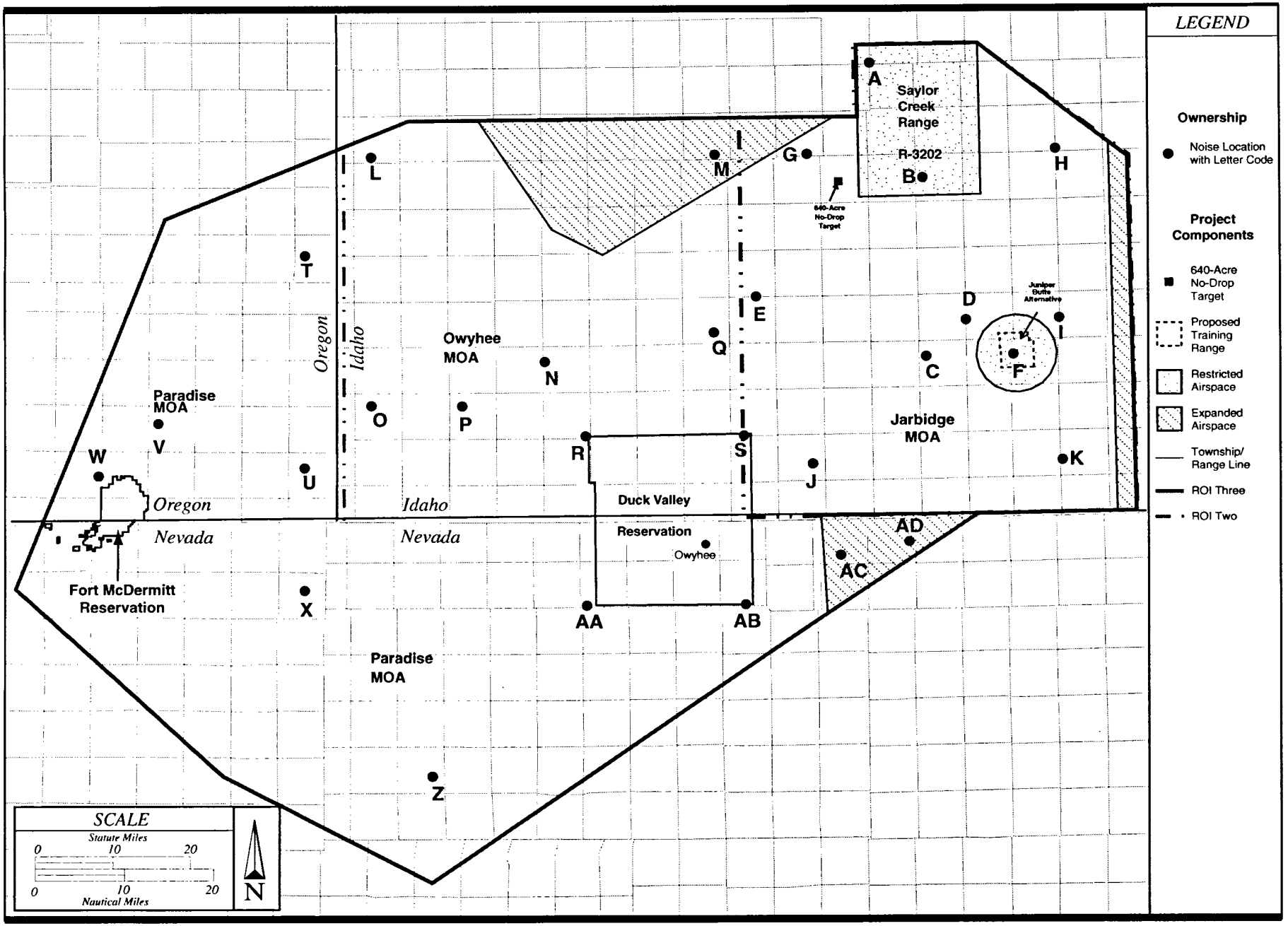
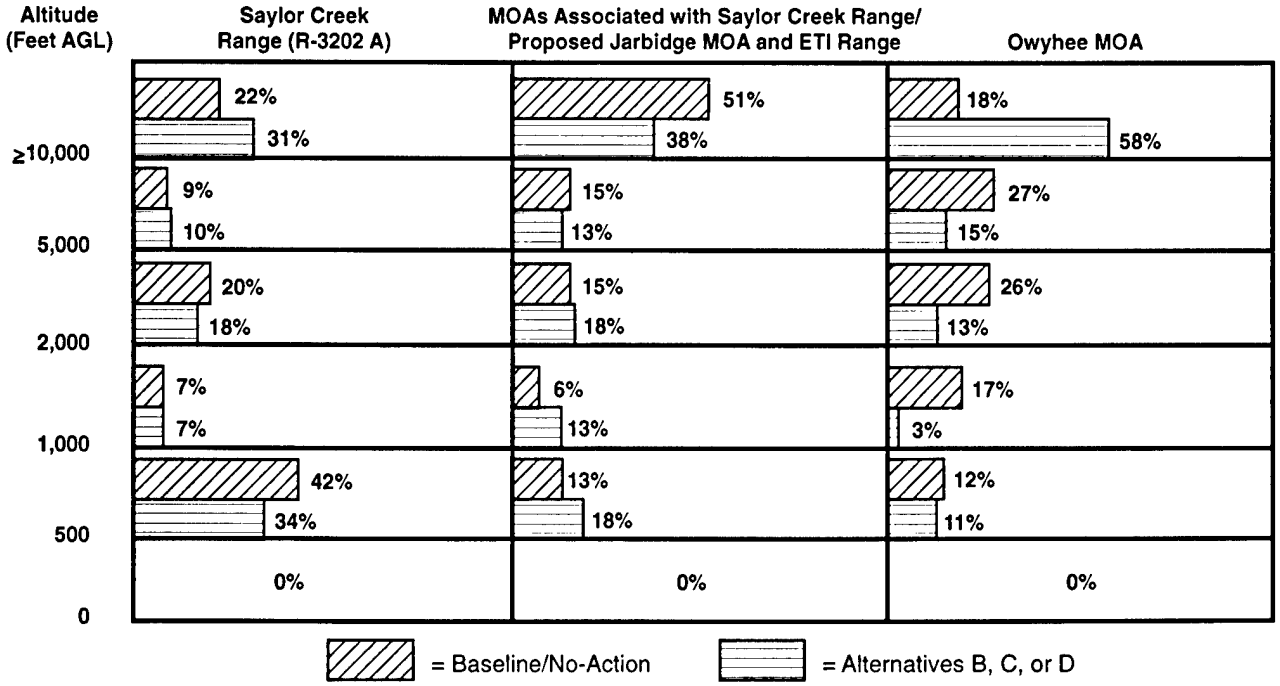



**Figure 4.2-5 Reference Points Used in the Noise Analysis. Alternative D - Juniper Butte Airspace Configuration**

**Table 4.2-4. Change in Percentage of Estimated Cumulative Time of Sortie-Operations per Altitude Block by Airspace Unit**

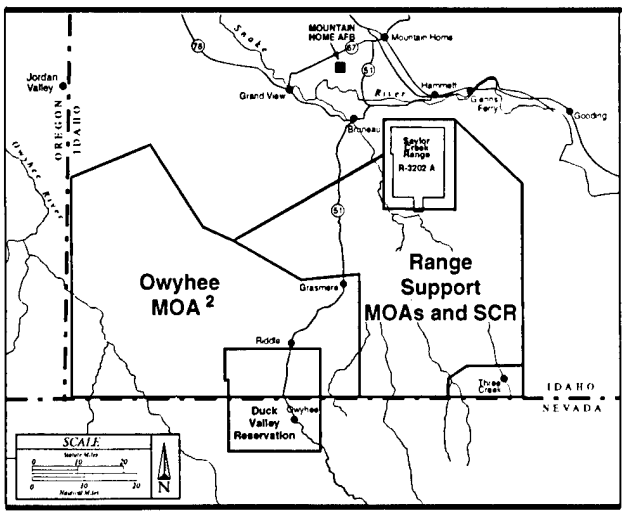
| *Altitude Block (AGL)* | AIRSPACE UNIT | | |
|---|---|---|---|
| | *SCR (R-3202A)* | *Owyhee MOA* | *Proposed Jarbidge MOA* |
| | *Change in Percentage of Cumulative Time of Sortie-Operations from Baseline to Alternative B* | | |
| 500 - 1,000 feet | - 8% | - 1% | + 5% |
| 1,000 - 2,000 feet | + 0% | - 14% | + 7% |
| 2,000 - 5,000 feet | - 2% | - 13% | + 3% |
| 5,000 - 10,000 feet | + 1% | - 12% | - 2% |
| Above 10,000 feet | + 9% | + 40% | - 13% |



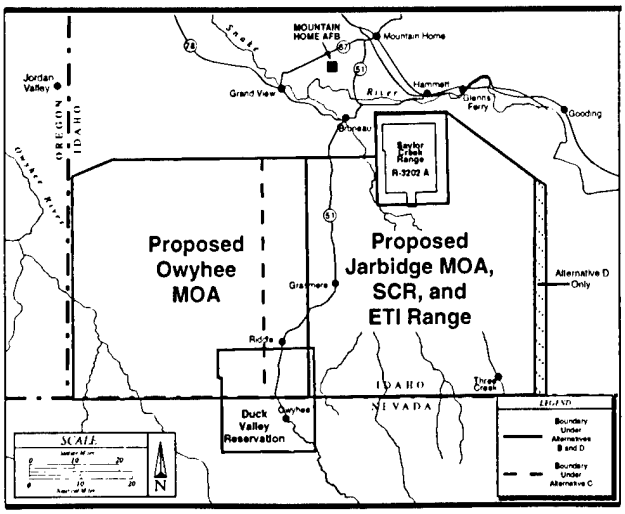

1. For Proposed Jarbidge MOA and Training Range, the estimated percentages include sortie-operations projected for SCR, the proposed ETI Range and no-drop targets.

2. Under baseline/No-Action, the Owyhee MOA extends up to approximately 10,000 feet AGL (14,500 feet MSL). The percentage shown here reflects a liberal estimate (50 percent) for those sortie-operations using the portion of the Paradise MOA that overlies the Owyhee MOA.

3. Saddle MOAs and Paradise MOAs, not presented. Saddle MOAs start at approximately 4,000 to 6,000 feet AGL and use of the altitude blocks is not expected to change. Paradise MOA starts at generally 8,000 to 10,000 feet AGL and is 3,500 feet thick, so no shift in use of altitude blocks is expected.




Baseline Airspace Structure




Proposed Airspace Structure

**Figure 4.2-6**
**Estimated Percentage of Cumulative Time of Sortie-Operations Per Altitude Block By Airspace Unit**

of time an aircraft spends between 1,000 and 10,000 feet AGL would increase by approximately 8 percent.

Under Alternatives B, C, and D, the existing Paradise MOA would be split into Paradise East and Paradise West, and the Paradise East MOA would be expanded to the east. The existing and the proposed Paradise MOAs have a floor of 10,000 feet AGL. Because the aircraft operations are confined to altitudes greater than 10,000 feet AGL, the noise environment under the Paradise MOA is not expected to change under the proposed alternatives.

Two areas in which the total amount of time aircraft sortie-operations would increase would be over the Owyhee/Jarbidge north airspace expansion area (Jacks Creek area) and over the training area (drop and no drop targets). Current operations transit through the Jacks Creek area from Mountain Home AFB and Gowen Field (IDANG) between 500 and 10,500 feet AGL. This is part of Area X-Ray (refer to Figure 1.3-1). Inclusion of this area in the Owyhee and Jarbidge MOAs under Alternatives B, C, and D will allow aircraft to maneuver in this area and would result in a slight increase in the percentage of operations currently flown in this area. Aircraft operations are also expected to concentrated around the drop and no drop targets. Concentration in sortie-operations will result in a higher cumulative noise levels as evidenced in Table 4.2-3.

#### 4.2.1.5 Noise from Electrical Power Generators

There will be approximately five to eight electronic emitters located under the Jarbidge MOA on a daily basis. Electricity is supplied to the emitters by either a MEP 003A or MEP 105 diesel power electric generator. When an emitter is located on a site, a generator will typically run 6 to 8 hours per day, 5 days per week, and sometimes on weekends. The MEP 003A uses a 4-cylinder air-cooled diesel engine to generate 10 kilowatts (kW) of electric power. Noise level at 100 feet from the MEP 003 is 72 dB(A) and at 500 feet is 57 dB(A). The MEP 105 uses a 6-cylinder turbo-charged diesel engine to produce between 50 and 60 kW of power. The noise level at 100 feet from this generator is 72 dB(A) and at 500 feet the level is 56 dB(A).

### 4.2.2 Alternative A — No-Action

Under the No-Action Alternative, the noise levels will remain the same as the baseline condition. See section 3.2.2 for a description of the baseline noise environment.

### 4.2.3 Alternative B — Clover Butte

#### 4.2.3.1 Saylor Creek Range

Reference points A and B present the range of cumulative noise levels in the SCR that would be expected under Alternative B. The $L_{dnmr}$ values range from a low of 60 dB to a high of 64 dB. Under this alternative, the noise levels would decrease by 1 dB relative to baseline conditions at

point A and 4 dB at point B. No significant adverse impacts to SCR would be expected as a result of this alternative.

#### 4.2.3.2 JARBIDGE MOA

Reference points C through K present the range of cumulative noise levels in the Jarbidge MOA. In general, noise levels would decline in the MOA except in the new restricted airspace associated with the Clover Butte Alternative. Increased flight activity near the alternative would increase noise. The $L_{dnmr}$ values would vary from a low of 43 dB to a high of 66 dB. Under Alternative B, the noise levels would increase by 5 dB at point D and by 1 dB at points E and F from the baseline condition. A reduction of 10 dB, 8 dB, and 7 dB would occur at points C, J, and K, respectively. At the remaining 3 points, the noise level would decrease by as much as 5 dB from the baseline condition. With the exception of point D, no significant adverse impacts to the Jarbidge MOA would be expected under this alternative. At reference point D, located at the center of the proposed Clover Butte range, the 5 dB increase in noise level would be noticeable.

#### 4.2.3.3 OWYHEE MOA

Reference points L through S present the range of cumulative noise levels in the Owyhee MOA that would be expected under Alternative B. Under this alternative, $L_{dnmr}$ values range from a low of 43 dB to a high of 59 dB. Most of the aircraft operations would be uniformly distributed over the MOA. The concentration of aircraft operations along an east-west corridor north of Duck Valley Reservation would be eliminated under Alternative B. This would have the effect of lowering the noise levels at most of the reference points. However, at reference point M within the new airspace expansion, the noise level would increase by 7 dB and such an increase would be noticeable as a substantial change. The noise level at point M would assume the same general noise characteristics as other locations in the Owyhee MOA.

#### 4.2.3.4 PARADISE MOAS

Reference points T through AD present the range of cumulative noise levels for the Paradise MOAs that would be expected under Alternative B. The noise levels would vary from a low of 42 dB to a high of 60 dB. Under Alternative B, all of the noise levels would remain the same as under baseline conditions. No adverse impacts to the Paradise MOAs would be expected under this alternative.

#### 4.2.3.5 SADDLE MOA

The highest cumulative noise level in the Saddle A MOA calculated under the centerline of VR-316/319 has an $L_{dnmr}$ value of 42 dB. In the Saddle B MOA, the highest cumulative noise level at the intersection VR-316/319 and VR-1302 has an $L_{dnmr}$ value of 48 dB. Under Alternative B, the noise levels would remain the same as for baseline conditions. No adverse impacts to the Saddle MOA would be expected under this alternative.

## 4.2.4 Alternative C — Grasmere

### 4.2.4.1 Saylor Creek Range

Reference points A and B present the range of cumulative noise levels in the SCR that would be expected under Alternative C. The $L_{dnmr}$ values range from a low of 61 dB to a high of 64 dB. Under Alternative C, the noise levels would remain the same at point A and decrease by 4 dB at reference point B. No significant adverse impacts to the SCR would be expected under this alternative.

### 4.2.4.2 Jarbidge MOA

Reference points C through K and reference points M, Q, and S present the range of cumulative noise levels in the Jarbidge MOA that would be expected under Alternative C. With the exception of reference points E and M, the noise levels would be reduced under this alternative. For instance, at reference point C, the noise level would decrease from 69 dB to 56 dB. The 13-dB decrease in the noise level would be noticeable as a substantial change. This is because the aircraft would no longer be concentrated as they approach R-3202A.

There would be an increase in flight activity in the new restricted airspace associated with the Grasmere Alternative. The noise levels would increase from 56 dB to 66 dB at reference point E, which is located at the center of R-320X, and from 46 dB to 51 dB at reference point M in the northern airspace expansion. The 10-dB increase at reference point E would be noticeable as a substantial change in the noise environment. The 5 dB increase at point M would be noticeable; this area would assume the same general noise characteristics as other locations in the MOA.

### 4.2.4.3 Owyhee MOA

Reference points L, N, O, P, and R present the range of cumulative noise levels in the Owyhee MOA that would be expected under Alternative C. The $L_{dnmr}$ values range from a low of 48 dB to a high of 58 dB. Under this alternative, the noise levels would decrease at all of the reference points. No significant adverse impacts to the Owyhee MOA would be expected under this alternative.

### 4.2.4.4 Paradise MOAs

Reference points T through AD present the range of cumulative noise level for the Paradise MOAs that would be expected under Alternative C. The noise levels would vary from a low of 42 dB to a high of 60 dB. Under this alternative, the noise levels would remain the same as under baseline conditions. No significant adverse impacts to the Paradise MOAs would be expected under this alternative.

#### 4.2.4.5 SADDLE MOA

The highest cumulative noise level in the Saddle A MOA calculated under the centerline of VR-316/319 has an $L_{dnmr}$ value of 42 dB. In the Saddle B MOA, the highest cumulative noise level at the intersection VR-316/319 and VR-1302 has an $L_{dnmr}$ value of 48 dB. Under Alternative C, the noise levels would remain the same as baseline conditions. No adverse impacts to the Saddle MOA would be expected under this alternative.

### 4.2.5 Alternative D — Juniper Butte

#### 4.2.5.1 SAYLOR CREEK RANGE

Reference points A and B present the range of cumulative noise levels in the SCR that would be expected under Alternative D. The $L_{dnmr}$ values range from a low of 61 dB to a high of 64 dB. Under this alternative, the noise levels would remain the same at point A and decrease by 4 dB at point B. No significant adverse impacts to the SCR would be expected as a result of this alternative.

#### 4.2.5.2 JARBIDGE MOA

Reference points C through K present the range of cumulative noise levels in the Jarbidge MOA. The noise levels would vary from a low of 43 dB to a high of 66 dB. With the exception of points F and I, the noise levels would generally decrease in the Jarbidge MOA, except in the new restricted airspace associated Alternative D. The noise levels would increase from 57 dB to 66 dB at reference point F, located at the center of the proposed Juniper Butte range, which is located at the center of R-320X, and from 57 dB to 59 dB at reference point I, which is located near R-320X. The 9-dB increase at reference point F would be noticeable as a substantial change to the noise environment and the 2-dB increase at reference point I would not be noticeable.

#### 4.2.5.3 OWYHEE MOA

Reference points L through S present the range of cumulative noise levels in the Owyhee MOA that would be expected under Alternative D. Under this alternative, $L_{dnmr}$ values range from a low of 42 dB to a high of 58 dB. Most of the aircraft operations would be uniformly distributed over the MOA. The concentration of aircraft operations along an east-west corridor north of Duck Valley Reservation would be eliminated under this alternative. This would have the effect of lowering the noise levels at most of the reference points. However, at reference point M, the noise level does increase by 6 dB relative to current conditions. Such an increase would be noticeable. The noise level at point M would assume the same general noise characteristics as other locations in the Owyhee MOA.

#### 4.2.5.4 PARADISE MOAS

Reference points T through AD present the range of cumulative noise level for the Paradise MOAs that would be expected under Alternative D. The noise levels vary from a low of 43 dB

to a high of 60 dB. Under this alternative, the noise levels would remain unchanged from baseline conditions. No significant adverse impacts to the Paradise MOAs would be expected under this alternative.

#### 4.2.5.5 SADDLE MOA

The highest cumulative noise level in the Saddle A MOA calculated under the centerline of VR-316/319 has an $L_{dnmr}$ value of 42 dB. In the Saddle B MOA the highest cumulative noise level at the intersection VR-316/319 and VR-1302 has an $L_{dnmr}$ value of 48 dB. Under Alternative D, the noise levels would remain the same as under baseline conditions. No adverse impacts to the Saddle MOA would be expected under this alternative.

### 4.2.6 Supersonic Noise Modeling Results for Alternatives A, B, C, and D

The range of cumulative noise levels due to military aircraft performing supersonic maneuvers is presented in Table 4.2-4. The noise levels were calculated using the BOOMMAP95 computer program (Frampton et al. 1993), which is based on extensive noise monitoring and modeling in MOAs that accommodate supersonic operations.

Each of the individual airspace alternatives was modeled separately. Results from the noise analysis showed that the range of cumulative noise levels for Alternative A are the same as under baseline conditions. Thus, under Alternative A, the noise due to supersonic operations would remain unchanged. The Alternatives B, C, and D airspace proposals were found to have the same cumulative noise levels. Table 4.2-5 has been simplified to reflect these findings.

**Table 4.2-5. Summary of Cumulative CDNL[1] Values due to Supersonic Operations**

| | BASELINE CONDITION ALTERNATIVE A – NO-ACTION | | ALTERNATIVES B, C, D: CLOVER BUTTE GRASMERE JUNIPER BUTTE | |
|---|---|---|---|---|
| *Description of Airspace* | *CDNL dB(C)* | *No. of Booms per Day* | *CDNL dB(C)* | *No. of Booms per Day* |
| Saylor Creek Range | 43 | 0.1 | 50 | 0.4 |
| Range-Support MOAs Jarbidge MOA | 50 | 0.4 | 52 | 0.6 |
| Owyhee MOA | 54 | 1.0 | 54 | 1.0 |
| Paradise MOAs | 45 | 0.1 | 45 | 0.1 |

Note: 1. C-Weighted Day-Night Average Sound Level

#### 4.2.6.1 SAYLOR CREEK RANGE

Table 4.2-5 presents the C-Weighted Day-Night Average Sound Level (CDNL) resulting from supersonic air combat training over the SCR. Under Alternatives B, C, and D, CDNL would increase from 43 dB(C) to 50 dB(C). A 7-dB increase would be noticeable. The number of sonic booms heard per day would increase from 0.1 to 0.4 boom per day. This change is equivalent to hearing one sonic boom in 10 days under baseline conditions to hearing one boom every 2 to 3 days under the range development alternatives. Reference point B is closest to the point where noise levels would be highest.

#### 4.2.6.2 JARBIDGE MOA

Table 4.2-5 presents the CDNL resulting from supersonic operations in the proposed Jarbidge MOA. Under Alternatives B, C, and D, the CDNL would increase from 50 dB(C) to 52 dB(C). A 2-dB increase in noise level would not be noticeable. On the average, under baseline conditions and Alternative A, there is 0.4 sonic boom heard per day, which is equivalent to hearing a sonic boom every 2 to 3 days. Under Alternatives B, C, and D, the number of sonic booms would increase to 0.6 boom per day, which is equivalent to hearing one sonic boom every 1 to 2 days. Reference point C is closest to the point where the noise levels are expected to be highest in the Jarbidge MOA.

#### 4.2.6.3 OWYHEE MOA

Table 4.2-5 presents the CDNL resulting from supersonic operations in the Owyhee MOA. Under Alternatives B, C, and D airspace proposals, the maximum cumulative noise level, which has a value of 54 dB(C), would remain the same as under baseline conditions. Reference point Q is closest to where the noise levels are expected to be highest in the Owyhee MOA. An average of one sonic boom is heard per day in the vicinity of this reference point.

#### 4.2.6.4 PARADISE MOAS

Table 4.2-5 presents the CDNL resulting from supersonic air combat training in the Paradise MOAs. Under baseline conditions and Alternative A, supersonic operations in the Paradise MOAs would be confined to the airspace that is directly above the Owyhee MOA. Under Alternatives B, C, and D, the airspace would be reconfigured so that the Paradise MOAs would no longer overlap the Owyhee MOA. As a result, there would no longer be supersonic training in the Paradise MOAs. However, sonic booms could still be heard in the Paradise MOAs because sonic booms could propagate from the Owyhee MOA into the Paradise MOAs. Sonic booms heard in the Paradise MOAs originate from military training in the adjoining Owyhee MOA. At reference point U, located near the boundary separating the Paradise MOAs from Owyhee MOA, the CDNL is 45 dB(C). This is the same noise level as occurs under baseline conditions. At reference point U, there are approximately 0.1 sonic boom heard per day, which is equivalent to hearing one sonic boom every 10 days.

### 4.2.7 Shoshone-Paiute Concerns About Noise

As discussed in section 3.2.3, the Shoshone-Paiute have three primary concerns about military aircraft noise:

- Noise from aircraft operations over or near the Duck Valley Reservation itself;
- Aircraft noise that interferes with ceremonies or disturbs the solitude of traditional cultural resources; and
- Effects of aircraft noise on native wildlife that are important as traditional cultural resources.

Table 4.2-6 summarizes the cumulative noise values ($L_{dnmr}$) for reference points near the Duck Valley Reservation and near the Fort McDermitt Reservation. For each reference point, cumulative noise levels would decline or remain unchanged under each alternative.

**Table 4.2-6. Summary of Cumulative $L_{dnmr}$ Values (dB) by Alternative for the Duck Valley and Fort McDermitt Reservations**

| *Reservation* | *Reference Point* | *Baseline* | *A No-Action Alternative* | *B Clover Butte* | *C Grasmere* | *D Juniper Butte* |
|---|---|---|---|---|---|---|
| Duck Valley Reservation | R | 53 | 53 | 44 | 48 | 45 |
| | S | 53 | 53 | 43 | 47 | 42 |
| | AA | 56 | 56 | 56 | 56 | 56 |
| | AB | 43 | 43 | 43 | 43 | 43 |
| Fort McDermitt Reservation | V | 57 | 57 | 57 | 57 | 57 |
| | W | 46 | 46 | 46 | 46 | 46 |

Military aircraft have been flying over southwest Idaho since 1942. Under Alternative A, No Action, they would continue to have the same noise level and frequency noted for baseline. Under Alternatives B, C, and D, flight activity would be more dispersed, usually reducing noise effects (see Tables 4.2-3 and 4.2-5).

Under one or more of the range development alternatives, cumulative noise levels could increase in specific locations that may potentially contain traditional cultural resources. However, as discussed in section 4.9, one known traditional cultural property would experience a decrease in cumulative noise levels. At that location, cumulative noise levels

would remain unchanged under Alternative A, decrease 2 dB under Alternative B, decrease 3 dB under Alternative C, and decrease 4 dB under Alternative D. Another traditional cultural property could experience no change under Alternative A, an increase of 1 dB under Alternative B, an increase of 10 dB under Alternative C, and no change under Alternative D.

The Air Force has agreed to temporarily reschedule or relocate aircraft operations to the greatest extent practicable to avoid disturbance to ceremonies and other special traditional activities, upon reasonable notification by the Shoshone-Paiute Tribes (refer to section 1.4.4.2). This process will continue regardless of which alternative is selected.

### 4.2.8 Cumulative Impacts

The change to the current airspace structure associated with the ETI project will generate a change to noise levels beneath overlying airspace. The result of this change was addressed in the previous sections. Noise levels as a result of the A-10 and B-1B actions vary and are accounted for in the baseline and environmental consequences sections. In most cases, the changes in noise levels as a result of these actions would not be noticeable, with both minor increases and decreases in the local noise environment. It is unlikely that the implementation of the three foreseeable projects discussed in section 2.6.2 would contribute to the overall noise levels resulting from the ETI project.

# SAFETY

Safety, in general, and fire safety, in particular, are greatly improved by the Air Force's proposal to use only "cold spot" spotting charges in training ordnance. When non-explosive training ordnance is dropped on a target, a small flash is usually seen to spot where the ordnance hits. This flash is the "hot spot." A cold spot accomplishes the same spotting purpose by releasing a small marking plume, rather than a flash. This cold spotting method reduces the risk of fire associated with air-to-ground training range operations.

The processes and procedures in effect for the operation of SCR have proven effective in managing the fire risk associated with current range operations. These procedures will apply to all new facilities. In addition to training maintenance personnel in fire suppression, the Air Force would locate a 50,000-gallon water tank and have access to an additional 50,000 gallons within the 12,000-acre range. This water will be available for interagency fire suppression.

Four other safety items were analyzed: flight safety, the effects of chaff use, radio frequency energy from radar emitters, and laser targeting.

Flight safety considers the risk of aircraft accidents and bird-aircraft strikes. Historical mishap data are used to calculate the statistically projected frequency of major mishaps. Calculations considering the use of the Mountain Home military training airspace do not indicate any levels of what could be considered an unacceptable risk.

Bird-aircraft strike hazards were calculated for each aircraft type based upon experience and projected use. Aircraft based at Mountain Home AFB have a very low level of bird-aircraft strikes. Continued avoidance of areas identified as having concentrations of waterfowl would further enhance safety and minimize flight risks and bird mortality.

Chaff is a thumb-sized bundle of very fine, hair-like material that dissipates upon ejection from an aircraft to confuse enemy tracking radar. Shoshone-Paiute Tribal members expressed concern that chaff used by the Air Force has impacted the environment. Several studies of chaff use have not found any risk to animals or humans. Nevertheless, in response to Shoshone-Paiute concerns, the Air Force has agreed to not use flares below 20,000 feet in training flights over the Duck Valley Reservation and to not use chaff over the reservation.

Training chaff is specifically designed so that it does not interfere with FAA radar tracking of commercial aircraft.



When ordnance is dropped on a target, it must be spotted to see whether it hit the target. "Hot spots" produce a flash and "cold spots" produce a small marking plume. The Air Force proposes to use cold spots on the range to reduce fire hazards.

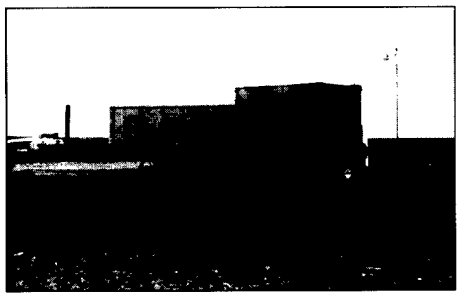
Radars would be placed on the emitter sites at different times during training to simulate enemy anti-aircraft defenses. Radio frequency energy generated by emitters is not at a level or duration that poses a hazard to health. Radars would not point at the ground or along roadways. Radar equipment would be operated under strict safety control measures determined for each system. These measures include installing warning signs, erecting barriers, and having the equipment manned while it is operating.

The emitters would be operated during scheduled training time and on frequencies selected to avoid interference with private or commercial transmission sources.

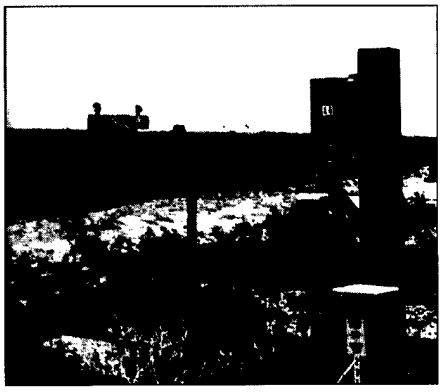
Aircraft have emitters to counter ground-based emitters. The energy levels used by aircraft equipment and aircraft speed result in no public hazard. The duration of any possible radio frequency energy exposure from any source associated with enhanced training would be very small, if such exposure were to occur at all.

Aircraft laser targeting would be used for certain training activities. The aircraft lasers have two settings: high and low. The high level would be used only within the proposed 12,000-acre training range and on Saylor Creek Range. The low level would be used on no-drop training targets. This procedure reduces any potential risks from laser targeting systems to insignificant levels.

There are no significant flight or ground safety issues associated with proposed operations of any training range development alternative.



Processes and procedures for training range operation plus the availability of trained personnel with communication equipment should reduce the risk of wildfires at the 12,000-acre training range.



Air Force procedures for fuel storage and electrical energy transmission are designed for safety of personnel and the environment.

# 4.3 SAFETY

## 4.3.1 Alternative A — No-Action

Under this alternative, potential environmental issues associated with current operations would remain relatively unchanged. However, the intent to eliminate the use of hot-spot spotting charges on training ordnance, thereby reducing fire risk, creates a positive ground safety impact.

### 4.3.1.1 Fire Risk and Management/Ground Safety

Under Alternative A, no new facilities would be constructed and the military training airspace in the region would continue to be used in its current configuration. SCR and the associated MOAs that currently provide direct range support would continue to provide air-to-ground training and support the use of training ordnance.

Under Alternative A, sorties on SCR and supporting MOAs would remain as under current conditions (refer to Table 4.0-1). A variety of non-explosive training ordnance would be used. Completing the phase-out of the use of hot spots on training ordnance by the year 2000 would eliminate one of the greatest sources of fire risk associated with the operation of air-to-ground training ranges.

Flares would continue to be authorized for release at low altitudes (as low as 700 feet AGL) over the impact area of SCR, and all safety procedures currently in effect would continue. All existing fire management procedures and fire response capabilities would also continue. These have proven to be highly effective in the past, and should continue to meet all requirements.

Although no new electronic emitter sites would be developed under Alternative A, those existing electronic emitters would continue to operate from their current locations. All established radio frequency energy safety zones around the emitters would continue to be maintained. Since these sites lie within the exclusive use area (EUA) at SCR and at the Grasmere electronic combat site, public access is controlled. Laser targeting procedures would continue to be used on approved targets on SCR. All existing safety processes and procedures would continue to be observed.

The Owyhee, Paradise, and Saddle MOAs would continue to provide support for military training activities, including supersonic flights, where permitted. Sortie-operations in these airspace elements are shown in Table 4.0-1. Chaff and flares would continue to be authorized for use in the Owyhee and Paradise MOAs, except over the Duck Valley Reservation. As discussed in section 3.3, the use of chaff poses negligible safety risk and the chaff itself is not harmful to people or animals. All flares are released higher than 2,000 feet AGL in these areas, thereby reducing the possibility of any incendiary material reaching the ground to very low levels. Flares burn completely within 4 to 4.5 seconds. This means that if aerodynamic drag forces are totally discounted, in 4.5 seconds the flare would fall a maximum of approximately

326 feet from its point of release. The 2,000-foot AGL minimum release altitude, which provides a safety margin of more than 600 percent, virtually guarantees that no burning material will reach the ground.

#### 4.3.1.2 FLIGHT RISKS

*AIRCRAFT MISHAPS*

Under Alternative A, aircrews would continue to train as under current conditions. The military training airspace would include the SCR and its supporting MOAs, as well as the Owyhee, Paradise, and Saddle MOAs. Data previously presented in Tables 3.3-3 through 3.3-6 identified the flight risks associated with this use.

*BIRD-AIRCRAFT STRIKE HAZARD*

The relatively low number of predicted and actual bird-aircraft strikes in the region indicates no need to significantly alter activities to ensure safety. However, continued awareness of the Bird Avoidance Model (BAM) predictions of high-risk areas and seasons, as well as continued avoidance of areas identified as having concentrations of waterfowl, will further enhance safety and minimize potential bird mortality concerns.

#### 4.3.1.3 MUNITIONS USE AND HANDLING

Chaff and flares would continue to be used at baseline levels at SCR, the Owyhee MOA, and the Paradise MOAs. No chaff or flares are expended in the Saddle MOA. Refer to section 3.3.3 for levels of use of ordnance, chaff, and flares.

### 4.3.2 Alternative B — Clover Butte

#### 4.3.2.1 FIRE RISK AND MANAGEMENT/GROUND SAFETY

Alternative B involves the continued use of SCR and the regional military training airspace; the development of a new tactical training range and associated restricted airspace at the Clover Butte location; the development of smaller no-drop target areas; and the creation of dispersed sites on which electronic emitters would be placed. Additionally, there would be modifications to, and a reconfiguration of, the Owyhee and Paradise MOAs, and a consolidation of the MOAs providing direct range support into a newly designated Jarbidge MOA. Sortie-operations in these airspace components are compared with existing conditions in Table 4.0-1.

Although total range sortie-operations would increase by 536 sorties under Alternative B, 176 fewer sortie-operations would be flown on SCR. Overall, total training ordnance released on SCR would be reduced by approximately 8 percent. Furthermore, the Air Force would totally discontinue the use of "hot spot" spotting charges on SCR and the proposed training range, and use only "cold spots," or ordnance with no spotting charges. This eliminates one of the

primary fire risk elements associated with range operations. With cold spots, the chemical reaction of the titanium tetrachloride with moisture in the atmosphere produces little or no heat. Therefore, they are essentially incapable of igniting vegetation. The processes and procedures in effect for the operation of SCR have proven fully capable of effectively managing the fire risk resulting from current range operations. With the reduced number of operations, ordnance, and flare use associated with this alternative, coupled with the use of only cold spot spotting charges, continuance of these procedures should further minimize the reduced risk at SCR. Since no other changes are planned for SCR under Alternative B, there are no significant ground safety issues associated with operations at SCR.

Developing the Clover Butte Range, the no-drop target areas, and the emitter sites may reasonably be expected to increase fire risk. Elements of the proposed development with the potential to increase risk include range construction and maintenance activity, increased accessibility, and increased human presence. Although this risk is low, it would be further minimized due to the following factors:

- During construction and maintenance activities, controls would be enforced on use of power tools, vehicle use around vegetation, and work crew smoking.
- During all construction, operations, and maintenance activities conducted during the fire season, trained personnel would be present on-site with equipment to support immediate fire suppression response.
- During periods of heightened fire risk, operations and maintenance activities on the range may be curtailed, or terminated entirely.
- All support equipment installed on the range and emitter sites would meet or exceed all federal and state safety standards and national fire safety codes.
- During training operations on the range, no "hot spot" spotting charges would be used.
- Overall flare use would be reduced throughout the military training airspace, and no flares would be released below 2,000 feet AGL, except over SCR.

Each of these factors is discussed in more detail below.

During the construction and maintenance of the target areas and emitter sites, sparks from equipment, hot exhaust pipes and mufflers on vehicles, smoking, and other accidental sources of ignition are sources of fire risk. Construction activities would disturb some areas that would then be susceptible to invasion by easily burned, weedy annual species such as cheatgrass. In areas where disturbance is temporary, stockpiling soil and backfilling using the stockpiled resource could encourage repopulation of original native vegetation.

To minimize fire risk during construction, safety procedures would be instituted for contractors and work crews. Such procedures could include no vehicle parking on vegetated areas, use of spark arrestors, and restrictions on smoking. Monitoring of activities would be necessary to ensure compliance with these policies.

Based on requirements, there is minimal fire risk associated with preparation of the emitter and scoring system sites. During site preparation, vehicles and personnel could inadvertently ignite a fire. However, as addressed above, application of mitigating construction practices would reduce this risk to an insignificant level.

After construction, daily operations and maintenance activities on the range complex also have a potential to increase safety risk. However, these activities would be guided by detailed operating procedures documented in an expanded range operating instruction. The aspects of range operation addressed would be similar to those subjects currently covered in Mountain Home AFB Instruction 13-287 (refer to section 3.3.1.3). Ground safety procedures prescribed for all range operations would match or exceed the successful procedures currently used at SCR.

The maintenance facility co-located on the 12,000-acre range would house equipment and trained personnel to support fire suppression. It is anticipated that these personnel would be contracted to provide pre-suppression, suppression, and post-suppression of fires occurring in the impact area of the proposed range. Specific fire response support requirements would be coordinated with other resource management agencies, and formalized in plans or agreements similar to those currently in effect concerning SCR. A 50,000-gallon water storage tank will be located on the facility. This would provide a water supply for a 1,200-gallon fire truck and two pick-up trucks with 200-gallon "slip-ons" which constitute part of the facility's planned equipment. A tank truck capable of transporting approximately 5,000 gallons of water would also be available to service the fire trucks away from the facility.

Many concerns were expressed in public and agency comments on the DEIS regarding the possibility of range fires or disruption to ranching operations from increased human presence. In response to these concerns, the Air Force proposes to develop a less than one-acre above-ground reservoir within a corner of the Clover Butte 12,000-acre training range. This less than one-acre above-ground reservoir would be linked to existing pipelines and be available for ranching operations. At all times, the proposed reservoir would have 50,000 gallons of water reserved to support fire suppression. Within the proposed withdrawal area, the water from the joint-use reservoir would be accessible from both outside and inside the perimeter fence.

To insure that the above-ground reservoir does not attract water fowl and create a bird-aircraft strike issue, the Air Force proposes to consult with resource management agencies and define a cover for the reservoir, if needed. This cover could be teflon balls, as have been used on other water bodies with similar concerns, or another suitable material.

Clover Butte Range would support the delivery of training ordnance. However, this ordnance is limited to small (25-pound) non-explosive training ordnance (bomb dummy unit [BDU]-33s or equivalent). No other ordnance would be authorized. Under Alternative B, 3,984 annual

sorties would deliver 6,364 BDU-33s. However, the Air Force has determined that only training ordnance with cold spots or no spotting charges would be used on the range. This decision negates the greatest fire risk associated with training range operations, and would significantly reduce the safety risk associated with operational activities throughout the training complex.

During periods of heightened fire risk, range operations would be modified to minimize fire potential. These measures are dependent on the type and level of risk, but could range from totally prohibiting flare use, to only using training ordnance with no spotting charges, to a complete cessation of all training operations, and maintenance activity on the range. Fire risk is determined using a rating system that integrates weather data and vegetation conditions. The BLM, supported by data from the fire weather branch of the National Weather Service, employs a computer analysis of conditions to define the burn index throughout a given day. This information is transmitted to Mountain Home AFB and SCR, and is used to determine what activities will be authorized on the ranges.

The Air Force has determined, through consultation with BLM range fire experts, that the BLM burn index alone may not be sufficient for determining when to limit operations in the specific geographic area of the training range. Air Force range personnel would rely on the expert judgment of fire fighters at the BLM, the National Interagency Fire Center, and the Mountain Home AFB Fire Chief to determine when extreme fire conditions exist. This determination would be made by highly trained and experienced fire fighters using a variety of available information such as:

- BLM burn index
- weather forecasts
- vegetation types
- quantity of dry vegetation present (fuel load)
- current regional fire suppression response capabilities
- area fire history

Any of these factors could cause fire conditions to be considered extreme in a specific location even though an overall region may exhibit only a moderate burn index. For example, under conditions of even moderate drought with fine fuel loads present, through consultation it may be determined that some portions of Owyhee County are at an extreme fire risk due to forecasted weather and all regional fire fighters being deployed to existing fires in Twin Falls County.

Storage tanks for diesel fuel would be placed at the maintenance facility for the training range and on the one-acre emitter sites. These storage tanks would be double-walled above-ground tanks. Each wall of the tank is steel, and the walls are separated by a layer of fire-proof concrete. The tanks themselves, as well as their maintenance and use, would comply with all

current federal and state safety standards for fuel storage tanks. The storage tanks on the one-acre emitter sites will be situated well away from the site fence, thereby minimizing any potential for vandalism or any spill migrating off-site.

Some targets would be equipped with heaters to provide a heat source simulating an operating engine or a heated building, etc. This would support training using the aircraft's infra-red targeting capability. On the drop targets, the heaters would most likely be powered by electricity; on the no-drop site, they would be propane powered. Service to the heaters would be provided by underground utility lines that would be buried and protected to avoid exposure and possible damage. All of the system components, as well as their installation and maintenance would be in compliance with all federal and state standards for such equipment. Additionally, all components used in the systems would meet or exceed operation safety standards established in the National Fire Codes published by the National Fire Protection Association.

All of the operational activity associated with the emitter sites would be on graveled surfaces, thereby reducing fire risk created by vehicles and personnel to negligible levels. The scoring system facilities include no equipment that could start a fire if it malfunctioned, and the limited number of maintenance visits to these sites would not increase fire risks over current levels.

Once the emitter sites are prepared, threat simulation emitters, or radars, would be located at five to eight sites daily throughout the training area. The frequencies at which radars operate are in the radio frequency (RF) band of the electromagnetic spectrum. Potential effects of RF energy on biological species, fuels, and electroexplosive devices are discussed below.

RF energy is non-ionizing energy and is absorbed macroscopically by an animal or human body in the form of heat and is defined as an increase in the mean kinetic energy of the molecules. The result is a temperature increase. At relatively low RF energy intensities, the heat induced can usually be accommodated by the thermoregulatory capabilities of the species exposed. Thus, any effects produced would generally be reversible. At high intensities, the thermoregulatory capabilities of any given species may be exceeded (i.e., heat gain is more rapid than natural heat loss), which could lead to thermal distress or even irreversible thermal damage to biologic tissue.

The effects of RF energy on humans depend on the frequency of the energy field, the polarization of the field, the size and shape of the individual, and the individual's ability to dissipate the absorbed energy by a normal biological response. Department of Defense Instruction (DODI) 6055.1 has set permissible exposure limits (PEL) for personnel. These PELs represent conditions under which it is believed that humans may be repeatedly exposed without adverse effects regardless of age, sex, or childbearing status. For personnel working in a designated controlled environment where the emitter is operating, the maximum allowable PEL to RF energy is 10 milliwatts per square centimeter (10 $mw/cm^2$) over any continuous 6-minute period. For persons in an uncontrolled environment (i.e., the public), the PEL is 5 $mw/cm^2$ over any continuous 6-minute period. Repetitive exposures to these levels that are

less than 6 minutes each would not be expected to be harmful. Most studies have shown that, in general, people can actually be exposed to up to 10 times the above-stated PEL without any deleterious health effects.

Animal studies on immune system response to RF absorption (using power densities well above the PEL) have yielded mixed results varying from slight decreases in immune response to increased longevity. The possibility that other effects result from RF energy absorption, including malignancy and developmental and genetic effects, has been investigated in animal studies. Some such effects have been found at high-power densities that also produce thermal effects, but they have not been shown to occur at exposure levels below the PELs.

Fuels, such as gasoline, aviation fuel, and jet fuel, are highly volatile and combustible. RF energy, if absorbed by metallic components that are used in refueling operations, could produce sparking that could result in ignition of a fuel vapor-air mixture. Air Force Occupational Safety and Health (AFOSH) Standard 161-9 also establishes permissible radio frequency exposure levels for these compounds.

Electroexplosive Devices (EEDs) are used to activate secondary explosive charges, to ignite propellants, and to actuate electroexplosive switches. A common electric blasting cap is one example of an EED. EEDs are used in aircraft systems to jettison flares, release externally carried missiles, and in some aircraft, to activate ejection seats. All EEDs are ignited electrically and, thus, are vulnerable to accidental ignition by exposure to electromagnetic fields. The degree of susceptibility depends on many variables: the safe no-hazard threshold of the EED, the ability of the EED leads to capture RF energy, the frequency and power density of the energy, and the exposure condition of the EED (i.e., whether it is contained in a shielded container, mounted inside an aircraft with shielding provided by the skin of the aircraft, or exposed to the environment with no shielding present). Air Force Manual AFM 91-201 provides guidelines for determining safe separation distances between EEDs and radio-frequency emitters.

Acceptable energy levels and safe separation distances for people, fuels, and EEDs vary depending on the frequency and transmitted power of the RF emitter. For the emitters to be used at the emitter sites, studies have been performed to determine the required separation distances for people and EEDs. EEDs were considered to be in an exposed condition. Therefore, the separation distances reported represent maximum safe separation. These data are presented in Table 4.3-1. Separation distances for fuels are not shown since it is a standard operating procedure to shut down emitters during any fueling operation (personal communication, 366 RANS SQI 91-3 1996).

The majority of the equipment in Table 4.3-1 is aircraft threat simulation radar. Units would be placed on elevated ground, and then emit skyward. They are not pointed at the ground or along roadways. The one-acre emitter sites would be fenced, thereby creating a safety buffer around the equipment. This equipment is operated under strict safety control measures that are determined for each system. These measures include installing warning signs, erecting

rope or chain barriers, and keeping the equipment and the surrounding area under constant observation while it is operating. Adherence to these established safety standards ensure no health or safety impacts would occur.

**Table 4.3-1. RF Energy Safe-Separation Distances**

| *Emitter* | SEPARATION DISTANCES (IN FEET)[1] | |
|---|---|---|
| | *People* | *EEDs* |
| AN/MPQ-T3 | 15 | 72 |
| AN/MSQ-T43 | 221 | 30 |
| AN/VPQ-1 | 23 | 50 |
| AN/SPS-66 | 2 | 2 |

Note: 1. Separation distances shown are at 8 to 15 feet AGL
Source: Personal communication, 366 RANS/DOOT 1996.

The emitters would only operate during scheduled training, and operate on frequencies specifically selected to avoid interference with any other private or commercial RF transmission sources. Any interference problems suspected to be caused by an electronic emitter and reported to the Mountain Home AFB Frequency Manager would be investigated.

RF emitters used on aircraft pose no hazard to the public due to the aircraft's altitude, the energy levels used by the equipment, and the speed of the aircraft. Given these factors, the duration of any possible RF radiation exposure is very small if such exposure were even to occur.

Laser targeting-equipped aircraft currently operate at SCR and would operate on the Clover Butte Range. Use of the "combat" mode of operation is limited to those specific targets and target areas that have been specifically approved for such operations. Before any lasing activities would be conducted on the Clover Butte Range, the specific areas being considered would be surveyed by a bioenvironmental engineer, and safe operating procedures would be established to ensure no hazardous situations exist. All laser operations in the "combat mode" will continue to be contained within the exclusive use area of SCR, and within the 12,000-acre area of the proposed range. Since no people would be present in the impact areas of either range when a target is being lased in the combat mode, there is no risk of exposure. While the potential for an animal's exposure to the high-intensity main beam of the laser cannot be totally discounted, it is considered to be highly improbable due to the specific series of events that would have to occur to result in such exposure. This series of events include being immediately adjacent to the target being lazed, directly looking at the approaching aircraft, and continuing to look at the aircraft during the targeting process.

Since use of lasers in locations other than the impact areas of the ranges (e.g., no-drop targets) would be limited to the "eye-safe" mode, there is no risk to people or animals in those areas.

Currently, all ground safety activities at SCR and associated training areas are conducted in accordance with detailed operating procedures documented and published by Mountain Home AFB. This regulation would be expanded and updated to include all new facilities associated with this proposal. Overall, many operations and maintenance activities are guided by levels of fire risk that are classified by an indexing system. At higher risk levels, many activities are limited or constrained; at the highest risk levels, they are often completely curtailed. These procedures, which have proven effective in managing current activities, are anticipated to remain effective in the future.

#### 4.3.2.2 FLIGHT RISKS

*AIRCRAFT MISHAPS*

Under Alternative B, aircrews would train on SCR and the Clover Butte range and continue to use the Owyhee, Paradise, and Saddle MOAs. Data presented in Tables 4.3-2 through 4.3-6 identify the changes to flight risks associated with this use. The tables reflect the statistically predicted Class A mishaps for the levels of activity in the airspace associated with Alternative A. Shown are the aircraft types, the planned utilization of the airspace, and the predicted frequency of Class A mishaps. For comparative purposes, where applicable, baseline data are repeated in the tables.

In evaluating this information, it should be emphasized that the indicated time interval between Class A mishaps in the airspace is only statistically predictive. The actual causes of mishaps are due to many factors, not simply the amount of flying time of the aircraft.

Under Alternative B, annual sortie-operations at SCR would be reduced by 176, and 3,984 annual sortie-operations would use the Clover Butte Range. However, since some aircraft would use both ranges, the overall increase at the actual range complex (SCR, Clover Butte, and the new Jarbidge MOA) would be 536 annual sortie-operations. Also, under Alternative B, the amount of time some aircraft spend in the airspace would be reduced. As a result, statistical predictions indicate a reduced safety risk from flight activities. As shown in Table 4.3-2, the minimum time between statistically estimated Class A mishaps for aircraft flying in this airspace would increase from an estimate of once every 11.1 years to once every 16.5 years.

Under Alternative B, the Owyhee MOA would be reconfigured to support training in a more comprehensive manner. Annual sortie-operations in the MOA would increase by 496, a 6.7

**Table 4.3-2. Baseline and Projected Class A Mishaps for SCR, ETI, and Supporting MOAs under Alternative B**

| *Aircraft* | *Class A Mishap Rate* | *Projected Years between Class A Mishaps (Baseline)* | *Sortie-Operations per Year (Alternative B)* | *Flight Hours per Year (Alternative B)* | *Projected Years between Class A Mishaps (Alternative B)* |
|---|---|---|---|---|---|
| A-6/EA-6B | 3.33 | 385.0 | 156 | 78 | 385.0 |
| A-10 | 2.56 | 21.7 | 2,401 | 1,801 | 21.7 |
| B-1 | 4.02 | 71.1 | 349 | 262 | 94.9 |
| B-2 | 0.00 | N/A [1] | 72 | 36 | N/A [2] |
| B-52 | 1.29 | 4,845.0 | 32 | 16 | 4,845.0 |
| C-130 | 0.99 | 1,980.6 | 50 | 51 | 1,980.6 |
| F-4 | 5.80 | 391.8 | 86 | 44 | 391.8 |
| F-14 | 5.76 | 17,361.1 | 2 | 1 | 17,361.1 |
| F-15 | 2.62 | 14.4 | 3,045 | 1,813 | 21.1 |
| F-16 | 4.57 | 11.1 | 2,036 | 1,327 | 16.5 |
| F-18 | 2.07 | 4,025.8 | 24 | 12 | 4,025.8 |
| F-111 | 6.16 | 4,058.4 | 7 | 4 | 4,058.4 |
| T-37 | 1.12 | 89,285.7 | 0 | 0 | N/A [1] |
| UH-1 | 3.43 | 4,164.9 | 13 | 7 | 4,164.9 |

Source: Personal Communications: Air Force and U.S. Navy Flying Safety Centers Mountain Home AFB 1996a

Notes: 1. Not Applicable. Aircraft not flown under indicated alternative.
2. Not Applicable. Aircraft has never experienced a Class A mishap

**Table 4.3-3. Baseline and Projected Class A Mishaps for Owyhee MOA under Alternative B**

| *Aircraft* | *Class A Mishap Rate* | *Projected Years between Class A Mishaps (Baseline)* | *Sortie-Operations per Year (Alternative B)* | *Flight Hours per Year (Alternative B* | *Projected Years between Class A Mishaps (Alternative B)* |
|---|---|---|---|---|---|
| A-6/EA-6B | 3.33 | 1,251.3 | 48 | 24 | 1,251.3 |
| AV-8 | 13.03 | 548.2 | 28 | 14 | 548.2 |
| A-10 | 2.56 | 23.9 | 1,632 | 408 | 95.7 |
| B-1 | 4.02 | 216.3 | 153 | 39 | 637.8 |
| C-130 | 0.99 | 3,060.9 | 33 | 33 | 3,060.9 |
| F-4 | 5.80 | 325.3 | 105 | 53 | 325.3 |
| F-15 | 2.62 | 12.2 | 3,572 | 1,464 | 26.1 |
| F-16 | 4.57 | 13.4 | 2,247 | 1,124 | 19.5 |
| F-18 | 2.07 | 4,830.9 | 20 | 10 | 4,830.9 |
| KC-135 | 0.69 | 144,927.5 | 2 | 1 | 144,927.5 |
| T-37 | 1.12 | 14,880.9 | 0 | 0 | N/A [1] |
| UH-1 | 3.43 | 9,718.2 | 6 | 3 | 9,718.2 |

Source: Personal Communications: Air Force and U.S. Navy Flying Safety Centers Mountain Home AFB 1996a

Notes: 1. Not Applicable. Aircraft not flown under indicated alternative.

**Table 4.3-4. Baseline and Projected Class A Mishaps for Paradise East MOA under Alternative B**

| *Aircraft* | *Class A Mishap Rate* | *Projected Years between Class A Mishaps (Baseline)* | *Sortie-Operations per Year (Alternative B)* | *Flight Hours per Year (Alternative B)* | *Projected Years between Class A Mishaps (Alternative B)* |
|---|---|---|---|---|---|
| A-6/EA-6B | 3.33 | 1,501.5 | 40 | 10 | 3,003.0 |
| AV-8 | 13.03 | 426.4 | 35 | 9 | 852.7 |
| A-10 | 2.56 | 253.7 | 60 | 15 | 2,604.2 |
| B-1 | 4.02 | 323.1 | 66 | 11 | 2,261.4 |
| C-130 | 0.99 | 8,417.5 | 6 | 6 | 16,835.0 |
| F-4 | 5.80 | 383.1 | 89 | 23 | 749.6 |
| F-15 | 2.62 | 13.0 | 1,996 | 1,134 | 33.7 |
| F-16 | 4.57 | 18.7 | 969 | 485 | 45.1 |
| F-18 | 2.07 | 6,038.6 | 16 | 4 | 12,077.3 |
| KC-135 | 0.69 | 4,140.8 | 69 | 18 | 8,051.5 |
| T-37 | 1.12 | 2,705.6 | 0 | 0 | N/A [1] |
| UH-1 | 3.43 | 9,718.2 | 6 | 2 | 14,577.3 |

Source: Personal Communications: Air Force and U.S. Navy Flying Safety Centers Mountain Home AFB 1996a

Notes: 1. Not Applicable. Aircraft not flown under indicated alternative.

**Table 4.3-5. Baseline and Projected Class A Mishaps for Paradise West MOA under Alternative B**

| *Aircraft* | *Class A Mishap Rate* | *Projected Years between Class A Mishaps (Baseline)* | *Sortie-Operations per Year (Alternative B)* | *Flight Hours per Year (Alternative B)* | *Projected Years between Class A Mishaps (Alternative B)* |
|---|---|---|---|---|---|
| A-6/EA-6B | 3.33 | 1,501.5 | 40 | 10 | 3,003.0 |
| AV-8 | 13.03 | 426.4 | 35 | 9 | 852.7 |
| A-10 | 2.56 | 253.7 | 80 | 20 | 1,953.1 |
| B-1 | 4.02 | 323.1 | 88 | 22 | 1,130.7 |
| C-130 | 0.99 | 8,417.5 | 6 | 6 | 16,835.0 |
| F-4 | 5.80 | 383.1 | 89 | 23 | 749.6 |
| F-15 | 2.62 | 13.0 | 2,661 | 1,001 | 38.1 |
| F-16 | 4.57 | 18.7 | 1,292 | 323 | 67.7 |
| F-18 | 2.07 | 6,038.6 | 16 | 4 | 12,077.3 |
| KC-135 | 0.69 | 4,140.8 | 69 | 18 | 8,051.5 |
| T-37 | 1.12 | 2,705.6 | 0 | 0 | N/A [1] |
| UH-1 | 3.43 | 9,718.2 | 6 | 2 | 14,577.3 |

Source: Personal Communications: Air Force and U.S. Navy Flying Safety Centers Mountain Home AFB 1996a

Notes: 1. Not Applicable. Aircraft not flown under indicated alternative.

**Table 4.3-6. Baseline and Projected Class A Mishaps for Saddle MOA under Alternative B**

| *Aircraft* | *Class A Mishap Rate* | *Projected Years between Class A Mishaps (Baseline)* | *Sortie-Operations per Year (Alternative B)* | *Flight Hours per Year (Alternative B)* | *Projected Years between Class A Mishaps (Alternative B)* |
|---|---|---|---|---|---|
| EA-6B | 3.33 | 30,030.0 | 1 | 1 | 30,030.0 |
| A-10 | 2.56 | 84.6 | 632 | 632 | 61.8 |
| B-1 | 4.02 | 1,658.4 | 20 | 20 | 1,243.8 |
| C-130 | 0.99 | 8,417.5 | 6 | 6 | 16,835.0 |
| F-4 | 5.80 | 1,014.2 | 34 | 17 | 1,014.2 |
| F-15 | 2.62 | 36.6 | 1,064 | 1,064 | 35.9 |
| F-16 | 4.57 | 86.8 | 332 | 332 | 65.9 |
| KC-135 | 0.69 | 6,901.3 | 41 | 21 | 6,901.3 |
| T-37 | 1.12 | 4,464.3 | 39 | 20 | 4,464.3 |

Source: Personal Communications: Air Force and U.S. Navy Flying Safety Centers Mountain Home AFB 1996a

percent increase. However, as a result of reduced flight time in the MOA, flight safety risks would be reduced per sortie-operation. As illustrated in Table 4.3-3, the minimum statistically estimated time between Class A mishaps would decrease from an expected one every 12.2 years to one every 19.5 years.

Under Alternative B, the Paradise MOA would be reconfigured, and divided into two MOAs – the Paradise East and Paradise West. This represents a geographical redistribution and separation of sortie-operation throughout the airspace, and would also result in a change in the times each aircraft would spend in each airspace element. As a result, care should be taken in drawing direct correlation between baseline and proposed conditions.

Overall, a total of 7,734 annual sortie-operations would be flown throughout the Paradise airspace, which would be an increase of 2,643 sortie-operations. However, because of the segregation of activities in either the east or west portion, the statistically predicted improvements in flight safety may be somewhat overstated. Flight safety data for these MOAs are presented in Tables 4.3-4 and 4.3-5.

Activity in the Saddle MOA would increase by approximately 9 percent to a total of 2,169 annual sorties. Although the overall risk of a Class A mishap would slightly increase (statistically indicated time between mishaps reduced by approximately 8 months), this is not considered to be a significant risk. The minimum statistically predicted time between Class A mishaps would be once every 35.9 years, as shown in Table 4.3-6.

***BIRD-AIRCRAFT STRIKE HAZARD***

The potential risk of bird-aircraft strikes may be assessed as a function of flight miles flown in a given element of airspace. Based on extensive operational and biological data, the Air Force has developed a computer-generated BAM that indicates relative risk of experiencing bird strikes at different times of day, and at various times of the year in specific geographic areas. The BAM is based on population and distribution of North American waterfowl (e.g., geese, ducks, and swan) and some species of raptors that comprise approximately 60 percent of all damaging bird strikes. The BAM data prepared for the military training airspace's ROI (ROI Three) predict the greatest incidence of bird strikes to occur in the morning and evening hours during the months of September, October, and November – the fall migratory season. The risk predicted during the spring migratory season (March, April, and May) is approximately half that associated with the fall migratory season.

When actual bird-aircraft strike incidents are compared with BAM predictions, actual strikes are somewhat less than those predicted by the model. Based on 11 years of data and an estimate of the total miles flown during those 11 years in each element of airspace, a strike-rate per 1 million NM of flight was computed. That strike rate was then used with the estimation of miles that would be flown under various alternatives to derive a statistical prediction of the expected frequency of bird-aircraft strikes.

Historic occurrences of bird strikes in specific elements of airspace can be used to estimate a strike rate per 1 million NM of flight. By using that strike rate with an estimate of the miles that would be flown under Alternative B, a statistical prediction of the expected frequency of bird strikes could be calculated.

For Alternative B, statistical data indicate that in the direct range support airspace, a strike may be expected about once every 9 months. In the Owyhee and Saddle MOAs, the interval is approximately 2.8 years and 9.7 years, respectively. Since the Paradise MOA has no historic incidence of bird strikes, a statistical prediction is not possible.

These time intervals do not represent a significant change from existing conditions, and do not create a specific safety issue. Nevertheless, awareness of BAM-predicted high-risk periods and sensitivity to the locations of concentrations of migrating birds would further reduce risks associated with bird-aircraft strikes.

#### 4.3.2.3 Munitions Use and Handling

There are no changes in the types of ordnance used in Alternative B. Overall, ordnance use would be reduced. At SCR, the total level of training ordnance released would be reduced from 23,633 to 15,469. On the Clover Butte Range, 6,364 BDU-33s would be dropped. However, overall use of BDU-33s is reduced by 1,416 annually. Furthermore, as was previously stated, no hot spot spotting charges would be used on any ordnance either at SCR or Clover Butte. Table 4.3-7 compares levels of ordnance use under Alternative B with current operations.

**Table 4.3-7. Ordnance Use under Alternative B**

| | Ordnance Type | | | | | |
|---|---|---|---|---|---|---|
| *Alternative* | *BDU-33* | *Mk 82 Inert* | *Mk 84 Inert* | *BDU-50* | *20 mm* | *30 mm* |
| **Baseline SCR** | 22,584 | 384 | 456 | 209 | 78,000 | 178,200 |
| **Alternative B** | | | | | | |
| SCR | 14,804 | 288 | 168 | 209 | 60,000 | 178,200 |
| ETI | 6,364 | N/A | N/A | N/A | N/A | N/A |
| Total | 21,168 | 288 | 168 | 209 | 60,000 | 178,200 |
| Change | -1,416 | -96 | -288 | 0 | -18,000 | 0 |

Source: Mountain Home AFB 1996a

Chaff and flares would continue to be expended in the reconfigured Owyhee and Paradise MOAs. No chaff or flares would be used in the Saddle MOA. Overall, chaff use would increase under this alternative, while flare use would decrease. Since chaff is an inert substance and has never been shown to create any health or safety risks to persons or animals, this increased utilization would create no safety impact. Procedures governing the use of flares

dictate minimum release altitudes that ensure no burning material reaches the ground. Compliance with these procedures minimizes safety risks associated with the use of flares.

Throughout the Owyhee, Paradise, and Jarbidge MOAs, and on the Clover Butte alternative route, flares are released no lower than 2,000 feet AGL. On SCR, although lower release altitudes are authorized during periods of low fire risk, the reduction in the number of flares used reduces risk.

Tables 4.3-8 and 4.3-9 compare proposed chaff and flare use with current conditions. For purposes of comparison with baseline levels, the levels of use in the Paradise East and West MOAs are combined.

**Table 4.3-8. Chaff Use under Alternative B**

| | AIRSPACE | | | |
|---|---|---|---|---|
| *Alternative* | *Ranges / Range Support MOAs* | *Owyhee MOA* | *Paradise East MOA* | *Paradise West MOA* |
| Baseline | 26,820 | 12,142 | 9,934 | |
| Alternative B | 23,498 | 15,820 | 5,096 | 10,276 |
| Change | -3,322 | +3,678 | +5,438 | |

Source: Mountain Home AFB 1996a

**Table 4.3-9. Flare Use under Alternative B**

| | AIRSPACE | | | |
|---|---|---|---|---|
| *Alternative* | *Ranges / Range Support MOAs* | *Owyhee MOA* | *Paradise East MOA* | *Paradise West MOA* |
| Baseline | 14,624 | 6,053 | 4,566 | |
| Alternative B | 9,640 | 5,708 | 2,272 | 3,292 |
| Change | -4,984 | -345 | +998 | |

Source: Mountain Home AFB 1996a

## 4.3.3 Alternative C — Grasmere

### 4.3.3.1 Fire Risk and Management/Ground Safety

Under Alternative C, SCR would continue to be used, and the same facilities would be developed and the same airspace modifications would occur as under Alternative B. The only variances would involve the specific location of the new tactical training range, and which no-drop target areas would be developed, and the fact that electrical power for the maintenance facility would be derived from propane-powered generators instead of from a routed electrical service line. However, fuel storage, routing, and generator operation would meet or exceed all

safety requirements of the National Fire Codes published by the National Fire Protection Association.

The proposed Grasmere site is in a transition zone between Fire Management Zone (FMZ) 1 and FMZ 2. As such, based on historic data and the presence of specific fuel types, fire risks associated with the development of this site may be somewhat higher than for those sites located exclusively within FMZ 2. However, the processes and procedures addressed in section 4.3.2.1 are equally applicable for this site, and would be expected to mitigate fire and ground safety risks to minimal levels. The same fire suppression equipment identified for the proposed Clover Butte range would also be present on the maintenance facility of the proposed Grasmere range. However, since alternative sources of water are available, there is no need to develop the less than one-acre above-ground reservoir.

It should also be noted that under this alternative, only ordnance with cold spot charges or without any marking devices would be expended on both SCR and the Grasmere site, thus eliminating a potential fire risk source associated with operations at the training range.

All fire and ground safety issues, and associated management activities discussed in section 4.3.2.1, are equally applicable under this alternative.

#### 4.3.3.2 Flight Risks

Flight activity under this alternative is identical to operations described in section 4.3.2.2. Refer to Tables 4.3-2 through 4.3-6 for a summary of the statistically estimated incidence of Class A mishaps. Risks associated with bird-aircraft strikes remain as discussed in section 4.3.2.2.

#### 4.3.3.3 Munitions Use and Handling

No new ordnance would be used under this alternative. The use of all munitions would be identical to that described in section 4.3.2.3. The levels of use regarding ordnance, chaff, and flares under this alternative are compared with current conditions in Tables 4.3-7, 4.3-8, and 4.3-9, respectively.

### 4.3.4 Alternative D — Juniper Butte

#### 4.3.4.1 Fire Risk and Management/Ground Safety

Under Alternative D, SCR would continue to be used, and the same facilities would be developed as under Alternative B. Airspace configuration changes would also occur. The major variances would involve the specific location of the new tactical training range and which no-drop target areas would be developed.

The proposed Juniper Butte site is in FMZ 2. As such, fire risks associated with the development of this site are similar to other sites within FMZ 2. The processes and procedures addressed in section 4.3.2.1 are equally applicable for this site, and would be expected to

mitigate fire and ground safety risks to minimal levels. Furthermore, as in section 4.3.2.1, a less than one-acre above-ground reservoir would be developed and located in a corner of the proposed 12,000-acre range, providing additional water supplies for fire suppression.

It should also be noted that under this alternative, only ordnance with cold spot spotting charges or lacking spotting charges would be expended on both SCR and the Juniper Butte site, thus negating potential fire risk source associated with the operation of the training range.

All fire and ground safety issues and associated management activities discussed in section 4.3.2.1 are equally applicable under this alternative.

#### 4.3.4.2 FLIGHT RISKS

Flight activity under Alternative D would be identical to operations described in section 4.3.2.2. Refer to Tables 4.3-2 through 4.3-6 for a summary of the statistically estimated incidence of Class A mishaps. Risks associated with bird-aircraft strikes remain as discussed in section 4.3.2.2.

#### 4.3.4.3 MUNITIONS USE AND HANDLING

No new ordnance would be used under this alternative. The use of all munitions is identical to that described in section 4.3.2.3. The levels of use regarding ordnance, chaff, and flares under this alternative are compared with current conditions in Tables 4.3-7, 4.3-8, and 4.3-9, respectively.

### 4.3.5 Shoshone-Paiute Concerns About Safety

Members of the Shoshone-Paiute Tribes have expressed concerns about the likelihood of an aircraft mishap on or near Duck Valley Reservation. Current Air Force policy restricts overflights over the Reservation (see section 1.4.4.2). As discussed in section 3.3.2, the statistical probability of an aircraft mishap underneath the affected airspace is currently very low. Under all alternatives there would continue to be a low probability of aircraft mishap beneath the affected airspace. Risks would decrease in some cases or increase only slightly.

The Shoshone-Paiute have also expressed concerns about the risks associated with the Air Force's current use of flares. While flares are approved for use in the MOAs within the ROI, their use constitutes minimal risk. When used anywhere except over the target areas of SCR, flares are released no lower than 2,000 feet above the ground in accordance with a coordinated agreement with the BLM. This altitude is more than double the normally approved safe-release altitude designated by the Air Force for flare use (Mountain Home AFB 1995c).

The Air Force agreed that absent compelling national security circumstances or military contingencies or hostilities, they will not use flares at night at any altitude, or use flares during the day below 20,000 feet AGL, for training operations over the present boundaries of the Duck Valley Reservation (see section 1.4.4.2).

In spite of its low risk, members of the Shoshone-Paiute Tribes have expressed the opinion that chaff used by the Air Force has littered the environment. Under all the range development alternatives, the overall use of chaff in the affected airspace would increase approximately 12 percent, although the specific areas where chaff would be used would vary. Chaff is an inert substance and has never been shown to create any health or safety risks to persons or animals. Therefore, this increased utilization would create no health or safety impacts.

The Air Force has agreed that absent compelling national security circumstances or military contingencies or hostilities, they will not use chaff for training operation over the present boundaries of the Duck Valley Reservation.

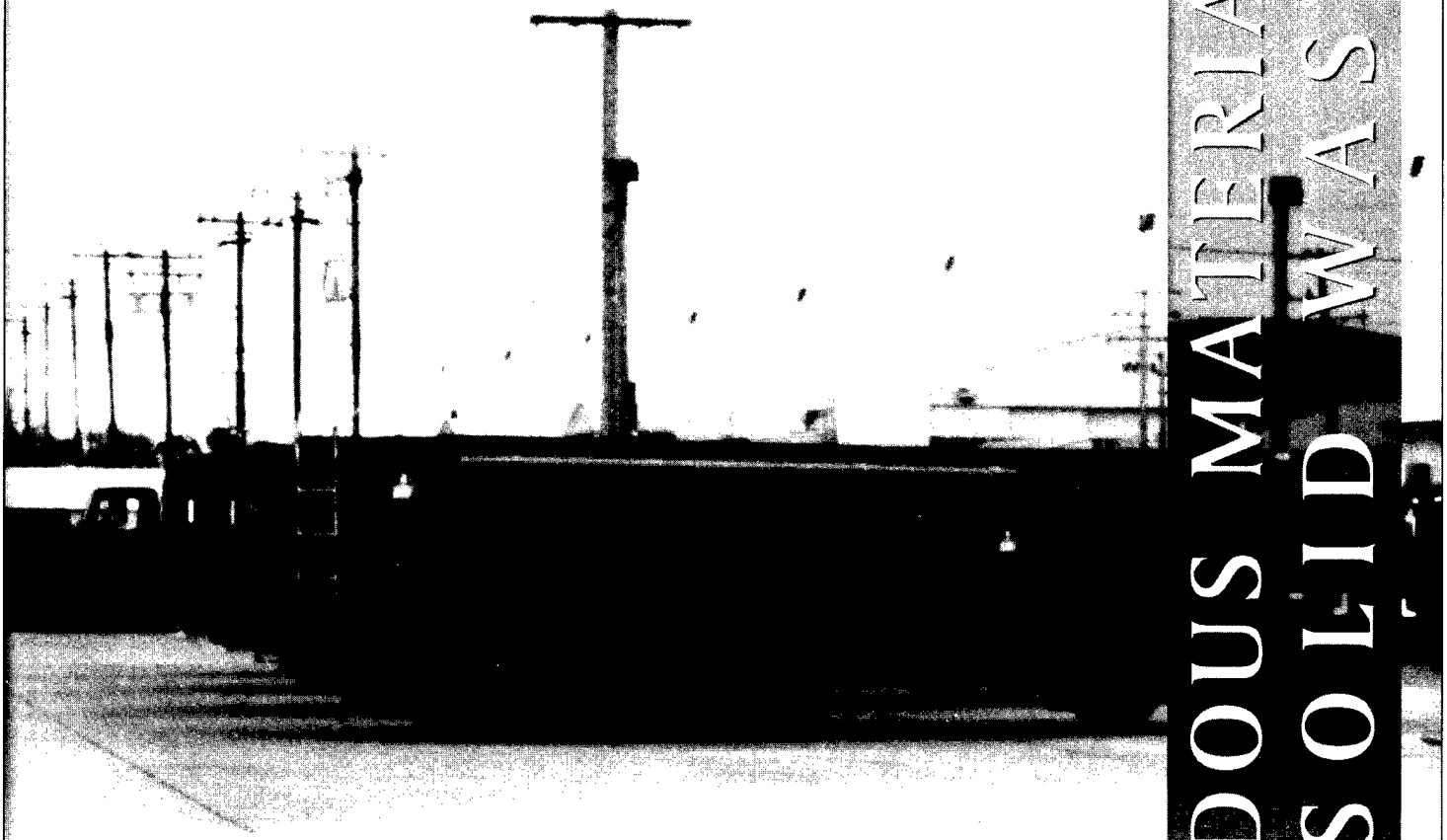
The Air Force's agreement to restrict the use of chaff and flares over the Duck Valley Reservation would not change under any of the alternatives.

The Shoshone-Paiute have expressed concern about ground safety in the immediate area around State Highway 51 due to increases in vehicular traffic and low-altitude aircraft operations associated with training range elements along the road. In general, traffic volume on Highway 51 is projected to remain relatively unchanged. On average, during range operations, it is estimated a maximum of five additional vehicle trips per day could occur. The presence of threat emitters does not necessarily attract aircraft flying at low altitude. Threat emitters are designed to replicate a wide range of enemy capabilities and they elicit a wide variety of offensive and defensive actions. The primary defensive action against a threat emitter is avoidance. Avoidance can include high overflight, terrain masking, or geographical separation. Typically, threat emitters would expel, rather than compel, close-in flight activity. In those instances when low-altitude flight operations are being conducted around the no-drop sites, it should be noted that the 366th Wing has briefed all aircrews that it is not acceptable to use people or private vehicles as simulated targets. Overall, there are only minimal ground safety risks associated with range operations around Highway 51.

### 4.3.6 Cumulative Impacts

The change of sorties and establishment of a range associated with the ETI project will generate a change in safety concerns. The results of this change were addressed in the previous sections. The A-10 and B-1B aircraft that are associated with other projects not related to ETI have been included in the analysis section. Appendix N provides a discussion of sortie-operations associated with historic use. None of the actions presented in section 2.6.2 would result in a cumulative impact to safety resources.

None of the reasonably foreseeable future actions create cumulative explosive safety impacts.



# 4.4 HAZARDOUS MATERIALS AND SOLID WASTE

There are currently no known hazardous waste sites within the proposed training areas, no-drop areas, or emitter locations. SCR follows all federal and state requirements for cleanup and disposal of all hazardous materials and solid wastes, including ordnance, oils, gunpowder, and projectiles.

Construction and maintenance activities associated with the development and operation of an alternative would require use of hazardous substances such as petroleum, oil, and lubricants. During construction, use of these substances for fueling and equipment maintenance would create the potential for minor spills and releases. Compliance with Air Force "Best Construction Practices" would reduce this potential to insignificant levels. Maintenance operations and facilities planned for the alternatives would be similar to those at SCR.

All cleaning substances from minor maintenance at a training range will be returned to Mountain Home AFB (pictured here) for recycling.



Spent practice ordnance, such as the BDU-33 casing above, with pen to show scale, is regularly collected and disposed of at a licensed solid waste facility.

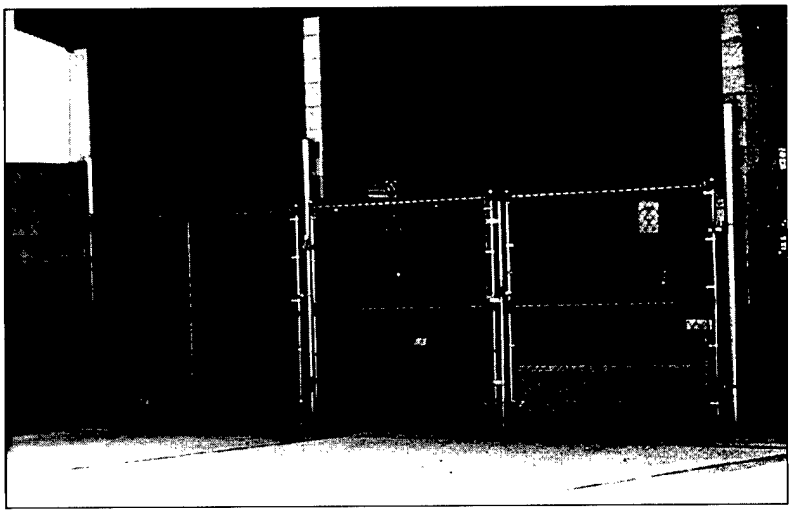
Substances used for, or resulting from, minor maintenance activities would be stored in small quantities at the training range maintenance facility. Used oils would be transported to Mountain Home AFB for approved disposal or recycling. Fuels would be stored in double-walled, above-ground storage tanks, and appropriate spill prevention and containment technologies would be incorporated into their design to minimize risk. The only difference among range development alternatives is that transmission lines would supply electricity to Clover Butte and Juniper Butte but propane would be stored at Grasmere to run generators for electricity.

A spill prevention countermeasure plan for fuels and cleaning materials would be developed and implemented, and appropriate spill response equipment would be on site.

Training ordnance at Saylor Creek and at any new range alternative generate solid waste. The majority of the solid waste would consist of training ordnance and target debris. Steel 25-pound inert ordnance simulates actual weapons. Waste products from inert training ordnance consist primarily of scrap steel and cast iron. Since spent training ordnance could contain unused cold spot charges, the spent training ordnance is collected by specially trained personnel. Spent ordnance debris is collected and target maintenance would occur regularly and consistently throughout the year.

The construction and operation of facilities to enhance training are not projected to use substantial amounts of hazardous materials or to generate substantial amounts of hazardous waste.

Used oils and cleaning chemicals generated at a new training range would be transported to Mountain Home AFB or Gowen Field for approved disposal.



## 4.4 HAZARDOUS MATERIALS AND SOLID WASTE MANAGEMENT

The qualitative and quantitative assessment of impacts from hazardous materials and solid waste management focuses on how and to what degree the alternatives affect hazardous materials usage and management, hazardous waste generation and management, and waste disposal. A substantial increase in the quantity or toxicity of hazardous substances used or generated is considered potentially significant. Significant impacts could result if a substantial increase in human health risk or environmental exposure is generated at a level that cannot be mitigated to acceptable standards. In comparison, a reduction in the quantity and types of hazardous substances used or generated can be considered a beneficial impact. If the quantity of hazardous substances used or generated is not changed, then there is no impact.

A comparative analysis of existing and proposed hazardous materials and waste management practices was used to evaluate impacts associated with the implementation of the alternatives. Hazardous waste generation records were reviewed to determine the magnitude of anticipated increases in hazardous waste generation considering historic waste generation levels, existing management practices, and storage capacity.

An environmental baseline survey (EBS) (or contamination study) as required for a land withdrawal and by the Air Force for any land and realty actions provided information on potential impacts based on the degree of risk or liability from existing environmental contamination. State and federal laws and regulations were used as threshold measurements for evaluation of potential impacts. Appendix C provides the results of the EBS. An earlier Air Force EBS addressed sites ND-8, BK, and AU. These sites were surveyed in 1995 and found to have no contamination (Mountain Home AFB 1995a).

Hazardous waste at Mountain Home AFB and all of its associated properties, including SCR, is managed within the following three classifications: accumulation points, accumulation sites, and at the permitted on-base storage building. Hazardous waste may only be accumulated at the approved accumulation sites or at accumulation points located in the same area where the waste streams are generated. Each accumulation site or accumulation point must comply with the associated requirements.

Each accumulation site and accumulation point must comply with requirements for siting, physical construction, operations, marking, labeling, inspections, and must maintain a container inspection log. The Installation Hazardous Waste Program Manager can be contacted if an additional accumulation point is required. The selection of accumulation points and sites is coordinated with the Hazardous Waste Program Manager and must minimize the threat to human health and the environment.

The on-base hazardous waste facility is permitted to store hazardous waste in accordance with Permit Identification #3572174557. This permit is administered by the Idaho Department of Health and Welfare Division of Environmental Quality (IDHW DEQ) to store hazardous waste.

Wastes restricted from land disposal may be stored at this facility for up to one year. It is the policy of Mountain Home AFB to ship hazardous waste off site as expeditiously as possible.

Mountain Home AFB maintains a hazardous waste stream inventory for every hazardous waste stream generated on base or at any of its associated sites, such as SCR. For any new sites, like the proposed range maintenance facilities, Mountain Home AFB would ensure that all wastes are properly characterized and classified as either hazardous or non-hazardous in accordance with guidance documents and the Defense Reuse Management System (DRMS) Form 1930, Hazardous Waste Profile Sheet, or equivalent. Information from the hazardous waste profile sheet would be used to maintain and update the hazardous waste stream inventory. The Installation Hazardous Waste Program Manager is responsible for quantifying all hazardous waste streams for hazardous waste stream inventory.

Transportation of hazardous waste must ensure that waste is accumulated and transported in the proper U.S. Department of Transportation specification container. The proper container can be determined by reference to the Hazardous Materials Table in 49 Code of Federal Regulations (CFR) 172.101.

### 4.4.1 Alternative A — No-Action

Under Alternative A, no changes to current conditions or activities with the potential to increase production of hazardous waste would occur. The types and quantities of hazardous materials and wastes generated at SCR and stored at Mountain Home AFB would not change. Consequently, implementation of Alternative A would have no added impact on hazardous materials. Alternative A would result in the use of the same amount of training ordnance as present, thus leaving the requirements for recycling or disposal unaltered.

### 4.4.2 Alternative B — Clover Butte

#### 4.4.2.1 Hazardous Materials

The primary hazardous waste generating activities associated with the proposed range components include maintenance of ground support equipment, infrastructure maintenance, and vehicle maintenance. Wastes generated in maintenance activities would include small quantities of spent solvents; used oils; absorbents contaminated with fuel, oil, and/or hydraulic fluid; contaminated fuels and greases; and lead. All defined hazardous waste generation associated with the range would be transferred or disposed of at Mountain Home AFB facilities.

Construction and maintenance activities associated with the development and operation of alternatives would require the use of hazardous substances such as petroleum, oil, and lubricants. During construction, use of these substances for fueling and equipment maintenance would create the potential for minor spills and releases. Compliance with Air Force best construction practices would reduce this potential to insignificant levels.

Maintenance operations planned for Alternative B would be similar to those performed at SCR. Only minor vehicle and equipment maintenance would be performed. Currently, operations at SCR involve the use of 6 gallons of oil per month, 15 gallons per month of ethylene glycol, 12 ounces per year of ether, 35 gallons per week of unleaded gasoline, and 150 gallons per week of diesel fuel. Maintenance facilities would be similar to those that exist at SCR, as well.

Petroleum, oil, and lubricants, as well as other substances required for minor maintenance activities, would be stored temporarily in approved storage lockers within the maintenance facility.

Accumulation points would be established for specific types of wastes. Management of these accumulation points would be performed by a civilian contractor. The Installation Hazardous Waste Program Manager would manifest hazardous wastes for transport to the facility on Mountain Home AFB. Substances used for, or resulting from, minor maintenance activities would be stored in small quantities in the facility. Used oils (not a hazardous waste) would be transported to Mountain Home AFB or Gowen Field for approved disposal or recycling. Diesel fuel for vehicles would be stored in aboveground storage tanks (ASTs) at the proposed maintenance facility, and appropriate spill prevention and containment technologies would be incorporated into their design to minimize risk associated with their use. In addition, a spill prevention countermeasure plan would be developed and implemented, and appropriate spill response equipment would be on site. No activities or operations are planned that would result in the generation of hazardous waste.

As part of the fire risk management processes, herbicides may be transported and used by certified herbicidal technicians approved by the Installation Entomology Flight. The herbicides planned for use are bioenvironmentally acceptable products to prevent noxious weed invasion and reduce fire hazard. Chemicals used for fire retardation or suppression may also be stored and used at target areas, along roads, and around facilities. All chemicals approved for fire suppression are tested by the USFS's Intermountain Fire Sciences Laboratory, so the risk associated with the use of these chemicals would be negligible.

Use of hazardous materials at the scoring systems locations would be minimal, consisting of limited application of lubricants during monthly maintenance. No activities at these sites would require storage or generation of hazardous waste. Fire suppression and prevention activities may occur at these locations, but only approved herbicides, retardant, and suppression chemicals would be used.

Activities on the emitter sites would involve regular use of minor amounts of hazardous materials. Gasoline-powered hand tools used in initial site preparation and periodic maintenance would require refueling and lubricating. However, these substances would be used sporadically and in negligible quantities, in accordance with a site-specific Spill Prevention Control and Countermeasure Plan. It is possible that motorized vehicles transporting the emitters may require on-site refueling, as may the diesel engines powering the generators that supply electricity for the operation of emitters. This on-site refueling would be

conducted under strict Air Force standard operating procedures, and any potential risk of spills would be minimized by compliance with all established safety procedures. No hazardous substances would be intentionally released at the locations, and the proposed activities would not generate hazardous wastes; therefore, impacts would not occur.

Propane would be used for building heat and generator power and to provide infrared signatures for simulated battle fields. These 2,000-gallon tanks would be mounted on concrete footings above ground and be surrounded by 5-foot "jersey barriers." It is expected that these tanks would be refilled every three months.

Adherence to all hazardous materials storage and use, as well as temporary storage of hazardous wastes, would be monitored annually under the Air Force's Environmental Compliance Assessment Management Program, which requires both internal audits and examination by independent reviewers.

#### *SAYLOR CREEK RANGE*

Operations at SCR would continue under Alternative B with the maintenance and support requirements for the range being met through current processes and procedures. Range personnel must perform all of the support requirements identified under current operations. No activities or operations associated with the proposed action would result in the generation of wastes defined as hazardous.

### 4.4.2.2 SOLID WASTE

Alternative B would generate solid waste requiring disposal. The majority of the solid waste would consist of small (25 pound) non-explosive training ordnance and target debris. Small ordnance without spotting charges or non-igniting cold spots would be used for practice training. The cold spot contains 2 grams of gunpowder and approximately 17 cubic centimeters of titanium tetrachloride contained in a glass ampule (Air Force Technical Order [T.O.] 11A4-4-7). The gunpowder discharges, crushing the glass ampule of titanium tetrachloride from the rear of the unit. The cloud, formed from the reaction of the titanium tetrachloride and the available moisture in the air, persists for 15 to 30 seconds and is estimated to be 8 to 10 feet in diameter and may rise 20 to 25 feet in the air. The gunpowder in the two types of signal cartridges contains nitroglycerin and nitrocellulose. These materials are ignited and consumed on impact. Gunpowder combustion products include carbon monoxide, carbon dioxide, and nitrogen oxides (Hercules, Inc. 1989). The small quantities of these substances in training ordnance and the byproducts they produce are dispersed and neutralized. Regular range cleaning prevents significant accumulation of any materials.

The non-explosive training ordnance proposed for use at the Clover Butte site weigh 25 pounds, and consists of steel and cast iron, with a shaft to hold a cold spotting charge. Waste products from this inert training ordnance consist only of scrap steel. This debris does not include any hazardous material. Expended ordnance would be located, inspected, and

accumulated in a locked bin on the maintenance complex for recycling as cast iron by a contractor.

The limited domestic solid waste generated at the maintenance facility would either be transported to the permitted landfill at Mountain Home AFB or disposed of through a commercial solid waste collection agency.

A set of scoring system cameras would be established to provide scoring on ordnance delivery events. Maintenance of the scoring system equipment would occur regularly but infrequently (e.g., every few months). Solid waste generated at the scoring system locations would consist of minor amounts of refuse associated with monthly maintenance and possible small quantities of domestic waste. These materials would not be left on site and would be disposed of at Mountain Home AFB.

There are no specific solid waste issues associated with the emitter sites. The only potential for generation of solid waste in these areas would be small amounts of residue from minor maintenance activities and possible small quantities of domestic waste. These would be collected by emitter crews and disposed of at Mountain Home AFB. Eventually, these solid wastes would be placed in an approved landfill or recycled.

***SAYLOR CREEK RANGE***

The composition and handling of solid waste on SCR would continue as discussed in section 3.4.3. Ordnance residue would be collected, rendered safe, and held for recycling by a contractor. Under this alternative, domestic solid waste and target debris generated at SCR would continue to be transported to Mountain Home AFB and disposed of in an approved landfill or recycled along with similar solid waste from the base.

## 4.4.3 Alternative C — Grasmere

Under this alternative, the development of a tactical training range is identical to that described in section 4.4.2, Alternative B. The project elements are the same and differ only by location. The only exception is two additional fuel tanks at the training range maintenance complex.

### 4.4.3.1 HAZARDOUS MATERIALS

Under this alternative, the proposed areas would be developed and used as described for Alternative B. Use and maintenance of scoring systems locations and emitter sites would also be identical to that defined under the proposed action. The minimal potential for hazardous materials to affect the environment would be the same as addressed in section 4.4.2.1.

Propane-powered generators would provide all electrical power to the site. An increase of two fuel tanks for generator power would not be expected to increase environmental risks. Maintenance activities associated with these generators rarely occur and generally consist of changing oil or antifreeze. In the event of a spill, sorbent pads or "OCLANSORB" are used to

mop up spilled material. The pads and any affected soil are double bagged and transported to an Initial Accumulation Point located on Mountain Home AFB.

#### 4.4.3.2 SOLID WASTE

Projected environmental effects associated with solid waste for these areas match those described for Alternative B, in section 4.4.2.2.

### 4.4.4 Alternative D —Juniper Butte

Under this alternative, development of the tactical training range would be identical to that described in 4.4.2, Alternative B. The project elements are the same and differ only by location. Alternative D does, however, involve additional airspace modifications to the east.

#### 4.4.4.1 HAZARDOUS MATERIALS

Under this alternative, the proposed land would be developed and used as described for Alternative B, section 4.4.2.1. The impacts for emitter sites and scoring systems locations associated with this alternative are identical to those defined under the proposed action description. As established earlier, the use of hazardous materials would be limited on this site and conducted according to the approved federal and Air Force regulations.

#### 4.4.4.2 SOLID WASTE

The composition and handling of solid waste under this alternative would continue as described in section 4.4.2.2. Ordnance residue would be collected, rendered safe, and held for recycling by a contractor. As indicated previously, other solid waste generated would continue to be transported to the landfill or recycled at Mountain Home AFB.

### 4.4.5 Cumulative Impacts

While the ETI proposal is expected to generate solid waste, no increase would occur. Spent training ordnance and target debris would increase at the alternative range site; however, a decrease in this solid waste would occur on SCR. Solid waste is recycled, reused, or disposed of in an approved land fill. The projects listed in section 2.6.2 would not generate an increase in solid waste; therefore, no cumulative impact would occur.

Activities on the proposed alternative sites would not require storage or generation of hazardous waste. As those projects listed in section 2.6.2 would also not generate or require storage of hazardous waste, no cumulative impact would result.

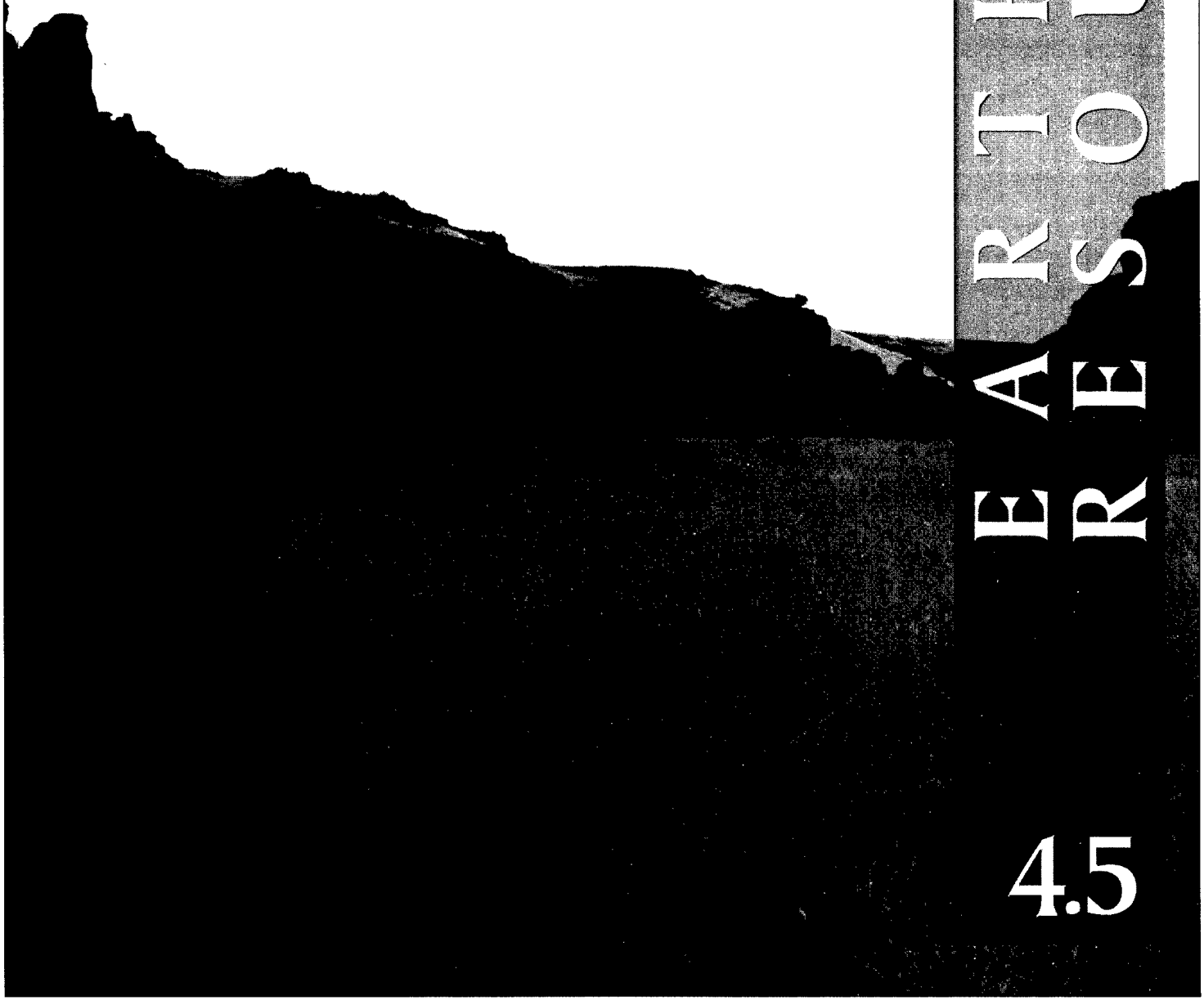
# EARTH RESOURCES

# 4.5

Earth resource specialists looked at the following areas to determine if any impacts would occur as a result of the Enhanced Training in Idaho proposal:

- Unique geologic/geomorphic features
- Seismologic conditions
- Soil erosion hazards
- Mineral and paleontological resources

The Air Force sited facilities using mitigation by avoidance to identify locations that have no significant impacts to areas of unique geological/geomorphic features, seismologic conditions, or mineral resources.



Improvements in roads could reduce long-term soil erosion below that anticipated under the No-Action Alternative. However, short-term soil erosion could occur as a result of road and site construction.

Soil erosion at the Clover Butte Alternative would be mitigated by controlling surface water during construction. Construction design would accommodate expansive soils and, in the long-term, reduce erosion potential at the existing road site.



No unique geologic features are found at any training range alternative.

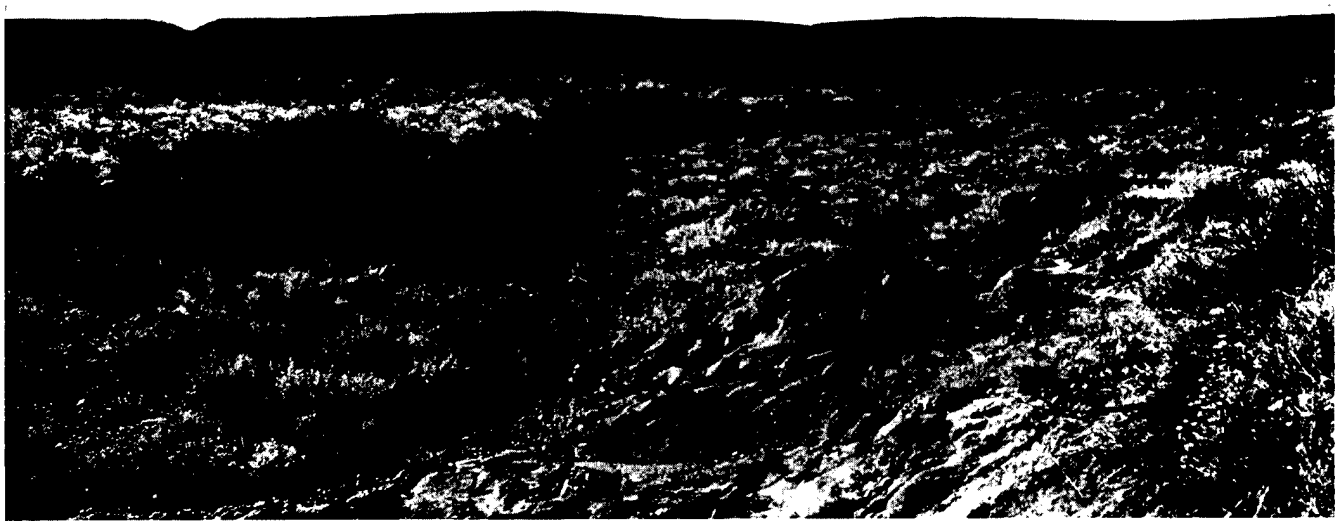
The Grasmere and Juniper Butte sites could have similar short-term soil erosion and soil expansion. In addition, both of these alternatives have soils that would be impacted by wind erosion during construction. Measures that would reduce impacts include the following:

- minimizing construction activities during dust storms
- controlling dust production during grading and hauling activities
- lessening the amount of soil disturbance during Air Force reseeding activities after range wildfires

Short-term soil erosion could occur during construction of simulated targets and electronic emitter sites. Two locations could have water erosion and wind erosion. Soil expansion would affect seven locations. Measures to reduce erosion include soil stabilization, avoiding construction during extreme weather conditions, and reseeding with native species.

Improvements to roads in conjunction with ETI construction and operation could reduce long-term surface erosion below that anticipated under the No-Action Alternative.

Although no fossil remains were found in the road cut adjacent to the site, a proposed emitter site road is near a paleontological resource area. Workers at the site would receive resource-awareness training, and any fossils uncovered during road grading would be cataloged and filed using federal and state rules and regulations.



# 4.5 EARTH RESOURCES

Unique geologic/geomorphic features are evaluated based on the number of similar features in the area and on the particular characteristics for each similar feature that might make the feature in question stand out. A rare or unique resource possesses a characteristic that is uncommon (i.e., previously unknown or unpreserved). Impacts on features that have no equivalents in the area or that have some particular outstanding characteristic that separates them from other similar features would be considered significant.

Impacts associated with landslides, faulting, ground acceleration, shaking, and rupture are evaluated in terms of the distance of the proposed action to known fault zones or landslides, the overall seismic characteristics of the area, and the history of the zones or slides.

With regard to soils, those that possess a moderate to severe potential for wind or water erosion and/or a moderate to high shrink-swell potential could result in significant impacts if left exposed for long periods of time.

The significance of impacts on any mineral resources is determined by the type, distribution, occurrence, and economic potential of the located resource. Evaluation of impact is based on the significance of the located mineral deposit relative to similar deposits in other areas of the state, nation, and other countries. In addition, significance is evaluated for project impacts related to access and transportation to and from the area of the known resource.

Impacts on paleontological resources are identified by classifying the scientific importance of the resource, as well as the type and extent of the disturbance anticipated as resulting from the proposed action. Paleontological resources are considered significant if they are rare, unique, or have a particular scientific value and may yield important information to the general study of the located fossils. A rare or unique resource possesses a characteristic that is uncommon (i.e., previously unknown or unpreserved). The scientific value of the resource is based on its age, type, rarity, assemblage association, geological setting, and the condition of its preservation. The evolution, migration patterns, and habitat diversity of a species, as well as the general environmental conditions of an area, can all be investigated from the association of a number of well-preserved fossil species within a single rock layer. In addition, paleontological resources may be significant if they are associated with another resource that can contribute to our knowledge of the lives of the early human inhabitants of North America. The resource is considered to be significantly affected if any of these characteristics are altered by project actions. Therefore, significant impacts include destroying or degrading the condition of the resource or removing the resource from its known locality without proper cataloging.

## 4.5.1 Unique Geologic/Geomorphic Features

Two major geologic/geomorphic features are found within ROI Two. The vent areas of more than 40 shield volcanoes are located within ROI Two. Each vent area could be considered

unique, having resulted from a particular set of eruptive conditions. However, in the context of the Snake River Plain (SRP), which contains over 500 shield volcanoes, the shields in ROI Two are not unique. The canyons of the Bruneau and Jarbidge rivers and their tributaries also cut through the center of ROI Two. The canyons have eroded through the volcanic units including the basalt lava flows from the shield volcanoes, the large rhyolite lava flows, and the layers of Cougar Point tuff. The red rocks of the rhyolite lava and ash flows have eroded in the canyons into tall, free-standing stacks or columns, called "hoodoos." Neither canyons nor hoodoos occur within or adjacent to any of the proposed components for any of the alternatives.

### ALTERNATIVE A — NO-ACTION

This alternative would not further impact the volcano vents or canyons. The present SCR does include Pence Butte, the vent area of a shield volcano. The top of the volcano is presently used for infrared targeting training, and has been somewhat modified over the history of the range. However, this alternative would not increase use of this site or cause any further modification to this shield volcano; therefore, no additional impacts would occur.

### ALTERNATIVE B — CLOVER BUTTE

The proposed 12,000-acre training range encloses the western side of Clover Butte, as well as two small vent areas. However, these features are not unique and lie outside areas proposed for construction, so impacts would not occur. The 300-acre primary ordnance impact area is also located on the flat (2 percent average slope) upland area east of the main Bruneau and Jarbidge River canyons. Since no ground disturbance would occur within or near the canyons, impacts on the geological features of the canyons from the proposed training range would not occur.

### ALTERNATIVE C — GRASMERE

This alternative range site encloses Poison Butte, a small shield volcano. This feature is not unique among the 500 or more shield volcanoes on the SRP; therefore, impacts would be negligible. In addition, the range is located within the moat zone of the Bruneau-Jarbidge eruptive center. This unique feature would not be impacted by range construction, since construction would not involve any excavation.

### ALTERNATIVE D — JUNIPER BUTTE

This alternative range site encloses the northern side and part of the crater area of Juniper Butte, the largest shield volcano in ROI Two, as well as a smaller subsidiary vent. However, construction and use of the range facilities would not modify either volcano, and no impacts would occur. The range is also located just west of a tributary of the Bruneau River, called Clover Creek. The canyon of this tributary is fairly shallow in this area, and does not reach the rhyolite lava flows, cutting only the basalt flows. Therefore, the canyon itself is not unique, and the location of the range above and adjacent to the canyon rim would not result in any impacts.

#### NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

No target or electronic emitter sites are located within or on the rim next to the river canyons. Therefore, no impacts would occur from construction at the sites. As noted in section 3.5.1.2, one no-drop target, ND-2, and eight emitter sites, AI, AQ, BA, BB, BC, BE, and BJ, are located on the tops of basalt shield volcanoes. However, construction of these sites and the roads leading to them would not result in any more than superficial modifications to these non-unique vent areas; therefore, impacts would be negligible.

### 4.5.2 Geologic Hazards

#### LANDSLIDES

A few landslides do exist within the larger ROI Two area, but none are located near any of the components proposed under the alternatives. No landslides or landslide-related features have been mapped or are known to occur within or near ROI One of the range alternatives; therefore, impacts due to landslides would not occur.

#### SEISMOLOGIC CONDITIONS

Faults traverse the ROI Two area and are located within the boundaries of some of the ROI One areas. However, none of these faults are considered active and none have been active in the recent geologic past (since the Pleistocene era — 10,000 years to 1.8 million years ago); therefore, impacts due to ground shaking or ground rupture would not occur.

ROI Two is essentially aseismic. In addition, no ground ruptures have resulted from the shaking felt in this area from earthquakes located in other parts of the state and region; therefore, impacts associated with seismic hazards would not occur.

#### ALTERNATIVE A — NO-ACTION

This alternative represents a continuance of the existing conditions and uses. Based on the aseismic conditions presented above, no specific impacts are associated with this alternative.

#### ALTERNATIVE B — CLOVER BUTTE

No faults traverse the area of the Clover Butte alternative training range site. No active faults are located near the area proposed for the range; therefore, impacts associated with geologic hazards would not occur.

#### ALTERNATIVE C — GRASMERE

The Grasmere training range alternative includes the moat zone and associated faults of the Bruneau-Jarbidge eruptive center. A major fault uplifts the Cougar Point tuff units on the west side of the range site. However, this fault has not been active since the formation and

subsidence of the eruptive center approximately 10 million years ago; therefore, impacts associated with geologic hazards would not occur.

#### ALTERNATIVE D — JUNIPER BUTTE

The impacts related to this alternative are the same as the impacts identified and discussed above under Alternative B.

#### NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

Some of the targets and emitter sites are located near faults that cut the basalt lava flows, forming the small northwest-southeast trending grabens that are located throughout ROI Two. However, none of these faults are considered to be active; therefore, impacts associated with geologic hazards would not occur.

### 4.5.3 Soil Erosion / Expansion Hazards

The soil erosion hazard from both wind and water for all the primary ordnance impact area of the proposed training ranges is generally low to moderate, although some soils within the 12,000-acre training range, but outside the primary ordnance impact areas, have been rated as moderate to high for water erosion and moderate to high or high for wind erosion. Other soils have shrink-swell potentials with ratings of high and moderate to high. In these areas, significant impacts from water and wind erosion could potentially occur. However, because the majority of these areas are located on relatively flat terrain and receive low levels of precipitation, the potential for water erosion is anticipated to be minimal. While the ground would be disturbed during site preparation construction of roads, and the less than one-acre above-ground reservoir, best management practices for construction provide for proper grading and restabilizing the site. The potential for erosion from road construction in these areas is, therefore, expected to be minimal. A similar potential exists for erosion from bridge construction at Clover-Three Creek road. However, the bridge improvement and the proposed above-ground reservoir would involve all best management practices to avoid sediment load and to meet U.S. Army Corps of Engineers' (USACE's) requirements. Therefore, the potential for wind erosion is expected to be minimal. In addition, the Air Force proposes to perform construction during dry periods or divert water during construction to prevent water erosion and to consult resource management agencies to minimize impacts from the above-ground reservoir.

It should be noted that the loss of plants caused by wildfires could significantly raise the wind erosion potential for the soil types in ROI One. In areas burned with sufficient intensity to remove sagebrush as well as grass, any wind action, including dust devils, moves the soil and causes erosion. While significant impacts from wind erosion of all the soil types can occur after wildfires, the proposed activities and sites have been designed to minimize the chances of wildfires caused by military activities (see sections 2.3.5 and 2.3.6). These measures, including restrictions on spotting charges in training ordnance and flare use make the potential for

wildfires caused by training activities extremely low. As such, the potential for wind and water erosion of soils would be negligible. The hazard and potential ratings for each soil type in ROI One are listed in Table 3.5.1, and the areas underlain by these soil types are shown in Figures 3.5.2, 3.5.3, and 3.5.4.

### ALTERNATIVE A — NO-ACTION

Because this proposed alternative includes no new road construction or site preparation, no new impacts would occur.

### ALTERNATIVE B — CLOVER BUTTE

This alternative is underlain on its east side by a small area of Bruncan-Minveno complex soil that has a water-erosion hazard of low to high. Because this rating is broad and general, including both low and high ratings, the potential for impacts due to water erosion are considered variable. Within the primary ordnance impact area, target construction would not take place on this soil complex and, therefore, would not have the potential to cause significant impacts. A larger area of Babbington-Piline Association soil occurs at the southern edge of the proposed training range. Because this soil has a shrink-swell potential rating of moderate to high, impacts associated with the 2.5 miles of substantial road improvements could be adverse during the period of improvement. Following these upgrades, the shrink-swell potential would be reduced, and over the long term, the effects of shrink-swell on soils would decrease below present conditions.

### ALTERNATIVE C — GRASMERE

Two fairly large areas of this proposed 12,000-acre training range are underlain by soil types with moderate to high potential ratings for surface-water erosion. The Rubbleland-Rock Outcrop-Pachic Argixerolls Complex soil type underlies the steep inner canyon walls of Wickahoney and China creeks that cut the Grasmere escarpment located on the west side of the area. The Freshwater-Larioscamp-Dishpan Complex soil type covers the top of the Poison Butte volcano in the east central part of the range. For both of these areas, impacts from soil erosion due to water could be significant. In addition, one soil type, the Wickahoney-Zecanyon (WZ) Complex underlying most of the more moderately sloped area between the creek canyons and above the Grasmere escarpment, has a low to high water-erosion hazard rating. Because this rating is broad and general, including both low and high ratings, impacts due to water erosion could be significant. However, neither road nor facility construction activities would take place in these areas, so no significant impacts are anticipated.

One soil within the proposed training range, the Troughs-Jenor-Laped Association, has a low to high rating for wind erosion. This soil occurs in a small area on the east side of the range where no construction-related activities would take place, so impacts would be negligible.

A number of areas within the proposed training range have soils with moderate to high or high ratings for shrink-swell potential. One soil type, the WZ Complex, has such a rating. The complex underlies large areas of the west side of the range where neither target nor road construction would occur. Four soil types, generally underlying much of the rest of the range, have moderate to high shrink-swell potentials. While the potential impacts associated with the approximate one mile of substantial road improvements and other construction could be adverse for the areas underlain by these soil types, measures such as improvements during the dry season and best management practices would minimize these impacts. In addition, these upgrades would, in the long-term, decrease the shrink-swell on soils from conditions found currently.

### ALTERNATIVE D — JUNIPER BUTTE

On the eastern portion of the proposed 12,000-acre training range where construction would not take place, two soil types are found: the Alzola-Troughs-Bigflat stony loams and the Bruncan-Minveno Complex. These have low to high water-erosion hazard ratings. Because this rating is both broad and general, including both low and high ratings, potential impacts, if construction were to occur, could be adverse.

In the northeast corner, outside of the primary ordnance impact area and where no roads would be constructed, the Scism Silt Loam is found. This soil type has a high rating for wind erosion, so if construction were to occur, the potential for soil erosion impacts could be adverse.

Three areas, covering most of the southern part of the proposed range, are underlain by soils that have moderate to high shrink-swell potential ratings. These soil types are the Arbidge-Chilcott silt loams, the Heckison-Bigflat silt loams, and the Alzola-Troughs-Bigflat stony loams. The potential impacts associated with road improvements and other construction in these areas could be adverse during construction activities. To minimize the impacts, required best management practices would be employed and construction would take place during the dry season.

### NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

Only one emitter site (BD) is underlain by soils that have water-erosion ratings that have the potential for adverse impacts due to road improvements or construction. Since this rating is low to high, impacts due to water erosion could be adverse if the required best management practices were not followed.

One one-quarter-acre emitter site, AB, has a high wind-erosion rating, and another site, AK, has a moderate to high rating. The soil types underlying these areas are Typic Torripsamments-Typic Torrifluvents Complex and Royal-Davey Complex, respectively. Again, if the required best management practices were not instituted, the potential for wind-erosion impacts in both these sites would be adverse.

The shrink-swell potential for several emitter sites are rated either low to high, moderate to high, or high. One emitter site, AL, and one no-drop target, ND-1, are both underlain by the Shoofly loam, which has a low to high potential rating. Because this rating is broad and general, including both low and high ratings, the potential for adverse impacts for water erosion would occur. However, adverse impacts would be minimized at both sites by limited construction and use of existing roads. Four emitter and no-drop target sites, BI, ND-4, and ND-5, are underlain by the Wickahoney-Monasterio-Yatahoney Association and the Bruncan-Hardtrigger-Buncelvoir Complex. Both of these soil types have moderate to high ratings for shrink-swell potential, but the required use of best management practices precludes adverse impacts.

### 4.5.4 Mineral Resources

The areas underlying ROI One do not contain active claims and are rated as having a low mineral-resource potential. In addition, sampling and analysis of stream sediments within two of the alternatives showed no anomalous levels for a range of metallic or non-metallic minerals. Finally, ROI One areas are not underlain by mineable deposits of industrial materials, such as sand and gravel. Therefore, no significant impacts on mineral resources would occur in the ROI One areas for any of the alternatives. In addition, the access to mining claims or leases in ROI Two of known mineral resource, like the Bruneau jasper mines in the bottom of Bruneau Canyon, would not be significantly impacted by any of the proposed ETI elements or alternatives.

### 4.5.5 Paleontological Resources

Substantial interest was expressed in paleontological resources. Of particular concern was the risk of indirect impacts from collectors. Only those areas in the northern part of ROI Two that are underlain by Idaho Group sediments have any possibility of containing significant paleontological resources. Neither the SCR nor any of the target alternatives is known to be underlain by significant paleontological resources. The increase of approximately 30 Air Force and contractor personnel among 6 to 12 locations is not expected to increase indirect impacts. Road improvements lead directly to Air Force facilities and do not access any paleontological resources. No impacts to such resources are anticipated. All range personnel are forbidden from driving off roads except in life-threatening emergencies. These personnel receive annual training covering the protection of natural and cultural resources.

#### NO-DROP TARGETS AND ELECTRONIC EMITTER SITES

One no-drop target, ND-1, and three emitter sites, AK, AT, and BF, are underlain by Idaho Group sediments. However, some of the sediments within this group do not normally contain fossils of any type, in particular, the gravel layers that underlie emitter sites AK and BF. No-drop target site ND-1 is underlain by only a thin layer of fine-grained sediments with a few scattered small areas of gravel. This area is also not fossiliferous. Impacts on the resource would not occur at any of these three sites. The only area that could possibly contain fossils is

the proposed road leading up to the gravel bench that underlies emitter site AT. However, the possibility of a significant resource is relatively minor, given that the same sediments exposed in roadcuts on the west side of the bench did not yield any fossils during a thorough field examination. Therefore, impacts on the paleontological resource at this site are considered to be negligible.

### 4.5.6 Cumulative Impacts

All aspects of the proposal including potential effects of ground disturbance and increased human presence were analyzed for possible cumulative impact. Construction associated with the ETI proposal would create an increase in soil erosion in a localized area. This change in erosion in relationship to the ETI proposal is discussed in the previous sections. Construction at the Air Force Communications Tower at Blue Butte and the Installation of Wind Turbine Generators at the Grasmere Electronic Combat site would occur in the vicinity of the ETI project, thus creating the potential for cumulative impacts with these projects. However, the amount of construction associated with the future foreseeable actions would be minimal (less than 3 acres) and mitigated on a project-specific basis. These projects would also occur on different schedules, further preventing a cumulative impact. When considered in conjunction with proposed ETI project construction, cumulative impacts to earth resources are not anticipated.

# 4.6 WATER RESOURCES

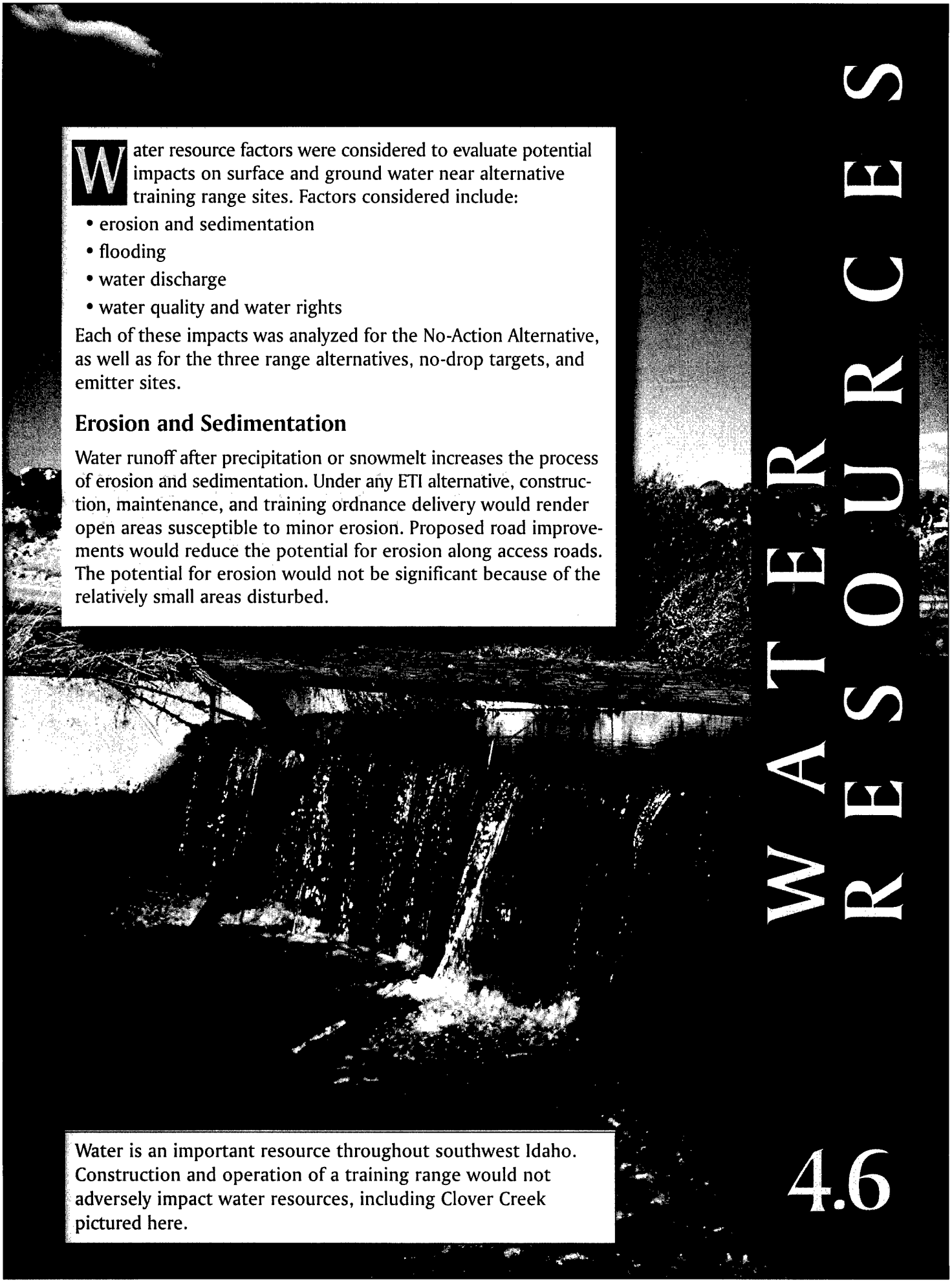
Water resource factors were considered to evaluate potential impacts on surface and ground water near alternative training range sites. Factors considered include:

- erosion and sedimentation
- flooding
- water discharge
- water quality and water rights

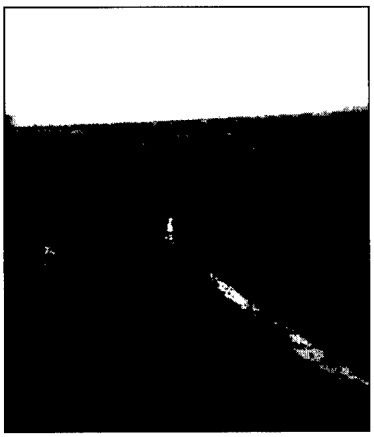
Each of these impacts was analyzed for the No-Action Alternative, as well as for the three range alternatives, no-drop targets, and emitter sites.

## Erosion and Sedimentation

Water runoff after precipitation or snowmelt increases the process of erosion and sedimentation. Under any ETI alternative, construction, maintenance, and training ordnance delivery would render open areas susceptible to minor erosion. Proposed road improvements would reduce the potential for erosion along access roads. The potential for erosion would not be significant because of the relatively small areas disturbed.



Water is an important resource throughout southwest Idaho. Construction and operation of a training range would not adversely impact water resources, including Clover Creek pictured here.



Proposed road improvements would reduce the potential for erosion along access roads.

### Flooding

Areas for potential flooding are located within the Bruneau River Basin. No impact to or from any alternative training range site would be anticipated.

### Discharge of Water

Any of the training range alternatives would result in grading activities and compaction of surface deposits for the construction of access roads, targets, and the target maintenance facility. Construction would produce minor, temporary changes to the quality of runoff. Proposed construction activities would not impact the water discharge volume into the Bruneau River. Construction at Grasmere could have short-term minor impacts to Wickahoney Creek.

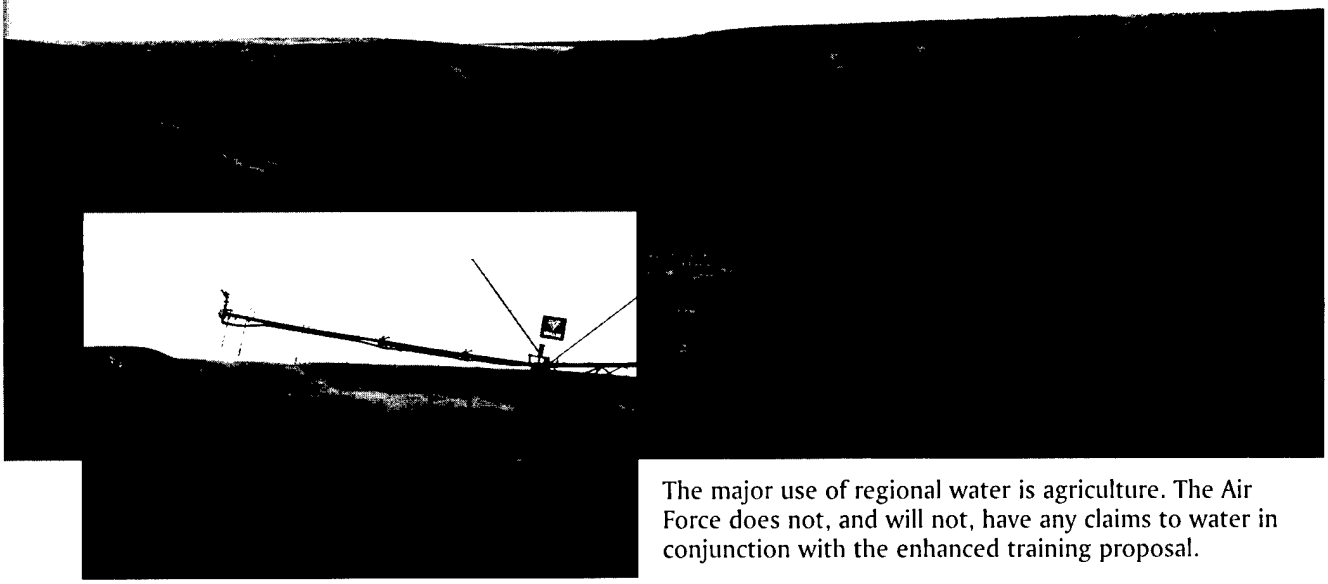
### Water Quality

Since no point sources are known along the Bruneau River, major influences on water quality can be attributed to natural sources. Under any ETI alternative, the Bruneau River system would not be expected to be impacted from nonpoint sources such as road construction, dropped training ordnance, and target maintenance activities. Road improvements have the potential for minor long-term positive impacts through control of surface run-off.

### Water Rights

All adjudicated claims to water within the area would remain under the jurisdiction of the Lower Snake River Adjudication. The Air Force does not propose any claims to water in conjunction with the enhanced training proposal.

During the siting process, major water sources, such as the East Fork of the Bruneau River shown below, were avoided.



The major use of regional water is agriculture. The Air Force does not, and will not, have any claims to water in conjunction with the enhanced training proposal.

# 4.6 WATER RESOURCES

Potential hydrology/water quality impacts within the ROI Two/ROI One area resulting from implementation of a range development alternative include flooding, increased runoff, erosion and sedimentation, and degradation of surface- and ground-water quality. The potential impact to adjudicated water rights is reduction in availability of water for beneficial uses in the area. This potential impact could result from fencing, Air Force activities near points of diversion or points of beneficial use, or training facility construction that would disrupt flows in ways that substantially impair beneficial uses. Each of these impacts is discussed separately below.

In this analysis, flooding impacts are considered significant if proposed structures or facilities are located within the floodway or flood fringe portion of the 100-year floodplain. Impacts as a result of erosion and sedimentation would be significant if development of the alternative resulted in increased runoff velocities in graded areas (e.g., cut/fill slopes) or in surface-water discharge areas (e.g., at culvert or stormdrain discharge locations), causing erosion and subsequent sedimentation in on-site or off-site areas. Impacts as a result of increased runoff would be significant if the alternative resulted in increased discharge of surface water to the river or to any of its tributaries such that an increased risk of flooding in any of these drainages occurred. Water quality impacts would be significant if development of the proposed activities resulted in the degradation of surface- or ground-water quality below established thresholds. Impacts causing loss of adjudicated water rights would be significant if the alternative resulted in a consequential reduction of water available for grazing in the area.

## 4.6.1 Alternative A — No-Action

### 4.6.1.1 Surface Water

Since no additional training range sites or emitter sites would be developed, water resources in the ROI Two/ROI One area would remain unchanged. As described in section 3.6, all surface perennial streams, such as Bruneau and Owyhee rivers, would continue to flow into the Snake River. Also, all intermittent streams would flow only in response to rainstorm or spring runoff; therefore, no proposal-related impacts would occur.

### 4.6.1.2 Floodplains

For the purpose of this analysis, flooding impacts are confined to those impacts related to a 100-year storm event and associated high flows in the major river or its tributaries. Under the No-Action Alternative, there would be no encroachment of structures into the 100-year floodway; therefore, no proposal-related impacts on structures associated with increased channel velocities and increased flood elevations would occur.

#### 4.6.1.3 GROUND WATER

The Air Force would not use ground water; therefore, no aspect of the alternatives would contribute to ground-water decline.

#### 4.6.1.4 WATER RIGHTS

No change in or impact to water rights claims is anticipated to result from the No-Action Alternative. This alternative would not cause any alteration in access to existing water rights claims, since it involves no new lands.

### 4.6.2 Alternative B — Clover Butte

#### 4.6.2.1 SURFACE WATER

The development of the target maintenance facility under Alternative B would result in grading activities and drainage alteration, compaction of surficial deposits, and graveling in a 3-acre site located at the corner of the 12,000-acre range site. Approximately 500 square feet would be covered with impervious (concrete) material. Although grading activities could affect the direction and velocity of runoff by changing drainage patterns, these activities are not likely to change the quantity of runoff into streams, nor are they likely to increase erosion and subsequent sedimentation into streams. Therefore, impacts would not occur.

Delivery of small (25 pound) non-explosive training ordnance and target maintenance (i.e., transporting, installing, and removing the simulated industrial complex target site) could result in very limited erosion. Hydrologic information on the local streams indicates runoff generally occurs only during and immediately after precipitation. Given the infrequency of precipitation events, in conjunction with the flat topography of the target area, the potential for erosion would be minimal. Also, small amounts of residue from the titanium tetrachloride spotting charges in the practice munitions can be expected to remain on or within ordnance debris. These residues are harmless, break down into harmless by-products, or quickly dissipate to nondetectable levels. Leaching of chemicals from inert ordnance debris into surface water is unlikely; therefore, impacts would not occur.

Development of the range would require the replacement of a bridge over Clover Creek at Clover Crossing. Demolition of the existing bridge and site work required to emplace new footings and supports for the new bridge have the potential to increase sedimentation in the stream. However, the potential is short term, and the use of best management practices during construction would keep the levels of sediment transport to a minimum. The Air Force would seek a Section 404 permit under the Clean Water Act (CWA), prior to replacing the bridge.

Adequate water resources for fire control were noted as a concern during public hearings on the DEIS. In response to this concern, the Air Force proposes to develop a less than one-acre above-ground reservoir within a corner of the Clover Butte 12,000-acre training range. This less

than one-acre above-ground reservoir would be linked to existing pipelines and be available for ranching operations. At all times, the proposed reservoir would have 50,000 gallons of water reserved to support fire suppression. Within the proposed withdrawal area, the water from the joint-use reservoir would be accessible from both outside and inside the perimeter fence. The Air Force proposes to consult with resource management agencies to minimize any impacts from the above-ground reservoir. No change in or impact to water rights will result from construction of the above-ground reservoir. Water resources to supply the reservoir would come from existing pipelines in coordination with the affected rancher.

#### 4.6.2.2 FLOODPLAINS

The Clover Butte Alternative is located well outside of the 100-year floodplain of the Bruneau River drainage area. None of the ordnance delivery and targets are planned for placement within the floodplain; therefore, the floodplain would not be affected by Alternative B. The only construction to occur in a floodplain would consist of replacement of the bridge at Clover Crossing. Since it would involve replacement of an existing bridge, it does not represent new construction in a floodplain.

#### 4.6.2.3 GROUND WATER

Similar to surface water, the potential for impacts on ground water arises from ordnance delivery and target construction activities that could compact and change the contour of the soil and thus cause localized changes in ground-water flow. Because the primary impact ordnance area, roads, and maintenance facility are located below the butte, it would not inhibit ground-water flow and recharge. Ground water would be free to move from the zone of saturation (location where water enters the ground) near the top of the butte and migrate down into the ground and outside the proposed site boundary. Conditions for such ground-water flow exist intermittently during the precipitation season. Because the proposed area is located in a largely undeveloped area, localized changes in ground-water flow patterns resulting from ordnance delivery and construction activities would not significantly alter the watershed in the ROI Two region.

#### 4.6.2.4 WATER RIGHTS

The Air Force plans to fence the 12,000-acre training range alternative it selects, and also the targets within the primary ordnance impact area at the center of the range. The training range fence would include access points that would be available in July and August to livestock; the primary ordnance impact area fences would not. The Air Force intends to permit continued grazing on land inside the training range but outside the primary ordnance impact areas. Water rights on land where grazing would continue would not be impaired by the training range fence, and would not be significantly impacted.

The fences around the primary ordnance impact areas would exclude livestock access, and could encumber any claims to water rights inside these areas. A records examination indicates,

however, that no water right claims exist within the Alternative B primary ordnance impact areas and, therefore, no impacts from fencing would occur.

To the extent that livestock grazing operations are disrupted, the Air Force proposes to compensate the permittee through monetary or in-kind compensation. In-kind compensation could include fencing, moving pipelines, extending pipelines, and constructing above-ground water reservoirs as required to meet permittee requirements and to comply with accepted grazing management practices. Neither fencing, planned construction activities, nor training-related ground movements at Alternative B are expected to cause changes that would prevent continued beneficial uses. Construction activities that would occur if Alternative B is selected would not disrupt stream flows so as to impair the use of claims to water rights. If it became necessary for the water pipeline inside the range to be relocated in order to protect it against damage from training activities, the Air Force would obtain either a range improvement permit or an amended or new BLM right-of-way, as appropriate. If a pipeline must be relocated, the Air Force would work with the BLM and owner of the pipeline. During the public comment period on the DEIS, permittees expressed concerns and a desire that they be compensated for disruption of ranching activities, including compensation in kind which includes fences, pipelines, and a water storage reservoir. Specific details would have to be negotiated with the rancher(s) affected by the land withdrawal. The Air Force's normal practice in such cases involves the local owner relocating the pipe with the Air Force paying the cost of relocation. No impacts to the water right claims would occur from these activities, because the water could still be put to beneficial use.

## 4.6.3 Alternative C — Grasmere

### 4.6.3.1 Surface Water

Activities associated with development of Alternative C are similar to those discussed for Alternative B. As discussed under Alternative B, temporary grading activities are not likely to change the quantity of runoff and sediment erosion. Drainage occurs in a southeast direction toward China Creek, which is about 1.25 miles away across gently sloping ground. The level of sediment transported to China Creek is therefore expected to be minimal, given the infrequency of precipitation events. Ordnance delivery in the area could increase the rate of sediment erosion, but due to regular annual monitoring and cleanup, impacts to surface-water quality from ordnance delivery would not be significant. The Air Force would seek a Section 404 permit under the CWA prior to replacing the bridge over Clover Creek.

The less than one-acre above-ground reservoir would not be required at the Grasmere 12,000-acre training range since alternate sources of water are currently available.

#### 4.6.3.2 FLOODPLAINS

No portion of the target area would be placed along Wickahoney Creek or its tributaries' fringe area. The proposed Grasmere range is located outside of the 100-year floodplain of the Bruneau River drainage area. Therefore, the floodplain would not be affected by Alternative C.

#### 4.6.3.3 GROUND WATER

Impacts to the proposed Grasmere range are the same as those described for Alternative B. No significant impacts to ground-water resources are expected to occur.

#### 4.6.3.4 CLAIMS TO WATER RIGHTS

Because the Air Force would carry out similar construction and operational activities for all of the alternative range sites, the potential for Air Force activities to affect water right claims associated with Alternative C would be similar to that described for Alternative B. No impacts to water right claims are expected from fencing of the training range or from construction activities or training-related ground activities. No changes in Points of Diversion (PODs) or Place of Use (POUs), preventing beneficial uses of water, or disruption of stream flows would occur.

A POD and POUs associated with a claim are located near the primary ordnance impact areas at the center of Alternative C. The claim is used for stockwater. The fence surrounding the 12,000-acre withdrawal for Alternative C would limit access to the POD and POUs for this claim. Maps of claims in the vicinity indicate a potential to relocate the POD and POUs outside the target area without reducing availability of water to holders of nearby claims and without interfering with uses associated with nearby claims. The holder of the claim could also elect to transfer the claim to another user. As such, significant impacts to claims in the area would not occur.

### 4.6.4 Alternative D — Juniper Butte

#### 4.6.4.1 SURFACE WATER

Impacts to the proposed Juniper Butte range alternative are similar to those discussed under impacts to Alternative B as previously described. The Air Force would seek a Section 404 permit under the CWA prior to replacing the bridge over Clover Creek.

The less than one-acre above-ground reservoir would be developed for the Juniper Butte 12,000-acre training range as described under Alternative B.

#### 4.6.4.2 FLOODPLAINS

The proposed Juniper Butte range alternative is located outside of the 100-year floodplain of the Bruneau River drainage area. None of the ordnance delivery or targets are planned for

placement within this floodplain; therefore, the floodplain would not be affected by Alternative D.

#### 4.6.4.3 GROUND WATER

Impacts to the proposed Juniper Butte range are similar to those described for Alternative B; therefore, no significant impacts would occur.

#### 4.6.4.4 CLAIMS TO WATER RIGHTS

Because the Air Force would conduct similar construction and operational activities for all of the alternatives, the potential for Air Force activities to affect water rights claims associated with Alternative D would be the same as described for Alternative B. With the exception of fencing around the primary ordnance impact areas, impacts to adjudicated rights from fencing around the 12,000-acre range and from all other actions, including possible relocation of a water pipeline, would be the same as discussed for Alternative B; therefore, no significant impacts would occur.

To the extent that livestock grazing operations are disrupted, the Air Force proposes to compensate the permittee through monetary or in-kind compensation. In-kind compensation could include fencing, moving pipelines, extending pipelines, and constructing above-ground water reservoirs as required to meet permittee requirements and to comply with accepted grazing management practices. Because POUs associated with one claim would be contained inside the primary ordnance impact area fences, impacts on the POUs from fencing this area would be the same as for the POUs discussed for Alternative C. The POUs supply stockwater and support wildlife. Maps of claims in the vicinity indicate that the POUs could be relocated outside the area without impairing other uses and without diminishing wildlife support. Air Force actions to preserve the viability and operational characteristics of water pipelines according to accepted grazing practices, local standards, and BLM requirements would preclude adverse impacts to PODs, POUs, and grazing management in general. Therefore, no significant impacts to claims in the area would occur.

### 4.6.5 No-Drop Target and Emitter Sites

#### 4.6.5.1 SURFACE WATER

The proposed development of the emitter sites and no-drop targets would result in relatively minor grading activities and drainage alteration, compaction of surficial deposits, and construction of impervious surfaces. These activities would likely produce minor or no changes to the quantity of precipitation runoffs toward the streams. Grading activities could affect the direction and velocity of runoff by changing drainage patterns.

During construction, grading and other earthwork would render previously vegetated areas susceptible to erosion. Increased sediment production resulting from construction activities

may have the potential to cause sheet and rill erosion and associated deposition, which may cause undesirable changes in graded areas such as building pads or cut/fill slopes. After development of the proposed project, minor increases in surface-water velocity of channelized and non-channelized flow exiting the roadway and other impermeable surfaces onto unpaved, natural surfaces have the potential to cause minor scour and erosion, which could have similar, but lesser effects. In addition, localized erosion could occur where surface runoff is allowed to accumulate on graded (i.e., cut/fill) slopes.

Development of the proposed no-drop targets and emitter sites could result in short-term significant impacts to surface-water quality due to construction activity (e.g., degradation of water quality as a result of construction-related sediment influx). However, the use of best management practices during construction would reduce these impacts to insignificant levels. Similarly, there would be no significant long-term impacts as a result of the operation of the proposed development.

Diesel fuel and propane gas would be stored in ASTs on the one-acre emitter sites. These are double-walled tanks that meet all federal standards. Secondary spill containment such as a catchment and berm system will be provided. The presence of this fuel should pose no hazard to surface water.

#### 4.6.5.2 FLOODPLAINS

None of the proposed no-drop targets or emitter sites within ROI Two would encroach upon a floodway area and fringe areas of a 100-year floodplain. The only developments planned in the floodplain are access roads. Construction of access roads within the floodway may involve grading, which could alter floodway channel geometry, causing changes in channel velocities or increasing the elevation of the 100-year floodplain. In addition, portions of the access roads within the floodway may be washed out during a 100-year storm. Based on historical floods in the Bruneau River system, the greatest possibility of flooding within ROI Two occurs from December to May in a given year. Therefore, if construction of access roads near or at the floodplain is limited to summer months, the probability of impacts would be low.

#### 4.6.5.3 GROUND WATER

Because the proposed area is located in a largely undeveloped area, localized changes in ground-water flow patterns resulting from compaction of soil and changes in soil contours from construction activities would not alter the watershed in the ROI Two region; therefore, construction and use of no-drop targets and emitter sites would not cause impacts on ground water.

#### 4.6.5.4 CLAIMS TO WATER RIGHTS

All no-drop targets and emitter sites would be far enough away from PODs and POUs so that good construction practices would allow construction, including access, to occur without

disrupting stream flow or precluding access to claims to water rights. For similar reasons, Air Force personnel and equipment should be able to access the sites during training-related operations without approaching POD and POU locations, and without impairing use of water; therefore, impacts would not occur.

### 4.6.6 Shoshone-Paiute Concerns About Water Resources

As discussed in section 3.6.6, the Shoshone-Paiute consider water to be a crucial resource that has several spiritual aspects in their traditions. Elsewhere in section 4.6, it is concluded that neither Alternatives A, B, C, nor D would have significant impacts on surface water, floodplains, ground water, or water rights. Therefore, there should be no adverse impacts to water resources in terms of Shoshone-Paiute concerns.

### 4.6.7 Cumulative Impacts

Impacts to surface or ground-water quality would not occur as a result of the implementation of the ETI proposal. In addition, no impacts associated with floodplains are expected. All aspects of the proposal including potential effects of ground disturbance and increased human presence were analyzed.

The areas involved in foreseeable future actions are not included in a floodplain nor are they anticipated to affect ground-water quality. If any impacts associated with these projects occur during construction, they would be mitigated on a project-specific basis; therefore, cumulative impacts to water resources are not anticipated.

# 4.7 AIR QUALITY

No measurable change in air pollutant emissions in the region of influence is expected under any range development alternative. Potential sources of minor emissions include facility and target construction, road construction, maintenance activities, vehicle and diesel-powered electric generator operations, construction of an electric powerline, vehicle travel, and aircraft operations. Aside from aircraft emissions, the primary pollutants that would result from operations are exhausts from ground-based internal combustion engines and fugitive dust. Vehicle use and generators at the three-acre maintenance facility and one-and one-quarter-acre emitter sites add a negligible contribution to air emissions. In no case is construction or operation projected to produce any significant impacts on air quality.



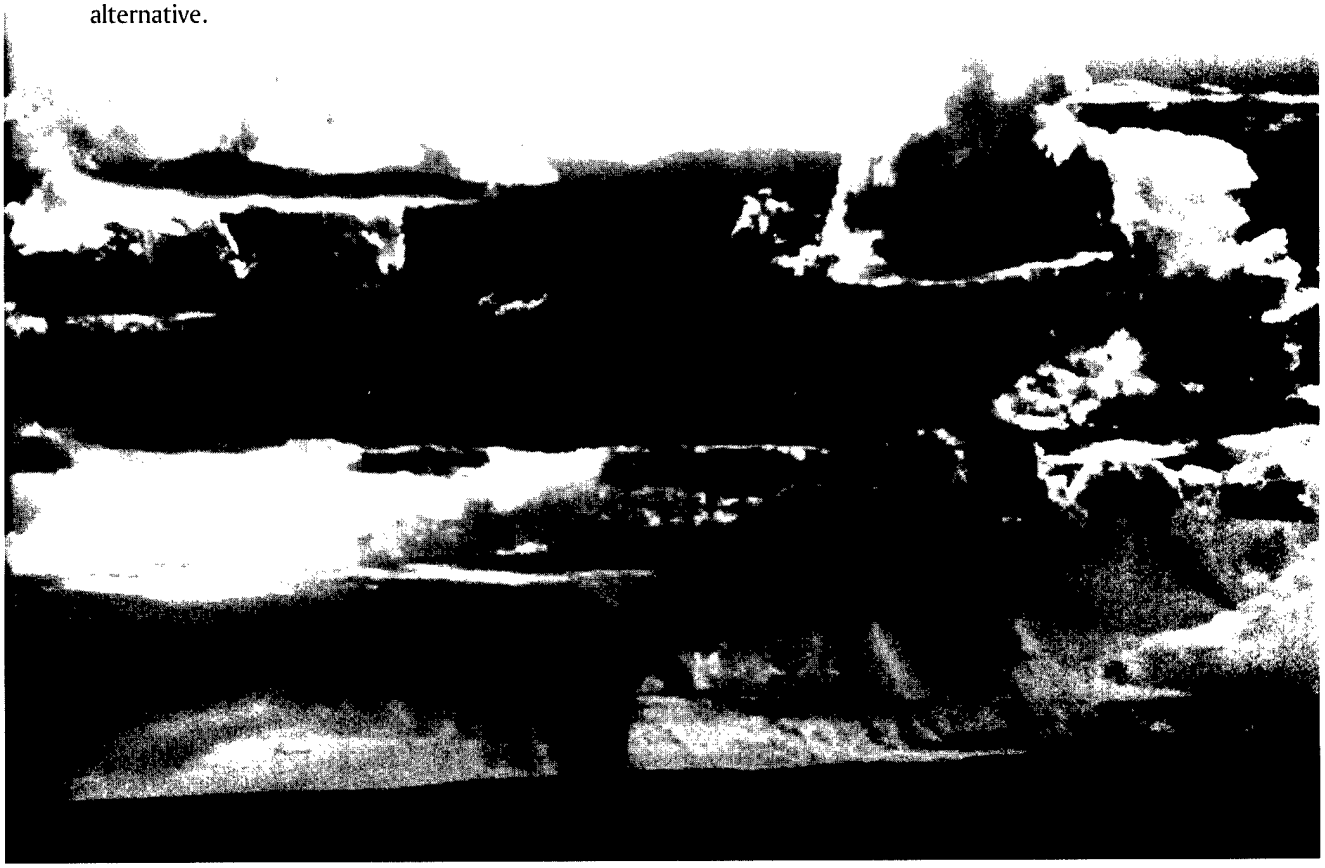
## Aircraft Emissions

The degree of potential aircraft emissions was determined by calculating the estimated change in criteria pollutant emissions attributed to proposed activities, and then comparing them with baseline conditions. Emission contributions were calculated to reflect both annual emissions measured in tons-per-year and maximum-use scenarios representing estimates of ground-level pollutant concentrations.

The computerized Multiple Aircraft Instantaneous Line Source Dispersion model was used to assess the significance of aircraft emissions. The model predicts concentrations of ground-level pollutants resulting from aircraft flight activities. A scenario that provides the greatest concentration of pollutants in the briefest time was developed so projections would be made of the significance of those levels in relation to air quality standards. The computer model demonstrated that the maximum-use scenario for any ETI alternative would not exceed any air quality standards at any location. No significant impacts to air quality are anticipated from any alternative.



Aircraft and other vehicles represent mobile emissions sources. Neither vehicle activity nor emissions from generators, however, would measurably change local or regional air quality under any range development alternative.



# 4.7 AIR QUALITY

Changes in the amount of emissions of criteria pollutants would occur as a result of the proposed alternatives; however, none are considered significant. Criteria to determine the significance of these changes are based on federal, state, and local air pollution standards and regulations. The changes would be significant if the emissions from the proposed alternatives (1) increase ambient pollution concentrations from below to above any National Ambient Air Quality Standards (NAAQS), (2) contribute to an existing violation of any NAAQS, (3) impair visibility within federally mandated Prevention of Significant Deterioration (PSD) Class I areas, or (4) result in non-conformance with the Clean Air Act (CAA) or any State Implementation Plan (SIP).

As stated in section 3.7.1, air quality in Idaho within ROI Three is designated better than national standards for total suspended particulates (TSP) and sulfur dioxide ($SO_2$), unclassifiable/attainment for ozone ($O_3$), carbon monoxide (CO), particulate matter equal to or less than 10 micrometers in diameter ($PM_{10}$), not designated for lead (Pb), and either cannot be classified or is better than the NAAQS for nitrogen dioxide ($NO_2$). The ROI is a remote area with no specific monitoring stations. The area is sparsely populated and contains no major industrial activities. The primary land use is cattle grazing. Currently, the only major identifiable source of pollutants are aircraft using the airspace for training activities.

In general, the proposed alternatives would introduce added emissions into the ROI generated by facility and target construction, road construction, maintenance activities, vehicle and diesel-powered electric generator operations, training ordnance use, and aircraft operations. Aside from aircraft emissions, the primary pollutants that would result from other operations are exhausts from ground-based internal combustion engines and fugitive dust.

Aircraft operations form the greatest source of emissions and the area of concern from public commentors. The contributions of these emissions were determined by calculating the estimated changes in the emissions of criteria pollutants attributed to proposed activities for the various ranges and MOAs, and then comparing them with baseline conditions in the same areas. Table 4.0-1 reflects the changed levels in the source of pollutants in the airspace units associated with these proposals.

To assess the significance of these added emissions, the computerized Multiple Aircraft Instantaneous Line Source (MAILS) dispersion model was employed. This model predicts concentrations of ground-level pollutants resulting from aircraft flight activities. By developing a scenario that provides the greatest concentration of pollutants in the briefest time, projections can be made of the significance of those levels in relation to the NAAQS. If this maximum use scenario does not create an exceedance, it can be reasoned that activities less intense would not either. The scenarios developed to provide input for this model, and the modeling results, are described below.

### 4.7.1 Alternative A — No-Action

Under Alternative A, all emissions would remain unchanged from the conditions described in section 3.7. As no emissions would be added to the ROI, conformity determinations would not be required, nor would PSD analyses.

### 4.7.2 Alternative B — Clover Butte

In accordance with the Air Force Air Conformity Applicability Model, emissions generated in support of the proposed Clover Butte alternative can be categorized as originating from either mobile or area sources of air pollutants. Mobile sources include aircraft, off-road support vehicles, and on-road vehicles. Area sources include emissions generated by construction activity, fugitive dust, facility space heating, and miscellaneous sources such as propane heaters used to provide infrared signatures for targets, and diesel-powered generators used to provide power to simulated-threat emitters.

#### 4.7.2.1 Construction and Maintenance

Emissions generated by construction activities, vehicle and emitter operations, and inert training ordnance use would generally be far less than those resulting from proposed aircraft operations. Construction emissions would be short term and temporary, and would consist primarily of fugitive dust, which is defined as particulate matter. These emissions would be generated both from grading and clearing of ground areas where the range maintenance facilities, target areas, stationary emitter, and new roads would be located. However, they would only occur during actual earth-moving activities.

Fugitive dust emissions from these construction activities are proportional to the area being worked and the level and types of construction activities. Based on USEPA standards, approximately 1.2 tons of fugitive dust are emitted per acre of construction for each month of construction activity.

The area affected by maintenance facility structure for the proposed alternative would be about 3 acres. Assuming a maximum one-month construction period involving ground disturbance, the total fugitive dust emitted for the maintenance facility would be approximately 4 tons. Target construction for the proposed Clover Butte training range would involve measurable exposure of soil during the construction period. Combined, construction would affect an estimated 60 acres directly for slightly less than one month, although only a proportion of the acreage would be affected daily. This analysis assumes concurrent construction at both locations, although it may not occur according to that schedule. Limited additional amounts of fugitive dust would occur from wind erosion of exposed soils. Based on these assumptions, the area preparation and target construction would produce approximately 72 tons of fugitive dust. Periodic maintenance of the targets is likely to produce only a minuscule proportion of this amount, since only small parts of the targets would require extensive maintenance in any given year.

Construction of new roads would contribute minor amounts of fugitive dust. Existing roads proposed for improvement are not considered contributors because the improvements would consist mostly of graveling. The new roads proposed for the Clover Butte Alternative would produce about 117 tons of fugitive dust. Construction at the emitter locations would be brief, resulting in an additional 18 tons of fugitive dust. No construction is proposed for the 640-acre no-drop site, so no fugitive dust emissions are anticipated.

The proposed Clover Butte Alternative would require construction of approximately 17 miles of electrical power distribution lines. Assuming an area 10-feet wide would be disturbed along the 16-mile construction area, 25 tons of fugitive dust would be generated during a one-month construction period.

Vehicles traveling along paved and unpaved roads would generate an additional 21 tons of fugitive dust based on the assumption that light-duty, four-wheeled vehicles would travel 17,000 miles supporting training activities annually, while heavy-duty, semi-tractor-type vehicles would travel approximately 5,500 miles.

In total, the construction proposed for the proposed alternative would produce approximately 257 tons of fugitive dust. These emissions would not have a measurable effect on ambient air quality for three reasons: (1) the total quantity is limited; (2) the construction sites are individually small and dispersed throughout a vast remote area characterized by good air quality; and (3) the scheduling of construction is likely to spread the individual construction projects over months and years, so the concentration of fugitive dust would be limited at any one time.

Based on USEPA standards of estimates, approximately 50 percent (100 tons) would be considered $PM_{10}$. Considering ultimate dispersion throughout ROI Two, this estimated volume constitutes less than 0.01 percent of the NAAQS. Since the construction activity is occurring in the area underlying the Jarbidge MOA, even if that smaller area alone is considered, the $PM_{10}$ concentrations resulting from ground disturbance are estimated at approximately 0.1 percent of the NAAQS.

Furthermore, fugitive dust calculations were prepared assuming that no dust control measures were incorporated and that all construction occurs during periods of no measurable precipitation. ROI Three is characterized as receiving sufficient precipitation to reduce fugitive dust an average of 60 days per year (USEPA 1995). Furthermore, the Air Force would use best management practices such as limiting vehicle speeds and soil stockpiling to reduce fugitive dust. Thus, fugitive dust emissions would likely be even less.

Other emissions, such as exhausts from construction, maintenance, emitter transport vehicles, and diesel-powered electrical generators powering the emitters, would not measurably alter ambient air quality. The limited number of these vehicles operating at one time or throughout a year, as well as their dispersal throughout the area under the Jarbidge MOA, support this assessment.

### 4.7.2.2 AIRCRAFT OPERATIONS

Aircraft using the ranges and local MOAs would vary in type from fighter, bomber, refueling, attack, and surveillance aircraft. These aircraft are equipped with engines ranging in number from at least one to as many as eight. Each aircraft type requires unique engine configurations; thus, each aircraft type has a unique emission generation rate. Since each aircraft type has differing emissions characteristics, direct comparison of changes in sorties or changes in annual flying hours may not provide useful comparison data. For example, substituting 10 F-15 sorties for 10 F-16 sorties would result in no change in sortie numbers; however, since F-15 aircraft have two engines and F-16 aircraft have only one, emissions would increase, while annual sorties remained constant. Table 4.7-1 provides a comparison of emission rates for the primary aircraft using the regional special-use airspace. The table represents emissions generated from each aircraft based on one hour of operation at a standard military power setting. As noted in the table, emissions rates can vary considerably. Furthermore, sortie duration may vary among aircraft type. For example, a typical A-10 sortie at SCR is estimated to last nearly 40 minutes, whereas some F-15 aircraft spend less than ten minutes at SCR during a range sortie. For these reasons, each airspace element has been analyzed considering the number and duration of sorties proposed by aircraft type.

**Table 4.7-1. Estimated Emission Rates for Primary Aircraft (pounds per hour at military power setting)**

| | *CO* | *VOC** | *NOx* | *SOx* | $PM_{10}$ |
|---|---|---|---|---|---|
| A-10 | 11.92 | 0.54 | 58.00 | 5.42 | 7.2 |
| C-130 | 19.32 | 3.68 | 85.56 | 9.2 | 4.16 |
| F-15 | 19.04 | 2.12 | 571.36 | 21.16 | 7.2 |
| F-16 | 9.52 | 1.06 | 285.68 | 10.58 | 3.6 |
| B-1 | 303.4 | 15.96 | 91.8 | 39.92 | 0.80 |

*VOC = Volatile Organic Compounds

Under the Clover Butte Alternative, airspace modifications would occur involving reconfiguration of the Owyhee MOA, a slight expansion of the Paradise MOA, and creation of the Jarbidge MOA. No airspace configuration changes are proposed for Saddle MOA. The Owyhee MOA expansion would have little effect on the total MOA airspace volume compared to baseline conditions. The same is true for the Jarbidge MOA, which effectively replaces the existing SCR support MOAs. Paradise MOA would be defined as Paradise East and Paradise West, and the minor expansion of the MOA in northern Nevada would result in a negligible airspace volume increase relative to the existing configuration. Emissions released under baseline conditions and under the proposed airspace configuration occur within the same ROI with the exception of Saddle MOA in Oregon. Since aircraft emissions in the existing and

proposed MOA configurations are released over such an extremely large area, and the proposed increase in MOA airspace is small compared to the existing airspace volume, total aircraft emissions for each airspace can be calculated and compared to representative airspace elements established under baseline conditions. For this analysis, the Saddle and Owyhee MOAs are compared directly to their respective existing conditions. Emissions released into the proposed Jarbidge MOA include emissions associated with projected Clover Butte range activity since the range is encompassed entirely within the boundaries of the Jarbidge MOA. These new total emissions are compared to those generated in the existing SCR support MOAs.

### *SAYLOR CREEK RANGE*

Proposed sorties at SCR are projected to decrease and be of shorter duration. Annual emissions would decrease in the existing SCR R-3202A airspace, referred to as SCR under the alternative. Changes in aircraft mix and sorties would result in reductions of CO, total hydrocarbons (THC), $NO_x$, $SO_x$, and $PM_{10}$ as noted in Table 4.7-2.

**Table 4.7-2. Emissions for Saylor Creek Range under Alternative B — Clover Butte**

| | | ANNUAL EMISSIONS (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|
| *Option* | *Annual Sortie-Operations* | *CO* | *THC* | *$NO_x$* | *$SO_x$* | *$PM_{10}$* |
| Baseline R3202A | 7,737 | 69.1 | 4.4 | 463.2 | 25.3 | 11.4 |
| Alternative B | 7,561 | 26.2 | 1.9 | 258.5 | 12.4 | 5.7 |
| | Percent Change* | -62.1 | -57.7 | -44.2 | -51.1 | -49.6 |

* Limited discrepancies in percent change result from number rounding convention

### *JARBIDGE MOA*

Under the proposed airspace configuration, baseline conditions are assumed to be represented by the emissions released into the SCR support MOAs. The existing MOAs adjacent to SCR would be essentially converted to the Jarbidge MOA.

Proposed Clover Butte range sortie-operations have been included in the total emissions estimates because the proposed range complex would be surrounded by the Jarbidge MOA. When examined independently, emissions from proposed Clover Butte range activity represent approximately 13 percent of the total emissions released into Jarbidge MOA, as summarized in Table 4.7-3. Emissions of criteria pollutants decrease with the exception of CO, which would increase by about 6.4 tons. The change is primarily driven by a reduction in time spent in the airspace by high-performance fighter aircraft, and an increase in time spent by bomber aircraft producing higher CO emission rates.

**Table 4.7-3. Emissions for Jarbidge MOA including ETI Range under Alternative B — Clover Butte**

| | | ANNUAL EMISSIONS (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|
| *Option* | *Annual Sortie-Operations* | *CO* | *THC* | *$NO_x$* | *$SO_x$* | *$PM_{10}$* |
| Baseline | 7,737 | 33.0 | 3.1 | 663.1 | 26.3 | 10.0 |
| Alternative B | 8,273 | 39.4 | 3.0 | 463.4 | 21.0 | 9.2 |
| | Percent Change* | 19.8 | -3.0 | -30.1 | -20.0 | -7.7 |

* Limited discrepancies in percent change result from number rounding convention

### *OWYHEE AND SADDLE MOAS*

Emissions resulting from proposed sortie-operations increases in Owyhee and Saddle MOA are presented in Tables 4.7-4 and 4.7-5, respectively. It is important to note that the predominant aircraft influencing changes in emissions in Owyhee MOA are those assigned to Mountain Home AFB. Although sortie-operations are shown to increase, sortie-operation duration for Mountain Home AFB-assigned aircraft would be reduced. As a result, emissions in Owyhee MOA would decrease. The duration of sortie-operations proposed in Saddle MOA would remain unchanged except for B-1B and F-16 aircraft. Sortie-operations for each of these aircraft would be extended approximately 15 minutes. The proposed sortie-operations increase for A-10 aircraft is the primary influence to emission increases in Saddle MOA.

**Table 4.7-4. Emissions for Owyhee MOA under Alternative B — Clover Butte**

| | | ANNUAL EMISSIONS (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|
| *Option* | *Annual Sortie-Operations* | *CO* | *THC* | *$NO_x$* | *$SO_x$* | *$PM_{10}$* |
| Baseline | 7,350 | 68.0 | 5.7 | 1193.8 | 49.3 | 20.8 |
| Alternative | 7,846 | 32.9 | 2.8 | 614.0 | 25.1 | 10.9 |
| | Percent Change* | -51.6 | -50.5 | -48.6 | -49.1 | -47.8 |

* Limited discrepancies in percent change result from number rounding convention

**Table 4.7-5. Emissions for Saddle MOA under Alternative B — Clover Butte**

| | | ANNUAL EMISSIONS (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|
| *Option* | *Annual Sortie-Operations* | *CO* | *THC* | *$NO_x$* | *$SO_x$* | *$PM_{10}$* |
| Baseline | 1986 | 18.1 | 1.5 | 357.3 | 14.5 | 6.2 |
| Alternative B | 2169 | 20.4 | 1.7 | 379.9 | 15.7 | 7.0 |
| | Percent Change* | 12.7 | 9.7 | 6.3 | 8.3 | 13.5 |

* Limited discrepancies in percent change result from number rounding convention

### *PARADISE EAST / PARADISE WEST MOAS*

Paradise MOA would be modified under the proposed alternative by adding a small expansion in the southeast corner and by dividing the existing MOA into eastern and western portions. Total sortie-operations have been proposed for each of the east and west MOAs; however, since aircraft can be scheduled to fly in each MOA during a given sortie, the total sortie-operations cannot be added together to reflect total emissions in each airspace element. Under Alternatives B-D, Paradise East is scheduled for 3,352 sortie-operations and Paradise West is scheduled for 4,382. To assess the changes from baseline conditions, the higher of the two proposed sortie-operations numbers was applied, assuming that all sortie-operations in Paradise East are characterized by some activity in Paradise West, in addition to those sortie-operations scheduled in Paradise West exclusively. While this may not occur, it provides a conservative estimate of emissions. Besides an overall reduction in sortie-operations, sortie-operation duration would also decrease by as much as 60 percent for some aircraft. Estimated emissions from baseline and proposed conditions are presented in Table 4.7-6.

**Table 4.7-6. Emissions for Representative Paradise MOAs under Alternative B — Clover Butte**

| | | ANNUAL EMISSIONS (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|
| *Option* | *Annual Sortie-Operations* | *CO* | *THC* | *$NO_x$* | *$SO_x$* | *$PM_{10}$* |
| Baseline | 5,091 | 50.4 | 4.6 | 1038.4 | 40.5 | 14.0 |
| Alternative B | 4,382[a] | 18.6 | 1.8 | 421.5 | 16.2 | 5.6 |
| | Percent Change* | -63.0 | -61.2 | -59.4 | -59.9 | -60.1 |

[a] Highest proposed sortie number for either Paradise East or West MOAs.

* Limited discrepancies in percent change result from number rounding convention

### *ROI THREE*

Tables 4.7-2 through 4.7-6 present estimates of annual total emissions and percent change relative to similar airspace elements under existing conditions. Table 4.7-7 presents the estimated change in emissions relative to ROI Three, which includes all of the affected airspace elements except Saddle MOA. When all emissions are considered collectively within the ROI, emissions of all pollutants modeled would decrease between about 44 and 48 percent.

**Table 4.7-7. Total Emissions for ROI Three under Alternative B — Clover Butte**

| | ANNUAL EMISSIONS (TONS/YEAR) | | | | |
|---|---|---|---|---|---|
| *Option* | *CO* | *THC* | *$NO_x$* | *$SO_x$* | *$PM_{10}$* |
| Baseline | 220.4 | 17.8 | 3358.6 | 141.4 | 56.2 |
| Alternative | 117.2 | 9.4 | 1757.5 | 74.5 | 31.4 |
| Percent Change* | -46.8 | -46.9 | -47.7 | -47.2 | -44.1 |

* Limited discrepancies in percent change result from number rounding convention

Because the majority of aircraft emissions would be released at altitudes higher than 1,000 feet AGL (the average mixing height in the ROI), ground-based impacts of pollutant levels are best assessed by examining the effects of highly concentrated low-level flights. Because the average mixing height is approximately 1,000 feet AGL, emissions released above this height are unlikely to contribute to ground-level pollutant concentrations, since emissions released above the mixing height can be inhibited and effectively blocked from mixing beneath a surface-based temperature inversion.

The highest concentration of low-altitude aircraft activity would remain in SCR. Aircraft making multiple passes during ordnance delivery training at the range repeatedly pass over the same point on the ground over short periods. The MAILS model was used to predict maximum ground-level pollutant concentrations resulting from aircraft overflight. Maximum use scenarios modeled for SCR involved a total of 60 aircraft flying 500 feet AGL, passing the exact same point on the ground within 1 hour. Activities making up the 1-hour maximum-use scenario included eight passes each by A-10, F-15C/D, F-15E, and F-16 aircraft; four passes each by B-1B, A-6, F-18, and F-4G aircraft; and two passes each by F-111, F-14, B-52, C-130, and UH-60 aircraft. Flying activities were scaled to represent maximum-use in 3-, 8-, 24-hour, and annual periods. Resulting pollutant concentrations were compared to the NAAQS to determine if exceedances would occur. As noted in Table 4.7-8, maximum pollutant concentrations would be well below NAAQS.

**Table 4.7-8. Maximum-Use Scenario Ground-Level Pollutant Concentrations for Saylor Creek Range**

| *Pollutant* | *Averaging Periods* | *Concentration ($\mu g/m^3$)* | *NAAQS ($\mu g/m^3$)* |
|---|---|---|---|
| CO | 1-hour | 8.02 | 40 |
| | 8-hour | 0.66 | 10 |
| $NO_2$ | Annual | 0.16 | 100 |
| $SO_2$ | 3-hour | 0.44 | – |
| | 24-hour | 0.06 | 365 |
| | Annual | <0.01 | 80 |
| $PM_{10}$ | 24-hour | 0.06 | 150 |
| | Annual | <0.01 | 50 |

Since the maximum-use scenario caused no exceedances, then it can be reasoned that other, less intense scenarios associated with the proposed alternative in any other airspace element would not result in exceedances either. Since the area is not currently in exceedance of any NAAQS, the proposed alternative would not adversely affect air quality.

#### 4.7.2.3 CONFORMITY DETERMINATION

In summary, based on the results of modeling and analyses regarding emissions anticipated to be introduced into affected airspaces, this alternative satisfies all of the requirements of the Conformity Rule. Since all areas within the ROI are in attainment of the NAAQS, and the emissions of criteria pollutants would decrease, they would neither create an exceedance condition nor impact the objectives of any SIP. Additionally, no deterioration to any PSD Class I area is indicated.

### 4.7.3 Alternative C — Grasmere

#### 4.7.3.1 CONSTRUCTION AND MAINTENANCE

In total, the construction proposed for Alternative C would produce approximately 230 tons of fugitive dust. The fugitive dust emissions would be approximately the same as those calculated for the Clover Butte alternative, except no powerline construction would be required. Fugitive dust emissions would not have a measurable effect on ambient air quality for three reasons: (1) the total quantity is limited; (2) the construction sites are individually small, and dispersed throughout a vast remote area characterized by good air quality; and (3) the scheduling of construction is likely to spread the individual construction projects over months and years, so the concentration of fugitive dust would be limited at any one time.

Based on USEPA standards of estimates, approximately 50 percent (100 tons) would be considered $PM_{10}$. Considering ultimate dispersion throughout the ROI, this estimated volume constitutes less than 0.01 percent of the NAAQS. Since the construction activity would occur in the area underlying the Jarbidge MOA, even if that smaller area alone is considered, the $PM_{10}$ concentrations resulting from ground disturbance are estimated at approximately 0.1 percent of the NAAQS.

Other emissions, such as exhausts from construction, maintenance, emitter transport vehicles, and diesel-powered electrical generators powering the emitters, would not measurably alter ambient air quality. Power would be supplied to maintenance facilities via propane- or diesel-powered electric generators. Emissions generated by the periodic use of electric generators would not measurably alter ambient air quality. The limited use of electric generators and limited number of vehicles operating at one time or throughout a year, as well as their dispersal throughout the area under the Jarbidge MOA, support this assessment.

#### 4.7.3.2 AIRCRAFT OPERATIONS

Aircraft operations and emissions would be identical to those discussed under Alternative B. Maximum ground-level pollutant concentrations would be expected to occur within SCR. The quantity of emissions associated with a proposed tactical range would remain the same, although range-related emissions would be released at the Grasmere location, which would also be encompassed by the Jarbidge MOA.

#### 4.7.3.3 CONFORMITY DETERMINATION

As discussed under Alternative B, based on the results of modeling and analyses regarding emissions anticipated to be introduced into affected airspaces, Alternative C satisfies all of the requirements of the Conformity Rule. Since all areas within the ROI are in attainment of the NAAQS, and the levels of criteria pollutants would decrease, they would neither create an exceedance condition nor impact the objectives of any SIP. Additionally, no deterioration to any PSD Class I area is indicated.

### 4.7.4 Alternative D — Juniper Butte

#### 4.7.4.1 CONSTRUCTION AND MAINTENANCE

Construction and maintenance emissions associated with Alternative D would be nearly identical to those calculated under Alternative B. Some construction would take place in different areas; however, the estimated emissions generated as a result of new road construction activities within the ROI would result in 264 tons of fugitive dust compared to 257 tons estimated under the Clover Butte Alternative; a difference of less than 3 percent.

#### 4.7.4.2 AIRCRAFT OPERATIONS

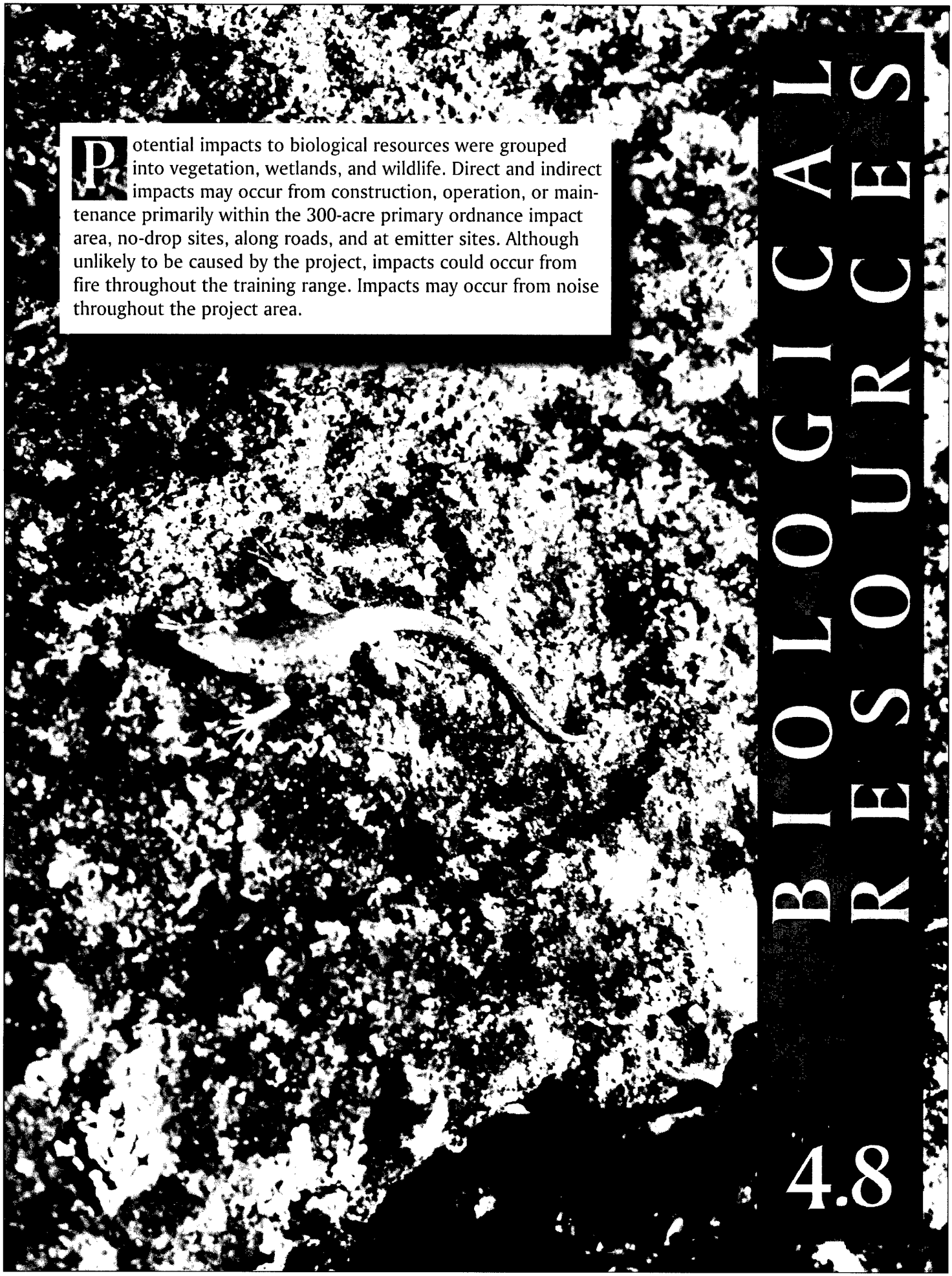
Aircraft operations and emissions would be identical to those discussed under the Clover Butte Alternative. Maximum ground-level pollutant concentrations would be expected to occur within SCR. The quantity of emissions associated with the proposed Juniper Butte range would remain the same, although range-related emissions would be released at the Juniper Butte location, which would also be encompassed by the Jarbidge MOA.

#### 4.7.4.3 CONFORMITY DETERMINATION

Based on the results of modeling and analyses regarding emissions anticipated to be introduced into affected airspaces, Alternative D satisfies all of the requirements of the Conformity Rule. Since all areas within the ROI are in attainment of the NAAQS, and the levels of criteria pollutants would decrease, they would neither create an exceedance condition nor impact the objectives of any SIP. Additionally, no deterioration to any PSD Class I area is indicated.

### 4.7.5 Cumulative Impacts

The change in sorties and construction associated with the ETI project will cumulatively result in indescribable changes to air quality. The combined effects of the foreseeable future actions would not result in cumulative changes to the amount of mobile source (i.e., aircraft) pollutant emissions in the affected MOA airspace. During the construction projects, temporary localized increases in stationary source emissions (especially particulates) would occur. This increase from other projects would be short term in duration and would occur before the proposed ETI construction is to occur. By following best management practices, localized fugitive dust could be reduced.



# 4.8 BIOLOGICAL RESOURCES

Potential impacts to biological resources were grouped into vegetation, wetlands, and wildlife. Direct and indirect impacts may occur from construction, operation, or maintenance primarily within the 300-acre primary ordnance impact area, no-drop sites, along roads, and at emitter sites. Although unlikely to be caused by the project, impacts could occur from fire throughout the training range. Impacts may occur from noise throughout the project area.





Documenting small mammals is key to determining the potential biodiversity of an area.

For vegetation analysis, it is expected that the 300-acre primary ordnance impact area would be directly disturbed, as would powerline and road corridors. A total of 895 to 1,074 acres of native grassland or sagebrush would be impacted, primarily by road and powerline construction.

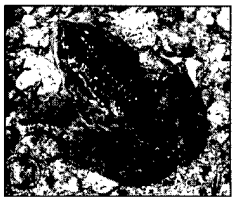
Impacts to rare plants could occur from construction, maintenance, or use of the target areas. Clover Butte has no rare plants, Grasmere has a slight potential for indirect impacts, and Juniper Butte has the potential to directly impact one population of a BLM rare plant species, slick spot peppergrass.

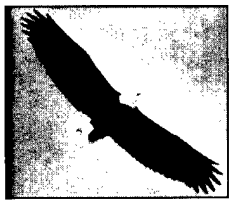
No wetlands are located within the 300-acre primary ordnance impact area at any site; therefore, the probability of direct impacts is low. Potential indirect impacts to streams and wildlife habitat could be caused by fire, erosion, sedimentation, and fugitive dust. The potential indirect impacts to wetlands are 1.2 acres at Clover Butte, 30.7 acres at Grasmere, and no wetlands at Juniper Butte. No direct impacts are associated with the no-drop target areas or emitter sites in any of the alternatives.

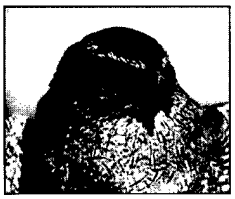
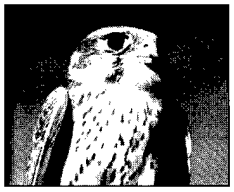
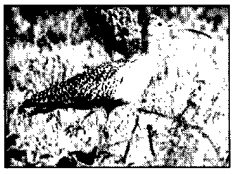
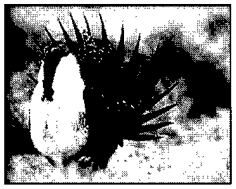
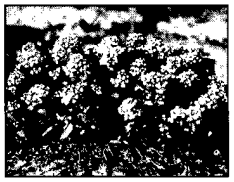
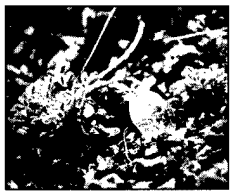
Potential sources of wildlife disturbance associated with any range alternative are construction, maintenance, use of a training range, and increased human presence. Impacts to most wildlife species due to ground disturbance, noise, or human presence would be negligible to low for Clover Butte or Juniper Butte and low for Grasmere. Impacts to protected and sensitive species would be similar to those for general wildlife species. For species that are known to be easily disturbed (e.g., bats, sage grouse, California bighorn sheep, some raptor species), impacts due to human presence would be higher at Grasmere and lower for other alternatives. Potential indirect impacts may affect the diversity and abundance of wildlife species associated with unique habitat features at each alternative training range site.



## SELECTED PROTECTED AND SENSITIVE WILDLIFE SPECIES KNOWN AND POTENTIAL OCCURRENCE

| Species | ROI One | | | ROI Two /Three | Notes |
|---|---|---|---|---|---|
| | Clover Butte | Grasmere | Juniper Butte | | |
|  **California Bighorn Sheep** *Ovis canadensis californiana* | N | Y | P | Y | **N** Not known to occur<br>**P** Possible occurrence, habitat present, no individuals known to occur<br>**Y** Individuals known to occur |
|  **Spotted Bat** *Euderma maculatum* | p | Y | P | Y | |
|  ©Merlin D. Tuttle, BCI **Townsend's Big-eared Bat** *Corynorhinus townsendii pallescens* | p | P | P | Y | |
|  **Long-eared Myotis Bat** *Myotis evotis evotis* | P | Y | P | Y | |
|  ©Merlin D. Tuttle, BCI **Long-legged Bat** *Myotis volans* | N | Y | P | Y | |
|  **Northern Leopard Frog** *Rana pipiens* | N | P | N | Y | |
|  Gary Will, Idaho Fish & Game **Western Toad** *Bufo boreas* | P | P | P | Y | |

| Species | ROI One | | | ROI Two /Three | Notes |
|---|---|---|---|---|---|
| | Clover Butte | Grasmere | Juniper Butte | | |
|  **Western Ground Snake** *Sonora semiannulata* | N | P | P | Y | **N** Not known to occur<br>**P** Possible occurrence, habitat present, no individuals known to occur<br>**Y** Individuals known to occur |
|  **Longnose Snake** *Rhinocheilus lecontei* | P | P | P | Y | |
|  **Mojave Black-collared Lizard** *Crotaphytus bicinctores* | N | P | P | Y | |
|  **Peregrine Falcon** *Falco peregrinus* | N | P | N | Y | |
|  **Ferruginous Hawk** *Buteo regalis* | P | Y | Y | Y | |
|  **Bald Eagle** *Haliaeetus leucocephalus* | N | N | N | Y | |
|  **White Faced Ibis** *Plegadis chihi* | N | Y | N | Y | |
|  **Loggerhead Shrike** *Lanius ludovicianus* | P | Y | P | Y | |

| Species | ROI One | | | ROI Two /Three | Notes |
|---|---|---|---|---|---|
| | Clover Butte | Grasmere | Juniper Butte | | |
|  **Northern Goshawk** *Accipiter gentilis* | N | P | N | Y | **N** Not known to occur<br>**P** Possible occurrence, habitat present, no individuals known to occur<br>**Y** Individuals known to occur |
|  **Burrowing Owl** *Speotyto cunicularia hypugaea* | Y | Y | Y | Y | |
|  **Prairie Falcon** *falco mexicanus* | Y | Y | Y | Y | |
|  **Long-billed Curlew** *Numenius americanus* | P | P | P | Y | |
|  **Sage Grouse** *Centrocercus urophasianus* | Y | Y | P | Y | |
|  **Slick Spot Peppergrass** *Lepidium papilliferum* | P | P | Y | Y | |
|  **Inch-high Lupine** *Lupinus unicalis* | P | Y | N | Y | |
|  **Dimersia** *Dimersia howellii* | P | Y | N | Y | |

# Comparison of Potential Impacts by Alternative for Biological Resources

## WILDLIFE

| Alternative A No-Action | Alternative B Clover Butte | Alternative C Grasmere | Alternative D Juniper Butte |
|---|---|---|---|
| No changes from baseline | Direct impacts from ground disturbance, wildfire, noise, and human presence would be negligible to low for most wildlife species<br><br>Human presence impacts would be negligible because few easily disturbed species occur in ROI One for Alternative B | Direct impacts from ground disturbance, wildfire, noise, and human presence would be low for most wildlife species<br><br>Human presence may have a moderate impact to general wildlife species that are known to be easily disturbed (e.g., golden eagles, bats, etc.) | Direct impacts from ground disturbance, wildfire, noise, and human presence would be negligible to low for most wildlife species<br><br>Impacts from human presence would be similar to those for Alternative B |

## PROTECTED AND SENSITIVE WILDLIFE SPECIES

| | | | |
|---|---|---|---|
| No changes from baseline | Direct and indirect impacts for protected and sensitive wildlife would be similar to those for general wildlife (i.e., negligible to low)<br><br>Human presence may have a moderate impact to protected and sensitive wildlife species that are known to be easily disturbed (e.g., sage grouse, loggerhead shrikes, etc.) | Direct and indirect impacts for protected and sensitive wildlife would be similar to those for general wildlife (i.e., low)<br><br>Human presence may have a moderate impact to protected and sensitive wildlife species that are known to be easily disturbed (e.g., California bighorn sheep, sage grouse, ferruginous hawks, prairie falcons, bats, etc.) | Direct and indirect impacts for protected and sensitive wildlife would be similar to those for general wildlife (i.e., negligible to low)<br><br>Human presence may have a moderate impact to protected and sensitive wildlife species that are known to be easily disturbed (e.g., bats, ferruginous hawks, etc.) |

## VEGETATION, WETLANDS, AND RARE PLANTS

| | | | |
|---|---|---|---|
| No change in impacts to any vegetation | Direct impacts from ground disturbance associated with the ordnance impact areas, emitters, roads, and no-drop target areas would include a loss of 515 acres of native plant communities. No direct impacts would be associated with wetlands or rare plants<br><br>Direct impacts to 49 intermittent and 1 perennial streams from new and upgraded road construction<br>Potential indirect impacts to 4,197 acres of native vegetation and 1.2 acres of wetland | Direct impacts from ground disturbance associated with the ordnance impact areas, emitters, roads, and no-drop target areas would include a loss of 511 acres of native plant communities, and 2.4 miles of "Waters of the U.S." No direct impacts would be associated with wetlands or rare plants<br><br>Direct impacts to 56 intermittent and 1 perennial streams from new and upgraded road construction<br>Potential indirect impacts to 7,609 acres of native vegetation and 33 acres of wetland | Direct impacts from ground disturbance associated with the ordnance impact areas, emitters, roads, and no-drop target areas would include a loss of 522 acres of native plant communities, loss of as much as 7.3 acres of rare plants, and 2.4 miles of "Waters of the U.S." No direct impacts would be associated with wetlands<br><br>Direct impacts to 58 intermittent and 1 perennial streams from new and upgraded road construction<br>Potential indirect impacts to 1,875 acres of native vegetation<br>No indirect impacts to wetlands |

# 4.8 BIOLOGICAL RESOURCES

This section is structured to focus on potential impacts to each biological resource from construction and operation of a training range alternative. Section 3.8 starts with a discussion of the overall region, ROI Three, under the airspace designated or proposed for military use. The section then provides a description of the environment focusing on ROI Two, which encompasses lands adjacent to and including the proposed alternatives. ROI One focuses directly on the specific locations of the range components.

This section, 4.8, analyzes the potential for direct or indirect impacts to biological resources from implementation of each alternative. Each alternative has components in ROI One, ROI Two, and ROI Three. The primary direct impacts are associated with construction and operations of facilities in ROI One or ROI Two. The indirect impacts potentially result from project induced changes to the environment, including proposed changes to airspace. Table 4.0-1 identifies changes in sortie-operations associated with the proposals. The initial discussions focus on the biological habitat, including vegetation, wetlands, and rare plants. Potential impacts to the species that use those habitats are addressed next. In all cases, the potential for impacts is tied directly to the alternatives under consideration.

## Vegetation, Wetlands, and Rare Plants

Impacts to vegetation, wetlands, and rare plants were analyzed to identify vegetation type, potential for impacts, and sensitivity to proposed activities. Potential impacts to vegetation resources were evaluated for both direct and indirect effects of construction, operation, and maintenance of the training range, no-drop target areas, emitters, powerline, and roads. Potential impacts that were considered in this analysis included direct and indirect impacts to vegetation through construction and maintenance of targets, use of ordnance, ordnance recovery and removal, and indirect effects resulting from fire.

Potential direct impacts to jurisdictional wetlands and riparian areas include dredging and filling associated with construction activities and ordnance delivery and removal. Direct impacts could be adverse if they changed the type or function of wetland vegetation. Indirect impacts could be decreased water quality, erosion and sedimentation from road use, off-road vehicle use, target operations, or maintenance. Construction and maintenance of target areas and other facilitates have the potential to alter the water regime that would alter the wetlands.

Direct wetland impacts associated with roads occur where new or upgraded roads cross intermittent or permanent streams. Potential indirect impacts from the roads include soil erosion and downstream sedimentation, both in the immediate area of the road crossings, as well as further downstream. Because the topography of the project area is generally flat or gently rolling, the potential for soil erosion and downstream sedimentation is minimal. During the dry season, there could also be a slight, non-significant indirect impact from dust churned up by vehicles using the road and being deposited on adjacent wetland vegetation. This has

the potential to reduce the affected plant's health and vigor. Indirect impacts could lead to a cumulative reduction in wetland function and habitat quality.

Ordnance delivery, off-road driving, fugitive dust, and fire may result in adverse impacts through alteration of hydrophytic vegetation. In these situations, hydrophytic vegetation may recover when the disturbance ends. Impacts on vegetation from occasional or infrequent fires would be temporary in nature, and would not be expected to have a long-term impact on basic wetland functions and values. Long-term effects on vegetation could include conversion from woodland/shrubland to herbaceous wetlands, if fires were frequent and severe over a long period.

Water quality in wetlands can be impacted by stream siltation resulting from increased erosion in and adjacent to wetland habitat from ordnance delivery, road construction, as well as from spills of toxic materials. Some degree of erosion and siltation into adjacent wetlands is expected from vegetation loss within the primary impact area due to ordnance delivery. Fuel spills could impact wetland vegetation and pollute downstream wetlands, depending on the timing and quantity of fuel spilled. Fuel spills in a wetland or migrating to a wetland would impact wetland biota until the fuel volatilized, biodegraded, or was removed. Decreased water quality adversely affects wetland vegetation, aquatic animals, and terrestrial wildlife that depend on wetlands for water, food, and cover.

Fugitive dust produced by construction activities, ordnance use, and by increased use of dirt roads could settle on wetland vegetation. Currently, little information exists on the effects of dust on vegetation. However, a continual cover of dust may reduce the overall vigor of individual plants by reducing their photosynthetic capabilities and increasing their susceptibility to pests or disease. Therefore, dust from ordnance impacts or vehicles using unpaved roads during the dry season could cause a negligible indirect cumulative impact on adjacent wetland vegetation.

## Wildlife

The proposed action may impact wildlife species in three general ways: by causing direct mortality of young or adults, by altering habitats, and by disrupting species' normal behavior. Potential sources of disturbance are the construction, maintenance, and use of the proposed training range, which may result in several types of disturbance such as ground disturbance, wildfire, soil and water contamination/erosion, noise, and other human disturbances.

Ground disturbance (e.g., construction and ordnance impacts) may result in loss or degradation of habitat and direct mortality of animals. Potential impacts of ground disturbance would occur only in ROI One. Impacts may be temporary in infrequently visited areas (e.g., no-drop target areas, powerline corridors) if wildlife habitat sufficiently recovers to accommodate disturbance-tolerant wildlife species.

Wildfires would result in direct mortality of individual animals and the destruction of wildlife habitat. Repeated fires in the widespread big-sagebrush community and other native vegetation would result in the replacement of natural habitat with non-native grassland, which supports a lower diversity of wildlife species than shrub-steppe communities. Overall, risks of wildfire from Air Force training activities would be reduced under all alternatives due to the discontinued use of hot-spot ordnance during training at SCR. Under all alternatives, only cold-spot or no-spot ordnance would be used.

Surface water contamination and soil contamination and erosion are potential impacts which may result from chaff, flare, and ordnance use, ground disturbance, wildfire, or contamination resulting from increased human use of the area. Potential impacts to surface water resulting from erosion in areas of ground disturbance have been determined to be negligible for all alternatives (refer to section 4.5, Earth Resources, and section 4.6, Water Resources). This potential impact level is based on the incorporation of erosion-limiting measures into the proposed action.

The long-term effects of chaff on soil and water chemistry are largely unknown, although the fact that it is composed mostly of silicon and other naturally occurring materials suggests it has a low potential to impact wildlife habitat. In addition, chaff has a limited potential to impact wildlife through inhalation, ingestion, or exposure if used as nesting material by birds or small mammals. However, the potential for soil or water contamination to occur as a result of use of chaff, flares, or ordnance is extremely low based on the current and proposed levels of use and low level of toxicity of these materials. Because the potential for erosion and soil and water contamination would be low under all alternatives, these impacts are generally not addressed further in this section.

Noise may result from several aspects of the proposed action, including the construction and maintenance of targets, emitters, and support facilities; the operation of emitters and their generators; and jet aircraft overflights. Sensitivity to noise varies among wildlife species and among individuals within species, due in part to differences in hearing acuity and previous exposure to noise.

Human disturbance may impact wildlife species through increased or unpredictable occupancy of areas resulting from use of the training facilities and improved public access in the area. Areas of easy access and those closest to roads would be the most susceptible to human disturbances.

Braid (1992) developed a definition framework for determining the level of impacts to wildlife from noise. This framework was modified for use in this document for noise and other types of disturbance (e.g., ground disturbance). The modified definitions of impacts are provided in Table 4.8-1.

| Table 4.8-1. Definition of Impacts to Wildlife Used in ETI Impact Analysis | | | |
|---|---|---|---|
| *Negligible* | *Low* | *Moderate* | *High* |
| Impact is unlikely to degrade habitat or affect individuals or local populations because it is infrequent, does not occur in same time or space as resource, or affect to resource is temporary or minimal. | Impact may degrade small areas of habitat. On occasion, may result in temporary changes in habitat use. Local animal population declines would be unlikely. Direct animal mortality would be limited to a few individuals. | Impact would degrade or alter small areas of habitat or reduce habitat quality in large areas. Would result in temporary changes in habitat use. Local animal population decline may result from (1) short-term habitat abandonment by some individuals, (2) reduced short-term reproductive success or life span, or (3) higher mortality. | Impact would degrade or alter small and large areas of habitat. Would result in long-term changes in habitat use by majority of population. Local and regional population declines may result from (1) long-term habitat abandonment by many individuals, (2) reduced long-term reproductive success or life span, or (3) higher mortality. |

## 4.8.1 Vegetation

### 4.8.1.1 ALTERNATIVE A —NO-ACTION

Under Alternative A, there would be no change to current baseline conditions. No new construction or training operation would occur; therefore, there would be no proposal-related impact to vegetation.

### 4.8.1.2 ALTERNATIVE B — CLOVER BUTTE

*TRAINING RANGE*

Crushing or removing vegetation could occur within the target area, particularly the primary ordnance impact area, during development and use of the targets. Construction and use of the primary ordnance impact area would adversely impact approximately 300 acres of crested wheatgrass on the Clover Butte training range. An additional 24 acres of native sagebrush-grassland communities would be impacted by construction of roads and maintenance facilities within the training range. The remaining area disturbed by roads and maintenance facilities is composed of crested wheatgrass from post-fire reseeding. Increased invasion of exotic plant species may occur as an indirect effect of vegetation disturbance within the primary ordnance impact area due to construction and use.

Off-road vehicle traffic over any portion of the range may occur during inspection for ordnance clean-up and maintenance of scoring system equipment. Ordnance cleanup and removal could result in crushing and uprooting plants, which would disturb root systems. Disturbance could then provide a niche for invasion by exotic weed species.

The remainder of the 12,000-acre training range outside of the primary ordnance impact area consists of a 4,197-acre Wyoming big sagebrush plant community and 6,253-acres of crested wheatgrass and intermediate wheatgrass seedings, and 1,340 acres of annual grasses and weeds which may be disturbed during a range fire. Both fires and subsequent fire suppression efforts (i.e., fire lines) would result in a loss of plant productivity, an increase in soil erosion, and a loss of wildlife habitat. Loss of the Wyoming big sagebrush plant community would be a significant adverse impact. The short- and long- term effects of fire depend on the type of vegetation and the severity of the fire. Fire severity is determined by weather conditions, fuel moisture, fuel continuity, and other factors. The following is summarized from Wright and Bailey (1982).

> Long-term loss of big sagebrush would result from fires. Some native grasses (e.g., bluebunch wheatgrass) would recover within a few years after a burn. Conversely, other native grasses (e.g., needlegrass and Idaho fescue) may require up to 12 years to recover. Non-native crested wheatgrass recovers rapidly after fire. Fire effects on forbs vary by species and season of the burn. Late summer and fall burns would have less effect than spring or early summer fires.

Reseeding after burns with crested wheatgrass and intermediate wheatgrass or other grasses can be beneficial in terms of controlling wind erosion, and in reducing invasion of cheatgrass. However, once established, these species may competitively preclude native forb and grass establishment.

Historically, training activities at SCR sometimes resulted in fires that spread outside of the EUA. Ordnance with "hot" spotting charges may have contributed to these fires. Additionally, flare use at SCR has been permitted at below 2,000 feet AGL. Approximately five to seven fires per year occur in the EUA; however, since 1979, no fires originating in the EUA have spread to surrounding lands. The reduction of widespread fires is attributable to the implementation of a fire prevention and suppression plan in the late 1970s that included an on-site immediate response capability and a 120-foot-wide firebreak around the perimeter of the EUA.

The risk of wildfire on the Clover Butte range would be substantially lower than current levels at SCR because the Air Force would eliminate or minimize potential ignition sources. No hot spot ordnance would be used at Clover Butte or SCR. Flares would not be released below 2,000 feet AGL, and flare use and ordnance delivery would cease during periods of extreme fire risk due to weather and fuel conditions. Therefore, the only potential ignition source associated with ordnance delivery would be from inert ordnance striking large rocks in or near the primary ordnance impact area, causing sparks to ignite dry fuel. The potential for this event occurring is very low, however, because ordnance would not be used when weather and fuel conditions were conducive to spark-ignited fires.

Maintenance crews trained in fire suppression and fire fighting equipment would be on site during range use. Section 4.3, Safety, details fire safety procedures. No fire breaks would be constructed because of the low fire risk associated with the reduction of ignition sources and

provision of fire suppression capabilities. While the overall risk of fire resulting from training activities is very low, if a fire evaded initial suppression efforts, it is possible that fire could spread through the 12,000-acre range and into ROI Two.

Potential beneficial impacts to vegetation could occur through additional on-site personnel who would provide a lookout for fire in the region. In addition, because the area would be inspected regularly, plants on the noxious weed list could be located and controlled.

### *ROAD AND POWERLINES*

Additional road construction to access emitter sites and no-drop target areas would impact vegetation through direct removal of 1,719 acres of vegetation. Approximately 500 acres of this total includes adverse impacts to sagebrush-grassland communities and the remainder is exotic vegetation and reseeded areas. Construction of the powerline would generally follow existing or proposed roads for this alternative, thus minimizing adverse impacts to vegetation and habitat. However, an additional 15 acres of native vegetation would be adversely impacted by powerline construction activities in areas not adjacent to roads. Nevertheless, the narrow road width would provide little or no hindrance to species travel, minimizing impacts due to habitat fragmentation.

Indirect impacts to vegetation from additional road construction could occur through increased access to an otherwise remote and undeveloped area. Off-road use, as a result of this access, would result in vegetation loss and compaction, increasing potential for human-caused fires. These disturbances could increase the potential for invasion by exotic species along the road corridors and in the off-road areas. However, most of the roads intended for construction or substantial improvement do not lead to recreational destinations. As such, additional use of the areas near these roads would be minimal.

### *NO-DROP TARGET AREAS*

No native vegetation was located at the 640-acre no-drop target area; therefore, none would be adversely impacted due to the construction, maintenance, or use of the targets. About 5 acres of native vegetation, 5 acres of crested wheatgrass, 5 acres of annual grass vegetation, and 5 acres of bare ground would be disturbed through use of the four five-acre (20 acres total) no-drop target areas. Fire hazard would be minimal because no ordnance delivery would occur.

### *EMITTER SITES*

Vegetation on the 20 one-quarter-acre emitter sites would be removed and each area graveled to create a parking area designed to permit safe operation of the units and reduce fire hazard. All vegetation on the 10 one-acre emitter sites would be removed, each area fenced, and a small permanent storage facility would be constructed.

A total of 4.25 acres (approximately 30 percent of the emitters) of native plant communities would be removed through construction of the emitter parking areas. An additional 4.5 acres of crested wheatgrass, 1.25 acres of bare ground, and 5 acres of annual weeds would also be removed.

#### 4.8.1.3 ALTERNATIVE C — GRASMERE

*TRAINING RANGE*

The primary ordnance impact area would impact approximately 300 acres of crested wheatgrass within the Grasmere site. Twelve acres of native sagebrush vegetation would be affected through road construction, and an additional 3 acres impacted by construction of the maintenance complex.

Outside the primary ordnance impact area, Wyoming big sagebrush (4,611 acres), crested wheatgrass (2,760 acres), low sagebrush (1,942 acres), native grasslands, sedge/rush meadow, tall shrub communities (1,056 acres), and annual grasslands (233 acres) potentially would be disturbed during a fire. Potential effects of fire and fire suppression would be similar to effects discussed for Alternative B.

*ROADS AND POWERLINES*

Additional road construction to access emitter sites and no-drop target areas would impact vegetation through direct removal of 1,846 acres of vegetation. Approximately 511 acres of this total includes adverse impacts to sagebrush-grassland communities. No construction of a powerline would occur for the Grasmere Alternative. Indirect impacts would be the same as discussed for Alternative B.

*NO-DROP TARGET AREAS*

Impacts to vegetation on no-drop target areas would be similar to those described for Alternative B. No impacts to native vegetation would occur. Of the four 5-acre areas, 10 acres of crested wheatgrass, 5 acres of annual grasslands, and 5 acres of bare ground would be disturbed.

*EMITTER SITES*

Impacts to emitter sites would be the same as described for Alternative B.

#### 4.8.1.4 ALTERNATIVE D — JUNIPER BUTTE

Construction within and use of the primary ordnance impact area would adversely impact approximately 300 acres: 95 acres of intermediate wheatgrass, 169 acres of rabbitbrush, and the rest annual grasslands. No native vegetation would be lost through construction of the maintenance complex, powerlines or roads. Impacts from the loss of seeded grasslands and

annual grasslands would be similar to impacts of those vegetation types described for Alternative B.

Outside the primary ordnance impact area the vegetation consists of rabbitbrush (1,706 acres) and seeded non-native grasses (9,067 acres), and bare ground (465 acres) burned in 1996. Although rabbitbrush, some sagebrush, and other native grasses and forbs have reestablished after the fire, this area is largely dominated by seeded intermediate wheatgrass. Impacts to these vegetation types would be similar to impacts described for Alternative B.

#### *ROADS AND POWERLINE*

Additional road construction to access emitter sites and no-drop target areas would impact vegetation through direct removal of 1,843 acres of vegetation. Approximately 514 acres of this total includes adverse impacts to sagebrush-grassland communities. An additional 18 acres of native vegetation would still be adversely impacted by the placement of the powerline that would parallel the proposed new road. The effects of vegetation disturbance would be similar to effects described for Alternative B.

#### *NO-DROP TARGET AREAS*

Impacts to vegetation on no-drop target areas would be similar to those described for Alternative B. No impacts to native vegetation would occur on the 640-acre area. Of the four no-drop target areas, 5 acres of native vegetation, 10 acres of crested wheatgrass, and 5 acres of bare ground would be disturbed.

#### *EMITTER SITES*

Impacts to emitter sites would be the same as described for Alternative B.

### 4.8.2 Wetlands

#### WETLAND HABITAT

Few wetlands are found within the high desert ecosystem of ROI Two and Three, but where wetlands occur, they provide breeding, rearing, and feeding grounds; thermal shelter; and hiding cover for many species of animals. Reduction of these wetlands could cause a reduction in species dependent on them.

Existing wetlands within the alternative training range sites that have not already been heavily impacted by livestock or that have excluded livestock altogether are the most significant. Many reservoirs used by livestock have already been adversely impacted and now provide minimal wetland habitat.

Perennial rivers and streams such as the Bruneau and Jarbidge rivers and Sheep and Wickahoney (which occurs within Alternative C) creeks are important because they provide

constant water in an arid environment. They provide year-round habitat for fish, amphibians, reptiles, and a number of mammals; nesting substrate and foraging area for neotropical migrant birds; and are used as a stop-over habitat for migrating waterbirds. Permanent systems in the area provide habitat for such special status species as redband trout, white-faced ibis, great egret, and spotted bat. Late-lying pools in the intermittent drainages provide water to wildlife. Padgett et al. (1987) states that riparian areas in the Intermountain region constitute a small portion of the total land area; however, they offer significant habitat to a disproportionally large number of wildlife species. Reservoirs are also an important source of wetland habitat and may provide year-round wildlife habitat.

### IMPACTS

Impacts to jurisdictional wetlands, riparian areas, and "waters of the U.S." were assessed by using GIS to overlay wetlands on proposed target areas, emitters, roads, and other proposed locations for ground disturbance activities for each alternative.

#### 4.8.2.1 ALTERNATIVE A — NO-ACTION

Under Alternative A, there would be no change in current baseline conditions. No new construction or training operation would occur; therefore, there would be no new proposal-related impacts to wetlands.

#### 4.8.2.2 ALTERNATIVE B — CLOVER BUTTE

##### *TRAINING RANGE*

Two small depressional, jurisdictional wetlands (1.2 acres) occur within the Clover Butte training range near the periphery of the 12,000-acre range. No wetlands are present in the primary ordnance impact area; therefore, no direct impacts to wetlands occur at Alternative B. Potential impacts from wildfire would not be significant. Wildfires are unlikely due to restrictions on ignition sources and effects would be temporary, as most wetland vegetation would recover by the end of the following growing season.

There would be a negligible potential for the two wetlands and the waters of the U.S. on site to be indirectly impacted from erosion and dust resulting from fires and ordnance impacts. The chance of erosion and downstream sediment transport on disturbed or burned areas would be minimal on this site, given the flat or gently sloping topography. Fuel would not be handled near these wetlands. Therefore, no significant impacts would occur.

In response to public and agency concerns that increased human presence could increase fire risk, the Air Force proposes to develop a less than one-acre above-ground reservoir within a corner of the Clover Butte 12,000-acre training range. The Air Force will consult with the USACE and resource management agencies to minimize impacts from the above-ground reservoir. Siting and construction of the above-ground reservoir would involve all best

management practices to avoid any existing water resources, unsuitable soil types, critical habitat, or rare plant occurrences where practicable. Surveys to assist siting decisions would be conducted at the appropriate time and season after consultation with resource management agencies.

This water source would be linked to existing pipelines and be available for ranching operations. At all times, the proposed reservoir would have 50,000 gallons of water reserved to support fire suppression. Within the proposed withdrawal are the water from the joint-use reservoir would be accessible from both outside and inside the perimeter fence.

### *NO-DROP TARGET AREAS*

There would be no direct wetland impacts associated with use of the no-drop target areas. The closest no-drop target area to a wetland would be 1,500 feet, with other no-drop target areas being over 2,500 feet. There would be negligible potential for indirect wetland effects because of the distance between no-drop targets and wetlands and limited ground disturbance.

### *EMITTER SITES*

There would be no direct wetland impacts associated with the emitter sites. The potential for indirect effects such as sedimentation on wetlands would be negligible because all emitters are over 1,000 feet from wetlands and the emitter area disturbed would be small.

### *ROADS*

Significant direct impacts to jurisdictional waters of the U.S. could occur at six sites due to construction of new roads. To provide mitigation, culverts would be placed at each site. This allows water flow to continue and lessens indirect downstream impacts due to water retention, erosion, and sedimentation. It will also maintain the functions and values of each drainage.

Construction of the replacement bridge at Clover Crossing has the potential for a short-term increase in sedimentation in the stream. In addition, the wetlands area may be decreased by relocating the diversion dam a few yards upstream.

One perennial and 42 intermittent stream crossings may have impacts due to upgrading. To prevent significant impacts during upgrading and new road construction, measures such as sediment catchments, dust control, and petroleum spill prevention will be used. In addition, long-term indirect impacts due to erosion and sediment transport would be reduced by implementing best management practices.

### 4.8.2.3 ALTERNATIVE C — GRASMERE

#### *TRAINING RANGE*

About 31 acres of jurisdictional wetlands, riparian streams, and springs occur within the Grasmere training range but outside of the 300-acre primary ordnance impact area. Some or all of these wetlands may be disturbed by ordnance impact over time because they are near (within 2,500 feet) the primary ordnance impact area. These impacts could include temporary removal of vegetation or changes in stream flow. In addition, 2.4 miles, or less than 1/2 an acre, of waters of the U.S. would be directly impacted by the primary ordnance impact area. Direct impacts to these areas could include erosion, removal of vegetation, and changes in stream flow. Impacts to these jurisdictional wetlands could potentially cause erosion, sedimentation, and changes in stream flow. However, due to the limited wetland values of these areas, these impacts are considered not significant. Potential for increased sedimentation or chemical contamination to downstream wetlands is also minimal due to the flat topography of the primary ordnance impact area. Although not significant, any impacts to jurisdictional wetlands are regulated by the USACE under Section 404 of the CWA. Additional consultation would be conducted with the USACE during the bridge design process. Mitigation for these impacts may include reestablishing drainage grades to assure water flow.

The jurisdictional wetlands and the waters of the U.S. may be indirectly impacted from increased erosion, potential sedimentation, and dust resulting from fires and ordnance impacts. The chance of erosion and downstream sediment transport on disturbed or burned areas is relatively high on this site, given the steep topography and location of some wetlands near the primary ordnance impact area. Indirect impacts such as erosion and downstream sediment transport from disturbed or burned areas would be controlled with erosion control measures developed in cooperation with agency biologists to protect species of special concern for Wickahoney Creek.

#### *NO-DROP TARGET AREAS*

There would be no direct impacts to wetlands associated with establishment or use of the no-drop target areas. The minimum distance between wetlands and a no-drop target area is 2,500 feet, with other no-drop target areas being 4,000 feet or more to the nearest wetland. There is an insignificant potential for indirect wetland effects based on proximity of wetlands to the no-drop target areas.

#### *EMITTER SITES*

There would be no direct impacts to wetlands associated with establishment or use of the emitter sites because emitters would be over 1,000 feet from wetlands.

*ROADS*

Impacts would be similar to those described for Alternative B; however, roads crossing an additional eight intermittent and perennial streams would be upgraded. This reconstruction may eliminate some sedimentation into wetlands and waters of the U.S. by enhancing road drainage.

#### 4.8.2.4 ALTERNATIVE D — JUNIPER BUTTE

*TRAINING RANGE*

About 2.4 miles (less than 1/2 acre) of jurisdictional waters of the U.S. located within the primary ordnance impact area would be directly impacted under this alternative. Direct impacts to these intermittent streams could be erosion, removal of vegetation, and changes in stream flow due to ordnance use. Impacts to these jurisdictional waters of the U.S. could potentially cause erosion, sedimentation, and changes in stream flow. However, due to the limited wetland values of these sites, these impacts are not significant. Potential for increased sedimentation or chemical contamination to downstream wetlands is also minimal due to the flat topography of the primary ordnance impact area. Although not significant, any impacts to jurisdictional wetlands are regulated by the USACE under Section 404 of the CWA. Additional consultation would be conducted with the USACE during the bridge design process. Mitigation may include reestablishing drainage grades damaged by ordnance to assure water flow. The less than one-acre above-ground reservoir described for Clover Butte (section 4.8.2.2) would also apply to Juniper Butte.

In addition, four non-jurisdictional wetlands may be directly impacted. These are not regulated by the USACE under Section 404 of the CWA.

There would be a potential for the stream segments designated as waters of the U.S. to also be indirectly impacted from increased frequency of fires, erosion, and sedimentation. Given the generally flat or gently sloping topography, however, the chance of erosion and downstream sediment transport on disturbed or burned areas is minimal on this site.

*NO-DROP TARGET AREAS*

There would be no direct wetland impacts associated with establishment of use of the no-drop target areas. The minimum distance between wetlands and a no-drop target area is 500 feet, with other no-drop target areas being 2,500 to 4,000 feet or more to the nearest wetland. There would be a slight potential for indirect effects to wetlands that would be 500 feet from the no-drop target areas.

*EMITTER SITES*

There would be no direct impacts to wetlands associated with establishment or use of the emitter sites because the shortest distance from wetlands to emitter sites would be over 1,000 feet.

*ROADS*

Impacts would be similar to those described for Alternative B. Fifty-one crossings would be upgraded on intermittent and perennial streams under this alternative. Reconstruction may eliminate some sedimentation into wetland and waters of the U.S. by enhancing road drainage. Intermittent and perennial stream crossings of existing roads would be similar as for the other alternatives (i.e., 94).

## 4.8.3 Rare Plants

In general, the direct impacts consist of those resulting directly from construction, maintenance, and use of the target areas, especially the primary ordnance impact areas. Indirect impacts could result from fires associated with ordnance delivery. Although the potential for such fires is low due to operational restrictions and fire suppression measures, a fire would destroy some vegetation, including any rare plant populations present. Modification in the plant communities subsequent to a fire would also affect the long-term viability of nearby rare plant populations. For this analysis, it is assumed that all vegetation within the primary ordnance impact areas would be altered significantly or eliminated.

The proposed emitter sites, roads, and no-drop target areas for all alternatives neither contain or adjoin any rare plant populations. As such, none of these components would affect rare plants. Due to the lack of impacts, these components receive no further attention.

### 4.8.3.1 ALTERNATIVE A — NO-ACTION

Under Alternative A, there would be no change in baseline conditions. No new construction or type of training operation would occur. The potential risk of fire and disturbance from ordnance would remain the same as current conditions. Therefore, there would be no additional proposal-related impacts to rare plant populations.

### 4.8.3.2 ALTERNATIVE B — CLOVER BUTTE

There were no rare plant occurrences located on the 12,000-acre Clover Butte site. Therefore, the Clover Butte Alternative would not have any impact on rare plant populations .

### 4.8.3.3 ALTERNATIVE C — GRASMERE

Alternative C contains five populations of three rare plant species. Two of these species, inch-high lupine (*Lupinus uncialis*) and dimeresia (*Dimeresia howellii*), are listed as S2 (imperiled due to rarity) by the Idaho Data Conservation Center (ICDC). Dwarf skullcap (*Scutellaria nana* var.

*nana*) is listed by ICDC as a monitor species. All three are listed as Sensitive by the BLM. No populations occur within or adjacent to the primary ordnance impact area. Any impact occurring to the sites would be indirect, (e.g., fugitive dust). However, the populations occur in a habitat of low sagebrush and rhyolite cinders. This specific habitat would not burn, reducing any potential indirect impact due to fire. A management plan or conservation agreement would be required for protection of all three species. This may have a positive impact on the rare plant populations by increasing the level of protection and management available.

#### 4.8.3.4 ALTERNATIVE D — JUNIPER BUTTE

Slick spot peppergrass (*Lepidium papilliferum*) was located within the primary ordnance impact area of the Juniper Butte Alternative. This population occurs within a 75-acre area within the 12,000-acre training range site. Approximately 7.3 acres of the species' habitat occur within the primary ordnance impact area, and the plants in that area would potentially be eliminated by the construction, maintenance, and use of the primary ordnance impact area. This species is considered vulnerable to species extinction because of rarity or other factors. The ICDC and BLM botanists have expressed concern over the species because of the recurring fires along the SRP (personal communications, Bob Moseley, Ann DeBolt 1996). Although this species may continue to occur after fire, the first fire often marks the beginning of the decline of the population (Moseley 1994). Siltation or a chemical change of the slick spots resulting from fires and encroachment of exotic annual species following fire can result in an immediate decline in the number of individuals at the occurrence. Also, the conversion of sagebrush community to seeded non-native grasslands or annual grasslands provides for more fine fuels to enhance the spread and frequency of subsequent fires.

Cattle grazing is also an impact on this species. Disturbance occurs through trampling of the slick spots, especially during the spring months when the sites are wet and the soil is easily compacted. Cattle are often attracted to the slick spots, which can retain standing water. Disturbance allows exotic annuals to encroach and causes a physical change in the slick spot.

There are only 61 occurrences, or populations of slick spot peppergrass known in Idaho. Of these, only six occurrences, including the Juniper Butte population, are found in Owyhee County, all east of the Bruneau-Jarbidge Canyon. In addition, genetic studies by the University of New Mexico indicate slick spot peppergrass found in this area is a unique genotype and also represents the southern-most end of the species range (personal communication, Lowery 1997). Therefore, a loss of the entire Juniper Butte occurrence would be an adverse impact to the regional population of this species. However, only 7.3 acres would be affected by the primary ordnance impact area. Plants outside of this area have a low risk of being impacted. In addition, the presence of fire suppression capabilities at the range may reduce the fire threat to this population. Other mitigation measures, such as fencing the known significant occurrences within the alternative, would protect the sites from grazing impacts.

### 4.8.4 Wildlife Habitat

The potential for impacts to wildlife species is directly tied to the potential impacts to that species' habitat. In most cases, the sagebrush-steppe ecosystem provides an array of wildlife habitats. Important wildlife habitats in the ecosystem are characterized by vegetation communities such as shrub-steppe, grasslands, wetland and riparian areas, isolated trees and woodlands, and agricultural fields. Lithic features, such as cliffs, rocky outcrops, slide rock, and talus slopes, also provide important habitat for many wildlife species. In most cases, species that are classified as sensitive by different agencies and are a concern to the public, are so classified because habitat for those species has declined.

Diverse shrub-steppe vegetation communities are usually dominated by big sagebrush, low sagebrush, antelope bitterbrush, rabbitbrush and shadscale. Wildlife species' abundance and diversity in shrub-steppe habitats are high. Any impacts to these native habitats would have corresponding impacts to the species dependent upon those habitats.

Conversely, grassland vegetation communities are dominated by non-native intermediate wheatgrass, crested wheatgrass, cheatgrass, tumble mustard, or peppergrass. Because the majority of wildlife species are adapted to the shrub-steppe communities that once dominated the region, non-native habitats provide little cover and reduce species diversity. Cheatgrass is an exotic annual that outcompetes native grasses following disturbance such as fire and only provides temporary, low-quality forage. It is usually the first to sprout, seed, and senesce. Cheatgrass contributes enormously to fuel loads and greatly increases the potential for catastrophic wildfires.

Wetlands include ephemeral pools, seeps, springs, marshes, reservoirs, and stock ponds. Riparian habitats are characterized by intermittent or perennial water courses and generally are composed of a vegetation community dominated by willows, currant, wild rose, rushes, and sedge.

Bare ground is area that has been disturbed, often by fire, and does not have a plant community reestablished.

Wildlife habitat within ROI One potentially would be impacted directly and indirectly. Table 4.8-2 compares the potential direct and indirect impacts to habitat types among the alternatives. Direct impacts, such as the elimination or degradation of wildlife habitat due to ground disturbance, would occur in the 300-acre primary ordnance impact area, one-quarter-acre and one-acre emitter sites, five-acre no-drop target areas, maintenance complex, and along road and powerline corridors. Direct impacts to native sagebrush-grasslands range from 527 acres for Alternative C to 541 acres for Alternative D. Other direct impacts that may occur in the 12,000-acre training range include the infrequent or short-term disturbance of wildlife habitat due to placement of targets in the 640-acre no-drop target area, ordnance impacts outside the primary ordnance impact area (due to occasional continued movement of ordnance after initial impact), and ordnance removal by Air Force personnel. Indirect impacts to wildlife habitat such as the

encroachment of invasive, non-native plants may occur along the perimeters of directly impacted areas.

For wildlife, the primary contrast among the alternative training range sites lies in the diversity and quality of wildlife habitat at each site. The proposed Grasmere 12,000-acre training range exhibits the greatest variety of wildlife habitats among the alternatives (Table 4.8-2; see Figure 3.8-4 for illustration of vegetation within the Grasmere training range). Ecotones, or edges of biological communities, are abundant within Grasmere, particularly between the low sagebrush communities on top of the Grasmere escarpment and the big sagebrush community below. The escarpment also is dissected by numerous canyons that create additional ecotones. These zones, where different types of biological communities meet, often support a greater diversity of wildlife species. The Clover Butte 12,000-acre training range contains approximately the same amount of big sagebrush habitat as Grasmere and potentially could support a variety of shrub-obligate species that would not likely occur at Juniper Butte (Table 4.8-2; see Figure 3.8-3 for illustration of vegetation within the Clover Butte training range). The Juniper Butte 12,000-acre training range is almost entirely covered by non-native grasses and rabbitbrush (Table 4.8-2; see Figure 3.8-5 for illustration of vegetation within the Juniper Butte training range). Although rabbitbrush is a native shrub, it frequently colonizes disturbed areas along with exotic weedy species and provides marginal wildlife habitat. Nevertheless, the lithic features and juniper stands present within and along Juniper Draw and the adjacent East Fork of the Bruneau Canyon provide wildlife habitats and ecotones not present at Clover Butte. Although direct impacts to native sagebrush steppe grasslands are comparable among the alternatives, the potential indirect impacts within the 12,000-acre training ranges would be greatest at Grasmere because the greater diversity of habitats at the site supports the widest variety of wildlife species, including some sensitive species (such as bighorn sheep) not likely to occur at either Clover Butte or Juniper Butte.

Ecosystem management of Department of Defense (DoD) lands and waters is a goal-oriented approach to maintain and improve the sustainability of biological diversity (memo from Sherri Goodman, Deputy Under Secretary of Defense, 08 Aug 1994). Biodiversity, in the simplest term, is "the variety of life and its processes" (Leslie et al. 1996). In recent times, many natural resource experts have become concerned by evidence of the increasing rate of losses of biodiversity (Leslie et al. 1996). According to Leslie et al. (1996), "the consequences of biodiversity losses are difficult to measure or forecast accurately, but it is certain that continuing losses erode natural resource values and ultimately compromise ecosystem integrity and the sustainability of human enterprise." Management activities on federal and military lands must address the issue of potential consequences of actions on biodiversity. A pattern in natural communities indicative of a loss of biodiversity is habitat fragmentation.

Habitat fragmentation results from the conversion of large expanses of similar-functioning ecosystems into an environment of small patches of remnant habitat largely separated by areas of different and, therefore, unusable habitat. The habitat is unusable for flora and fauna that had previously occupied that same area. If the conversion is of a permanent time frame, then

**Table 4.8-2 Comparison of Direct and Indirect Impacts to Habitat Types (in acres) among the Alternatives**

| Habitat Types | ALTERNATIVE | | | | | |
|---|---|---|---|---|---|---|
| | *Clover Butte* | | *Grasmere* | | *Juniper Butte* | |
| | **Direct Totals[1]** | **Indirect Totals[2]** | **Direct Totals[1]** | **Indirect Totals[2]** | **Direct Totals[1]** | **Indirect Totals[2]** |
| Native Sagebrush Steppe Grasslands | 537 | 4172 | 548 | 7233 | 722 | 1706* |
| Seeded and Non-Native Species | 934 | 7859 | 960 | 3930 | 855 | 9648 |
| Riparian / Wetlands | 0.3 mile intermittent streambeds | 25 miles intermittent streambeds/ 1 acre wetlands | 2.4 miles intermittent streambeds/ 0.1 acre wetlands | 46 miles intermittent streambeds/ 33 acres wetlands | 2.4 miles intermittent streambeds | 61 miles intermittent streambeds/ 1 acre wetlands |
| Lithic Features | 0 | small draw with 6-foot-high rock wall | 0 | slide rock, cliffs, talus slopes, rocky outcrops, and boulder piles on canyon slopes and escarpment | 0 | rocky outcrops and 6-foot-high basalt strips on margins and eastern slope along Juniper Draw and adjacent E.Fk Bruneau Canyon |
| Woodlands | 0 | 0 | 1 acre willows/ currant/rose | 51 acres willows/currant /rose / scattered junipers and aspen in canyons | 0 | various stands (250 feet x 100 feet) of junipers and stand of aspen in Juniper Draw |
| Bare Ground | 61 | 0 | 61 | 0 | 61 | 465 |

Note: 1. Direct impact totals comprise wildlife habitat acreage in the primary ordnance impact area, 0.25 and 1.0-acre emitter sites, 5.0-acre no-drop target areas, maintenance complex, and along roads and powerlines.

2. Indirect impact totals comprise wildlife habitat acreage in the 640-acre no-drop target area and 12,000-acre training range.

*denotes rabbitbrush as dominant native seral shrub component.

habitat obligate species will suffer population declines due to density dependent factors (Knick and Rotenberry 1995). The proposed action occurs in an area of already high habitat alteration from historic conditions. The shrub-steppe ecosystem of the Snake River Plain has shifted to a landscape of remnant patchy sagebrush stands surrounded by large expanses of annual grasslands. Shrub obligate species such as sage grouse, Brewer's sparrow, and sage thrashers are decreasing in southwestern Idaho as a result of this habitat fragmentation. For this proposed action, Alternatives B and D would have lower direct and indirect effects on biodiversity and habitat fragmentation on the current landscape than Alternative C.

## 4.8.5 Protected and Sensitive Wildlife Species

There are five endangered, two threatened, two candidate, and 60 BLM Sensitive species that may occur within ROI Three. Nineteen of the federal candidate or BLM Sensitive species are also state Species of Special Concern. Federally listed and candidate species, including Bruneau hot springsnail, Idaho springsnail, Bliss Rapids snail, Snake River physa, Utah valvata, American peregrine falcon, bald eagle, bull trout, and spotted frog, are discussed in detail in the Biological Assessment; these discussions are summarized in this section. Potential impacts to protected and sensitive species may include direct mortality, habitat loss or degradation, change in activity patterns, and reduced reproductive success.

### 4.8.5.1 ALTERNATIVE A — NO-ACTION

In general, potential impact sources to protected and sensitive species under the No-Action Alternative would include noise, human disturbance, and habitat modification due to ground disturbance and wildfire. Habitat modification would result from continued use and maintenance of existing roads and the SCR, and from wildfires. Most noise would be associated with continued overflights. In addition, noise from ground activities such as road and emitter use, and use of the SCR target range, would continue. Human disturbance includes disruption of wildlife foraging, breeding, resting, or movements caused by human presence or activities.

#### *NOISE*

The quantitative analysis of noise impacts to wildlife must be based on a number of factors. First, the location and relative abundance of the wildlife resource must be known, as well as the location, level, and relative frequency of the noise source. The analysis must also include information about the range of responses to noise by a particular wildlife species under similar conditions, and previous exposure of a particular individual or population to noise. However, if the data used in the analysis are unreliable or incomplete, then the conclusions reached through the analysis may lack accuracy or precision to be reasonably characteristic or representative of actual impacts. The precise location and abundance of wildlife populations are difficult to determine, particularly for mobile species in remote areas such as Owyhee County, and estimates are often based on spatially or temporally limited surveys.

Investigations of noise effects on wildlife species may not be available or may have been conducted under highly dissimilar conditions. As a result of these data limitations, noise impact analyses are necessarily qualitative in nature.

In most cases, precise assessments of wildlife occurrences within ROI Three, Two, and One are not possible. Using the most current and best available data from field surveys conducted by the Air Force, BLM, IDFG, and Nevada Department of Wildlife (NDOW), general descriptions of wildlife relative abundance and habitat quality can be made for most species. In general, such descriptions are of comparable quality to the information available in the wildlife noise effects literature. In addition, the precision of estimates of daily occurrences of sorties over specific locations in a MOA is low. Noise effects on wildlife species present or potentially present in the ROIs are, therefore, evaluated qualitatively based on related situations in the wildlife literature.

The effects of noise on most resources is evaluated based on the $L_{dnmr}$ (section 4.2, Noise). $L_{dnmr}$ is a weighted measure of single event noise levels that are averaged for one month. Potential startle or alarm response associated with short-term events such as aircraft overflights is a primary concern related to the effects of noise on wildlife. In general, startle or panic responses by many wildlife species begin to appear at noise exposures greater than 95 dB(A) (Eleventh Air Force 1992). Therefore, many wildlife managers feel that the noise metric most applicable to impact analysis for wildlife is the SEL (see Appendix K for a detailed explanation of noise measures). SEL is a composite measure that represents both the total acoustic energy associated with a noise event and the total duration of the event. In calculating SEL, all of the acoustic energy that occurs during the event, which may have a duration of 20 to 30 seconds, is normalized into one second. Therefore, SELs normally reflect a sound level that is 0 to 15 dB(A) higher than the maximum sound level for that event. The use of a single event measure such as SEL also enables a comparison of noise exposures associated with the alternatives with those evaluated in the scientific literature of noise effects on wildlife. For purposes of this analysis, high-decibel SEL events are defined as occurring within the range between 85 dB(A), when observable, behavioral responses in wildlife generally begin to appear (Manci et al. 1988), and 116 dB(A), the upper limit of noise generated by subsonic overflights of aircraft currently or proposed to be used in ROI Three.

The SEL associated with flights at various altitude blocks can be measured for particular aircraft (Table 4.8-3). These SEL values are those that would be experienced by a receptor directly below (or at an equivalent slant range to) a specific aircraft at a specific speed and altitude. The range of SEL values for each altitude block represents the boundaries of the altitude block rather than a range of values for any specific altitude.

**Table 4.8-3. Aircraft Sound Exposure Level (SEL) by Distance from Receptor**

| | ALTITUDES/SLANT RANGES | | | |
|---|---|---|---|---|
| | *500 - 1000 feet* | *1001 - 2000 feet* | *2001 - 5000 feet* | *5001 - 10,000 feet* |
| *Aircraft* | *Range of SELs for Indicated Altitudes/Slant Ranges* | | | |
| A-10 | 95 - 89 | 89 - 82 | 82 - 72 | 72 - 63 |
| B-1 | 112 - 107 | 107 - 101 | 101 - 92 | 92 - 82 |
| F-15 | 112 - 107 | 107 - 101 | 101 - 90 | 90 - 80 |
| F-16 | 103 - 98 | 98 - 91 | 91 - 81 | 81 - 70 |
| C-130 | 96 - 91 | 91 - 85 | 85 - 77 | 77 - 69 |

Under the No-Action Alternative, noise conditions with potential to impact protected and sensitive species would be limited to the continued exposure to aircraft overflights. The number and noise levels of annual sorties under the No-Action Alternative would be the same as compared to the baseline. Therefore, no additional proposal-related impacts are associated with Alternative A.

Under the No-Action Alternative, the potential for air-to-air operations resulting in supersonic events in ROI Three would be 537 events annually (see Noise, section 4.2). The number of booms per day would range from 0.1 boom per day in the Paradise MOA and at SCR to 1.0 in the Owyhee MOA. (No supersonic events would be conducted in the Paradise MOA; however, such events in the adjacent Owyhee MOA could cause sonic booms to be audible under the Paradise MOA). No change in potential impacts to protected and sensitive species from supersonic events would likely occur under the No-Action Alternative.

***GROUND DISTURBANCE***

The use of existing roads, emitters, and SCR would continue in previously disturbed habitat. Potential impacts to protected and sensitive species would be reduced use of habitat near roads or the existing SCR target area. There would be no additional habitat disturbances as a result of the No-Action Alternative; therefore, no additional impacts to protected and sensitive species would occur.

***WILDFIRES***

Fires caused by Air Force activities may result in direct mortality, loss of habitat, or reduced quality of habitat for protected and sensitive species. Potential for fire as a result of ordnance delivery would decrease under the No-Action Alternative because hot spot ordnance would no longer be used at SCR. Wildfire potential from other sources (e.g., from vehicles or cigarettes)

would remain at current levels. Impacts to protected and sensitive species from fires would be low under the No-Action Alternative because the potential for fire would be low.

*HUMAN DISTURBANCE*

No increase in human activity within the general region of influence would occur as a result of the No-Action Alternative. Continued impacts would include disturbance of sensitive wildlife species during foraging or breeding and reduced use of habitats near areas of human activity (e.g., roads, target areas). No additional impacts to protected and sensitive species would occur.

### 4.8.5.2 ALTERNATIVE B — CLOVER BUTTE

In general, potential impact sources to protected and sensitive species under Alternative B would be similar to those discussed under Alternative A. These sources would include noise, habitat modification from ground disturbance, wildfire, and human disturbance. Assessment of direct impacts to habitat, potential habitat, or wildlife species within the 12,000-acre training range is restricted to the 300-acre primary ordnance impact area and approximately 100 additional acres associated with road construction and maintenance buildings. Indirect impacts to habitat (refer to Wildlife Habitat, section 4.8.4) and wildlife species may occur beyond the perimeter of the primary ordnance impact area and roads from other activities associated with the proposed action. These indirect impacts are related to aircraft and ground equipment noise, vehicle movements, human presence, lights, and fugitive dust. Although ordnance has a low probability of skipping out of the primary impact area, it may facilitate habitat degradation or destruction within the training range through impact or from subsequent recovery operations. Outside of the training range, direct loss of habitat from construction would occur at emitter, new road, and powerline sites. Therefore, overall potential impacts would be greater under Alternative B when compared to the No-Action Alternative.

Potential impacts from each disturbance type for Alternative B are summarized under each species discussion below. Potential impacts from individual range components (i.e., training range, no-drop targets, emitter sites, roads, or powerlines) for each alternative are discussed in detail under the species group for whom impacts are likely.

There would be no ground disturbance or increase in human activity in ROI Three (including the proposed airspace additions) or ROI Two. Ground disturbance would be caused by the construction and use of the primary ordnance impact area, other target areas, emitter sites, powerline, and roads. Human disturbance would increase in the vicinity of the 12,000-acre training range area, no-drop target areas, emitter sites, new and improved roads, and powerline.

In general, the impacts of wildfire would be similar to those of ground disturbance but would be less likely to occur because of fire prevention measures intrinsic to the proposed enhanced

training including the use of cold-spot ordnance, limits on the use of flares and ordnance during periods of extreme fire risk, and restrictions on smoking and vehicle use during development and operation of the range.

*NOISE*

Sources of noise impacts for Alternative B include aircraft overflights and power generators at emitter sites, and at the 12,000-acre training range and no-drop target areas. Noise from aircraft overflights would be the primary impact source present within ROI Three. Because the proportion of night (after 10 P.M.) to day (after 10 A.M.) sortie-operations would not change from baseline under Alternative B, day-night changes in sortie-operations are not analyzed separately. However, the number of night sortie-operations in the proposed Jarbidge MOA would increase by approximately one per week under Alternative B. Nocturnal animals tend to be more acoustically-oriented (Manci et al. 1988), and may be more sensitive to overflights at night.

In ROI Two and most areas in ROI Three under Alternative B, there would be a decrease in the estimated cumulative time of low-altitude sortie-operations compared to the baseline/No-Action Alternative. In most areas, reductions in low-level sortie-operations are attributable to the proposed airspace expansion, and changes in tactics that require higher altitude approaches to targets and maneuvering. The estimated cumulative time of annual sortie operations in the altitude block between 500 and 1,000 feet AGL would decrease by 8 percent over SCR under Alternative B compared to the No-Action Alternative, and would remain approximately the same in most of the Owyhee MOA (Table 4.8-4). Therefore, on average, potential exposure to SELs ranging from 89 to 116 dB(A) (refer to Table 4.8.3), would similarly decrease or remain the same as baseline in these areas. Estimated cumulative use of altitudes between 1,000 and 10,000 feet AGL would decrease by 40 percent in most of the Owyhee MOA, increase by 3 to 7 percent in the proposed Jarbidge MOA, and remain the same over SCR. High-altitude sortie-operations (over 10,000 feet AGL) would increase by about 40 percent in most of the Owyhee MOA and by 9 percent over SCR. Therefore, the potential for exposure to high SELs in most areas would decrease or remain the same as the cumulative time for sortie-operations shift from low to high altitudes.

Under Alternative B, the existing Paradise MOA would be split into Paradise East and West MOAs, and the Paradise East MOA would be expanded to the east in Nevada. The sortie-operations that would be flown in the Paradise MOAs under Alternative B would be flown generally above 10,000 feet AGL, as are all sorties in the existing Paradise MOA under baseline conditions. Because of the high altitude of overflights, no change in the potential exposure to SELs would occur on the ground in the proposed expansion area of Paradise East MOA. In addition, the expansion area overlaps an existing MTR.

**Table 4.8-4. Change in Percentage of Estimated Cumulative Time of Sortie Operations per Altitude Block by Airspace Unit**

| | AIRSPACE UNIT | | |
|---|---|---|---|
| | *SCR (R-3202A)* | *Owyhee MOA* | *Proposed Jarbidge MOA* |
| *Altitude Block (AGL)* | *Change in Percentage of Cumulative Time of Sortie Operations from Baseline to Alternative B* | | |
| 500 - 1,000 feet | - 8% | - 1% | + 5% |
| 1,000 - 2,000 feet | + 0% | - 14% | + 7% |
| 2,000 - 5,000 feet | - 2% | - 13% | + 3% |
| 5,000 - 10,000 feet | + 1% | - 12% | - 2% |
| Above 10,000 feet | + 9% | + 40% | - 13% |

Two areas in which estimated cumulative time of sortie-operations would increase would be over the Owyhee/Jarbidge north airspace expansion area and over the training range. Currently, aircraft from Mountain Home AFB and Gowen Field (IDANG) transit through the proposed airspace expansion at altitudes from 500 to 10,500 feet AGL. Inclusion of this area in the Owyhee and Jarbidge MOAs, under Alternative B, would alter use of the area from direct transit flights to maneuver operations, and would result in a slightly increased estimated cumulative use of lower altitudes and thus increased potential for exposure to high SELs.

About 3,984 sortie-operations would be flown each year over the training range and would result in approximately 20 overflights daily. Currently, this area is part of the Range Support MOAs which receive 7,737 sorties annually. Although the total number of sortie-operations in the proposed airspace associated with the training range would be lower under Alternative B, the area underlying the current MOA is 1.1 million acres, while the area underlying the proposed airspace would be 50,000 acres. Estimated cumulative time of sortie-operations in ROI One and adjacent areas in the Jarbidge MOA would increase compared to baseline/No-Action conditions by 7 percent for altitudes from 1,000 to 2,000 feet AGL, and by 3 percent for altitudes between 2,000 and 10,000 feet AGL. Estimated cumulative time of sortie-operations for altitudes between 500 and 1,000 feet AGL would increase by 5 percent compared to baseline conditions, and use of altitudes above 10,000 feet would decrease by approximately 13 percent. Alternative B, therefore, would result in an increased frequency of overflights in and near ROI One and a slightly increased potential for exposure to higher SELs.

Under Alternative B, the potential for air-to-air operations resulting in supersonic events in ROI Three would increase from 537 annually under baseline to 593 for Alternative B (refer to Noise, section 4.2). Supersonic events would only occur at 10,000 feet AGL or higher. Above SCR, the

potential for supersonic events would increase from 235 under baseline to 267 annually under Alternative B (refer to Noise, section 4.2). This would result in an increase in the number of sonic booms heard on the ground from one boom in ten days under baseline, to one boom every two or three days under Alternative B. Similarly, in the Jarbidge MOA, the number of sonic booms heard on the ground would increase from one every two to three days under baseline, to one every one to two days.

At emitter sites that are being used, a diesel-powered electric generator would run 6 to 8 hours per day, 5 days per week, and sometimes on weekends. The noise levels from the generator at 100 feet and 500 feet would be 72 and 57 dB(A), respectively.

***INVERTEBRATES***

There is no known habitat for Idaho Dunes tiger beetle within ROI One. Ground disturbance within ROI One would have no potential effect on tiger beetle populations in other areas.

Ground disturbance in ROI One would be unlikely to result in water quality changes downstream from Clover Butte, the no-drop target areas, or the emitter sites. These water quality changes would, therefore, not affect snail populations in the Bruneau and Snake Rivers.

Snail and tiger beetle populations in ROI Three would not be affected by changes in noise resulting from the proposed action.

***FISH***

Because ground disturbance would not result in water quality changes downstream from Clover Butte, the no-drop target areas, and the emitter sites, it would not affect redband trout populations in the Bruneau and East Fork Bruneau Rivers. Bull trout populations in southwestern Idaho are all upstream of any potential ground disturbances in ROI One and would not be affected by the proposed action.

While few studies have been conducted on the effects of aircraft noise on fish species, potential effects may include disruption of normal behavior, physiological stress responses, and increased mortality of eggs due to noise-related vibrations during critical periods of development (Manci et al. 1988). In laboratory studies of rainbow trout, however, sonic booms caused no change in blood stress indicators and caused only "very slight" reactions to the disturbance (Manci et al. 1988). In addition, rainbow trout, cutthroat trout, and chinook salmon eggs exposed to repeated sonic booms during vibration-sensitive phases of development showed no increase in mortality compared with eggs that were not exposed to noise. Therefore, redband, bull, and Lahontan cutthroat trout would not be affected by the small increases in noise that may occur in parts of ROI Three and ROI One as a result of the proposed action.

### *AMPHIBIANS AND REPTILES*

Wetlands comprising 1.2 acres are found at Clover Butte within ROI One but outside of the 300-acre primary ordnance impact area. Northern leopard frogs and spotted frogs are not likely to occur in these ephemeral wetlands and, therefore, the proposed range would not affect these species. Western toads, however, may breed here. Because western toads are rare in southwestern Idaho, the potential for a breeding population to occur here is low, and potential habitat would unlikely be impacted by ground-disturbing activities. Therefore, the proposed action at Clover Butte would represent a low adverse impact to the local or regional population of western toads.

In addition, the small wetland at Clover Crossing may be suitable habitat for spotted frogs, northern leopard frogs, and western toads. Under Alternatives B, C, and D, reconstruction of the bridge at Clover Crossing would temporarily disturb a small portion of this habitat, and may reduce the size of the pool between the existing bridge and the small diversion dam approximately 10 feet downstream. However, the pool is dewatered annually by the holder of the water right after irrigation needs are met. Construction activities would take place when potential impacts to amphibian populations would be lowest. Site-specific surveys for spotted frogs, northern leopard frogs, and western toads will be conducted at Clover Crossing in spring 1998; if these species are found, bridge design would be modified to the extent practicable to minimize loss of amphibian breeding habitat. Therefore, the proposed action would have a low impact to local and regional populations of spotted frogs, northern leopard frogs, and western toads.

Because few rocky areas or sandy soils are found within ROI One for the Clover Butte Alternative, mojave black-collared lizards and western ground snakes are not likely to occur here.

Longnose snakes may occur within grass and shrub habitats throughout all of ROI One. Longnose snakes may be more common in southwestern Idaho than previously thought (Diller and Wallace 1981) but an estimate of densities or abundance of the species within the region is not available. Improved quality of the roads associated with ROI One may fragment snake habitat and would increase the potential for road kills as snakes attempt to traverse their previously continuous habitat. Potentially, increased public visitation may mean a greater number of snakes taken by reptile collectors. Longnose snakes are known to communally hibernate in dens. If a den is destroyed by ground disturbance, a number of these snakes could be lost. Direct mortality or loss of habitat for longnose snakes as a result of ground disturbance may have a low adverse impact on local populations of the species.

Although few field studies have been conducted to evaluate the impacts of noise on amphibians and reptiles, Manci et al. (1988) summarized the results of several laboratory studies that demonstrated the sensitivity of herptiles to sound. Desert iguanas and Mojave fringe-toed sand lizards were shown to experience hearing losses or decreases in hearing sensitivity after exposure to simulated off-road vehicle noise of 95 to 114 dB. Neotropical

treefrogs redistributed their calls to fall within spaces between tone bursts of up to 41 dB. Spadefoot toads, which appear to use auditory cues (such as thunderstorms) to emerge from hibernation, emerged from burrows after exposure to motorcycle sounds of 95 dB(A). Emergence during a period when water is not available may negatively impact toad populations in arid regions.

These studies indicate that exposure to high noise levels at certain times of year may cause amphibians and reptiles to respond inappropriately or with reduced sensitivity to auditory stimuli. While aircraft noise has not been shown to affect herptiles, the noise levels expected to occur under Alternative B would fall within the range of noises described in the studies above. In areas exposed to SELs of 95 dB(A) or greater, noise may have a low impact to spotted frogs, northern leopard frogs, western toads, Mojave black-collared lizards, western ground snakes, and longnose snakes.

***RAPTORS***

Bald eagles are neither known nor likely to nest, winter, or forage in the vicinity of ROI One for this alternative. Nesting habitat for peregrine or prairie falcons does not exist within ROI One. Peregrines or prairies potentially nesting in canyon areas near ROI One or migrating through the area may forage in the 12,000 acres of sagebrush/grasslands within ROI One. Although nesting has not been confirmed, peregrines are likely to nest in the major canyons within ROI Two and ROI Three. Prairie falcons are known to nest in these areas. Ferruginous hawks are not known to nest within the Clover Butte site. Potential nesting habitat is limited to a small rocky area on Clover Butte. However, ICDC data show a ferruginous hawk nest near the East Fork Bruneau River canyon, 4 miles east of the site, and these or nearby birds may forage in the area. Burrowing owls and northern harriers have been observed at Clover Butte and may occur in sagebrush, rabbitbrush, and grassland habitats throughout ROI One. Although northern goshawks may nest in a few areas in ROI Three, woodlands of adequate size to support nesting goshawks do not occur in ROI One or ROI Two, and the species is likely an uncommon visitor to the area during migration.

*Ground Disturbance.* Based on vegetation data, the sagebrush habitat at Clover Butte is of moderate density and quality compared with other sagebrush areas in ROI Two. Loss of this foraging habitat due to ground disturbance would, therefore, have a low impact on nesting or transient peregrines, prairie falcons, ferruginous hawks, northern harriers, and burrowing owls. Ground disturbance also may result in direct mortality, especially for ground-nesting species (i.e., northern harriers and burrowing owls) if ground-disturbing activities occur during the breeding season. Because they nest in burrows in soft soils, burrowing owls at the Clover Butte site may be particularly vulnerable to direct mortality caused by vehicles or earth-moving equipment crushing burrows, eggs, young, or adults.

Because of the low probability of ground disturbance affecting water quality downstream from ROI One in the Bruneau and Snake Rivers, thereby impacting potential prey populations,

potential adverse impacts of ground disturbance would not affect bald eagles. Ground disturbance would not affect northern goshawks.

*Noise.* The change in overflight noise in most of ROI Three, including decreases in exposure to high SELs, may reduce noise stress to raptors. In the proposed airspace addition, however, where birds are assumed to be at least temporarily more sensitive to noise due to lower previous exposure, an increase in exposure to high noise levels has a greater potential to stress raptors, particularly during the breeding season. Flights at less than 500 feet from nests and sonic booms of greater than 112 dB are most likely to elicit biologically significant responses to stimuli (Ellis et al. 1991); long-term consequences of high-frequency exposure to these disturbances are unknown. According to Gladwin and McKechnie (1993), long-term reactivity to overflights may result in energy losses, which "could be a critical problem for animals that are somewhat energy-limited in the first place." While Ellis et al. (1991) did not demonstrate that elevated reactivity resulted in reductions in reproductive success, the overall effects of long-term disturbance are still uncertain because of the limited data available. Wintering or migrating birds, or nesting birds in drought or other low-prey situations, may be energy-limited, and may respond differently to overflight noise than the subject birds in the studies described above.

Noise disturbance would likely have low adverse impacts on sensitive raptor species in most areas of ROI Three because noise levels would decrease. Bald eagles and northern goshawks are not known nor likely to occur in areas underlying the proposed Jacks Creek airspace addition and, therefore, would not be affected by increases in noise levels in that area.

Because noise levels in ROI Two are projected to decrease in most areas, noise disturbance is expected to have a negligible impact on peregrine falcons, prairie falcons, ferruginous hawks, northern harriers, and burrowing owls that may occur in ROI Two. Overflight frequency and, therefore, the potential for nesting raptors to experience high SELs, would increase in ROI One. However, due to low population size and magnitude of habitat disturbance in these areas, raptor species may experience low adverse effects from overflight noise.

*Human Disturbance.* Increased human presence in ROI One may result in reduced use of foraging or nesting habitat by raptor species. Studies described by Snow (1981) and Olendorff (1993) indicate that ferruginous hawks appear to be especially sensitive to human activity. Ferruginous hawks have been documented to abandon nests after a single visit by researchers or egg collectors. Greater public use of ferruginous hawk nesting habitat can increase the premature departure of young birds from nests and, thereby, increase the rate of mortality factors such as predation (White and Thurow 1985). White and Thurow (1985) recommended a buffer zone of 800 feet around ferruginous hawk nests during years in which prey was abundant, with a larger buffer during years when prey are scarce, when birds appear to be less tolerant of disturbance. Intermittent, irregular use of emitter sites under Alternative B may impact ferruginous hawks if nests occur within 800 feet of emitter sites, and emitter use occurs during the breeding season, when adult hawks are most sensitive to disturbance and may abandon

eggs or nestlings. However, because of the low probability of ferruginous hawks nesting within ROI One, the impacts would be negligible.

Burrowing owls and northern harriers, the species known to occur at Clover Butte, are known to be somewhat tolerant of human disturbance. There are records of burrowing owls and harriers nesting along roads, jet runways, and in areas frequently disturbed by tanks and live ordnance delivery at the Orchard Training Area in southwestern Idaho (Raptor Research and Technical Assistance Center [RRTAC] 1993). These data indicate that increased human presence in ROI One would have a negligible impact on burrowing owls or northern harriers.

***UPLAND GAME BIRDS***

Available habitat for mountain quail or Columbian sharp-tailed grouse does not exist in ROI One for the Clover Butte Alternative. Mountain quail have been detected within ROI Two and may occur in several of the major canyons within ROI Two and ROI Three. Sharp-tailed grouse are not known to occur in the project area, but suitable habitat may be present in the southern portions of ROI Three. Neither species would be affected by ground disturbance or increased human presence in ROI One.

Sage grouse have been observed within the proposed Clover Butte 12,000-acre training range. During spring lek surveys (personal communication, Klott 1997), an active lek consisting of 12 males and 2 females was observed in the southwest corner of the Clover Butte Alternative on April 3, 1997. Another lek, with 4 males, was observed on the east side of the East Fork Bruneau Canyon on April 15, approximately 2.5 miles east of the Juniper Butte Alternative. One historic lek site in the area was burned in the early 1990s and is not currently active (BLM 1996c, unpublished data). In addition, a historic lek site is near emitter site AI. The BLM and Shoshone-Paiute Tribes have expressed concern about the locations of emitter sites AQ and BD, where the suitability of habitat and concentration of sage grouse droppings indicate use of these areas by breeding or wintering sage grouse. During public hearings for ETI, wildlife managers and citizens expressed concern that range construction and support activities may disturb strutting, nesting, brood-rearing, or wintering sage grouse that occur within ROI One. To the extent possible, emitter sites have been selected to avoid all known sage grouse leks. If certain emitter sites were found to contain leks, steps would be taken wherever possible to avoid them during the breeding season. The number of emitter sites permits avoidance of sites with specific sage grouse activity during breeding and wintering periods. Fragmentation and loss of sagebrush habitat are the primary causes of sage grouse population declines in the western United States. Less than 550 acres of sagebrush would be destroyed as a result of all project components. The loss or degradation of sagebrush habitat under this alternative, due to ground disturbance, wildfire, noise, or human presence, would have a low impact on the regional sage grouse populations.

*Noise.* Upland game birds have not been found to vacate areas or experience reproductive losses in response to short-term exposure to aircraft noise or sonic booms (Manci et al. 1988). Gallinaceous birds are not known to be highly sensitive to aircraft noise (Lynch and Speake 1978; Lamp 1989). In general, impacts to mountain quail or sharp-tailed grouse from noise in ROI Three would be negligible. Quail in the Jacks Creek canyon complex may be naïve to training overflights and may have a greater response than birds that have previously been overflown at similar noise levels in other portions of ROI Three. However, impacts to quail in this area due to noise are expected to be low.

Although information about noise effects on sage grouse is not available in the literature, wildlife managers have expressed concern about several areas of potential impact. Immature and adult female sage grouse use vocalizations to locate leks during the breeding season, and aircraft or generator noise may mask the strutting of male sage grouse (personal communication, Klott 1996). Sage grouse may also be subject to startle or alarm effects of low-level overflights. To protect sage grouse breeding and wintering areas from potential impacts from energy development and other human activities, the Western States Sage Grouse Committee recommends establishing a buffer zone of 2.0 miles (3.2 kilometers) between development activities and sage grouse breeding and wintering complexes (Autenrieth et al. 1982). Noise or other human disturbances (e.g., construction, ordnance delivery) that occurs within this buffer may impact sage grouse. However, the low level of sage grouse use of ROI One relative to other areas within ROI Two suggests that the impacts to sage grouse from noise and other human activities would be low in ROI One.

***WATERBIRDS***

There is no breeding habitat for white-faced ibises, black terns, American white pelicans, or trumpeter swans present in ROI One for this alternative. However, ephemeral pools at the Clover Butte site may be used by these species on stopovers during spring migration.

*Ground Disturbance.* The few small ephemeral pools that waterbirds potentially may use during spring migration would not be affected by ground disturbance because they occur outside of the primary ordnance impact area. Human presence may preclude use of habitat by waterbirds. Impacts to waterbirds would be low. Potential effects of wildfire and human disturbance would not increase in waterbird breeding areas under Alternative B.

Long-billed curlews are likely to be found during the breeding season in the annual grasslands and wheatgrass seedings of Clover Butte, the no-drop areas, powerline corridor, roads, and emitter sites. With approximately 480 acres of curlew habitat available, Clover Butte represents approximately 1 percent of the habitat type within ROI Two. Curlews are ground-nesting birds and, therefore, may experience direct mortality, most likely to eggs and young, as a result of ground disturbing activities. Because annual grasslands and wheatgrass seedings are increasing annually in southwestern Idaho as a result of wildfires, habitat loss due to ground disturbance in ROI One would likely be offset by increases in grasslands elsewhere, and the impact to curlews as a result of ground disturbance would be negligible.

*Noise.* Noise impacts to sensitive waterbird species may result in disruption in activity patterns or reduced reproductive success. Several studies report contradictory results on the effects of military overflights on time-activity budgets of waterbirds (Black et al. 1984, Lamp 1989, Fleming et al. 1996). Results from a comprehensive study indicated that the effects of military overflights on waterbirds in Florida did not adversely affect breeding success, colony establishment, or size (Black et al. 1984). Conversely, Lamp (1989) reported that some waterbird species were sensitive to both subsonic and supersonic military overflights. Observations made at Naval Air Station Fallon revealed that passing jet aircraft generally elicited no response from flocks of white-faced ibis. However, in two instances involving low-level bombing runs, the birds flushed and vacated the feeding area (Lamp 1989). Bunnell et al. (1981) also found that low-level aircraft overflights impacted survivorship of young and reproductive success of a colony of American white pelicans.

Overflights near the Duck Valley Reservation would have negligible impacts on the white-faced ibis and black tern breeding populations because sorties would be flown above 10,000 feet AGL in this area.

***PASSERINES***

Shrub-obligate passerine species such as loggerhead shrikes, gray flycatchers, sage sparrows, and Brewer's sparrows are known or likely to occur within the big sagebrush habitat within the Clover Butte primary ordnance impact area, emitter sites, powerline corridor, roads, and no-drop target areas.

*Ground Disturbance.* Under this alternative, less than 550 acres of big sagebrush habitat would be destroyed. This habitat probably does not contain a high density of nesting passerines, but may support numerous breeding pairs of each species. Loss of shrubsteppe vegetation has been found to be a primary factor in observed declines of these species (Woods and Cade 1996, Saab and Groves 1992, Knick and Rotenberry 1995). Therefore, loss of the sagebrush habitat under this alternative, due to ground disturbance, may have a low impact on these species in southwestern Idaho.

Habitat for woodland and riparian passerine species within ROI One is limited to a small amount of riparian vegetation at Clover Crossing for Alternative B. Reconstruction of the bridge at Clover Crossing would temporarily disturb as much as several square meters of riparian vegetation. Because construction would take place in the fall, when passerine densities are lowest, impacts to protected and sensitive passerine species would be low. In other areas of ROI One, these species would not be affected by ground disturbance, wildfire, or human disturbance.

*Noise.* Few studies have been conducted regarding the impacts of noise to passerines. In general, impacts to sensitive passerine species in all ROIs would be similar to those discussed above for raptors.

### *BATS*

No records were found for spotted bats, Townsend's big-eared bats, long-eared myotis, long-legged myotis, or western small-footed myotis in the vicinity of the proposed Clover Butte training range, powerline corridor, or emitter sites. Yuma myotis have been documented in the East Fork Bruneau River canyon, 4 miles directly east of the Clover Butte training range, and roosting habitat for other sensitive bat species is available for these species. Because fringed myotis are unlikely to use shrubsteppe habitats greater than one hour distant from forested areas (O'Farrell and Studier 1980), fringed myotis are not likely to be found within ROI One or ROI Two for Alternative B. Spotted bats have been recorded at the 640-acre no-drop site, which may represent an important foraging area or travel corridor.

*Ground Disturbance.* Potential bat foraging habitat of moderate quality may occur within the grass and shrub communities of the Clover Butte primary ordnance impact area and accessory sites. Loss of these habitats due to ground disturbance would have a low impact on local populations of Townsend's big-eared bats, yuma myotis, long-eared myotis, long-legged myotis, and western small-footed myotis. Population estimates are unavailable for spotted bats in southwestern Idaho, but the rarity of the species regionally suggests that loss of foraging habitat may adversely affect the local population of this patchily distributed species.

*Noise.* Effects of noise on bats have not been studied in depth. Potential impacts may include foraging disruption, physiologic stress, roost abandonment, and hibernation disturbance. Several studies have found no short-term impacts to roosting bats due to aircraft overflights (Dalton and Dalton 1993) or echolocation interference (or "jamming") by a constant noise field (Griffin et al. 1963, Troest and Mohl 1986, Schmidt and Joermann 1987). However, the long-term effects of exposure have not been investigated, and responses to noise may be species-specific. The proposed number of sorties generating high SELs would be expected to have a negligible to low impact on local populations of sensitive bat species that use these areas. These species include spotted bats, Townsend's big-eared bats, long-legged myotis, long-eared myotis, western small-footed myotis, and yuma myotis.

### *SMALL MAMMALS*

No records of pygmy rabbits exist in the vicinity of Clover Butte, and sagebrush habitat within ROI One for the Clover Butte Alternative appears to be of inadequate stand size, density, and height to support pygmy rabbits. Soils and vegetation appear to be inappropriate to support dark kangaroo mice. Ground disturbing activities associated with the Clover Butte Alternative would, therefore, have no impact to pygmy rabbits or dark kangaroo mice in ROI One.

*Noise.* Frequent exposure to high noise levels has been found to cause temporary threshold shifts in hearing sensitivity of small mammals (Manci et al. 1988). Because small mammals rely strongly on hearing to avoid predators, changes in hearing sensitivity may have a low impact to pygmy rabbits and dark kangaroo mice. Populations of these species may occur in a few

areas of ROI Three, but these areas would experience a lower potential for exposure to high SELs under Alternative B when compared with the No-Action Alternative.

### *LARGE MAMMALS*

California bighorn sheep are not known to occur in the vicinity of the proposed Clover Butte training range, no-drop target areas, powerline corridor, roads, or emitter sites. Suitable habitat for bighorn sheep does not exist within these areas. Ground-disturbing activities associated with the Clover Butte Alternative would, therefore, have no impact on California bighorn sheep in ROI One.

There are no records of kit fox occurring in the vicinity of ROI One, and soil types in the area are inappropriate for kit fox denning. Ground-disturbing activities associated with the Clover Butte Alternative would, therefore, have no impact to kit fox in ROI One.

*Noise.* The impacts of aircraft noise to bighorn sheep have been investigated in numerous controlled and *in situ* studies (Workman and Bunch 1991a, Weisenberger et al. 1996, Bodie et al. 1995). Bighorn sheep response to human disturbance can vary from changes in heart rate (MacArthur et al. 1982) to flight (Hicks and Elder 1979, Miller and Smith 1985, King and Workman 1986) to avoidance (Hamilton et al. 1982). Factors such as type of disturbance, distance of disturbance source to sheep, and size and composition of bighorn sheep groups influence how sheep respond. MacArthur et al. (1982) found no change in sheep heart rates when helicopters or fixed-wing aircraft were over 1,300 feet away. In a study conducted on the Jacks Creek herds, Bodie et al. (1995) found that 60 percent of radio-collared bighorn sheep changed location in response to aerial surveys and suggested that frequent low-level overflights by helicopters or fixed-wing aircraft may increase sensitivity to incidental aircraft overflights. Weisenberger et al. (1996) suggested that bighorn sheep habituated to low-level aircraft noise with increased exposure.

Potential impacts to bighorn sheep would be low in most areas on ROI Three and ROI Two for Alternative B. Overflight noise would decrease over the Owyhee River Bighorn Sheep Habitat Area of Critical Environmental Concern (ACEC), and would remain the same or increase slightly compared with current levels over the Cottonwood Creek ACEC and Bruneau-Jarbidge Bighorn Sheep Habitat ACEC. Noise levels associated with ETI alternatives would have a low impact to bighorn sheep in these areas. Based on the studies cited above, these impacts are expected to be temporary and minor, with no mechanism for long-term effects to wildlife populations.

Because proximate causes of the Owyhee River bighorn sheep decline (discussed in section 3.8.6) have not been determined, the extent to which aircraft noise contributed to the decline cannot be estimated. During public hearings for ETI, wildlife managers and citizens expressed concern that military training overflights may place bighorn sheep ewes and lambs at risk, possibly leading to population-level impacts. The studies cited above suggest that noise disturbance would not be a primary factor in reduced reproductive success or survivorship in bighorn sheep.

However, the Air Force noise impacts study currently underway will provide more information about the effects of overflights on bighorn sheep in southwestern Idaho.

Effects of aircraft noise on canids such as the kit fox are largely unknown. Wolves have been reported to exhibit a strong startle response to overflights by helicopters and fixed-wing aircraft (Manci et al. 1988, Krausman et al. 1986). Coyotes rely strongly on auditory stimuli for detecting prey (Manci et al. 1988); kit fox may be even more reliant on sound because of their nocturnal habits. Recent studies on the impacts of aircraft overflight noise on kit fox indicate that kit fox are able to habituate to simulated overflights with SELs of 65-95 dB(A) (Bowles et al. 1996). Kit fox responses to simulated prey sounds decreased in the presence of simulated overflights, while responses to simulated predator sounds remained the same regardless of noise. A study on sound levels from low-altitude overflights measured within kit fox dens (Francine et al. 1995) suggests that dens afford substantial protection from noise, with sound attenuating 20 to 40 dB within the den. Noise from overflights would be low in areas in ROI Three where kit fox may occur because projected sortie frequency and noise levels would decrease in most of these areas under Alternative B.

#### 4.8.5.3 ALTERNATIVE C — GRASMERE

In general, potential types of impact sources to protected and sensitive species under Alternative C would be similar to those discussed under Alternative B. However, habitat diversity is greater and, therefore, wildlife diversity is also greater in the proposed 12,000-acre training range under Alternative C compared to Alternative B. Therefore, overall potential impacts would be higher under Alternative C.

There would be no ground disturbance or increase in human activity in ROI Three (including the proposed airspace additions) or ROI Two. Ground disturbance would be caused by the construction and use of the primary ordnance impact area, other target areas, emitter sites, powerline, and roads. Human disturbance would slightly increase in the vicinity of the ROI One sites.

Sources and potential for wildfire to occur would be the same as those discussed for Alternative B.

*NOISE*

The estimated cumulative time of sortie-operations in all airspace units, including the Owyhee/Jarbidge north airspace expansion and ROI One, would be the same as discussed for Alternative B. Estimated cumulative use of low altitudes, and thus potential for exposure to high SELs, would decrease in most areas and would increase in the north expansion area and in the proposed restricted airspace associated with the training range. Impacts would be similar but of a greater magnitude as those described for Alternative B. This is because the habitat diversity (including canyon areas) and quality, and wildlife species diversity and abundance is greater than found on and near the Alternative B, Clover Butte training range.

The potential for exposure to sonic booms under Alternative C would be the same as for Alternative B, section 4.8.5.2.

Potential impacts to invertebrates, bull trout, bald eagles, northern goshawks, mountain quail, Columbian sharp-tailed grouse, Townsend's big-eared bats, fringed myotis, dark kangaroo mice, and kit fox under Alternative C would be similar to those discussed for Alternative B.

### *FISH*

Potential impacts to bull trout and redband trout in the Jarbidge and Bruneau Rivers and most tributaries would be similar to those discussed for Alternative B. Potential adverse impacts to the redband trout in Wickahoney Creek resulting from ground disturbance and fires are unlikely to occur. However, these disturbances could cause increased levels of silt and sediment in Wickahoney Creek. Increased silt deposition is known to cause the following adverse impacts to trout: decreased production of the aquatic invertebrates trout eat; decreased production of trout due to loss of spawning habitat; and loss of trout wintering habitat. In addition, fires may cause loss of streamside vegetation, which may increase water temperatures to levels trout cannot tolerate. These disturbances would have a moderate impact to redband trout populations if they occurred as a result of the proposed action; however, the low potential for impact occurrence would result in an overall low impact to redband trout.

### *AMPHIBIANS AND REPTILES*

Wetlands comprising 48 acres are found at the proposed Grasmere training range within ROI One and represent 1 percent of the wetland habitat in ROI Two. Northern leopard frogs, spotted frogs, and western toads may breed here. Ground disturbance of potential amphibian habitat would not occur within the Grasmere 12,000-acre training range. Within other areas of ROI One, ground disturbance of potential habitat would occur where new roads cross streams. Overall impact to the local amphibian populations from ground disturbance would be low because little wetland habitat is being adversely affected.

Potential impacts to amphibians and reptiles due to noise would be similar to Alternative B; however, the level of impact under Alternative C may be greater because the quality of habitat and potential for occurrence of sensitive reptile and amphibian species are greater.

Mojave black-collared lizards and western ground snakes may occur in rocky areas within ROI One, and longnose snakes may occur within grass and shrub habitats within ROI One. Direct mortality or loss of habitat for black-collared lizards and western ground or longnose snakes as a result of ground disturbance would have a low adverse impact on local populations of these species.

### *RAPTORS*

Nesting habitat for peregrine falcons does not exist within ROI One. Peregrines potentially nesting in canyon areas near ROI One or migrating through the area may forage in the 12,000 acres of sagebrush/grasslands within ROI One. Prairie falcons, ferruginous hawks, burrowing owls, and northern harriers are known to occur in greater densities within the Grasmere training range than within the Clover Butte training range. Loss of nesting and foraging habitat in ROI One due to ground disturbance would likely have a low impact to nesting or transient peregrines, prairie falcons, ferruginous hawks, northern harriers, and burrowing owls.

### *UPLAND GAME BIRDS*

Sage grouse are known to occur during the nesting and brood rearing seasons within the Grasmere 12,000-acre training range, and at least three active leks are present in the area. Sage grouse may also use emitter sites AI, AQ, and BD. Less than 550 acres of sagebrush habitat would be destroyed within the primary ordnance impact area and within the accessory sites located outside the 12,000-acre training range. The loss or degradation of sagebrush habitat under this alternative, due to ground disturbance, wildfire, or noise, would have a low impact on the regional sage grouse populations. Human presence may cause sage grouse to at least temporarily avoid areas within ROI One and would have a moderate impact on sage grouse.

### *WATERBIRDS*

A limited amount of breeding habitat for white-faced ibis may be present in permanent wetlands immediately adjacent to the Grasmere training range. In addition, these wetlands and other ephemeral pools may be used by ibises, black terns, American white pelicans, and trumpeter swans on stopovers during spring migration. No potential waterbird habitat would be destroyed by ground disturbance under this alternative. Human presence may preclude use of habitat by waterbirds. Impacts to waterbirds would be low.

### *PASSERINES*

Loggerhead shrikes and other shrub-obligate species (e.g., sage sparrow, Brewer's sparrow) are known to occur within the 7,000 acres of sagebrush habitat within the Grasmere 12,000-acre training range, emitter sites, powerline corridor, roads, and no-drop-target areas. Big sagebrush habitat at Grasmere and the accessory sites is of high density and stand size relative to other sagebrush habitat in ROI Two. Based on habitat quality and survey results, this area supports a greater abundance of shrub-obligate species than the other alternatives. Loss of shrubsteppe vegetation has been found to be a primary factor in observed declines of these species. Because a small amount of big sagebrush would be destroyed by ground disturbance under this alternative, impacts to shrub-obligate bird species would be low.

Grasmere also supports a number of sensitive passerine species in the 48 acres of riparian vegetation found in or adjacent to the site. Riparian corridors in southern Idaho are uncommon

and support a high diversity of species compared with other habitats in the region. However, riparian areas in southwestern Idaho are decreasing due to overgrazing and wildfire (Saab and Groves 1992). No riparian habitat would be destroyed by ground disturbance under this alternative. Impacts to passerine birds species would be low.

*BATS*

Roosting and foraging habitat is available for spotted bats, long-legged myotis, long-eared myotis, and yuma myotis in the vicinity of the Grasmere 12,000-acre training range and, except for yuma myotis, each species has been recorded in the area. Spotted bats also have been recorded foraging in the 640-acre no-drop target area. Due to lack of suitable habitat, these species are not likely to forage or roost in the vicinity of the powerline corridor, roads, or emitter sites. Loss of foraging habitat at Grasmere and the 640-acre no-drop target area due to ground disturbance would have a low impact to the local populations of these species.

*SMALL MAMMALS*

Sagebrush habitat in a few areas of ROI One for the Grasmere Alternative appears to be of adequate stand size, density, and height to support pygmy rabbits. No records of pygmy rabbits exist for the area, however, and no sign of pygmy rabbits were found during small mammal and avian surveys of the area. Ground disturbing activities associated with the Grasmere Alternative would therefore have a low impact to pygmy rabbits in ROI One.

*LARGE MAMMALS*

California bighorn sheep are found within the Grasmere 12,000-acre training range and are known to use the big sagebrush and low sagebrush habitats in the western portion of the site during the late spring, summer, fall and early winter. Late winter and early spring use of the area is unknown. Overflight frequency and the potential for exposure to SELs of 90 dB(A) or greater in the area of the training range would increase under Alternative C. However, noise disturbances would have a low impact to bighorn sheep occurring in the Grasmere area. Bighorn sheep are known to be sensitive to human presence (Miller and Smith 1985), and the effect of increased human presence would have a moderate impact to the local population of California bighorn sheep.

### 4.8.5.4 ALTERNATIVE D — JUNIPER BUTTE

In general, potential types of impact sources to protected and sensitive species under Alternative D would be similar to those discussed under Alternative B. The overall potential level of impacts under Alternative D would be similar to Alternative B, but lower than Alternative C.

There would be no ground disturbance or increase in human activity in ROI Three (including the proposed airspace additions) or ROI Two. Ground disturbance would be caused by the

construction and use of the primary ordnance impact area, other target areas, emitter sites, powerline, and roads. Human disturbance would increase slightly in the vicinity of the 12,000-acre training range, no-drop target areas, emitter sites, new and improved roads, and powerline.

Sources and potential for wildfire to occur would be the same as those discussed for Alternative B.

The estimated cumulative time of sortie-operations in all airspace units, including the Owyhee/Jarbidge north airspace expansion and ROI One, would be the same as discussed for Alternative B. Estimated cumulative use of low altitudes, and thus potential for exposure to high SELs, would decrease in most areas and would increase in the north expansion area and in the proposed restricted airspace associated with the training range. Impacts would be similar to those described for Alternative B. The potential for exposure to sonic booms under Alternative D would be the same as for Alternative B.

Potential impacts to invertebrates, bull trout, bald eagles, northern goshawks, mountain quail, Columbian sharp-tailed grouse, dark kangaroo mice, and kit fox under Alternative D would be similar to those discussed for Alternatives B and C.

### *FISH*

Potential impacts to redband trout in the Jarbidge and Bruneau rivers and most tributaries would be similar to those discussed for Alternative B. Potential adverse impacts to redband trout in the East Fork of the Bruneau River resulting from ground disturbance and fires in ROI One are unlikely to occur. However, these disturbances could cause increased levels of silt and sediment and would have a moderate impact to redband trout populations if they occurred as a result of the proposed action.

### *AMPHIBIANS AND REPTILES*

Spotted frogs and northern leopard frogs are not likely to occur in the small ephemeral pools at the proposed Juniper Butte 12,000-acre training range. Western toads, however, may breed here. Ground disturbance of potential amphibian habitat would not occur within the Juniper Butte 12,000-acre training range. Within other areas of ROI One, ground disturbance of potential habitat would occur where new roads cross streams. Overall impact to the local amphibian populations from ground disturbance would be low because little wetland habitat is being adversely affected.

Mojave black-collared lizards and western ground snakes may occur in rocky areas in the Juniper Draw area as well as in areas near the East Fork Bruneau River canyon. Longnose snakes may occur within grass and shrub habitats throughout ROI One. Direct mortality or loss of habitat for these species as a result of ground disturbance would have a low adverse impact on local populations.

Potential impacts to amphibians and reptiles due to noise would be similar to Alternative B.

### *RAPTORS*

Nesting habitat for peregrine falcons does not exist within ROI One. Peregrines potentially nesting in canyon areas near ROI One or migrating through the area may forage within ROI One. Prairie falcons, ferruginous hawks, burrowing owls, and northern harriers are known to occur at the Juniper Butte training range. Loss of nesting and foraging habitat in ROI One due to ground disturbance would have a low impact to nesting or transient peregrines, prairie falcons, ferruginous hawks, northern harriers, and burrowing owls. Ferruginous hawks nesting within the 12,000-acre training range may be affected by human disturbance or noise during the early nesting period (personal communication, Klott 1997).

### *UPLAND GAME BIRDS*

At least three historic sage grouse leks are present in the vicinity of the Juniper Butte training range. Sage grouse also may use emitter sites AI and BD. Little sagebrush habitat would be destroyed by ground disturbance under this alternative. Because little sage grouse habitat is present, noise, wildfire, human presence, and ground disturbance would have low impacts on sage grouse populations in the region.

### *WATERBIRDS*

There is no breeding habitat for waterbirds present in ROI One for this alternative. However, small ephemeral pools at the Juniper Butte training range may be used by ibises, black terns, American white pelicans, and trumpeter swans on stopovers during spring migration. The few small ephemeral pools that waterbirds potentially may use during spring migration would not be affected by ground disturbance because they occur outside of the primary ordnance impact area. Human presence may preclude use of habitat by waterbirds. Impacts to waterbirds would be low.

### *PASSERINES*

Loggerhead shrikes and other shrub-obligate species (e.g., sage sparrow, Brewer's sparrow) are not likely to occur within most of ROI One for this alternative because of the small amount of sagebrush habitat present. Therefore, loss of habitat at Juniper Butte due to ground disturbance would have a negligible impact on these species.

Juniper Butte may also support a number of sensitive passerine species in Juniper Draw or adjacent to the site in the East Fork Bruneau River canyon. Similar habitats in nearby canyons have been found to support yellow-billed cuckoos, gray flycatchers, dusky flycatchers, cordilleran flycatchers, green-tailed towhees, and yellow warblers (personal communication, Doremus 1996). Loss or reduced use of this habitat due to wildfire or noise would have a low impact on these sensitive passerine species.

*BATS*

Roosting and foraging habitat is available for spotted bats, long-legged myotis, long-eared myotis, and yuma myotis in the vicinity of the Juniper Butte training range, although yuma myotis is the only species to have been recorded in the immediate area. Spotted bats have been recorded foraging over Clover Creek near Winter Camp Butte (Doering and Keller 1996). Spotted bats were not detected within the Juniper Butte site, although appropriate roosting habitat is found within the adjacent Clover Creek canyon. Spotted bats have also been recorded foraging in the 640-acre no-drop target area. Due to lack of suitable habitat, these species are not likely to forage or roost in the vicinity of the powerline corridor, roads, or emitter sites. Loss of foraging habitat at Juniper Butte and the 640- acre no-drop site would have a low impact to the local populations of these species.

*SMALL MAMMALS*

Pygmy rabbits are not known to occur in the vicinity of the Juniper Butte training range and suitable habitat for this species does not exist in ROI One for Alternative D. Potential impacts resulting from ground disturbance, wildfire, or noise in ROI One would, therefore, be negligible. Impacts in ROI Three and ROI Two due to noise would be the same as for Alternatives B and C.

*LARGE MAMMALS*

California bighorn sheep are not known to occur in the vicinity of the Juniper Butte 12,000-acre training range and suitable habitat for this species does not exist in ROI One for Alternative D. Potential impacts resulting from ground disturbance, wildfire, or noise in ROI One would therefore be negligible. Impacts to bighorn sheep in ROI Three and ROI Two due to noise would be the same as for Alternatives B and C.

## 4.8.6 Large Mammals

Seventeen large mammal species, including furbearers and small carnivores, potentially occur within the ROIs of the alternatives under consideration (see section 3.8.6). Potential consequences of the range development alternatives to large mammals may include direct mortality, change in activity patterns and habitat use, and reduced reproductive success. Potential impacts to two other large mammal species (bighorn sheep and kit fox) are discussed in section 4.8.5 (Protected and Sensitive Wildlife Species).

### 4.8.6.1 ALTERNATIVE A — NO-ACTION

The general potential impact sources to large mammals under Alternative A would be the same as those described for protected and sensitive wildlife species (section 4.8.5.1). These sources would include noise, habitat modification, wildfire, and human disturbance. Most noise would be associated with continued overflights. In addition, noise from ground activities such as road

traffic, service of emitters, and use of SCR would continue. Habitat modification would include continued disturbance of the existing target area from ordnance use. Overall, impact levels under this alternative would remain negligible.

### *NOISE*

The frequency of overflights and potential for exposure to high SELs under the No-Action Alternative would be the same for large mammals as for protected and sensitive wildlife species, section 4.8.5.1. The potential for exposure to sonic booms would not change under the No-Action Alternative.

Lamp (1989) found that response of mule deer to overflights at Naval Air Station Fallon, Nevada were temporary behavioral changes and minor changes in winter habitat use. However, Lamp (1989) suggested that long-term cumulative impacts are unknown and need to be evaluated in future studies. Weisenberger et al. (1996) suggested that bighorn sheep and mule deer habituated to low-level aircraft noise with increased exposure. In support of this opinion, mule deer and bighorn sheep populations continue to exist under airspace where low-level aircraft sorties having been flown for years at such training areas as the Nellis Range, Nevada, and the Goldwater Range, Arizona.

Naïve, penned, heart-rate telemetered pronghorn antelope (Workman et al. 1992a) and Rocky Mountain elk (Workman et al. 1992b) were exposed to F-16 super and subsonic overflights. Exposure duration varied from nine seconds to over one minute, AGLs varied from 5,000 to 9,000 feet, and the time interval between exposures was 30 minutes for pronghorn antelope and 15 minutes for elk. Both pronghorn antelope and elk experienced the highest elevated heart rates and behavioral responses (jumping, running) during their first exposures to super and subsonic overflights. Average heart rates during exposures were at least double pre-exposure rates in most cases. Subsequent exposures over two to four trials produced diminishing responses as animals appeared to habituate to the noise source. However, sample sizes and a lack of duplication precluded statistical analyses or an inference beyond the experimental animals used in the study.

### *GROUND DISTURBANCE*

Within ROIs One and Two, use and maintenance of the 163.6 miles of existing roads would remain the same. Current and potential impacts of road use to large mammals includes habitat fragmentation and behavioral responses due to human presence (Easterly et al. 1992, Stephenson et al. 1996). However, impacts from continued road use should remain the same.

There would be no additional ground disturbance in any of the ROIs under the No-Action Alternative. Current levels of habitat disturbance from target area use on the SCR would remain at baseline levels.

*WILDFIRES*

A limited potential for wildfires would exist for ROI Three and ROI Two under the No-Action Alternative. The probability of wildfire occurring as a result of ordnance delivery at SCR would decrease below baseline levels because the use of "hot spot" spotting charges would be discontinued and only "cold spot" spotting charges would be used. The potential for flare caused fires is low (refer to section 4.3, Safety). Vehicle catalytic converters and improperly disposed of cigarettes and matches may also result in wildfires under current levels of public use of ROI Three and ROI Two.

Fire frequency in shrub-steppe vegetation communities tends to increase following burns due to a shift in vegetation composition from shrublands to annual grasslands. However, the potential for fire frequency to increase under the No-Action Alternative would be negligible. Any additional loss of sagebrush would further reduce the overall quality of the existing shrub-steppe habitat in the region.

*OTHER HUMAN DISTURBANCE*

Large mammals may abandon habitats and increase home range sizes due to human presence. Stephenson et al. (1996) concluded that impacts to mule deer are more intense from unpredictable versus predictable human presence. Current and potential impacts from human disturbance to large mammals will remain the same under the No-Action Alternative.

### 4.8.6.2 ALTERNATIVE B — CLOVER BUTTE

In general, potential impact sources to large mammals under Alternative B would be similar to those discussed under Alternative A. These sources would include noise, habitat modification from ground disturbance, wildfire, and increased human presence. Assessment of direct impacts to habitat, potential habitat, or wildlife species within the proposed 12,000-acre training range is restricted to the 300-acre primary ordnance impact area and approximately 100 additional acres associated with road construction and maintenance buildings. Indirect impacts to habitat (refer to Wildlife Habitat, section 4.8.4) and wildlife species may occur beyond the perimeter of the primary ordnance impact area and roads from other activities associated with the proposed action. These indirect impacts are related to aircraft and ground equipment noise, vehicle movements, human presence, lights, and fugitive dust. Although ordnance has a low probability of skipping out of the primary impact area, it may facilitate habitat degradation or destruction within the training range through impact or from subsequent recovery operations. Outside of the training range, direct loss of habitat from construction would occur at emitter, new road, and powerline sites.

*NOISE*

The primary sources of noise impacts are aircraft overflights (general flight noise and sonic booms) and power generators at the 12,000-acre training range, emitter sites, and no-drop

target areas. Detailed information of noise levels are discussed in Protected and Sensitive Wildlife Species (section 4.8.5) and Noise (section 4.2).

Estimated exposure to noise for large mammals would be the same as for protected and sensitive species (section 4.8.5). In general, exposure to high SELs would increase in the vicinity of the proposed training range and Owyhee/Jarbidge north expansion and would decrease in other areas. The frequency of sonic booms would increase greatly at SCR and increase slightly in the Range Support and Jarbidge MOAs. Overall, impacts to large mammals would be low under the Clover Butte Alternative. Noise impacts from power generator operations would vary inversely with distance from generators. Generators considered for use produce sound levels of approximately 72 dB(A) at 100 feet and 57 dB(A) at 500 feet. Emplacement would result in new constant noise sources in the environment.

Overall, impacts to large mammals would be low under the Clover Butte Alternative.

***GROUND DISTURBANCE***

There would be no additional ground disturbances in ROI Three and ROI Two including the proposed expanded airspace in Idaho and Nevada.

Within ROI One, four large mammal species may be affected by implementation of Alternative B (refer to section 3.8.4.3). Direct loss of potential large mammal habitat from construction and use is anticipated to have a low impact because of limited use of the area by large mammals (personal communication, Toweill 1996). The potential for effects would be low because of the total acreage disturbed and because much of the area is annual grasslands and wheatgrass stands that provide limited habitat for large mammals.

***WILDFIRE***

Impacts from wildfires would be similar to those discussed for the No-Action Alternative. A limited potential for wildfires would exist for ROIs Three and Two. Sources of these fires would primarily be from increased public use of the area resulting in wildfires due to vehicle catalytic converters and improperly disposed of cigarettes and matches. The potential for flare use resulting in wildfire is low (refer to section 4.3, Safety).

Potential causes of wildfire in ROI One are development and maintenance of the training range. Development of the 12,000-acre target area, no-drop target areas, and emitter sites may increase fire risk through accidental sources of ignition such as sparks from equipment, hot exhaust pipes on vehicles, and smoking. However, safety procedures would be implemented for contractors and work crews, including use of spark arrestors, no parking of vehicles on vegetated areas, and restrictions on smoking. The probability of wildfire occurring as a result of ordnance delivery would be very low because only cold spot spotting charges (or no spot) would be used at the new range and at SCR.

Fire frequency tends to increase following burns in the shrub-steppe ecosystem due to a shift in vegetation composition from shrublands to annual grasslands. However, the potential for fire frequency to increase under Alternative B would be low. Use of fire protection measures would increase the chance that fires ignited in the vicinity of the training range would be contained and limited. The relatively small amount of sagebrush in ROI One would limit the potential long-term effects of wildfire on large mammals. Although the potential for fire to occur or to spread outside of ROI One is low, the additional loss of sagebrush would further reduce the overall quality of the existing shrub-steppe habitat in the region. Overall, the potential impacts from wildfires to large mammals would be negligible under the Clover Butte Alternative.

***OTHER HUMAN DISTURBANCE***

Sources of impacts from human disturbance would be similar to those discussed for Alternative A. The impacts to large mammals would be greater compared to the Alternative A potential impacts because of the increased human presence during construction, use, and maintenance of roads and target areas. However, overall potential human disturbance impacts to large mammals under the Clover Butte Alternative would be negligible.

### 4.8.6.3 ALTERNATIVE C — GRASMERE

Impacts to large mammals in ROI Three and Two would be the same as those described under Alternative B. The types of impacts to large mammals in ROI One would be generally similar to those described for Alternative B; however, the level of impact would be greater. The Grasmere target area has greater habitat and topographic diversity. Therefore, more species (12) are present and their population sizes are greater compared to the number of species (4) and population sizes found on the Alternative B (Clover Butte) site. Based on the potential loss of habitat and increased overflights, the potential impacts to large mammal species under Alternative C would be low (personal communication, Toweill 1996; Nelson 1996).

***NOISE***

Sources of noise and level of impacts to large mammals are similar to Alternative B (Clover Butte). However, a greater diversity and abundance of large mammal species would be affected under Alternative C.

***GROUND DISTURBANCE***

Ground disturbance impacts to large mammals in ROI Three and Two would be similar to those described under Alternative B related to habitat fragmentation. The impacts may be greater compared to the Alternative B potential impacts because of the generally better habitat and higher populations of large mammals. Impacts from construction and use of emitter sites and no-drop areas (see section 4.8.1, Vegetation) would be low and identical to those described for Alternative B.

Within ROI One, 12 large mammal species may be affected by implementation of Alternative C (see section 3.8.4.3). The loss of this habitat due to construction and use is expected to have low impacts on large mammals.

*WILDFIRE*

Sources and levels of impact from wildfires would be similar to those discussed for Alternative B. However, because of higher habitat quality, a greater diversity and abundance of large mammal species would be affected under Alternative C (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2.). Potential impacts from wildfire under Alternative C would be low.

*OTHER HUMAN DISTURBANCE*

Sources and levels of impacts from human disturbance would be similar to those discussed for Alternative B. However, generally better habitat and higher populations of large mammals would be affected. Overall, human disturbance impacts would be low under Alternative C.

#### 4.8.6.4 ALTERNATIVE D — JUNIPER BUTTE

Impacts to ROI Three and Two would be the same as those described under Alternative B. The types of impacts to large mammals in ROI One would be generally similar to those described for Alternative B. The Juniper Butte training range has less undisturbed sagebrush habitat than the other alternative training ranges. Consequently, only about six species of large mammals are present. The population sizes of these species and their use of the ROI One area are also less compared to that found on the Alternative B (Clover Butte) site. Summer use of the area by mule deer and pronghorn is relatively limited (personal communication, Williams 1996; personal communication, Toweill 1996). Similarly, the area is not considered critical winter habitat for pronghorn (personal communication, Smith 1996), although several hundred pronghorn have been observed in the general vicinity of the proposed Juniper Butte site (personal communication, Williams 1996). Therefore, potential impacts to large mammal species at the Juniper Butte site would be low (personal communication, Toweill 1996).

*NOISE*

Sources of noise and level of impacts (low) to large mammals are similar to Alternative B (Clover Butte). Large mammal species diversity and abundance is similar to Alternative B (Clover Butte) and lower than under Alternative C (Grasmere) (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2.).

*GROUND DISTURBANCE*

No ground disturbance would occur in ROI Three and Two. Within ROI One, as discussed in section 2.3.2, new roads would be constructed. Impacts to large mammals would be similar to those described under Alternative B related to habitat fragmentation. The impacts may be less

compared to the Alternative B potential impacts because of the generally lower quality of habitat and lower use by large mammals.

Within ROI One, six large mammal species may be affected by implementation of Alternative D (refer to section 3.8.5.3). The loss of this habitat due to construction and use is anticipated to have a negligible impact to large mammals because the habitat lost would be of low quality and the low level of use of the area by large mammals (personal communication, Toweill 1996).

*WILDFIRE*

Sources of impacts from wildfires would be similar to those discussed for Alternative B. The impacts to large mammals may be lower compared to the Alternative B potential impacts because of the lower quality habitat and smaller populations of large mammals. The potential impacts from wildfires on large mammals at the Juniper Butte site would be negligible.

*OTHER HUMAN DISTURBANCE*

Sources of impacts from human disturbance would be similar to those discussed for Alternative B. The impacts to large mammals may be lower compared to the Alternative B potential impacts because of the lower quality habitat and smaller populations of large mammals. Overall, the impacts to large mammals from human disturbance at the Juniper Butte site would be negligible.

## 4.8.7 Bats and Small Mammals

Within the ROIs of the alternatives, seven bat and 36 small mammal species without special conservation status may be present (refer to section 3.8.7). These species can occur in all habitat types within the ROIs. Potential consequences to bats and small mammals may include direct mortality, change in activity patterns and habitat use, and reduced reproductive success. Potential impacts to seven other bat and two other small mammal species are discussed in section 4.8.5 (Protected and Sensitive Wildlife Species).

### 4.8.7.1 ALTERNATIVE A — NO-ACTION

The general potential impact sources to bats and small mammals under Alternative A would be the same as those described for protected and sensitive wildlife species (section 4.8.5.1). These sources would include noise, habitat modification, wildfire, and human disturbance. Most noise would be associated with continued overflights. In addition, noise from ground activities such as road traffic, service of emitters, and use of SCR would continue. Habitat modification would include continued disturbance of the existing target area from ordnance use. Overall, impact levels under this alternative would remain the same or increase slightly over baseline.

*NOISE*

The frequency of overflights and potential for exposure to high SELs under the No-Action Alternative would be the same for bats and small mammals as for large mammals (section 4.8.5.1). The potential for exposure to sonic booms would not change under the No-Action Alternative.

Potential impacts resulting from aircraft noise may be partitioned into daytime effects (occurring while bats are roosting) and nighttime effects (occurring while bats are active). Night flights do occur in the airspace. Generators emplaced in the field would create point sources of constant noise over a broad band of frequencies. Impacts from these noise sources may include foraging disruption, physiologic stress, maternity or day roost abandonment, and hibernation disturbance.

Few studies have been conducted on the effects of anthropogenic noise on free-ranging bats. Howell (1992) found that noise from unmanned aerial vehicles overlapped with lesser long-nosed bat's hearing at only one frequency (30 kilohertz), and flights at operational cruising altitude (3,000 feet AGL) were inaudible. Another study conducted on the same bat species found no apparent short-term effects of low-flying jet aircraft on bats in maternity roosts within a mine; however, the researchers warned that their results may not be adequate for extrapolation to other areas because of differences in roost site geometry and the outside terrain (Dalton and Dalton 1993). Dalton and Dalton (1993) remained concerned that long-term effects may have a negative impact on the colony, but no study had been conducted yet to test that hypothesis. Griffin et al. (1963) found that echolocating Townsend's big-eared bats were able to resist jamming from a constant noise field by orienting to second harmonics. Jamming resistance and an ability to navigate and locate targets despite acoustical clutter and interference has been demonstrated for numerous other bat species (Simmons et al. 1974, McCarty and Jen 1983, Troest and Mohl 1986, and Schmidt and Joermann 1987). Many of these adaptations appear designed to allow for echolocation, in the presence of conspecifics. In terms of acoustical systems operation, resistance to jamming may indicate that bats are adaptable, within limits, and can use an array of frequencies for echolocation but the ecological implications of anthropogenic noise have not been addressed.

Studies on the effects of noise on wild small mammals have shown increased adrenal and body weights, as well as temporary threshold shifts in hearing (Manci et al. 1988). Long-term exposure to aircraft noise has been shown to cause increased adrenal weights in mice, which generally corresponds to higher levels of stress. However, no adverse impacts on longevity, reproductive success, or health were detected or noted (Chesser et al. 1975). A study testing the effects of off-road vehicle impacts reported that vehicle noise caused a temporary shift in hearing sensitivity in desert kangaroo rats, with recovery of hearing thresholds taking at least three weeks (Brattstrom and Bondello 1983). Kangaroo rat species have highly developed hearing capabilities which they depend on for predator avoidance (Webster and Webster 1972). Damage to kangaroo rat hearing would result in altered rates of predation.

### *GROUND DISTURBANCE*

As discussed in section 4.8.5.1, Protected and Sensitive Wildlife Species, use and maintenance of existing roads would remain the same. Potential impacts to small mammals primarily would include reduced use of habitat near roads. Impacts to bats would be negligible because human activity on or off roads would occur primarily during the day when bats are not active.

There would be no additional habitat disturbance under Alternative A. Road maintenance, target use, and target area clean-up activities would continue to disturb previously disturbed habitat. Habitat in the only existing target area (SCR) is highly disturbed and of exceptionally low quality for small mammal and bat species. Therefore, impacts would be negligible under Alternative A.

### *WILDFIRES*

Potential fire-related impacts to small mammal species are several and may be direct or indirect. Direct effects include direct mortality, destruction of burrows or nests, destruction of food caches and forage, and removal of structural (vegetative) habitat. Indirect effects include displacement of animals, shifts in the vegetative community to exotic grassland, permanent loss of cover and vertical habitat structure, reduction in forage diversity and nutritional quality, and damage to soil structure for burrows. Primarily, impacts to bat species would be loss of roosting habitat, foraging habitat, and prey habitat. Fire-modified plant communities, with exotic grassland replacing shrub-steppe, does not support the same insect community. This altered prey base in burned areas, even after post-fire revegetation, may be unsuitable or of marginal quality, especially for the more specialized bat foragers. The result would be a highly diffuse or patchy insect prey community. Though this idea has not been tested, it is likely that such changes would lead to lower prey capture rates, increased foraging costs, and ultimately modified energy budgets. The limits of this impact on individual and long-term population survival are not known. Impacts from wildfires to small mammals and bats under the No-Action Alternative would remain at current levels.

### *OTHER HUMAN DISTURBANCE*

No increase in human activity potentially resulting in increased human disturbance impacts is expected under Alternative A. Humans may disturb bats in roosts simply through presence. This is particularly true for hibernacula and maternity colonies. Impacts from disturbance include energy reserve depletion and roost and neonate abandonment. Obviously, the timing of this sort of disturbance would be critical (winter or spring-early summer) but in the worst circumstance human disturbance could devastate a population. Additionally, lights may influence bats by modifying flight paths or modifying insect prey patches.

### 4.8.7.2 ALTERNATIVE B — CLOVER BUTTE

In general, potential sources of impact to small mammals and bats under Alternative B would be similar to those discussed under Alternative A. These sources would include noise, habitat modification, wildfire, and human disturbance. Assessment of direct impacts to habitat, potential habitat or wildlife species within the 12,000-acre training range is restricted to the 300-acre primary ordnance impact area and approximately 100 additional acres associated with road construction and maintenance buildings. Indirect impacts to habitat (refer to Wildlife Habitat, section 4.8.4) and wildlife species may occur beyond the perimeter of the primary ordnance impact area and roads from other activities associated with the proposed action. These indirect impacts are related to aircraft and ground equipment noise, vehicle movements, human presence, lights, and fugitive dust. Although ordnance has a low probability of skipping out of the primary impact area, it may facilitate habitat degradation or destruction within the training range through impact or from subsequent recovery operations. Outside of the training range, direct loss of habitat from construction would occur at emitter, new road, and powerline sites. Therefore, overall potential impacts would be greater under Alternative B when compared to the No-Action Alternative.

#### *NOISE*

The primary sources of noise impacts are aircraft overflights (general flight noise and sonic booms) and power generators at the 12,000-acre training range, emitter sites, and no-drop target areas. Detailed information of noise levels are discussed in Protected and Sensitive Wildlife Species (section 4.8.5) and Noise (section 4.2).

Estimated exposure to noise for bats and small mammals would be the same as for protected and sensitive species (section 4.8.5). In general, exposure to high SELs would increase in the vicinity of the proposed training range and Owyhee/Jarbidge north expansion and would decrease in other areas. The frequency of sonic booms would increase greatly at SCR and increase slightly in the Range Support and Jarbidge MOAs. Overall, impacts to large mammals would be low under the Clover Butte Alternative. Noise impacts from power generator operations would vary inversely with distance from generators. Generators considered for use produce sound levels of approximately 72 dB(A) at 100 feet and 57 dB(A) at 500 feet. Emplacement would result in new constant noise sources in the environment.

Overall, impacts to bats and small mammals from noise would be negligible to low under the Clover Butte Alternative.

#### *GROUND DISTURBANCE*

There would be no ground disturbances in ROI Three and ROI Two including the proposed expanded airspace units (Jacks Creek and Nevada).

Within ROI One, 26 small mammal species may be affected by implementation of Alternative B (see section 3.8.7.3). Based on studies conducted in other regions, density estimates can be calculated for 17 of 26 species (California Wildlife Habitat Relationships Database no date [n.d.]). From these studies, about 180 small mammals per acre may be displaced or eliminated in ROI One. Loss of potential small mammal habitat due to construction and use would have low impacts to small mammals because the overall amount and quality of habitat disturbed would be negligible.

Few appropriate bat roosting areas were observed in the Clover Butte training range. A rocky gully with a low basalt ledge to the west of Clover Butte may provide potential roosting for some bat species. Given its distance from appropriate forage and north tending aspect, this area does not appear to be essential day roosting habitat. Vegetation removal and disturbance in ROI One would reduce foraging habitat for bats. In addition, several isolated ephemeral ponds that lie in association with existing roads (refer to section 3.8) would likely be impacted. These pools may serve as seasonal foraging and water sources for bats. Because no bats were detected during two single-day surveys during different portions of the activity season, the 12,000-acre training range may provide only marginal foraging habitat. Nevertheless, bats foraging in these marginal grassland and shrub-steppe communities may be impacted. No bat roosts are known to be adjacent to the roads, emitter sites, or no-drop areas. Overall, impacts to bats from loss of foraging habitat would be negligible.

*WILDFIRE*

Impacts from wildfires would be similar to those discussed for the No-Action Alternative and in section 4.8.5.2. A limited potential for wildfires would exist for ROIs Three and Two. Sources of these fires would be primarily from flares but the potential for flare use resulting in wildfire is low (refer to section 4.3, Safety). If public use of the area increases as a result of improved road access, vehicle catalytic converters and improperly disposed of cigarettes and matches may also result in wildfires.

Potential causes of wildfire in ROI One are development and maintenance of the training range, and ordnance delivery. Development of the 12,000-acre training range, no-drop target areas, and emitter sites may increase fire risk through accidental sources of ignition such as sparks from equipment, hot exhaust pipes on vehicles, and smoking. However, safety procedures would be implemented for contractors and work crews, including use of spark arrestors, no parking of vehicles on vegetated areas, and restrictions on smoking. The probability of wildfires occurring as a result of ordnance delivery would decrease over current levels because only cold spot spotting charges would be used at the new range and at SCR.

Fire frequency tends to increase following burns in the shrub-steppe ecosystem due to a shift in vegetation composition from shrublands to annual grasslands. However, the potential for fire frequency to increase under Alternative B would be low. Use of fire protection measures would increase the chance that fires ignited in the vicinity of the training range would be contained and limited. Much of the habitat within ROI One that would be at potential risk

would be annual grasses, seeded wheatgrass, and sagebrush. The relatively small amount of sagebrush in ROI One would limit the potential long-term effects of wildfire on bats and small mammals. Although the potential for fire to occur in ROI One is low, the additional loss of sagebrush would further reduce the overall quality of the existing shrub-steppe habitat in the region. Overall, the potential impacts from wildfires to bats and small mammals would be negligible under the Clover Butte Alternative.

***OTHER HUMAN DISTURBANCE***

Types of impacts from direct human disturbance would be similar to those discussed for Alternative A. A low potential for direct human disturbance would exist for ROIs Three and Two. This impact cannot be quantified but may be considered negligible for small mammal and bat species. As stated previously, bat roost habitat is poor in the Clover Butte 12,000-acre training range. It is highly unlikely that maternity roosts or hibernacula occur here. Also, non-native grasslands dominate. Because of these facts, impact from human disturbance would be negligible for small mammals and bats.

### 4.8.7.3 ALTERNATIVE C — GRASMERE

In general, potential types of impact sources to small mammals and bats under Alternative C would be similar to those discussed under Alternative B (Clover Butte). However, habitat quality is better on the Alternative C Grasmere site (ROI One) than on the Alternative B Clover Butte site (ROI One) (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2). Therefore, overall potential impacts would be low.

***NOISE***

Sources of noise and level of impacts to bats and small mammals are similar to Alternative B (Clover Butte). However, a greater diversity and abundance of bat and small mammal species would be affected under Alternative C; therefore, the impact level would be low.

***GROUND DISTURBANCE***

There would be no increased ground disturbances in ROI Three and ROI Two.

Within ROI One, 31 small mammal and seven bat species may be affected by implementation of Alternative C (see section 3.8.7.4). Small numbers of species may be displaced or lost from construction and use. The diversity and quality of habitats on the Grasmere site is greater relative to the Clover Butte area. Many observed bat roosting areas and extensive high quality bat roosting habitat are found within the Grasmere escarpment on the 12,000-acre training range. Impacts to small mammals and bats would be greater compared to Alternative B because of greater species diversity and abundance. Within ROI One for Alternative C, impacts would be low for small mammal species and bat species.

*WILDFIRE*

Impacts from wildfires would be similar to those discussed for Alternative B for ROIs Three and Two. Within ROI One, the process of plant community change associated with fire would have a greater impact on the Grasmere 12,000-acre training range than on Clover Butte. In addition, wildfire sweeping up draws and small canyons would lead to direct mortality of roosting bats and potential changes in roosting site characteristics. The low probability of fire related to the proposed action would suggest the impact on bat and small mammal species would be low. The occurrence of fire, however, would be potentially devastating to a unique habitat area containing many bat and small mammal species. For this reason, fire impact would be considered low for small mammals and bats.

*OTHER HUMAN DISTURBANCE*

Types of impacts from direct human disturbance would be similar to those discussed for Alternative B. Impact on small mammal species would be considered low in all ROIs. It should be noted that the Grasmere target area likely supports bat species' maternity roosts and hibernacula. A major source of mortality among bat species is human disturbance to maternity roosts and hibernation sites. Increased ground activities would eventually lead to the discovery and disturbance of these areas. Impact would be low.

### 4.8.7.4 ALTERNATIVE D — JUNIPER BUTTE

In general, potential types of impact sources to small mammals and bats under Alternative D would be similar to those discussed under Alternative B (Clover Butte). Overall habitat quality is similar on the Juniper Butte 12,000-acre training range (ROI One) compared to the Clover Butte site (ROI One) with the exception of Juniper Draw, an area of high relief that terminates in a substantial canyon (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2).

*NOISE*

Sources of noise and level of impacts to bats and small mammals are similar to Alternative B. However, bat and small mammal species diversity and abundance may be slightly greater under this alternative than in Alternative B and lower than under Alternative C.

*GROUND DISTURBANCE*

There would be no increased ground disturbances in ROI Three and ROI Two.

Within ROI One, 21 small mammal and seven bat species may be affected by implementation of Alternative D (see section 3.8.7.5). Small numbers of bat and small mammal species may be displaced or lost from construction and use. Less suitable small mammal and bat habitat exists under this alternative; therefore, impacts would be low and similar to Alternative B.

*WILDFIRE*

Impacts from wildfires would be similar to those discussed for Alternative B.

*OTHER HUMAN DISTURBANCE*

Types of impacts from direct human disturbance would be similar to those discussed under Alternative A. Levels of impacts from direct human disturbance would be lower than those discussed for Alternative C. Impact would be low for bats and small mammals.

## 4.8.8 Upland Game Birds

Within the ROIs of the alternatives under consideration, five upland game bird species without special status may be present (refer to section 3.8.8). These species can occur in all habitat types within the ROI. Potential consequences to upland game birds may include direct mortality, change in activity patterns and habitat use, and reduced reproductive success. Potential impacts to three additional upland game bird species, including sage grouse, are discussed in section 4.8.5 (Protected and Sensitive Wildlife Species).

### 4.8.8.1 ALTERNATIVE A — NO-ACTION

The general potential impact sources to upland game birds under the No-Action Alternative would be the same as those described for protected and sensitive wildlife species (section 4.8.5.1). These sources would include noise, habitat modification from ground disturbance, wildfire, and human disturbance. Habitat modification may result from continued use and maintenance of existing roads and SCR and wildfires. Most noise would be associated with continued overflights. However, noise from ground activities such as road and emitter use, and use of the SCR target area, would continue. In general, overall potential impacts to upland game birds under Alternative A would remain the same.

*NOISE*

The frequency of overflights and potential for exposure to high SELs under the No-Action Alternative would be the same for upland game birds as for large mammals, section 4.8.5.1. The potential for exposure to sonic booms would not change under the No-Action Alternative compared to the baseline. Sensitivity to noise and other disturbances varies among bird species and among individuals within species, due in part to differences in hearing acuity and previous exposures to noise. Sensitivity to noise is also dependent on timing; birds are typically most sensitive to disturbance during the nesting season.

Studies of noise effects on gallinaceous birds are rare for upland game birds but more common for poultry. At Naval Air Station Fallon, chukar exhibited brief (average 57 seconds) changes in behavior as a response to aircraft disturbances (Lamp 1989). White leghorn chicks exposed to simulated sonic booms (156 dB peak flat) had significantly lighter weights than control chicks

(Jehl and Cooper 1980). In contrast, Stadelman (1958) found that noise levels of 80-118 dB did not effect the growth of young chickens. Sonic boom noise had no effect on the hatchability of chicken eggs (Jehl and Cooper 1980, Heinemann 1969); however, aircraft overflights (115 dB) interrupted hens brooding their young (Stadelman 1958). The effect of long-term exposure to overflights on game birds has not been investigated and is unknown.

Although the overall potential for a biological resource to be overflown would increase as discussed in section 4.8.5.1, impacts to upland game birds would remain the same.

*GROUND DISTURBANCE*

Sources and levels of ground disturbance would be identical to those discussed in section 4.8.5.1, Protected and Sensitive Wildlife Species. Use and maintenance of existing roads would remain the same. Therefore, no additional habitat disturbance under Alternative A is expected. Potential impacts to upland game birds primarily would include reduced use of habitat near roads. Current levels of habitat disturbance from use of SCR would remain the same. In general, impacts to upland game birds from ground disturbance would remain the same.

*WILDFIRES*

Sources and impacts of wildfire and the potential for their occurrence under Alternative A would be identical to those discussed in section 4.8.5.1, Protected and Sensitive Wildlife Species. Impacts from wildfires to upland game birds would remain at current levels.

*OTHER HUMAN DISTURBANCE*

Sources and levels of human disturbance would be identical to those discussed in section 4.8.5.1, Protected and Sensitive Wildlife Species. No increase in human activity potentially resulting in increased human disturbance impacts is expected under Alternative A. Humans may disturb upland game birds simply through presence. However, impacts from human disturbance would remain at current levels.

### 4.8.8.2 ALTERNATIVE B — CLOVER BUTTE

In general, potential sources of impact to upland game birds under Alternative B would be similar to those discussed under Alternative A. These sources would include noise, habitat modification from ground disturbance, wildfire, and human disturbance. Assessment of direct impacts to habitat, potential habitat, or wildlife species within the 12,000-acre training range is restricted to the 300-acre primary ordnance impact area and approximately 100 additional acres associated with road construction and maintenance buildings. Indirect impacts to habitat (refer to Wildlife Habitat, section 4.8.4) and wildlife species may occur beyond the perimeter of the primary ordnance impact area and roads from other activities associated with the proposed action. These indirect impacts are related to aircraft and ground equipment noise, vehicle movements, human presence, lights, and fugitive dust. Although ordnance has a low

probability of skipping out of the primary impact area, it may facilitate habitat degradation or destruction within the training range through impact or from subsequent recovery operations. Outside of the training range, direct loss of habitat from construction would occur at emitter, new road, and powerline sites. Therefore, overall potential impacts would be greater under Alternative B when compared to the No-Action Alternative. In general, overall potential impacts to upland game birds under Alternative B would be negligible.

### *NOISE*

The primary sources of noise impacts are aircraft overflights (general flight noise and sonic booms) and power generators at the 12,000-acre training range, emitter sites, and no-drop target areas. Detailed information of noise levels are discussed in Protected and Sensitive Wildlife Species (section 4.8.5) and Noise (section 4.2).

Estimated exposure to noise for upland game birds would be the same as for protected and sensitive species (section 4.8.5). In general, exposure to high SELs would increase in the vicinity of the proposed training range and Owyhee/Jarbidge north expansion and would decrease in other areas. The frequency of sonic booms would increase greatly at SCR and increase slightly in the Range Support and Jarbidge MOAs. Overall, impacts to large mammals would be low under the Clover Butte Alternative. Noise impacts from power generator operations would vary inversely with distance from generators. Generators considered for use produce sound levels of approximately 72 dB(A) at 100 feet and 57 dB(A) at 500 feet. Emplacement would result in new constant noise sources in the environment.

Overall, impacts to game birds from noise would be negligible under the Clover Butte Alternative.

### *GROUND DISTURBANCE*

Sources and levels of ground disturbance for Alternative B have been discussed in section 4.8.5.2, Protected and Sensitive Wildlife Species. The impacts to upland game birds from ground disturbance would be greater than those described for the No-Action Alternative (section 4.8.8.1) because more habitat would be destroyed or modified. Within ROI Three and Two, impacts to upland game birds would be negligible. Within ROI One, five upland game bird species may be affected by implementation of Alternative B (see section 3.8.8.3). Direct loss of potential game bird habitat due to construction and use would have negligible impacts to gamebirds because little suitable habitat is present.

### *WILDFIRE*

Sources and impacts of wildfire and the potential for their occurrence under Alternative B would be identical to those discussed in section 4.8.5.2, Protected and Sensitive Wildlife Species. Within ROI Three and Two, impacts to upland game birds would be negligible. Within ROI One, five upland game bird species may be affected by implementation of

Alternative B (see section 3.8.8.3). However, because of the general lack of suitable habitat, few of these species are likely to occur in appreciable numbers; therefore, impacts to upland game birds in ROI One would be negligible.

***OTHER HUMAN DISTURBANCE***

Sources and levels human disturbance would be identical to those discussed in section 4.8.5.2, Protected and Sensitive Wildlife Species. Increased human activity potentially may result in increased human disturbance impacts under Alternative B. Humans may disturb upland game birds simply through presence. However, impacts from human disturbance in all ROIs would be negligible.

### 4.8.8.3 ALTERNATIVE C — GRASMERE

In general, potential types of impact sources to upland game birds under Alternative C would be similar to those discussed under Alternative B (Clover Butte). Overall potential impacts to upland game birds under Alternative C would be negligible. However, higher quality habitat and its resulting higher species diversity and abundance would be affected under Alternative C (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2).

***NOISE***

Sources of noise and level of impacts to upland game birds are similar to Alternative B (Clover Butte). The level of impact would be negligible; however, a greater diversity and abundance of game bird species would be affected under Alternative C.

***GROUND DISTURBANCE***

Sources and levels of ground disturbance for Alternative C have been discussed in section 4.8.5.3, Protected and Sensitive Wildlife Species. Impacts to upland game birds under Alternative C would be the same in ROIs Three and Two. However, within ROI One, impacts to upland game birds from ground disturbance for Alternative C would be greater than those described for Alternative B (section 4.8.8.2). Because a greater diversity of habitats and associated upland game bird species occur at the Grasmere training range, impacts would be negligible within ROI One.

***WILDFIRE***

Sources and impacts of wildfire and the potential for their occurrence under Alternative C would be identical to those discussed in section 4.8.5.3, Protected and Sensitive Wildlife Species. Within ROI Three and Two, impacts to upland game birds would be negligible. Within ROI One, five upland game bird species may be affected by implementation of Alternative C (see section 3.8.8.3). Because of the overall higher quality of habitats in the Grasmere training range, higher numbers of the majority of upland game species are likely to occur. However, impacts to upland game birds in ROI One would be negligible.

*OTHER HUMAN DISTURBANCE*

Sources and levels of human-caused disturbance would be identical to those discussed in section 4.8.5.3, Protected and Sensitive Wildlife Species. Increased human activity potentially may result in increased human disturbance impacts under Alternative C. In general, impacts from human disturbance in all ROIs would be negligible.

### 4.8.8.4 ALTERNATIVE D — JUNIPER BUTTE

In general, potential types of impact sources to upland game bird species under Alternative D would be similar to those discussed under Alternative B (Clover Butte). Overall habitat quality is similar on the Alternative D Juniper Butte site (ROI One) compared to the Alternative B Clover Butte site (ROI One) (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2). Therefore, the overall potential levels of impact would be similar under Alternative D when compared to Alternative B. In general, potential impacts to upland game birds under Alternative D would be negligible.

*NOISE*

Sources of noise and level of impacts to upland game birds are similar to Alternative B (Clover Butte). However, upland game bird species diversity and abundance may be slightly greater under this alternative than in Alternative B (Clover Butte) and lower than under Alternative C (Grasmere). Although chukar are known to occur within Clover Creek adjacent to Juniper Butte, gallinaceous birds are not known to be highly sensitive to aircraft noise (Lynch and Speake 1978; Lamp 1989). Impact to upland game birds from noise would be negligible

*GROUND DISTURBANCE*

Sources of ground disturbance for Alternative D have been discussed in section 4.8.5.4, Protected and Sensitive Wildlife Species. The types and levels of impacts to upland game bird species under Alternative D would be the same in all the ROIs as Alternative B. In general, impacts to upland game birds from ground disturbance would be negligible.

*WILDFIRE*

The types and levels of impacts to upland game bird species under Alternative D would be the same in all the ROIs as Alternative B. In general, impacts to upland game birds from wildfire would be negligible.

*OTHER HUMAN DISTURBANCE*

Types and levels of impacts upland game birds from direct human disturbance would be similar to those discussed for Alternative B. In general, impacts to upland game birds from other human disturbance would be negligible.

## 4.8.9 Waterbirds

Seventy-one species of non-protected or sensitive waterbirds nest, migrate, or winter within the general region of the proposed action and alternatives (section 3.8.9, Waterbirds). These species primarily are associated with aquatic, riparian, and wetland habitats, which are seasonal and sparse throughout the ROIs (section 3.8.2, Wetlands). Potential consequences to waterbirds may include direct mortality, change in activity patterns and habitat use, and reduced reproductive success. Potential impacts to protected and sensitive waterbird species are discussed in section 4.8.5, Protected and Sensitive Wildlife Species.

### 4.8.9.1 ALTERNATIVE A — NO-ACTION

The general potential impact sources to waterbirds under Alternative A would be the same as those described for protected and sensitive wildlife species (section 4.8.5.1). These sources would include noise, human disturbance, and habitat modification due to ground disturbance and wildfire. Habitat modification would result from continued use and maintenance of existing roads, use of the SCR, and from wildfires. Most noise would be associated with continued overflights. In addition, noise from ground activities such as road and emitter use, and use of SCR, also would continue. Human disturbance includes disruption of wildlife foraging, breeding, resting, or movements caused by human presence or activities. No increase in impact levels is expected.

#### *NOISE*

Under Alternative A, impacts to waterbirds would be primarily limited to exposure to noise from aircraft. The frequency of overflights and potential for exposure to high SELs under the No-Action Alternative would be the same for waterbirds as for large mammals, section 4.8.5.1. The potential for exposure to sonic booms would not change under the No-Action Alternative. Many studies have focused on the impacts of aircraft noise on waterbirds (Manci et al. 1988). A majority of studies involved piston-engined fixed-wing aircraft or helicopters that may or may not elicit different behavioral responses than subsonic and supersonic jets due to differences in noise frequencies and levels, and different visual stimuli; therefore, their applicability to the proposed military activity is speculative.

Several studies report contradictory results on the effects of military overflights on time-activity budgets of waterbirds (Black et al. 1984, Lamp 1989, Fleming et al. 1996). Results from a comprehensive study indicated that the effects of military overflights on waterbirds in Florida did not adversely affect breeding success, colony establishment, or size (Black et al. 1984). Some of the birds in this study (e.g., great egrets, snowy egrets, cattle egrets) occur in ROI Three as well. Fleming et al. (1996) found that the energy costs associated with response behaviors of wintering black ducks (*Anas rubripes*) to military overflights in North Carolina were low. However, Ward and Stehn (1989) report that foraging activity of staging geese in Alaska was disrupted by helicopter and fixed-wing aircraft overflights. Schweinsburg (1974) found that duck populations on Canadian North Slope lakes showed short-term decreases, as much as 40

percent, when aircraft overflights occurred. Additionally, Lamp (1989) reported that some waterbird species were sensitive to both subsonic and supersonic military overflights, with snow geese exhibiting adverse responses (alert calling, alert posture, flight) 59 percent of the time. Other species that displayed sensitivity to military jet overflights in Lamp's study include several species (northern pintail, long-billed dowitcher, American widgeon, and green-winged teal) that might potentially occur in ROI Three. Burger (1981) found that supersonic jet overflights caused herring gulls to fly from their nest and fight more when they returned, causing many eggs to break.

Noise disturbance from maintenance activities may impact waterbirds if they occur close to wetland habitat. A study on breeding trumpeter swans found that vehicular traffic caused behavioral responses (alert posture) at nests closest to roads where neither vegetation nor the landscape formed a visual barrier, or when vehicles stopped (Henson and Grant 1991). Noise impacts during migration may mask natural sounds in the environment. It is hypothesized that migrating birds use natural sounds to impart information on surfaces and landscapes below them and possibly gauge wind velocities (D'Arms and Griffin 1972, Griffin and Hopkins 1974). Noise levels would not increase near known concentrations of breeding and wintering waterbirds. Therefore, noise impacts to waterbirds are expected to be negligible under this alternative.

#### *GROUND DISTURBANCE*

The use of existing roads, emitters, and the SCR would continue in previously disturbed habitat. Continued disturbance to waterbirds would be limited to where roads currently abut or traverse bird foraging and nesting habitat. Continued impacts would include disturbing birds during foraging or nesting, or direct loss of foraging and nesting habitats by precluding use by birds. No additional waterbird habitat would be disturbed as a result of No-Action Alternative and, therefore, no additional impacts on birds are expected to occur.

#### *WILDFIRES*

Potential sources of wildfire are discussed in section 4.8.5.2, Protected and Sensitive Wildlife Species. Fires caused by Air Force or other activities may destroy or degrade waterbird habitat. Impacts from wildfires to waterbirds are expected to be negligible under this alternative because the potential for fire is low (section 4.8.5.2, Protected and Sensitive Wildlife Species) and waterbird habitat is sparse and widely dispersed throughout all the ROIs.

#### *OTHER HUMAN DISTURBANCE*

No increase in human activity within the ROIs would occur as a result of Alternative A; therefore, no additional impacts on waterbirds are expected to occur.

### 4.8.9.2 ALTERNATIVE B — CLOVER BUTTE

In general, potential impact sources to waterbirds under Alternative B would be similar to those discussed under Alternative A. These sources would include noise, habitat modification from ground disturbance, wildfire, and human disturbance. Assessment of direct impacts to habitat, potential habitat, or wildlife species within the 12,000-acre training range is restricted to the 300-acre primary ordnance impact area and approximately 100 additional acres associated with road construction and maintenance buildings. Indirect impacts to habitat (refer to Wildlife Habitat, section 4.8.4) and wildlife species may occur beyond the perimeter of the primary ordnance impact area and roads from other activities associated with the proposed action. These indirect impacts are related to aircraft and ground equipment noise, vehicle movements, human presence, lights, and fugitive dust. Although ordnance has a low probability of skipping out of the primary impact area, it may facilitate habitat degradation or destruction within the training range through impact or from subsequent recovery operations. Outside of the training range, direct loss of habitat from construction would occur at emitter, new road, and powerline sites. Therefore, overall potential impacts would be low but greater under Alternative B when compared to the No-Action Alternative.

#### *NOISE*

The primary sources of noise impacts are aircraft overflights (general flight noise and sonic booms) and power generators at the 12,000-acre training range, emitter sites, and no-drop target areas. Detailed information of noise levels are discussed in Protected and Sensitive Wildlife Species (section 4.8.5) and Noise (section 4.2).

Estimated exposure to noise for waterbirds would be the same as for protected and sensitive species (section 4.8.5). In general, exposure to high SELs would increase in the vicinity of the proposed training range and Owyhee/Jarbidge north expansion and would decrease in other areas. The frequency of sonic booms would increase greatly at SCR and increase slightly in the Range Support and Jarbidge MOAs. Overall, impacts to large mammals would be low under the Clover Butte Alternative. Noise impacts from power generator operations would vary inversely with distance from generators. Generators considered for use produce sound levels of approximately 72 dB(A) at 100 feet and 57 dB(A) at 500 feet. Emplacement would result in new constant noise sources in the environment.

Overall, impacts to waterbirds from noise would be negligible to low under the Clover Butte Alternative.

#### *GROUND DISTURBANCE*

There would be no ground disturbances in ROI Three (including the proposed expanded airspaces: Jacks Creek and Nevada) and ROI Two.

Within ROI One, impacts to waterbirds due to direct loss of potential waterbird habitat from construction and use would be negligible. The few small ephemeral pools and intermittent streams provide little, if any, nesting habitat and are probably only used by very low numbers of a few waterbird species during spring migration.

*WILDFIRE*

Potential sources of wildfire are discussed in section 4.8.5.2, Protected and Sensitive Wildlife Species. Fires caused by Air Force activities may destroy vegetation associated with waterbird habitat and could cause sedimentation of water, thereby degrading habitat quality. Impacts from wildfires to waterbirds within ROIs Three and Two are expected to be negligible under this alternative because the potential for fire is low (section 4.8.5.2, Protected and Sensitive Wildlife Species) and waterbird habitat is sparse and widely dispersed throughout these ROIs. Because the potential for wildfire occurring within ROI One is low and little suitable habitat is present, the level of impact on waterbirds under this alternative is negligible.

*OTHER HUMAN DISTURBANCE*

No increase in human activity would occur within ROIs Three and Two. Human activity and disturbance to waterbirds would increase within ROI One, but impacts are expected to be negligible.

#### 4.8.9.3 ALTERNATIVE C — GRASMERE

In general, potential types of impact sources to waterbirds under Alternative C would be similar to those discussed under Alternative B (Clover Butte). However, more aquatic habitat is present in the training range under Alternative C compared to the Alternative B training range (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2).

*NOISE*

Sources of noise and level of impacts to waterbirds are similar to Alternative B (Clover Butte). However, a greater diversity and abundance of waterbird species would be affected under Alternative C; therefore, the level of impact would be negligible.

*GROUND DISTURBANCE*

As in Alternative B (Clover Butte), no ground disturbance would occur within ROIs Three and Two under Alternative C.

Direct loss of potential waterbird habitat due to construction and use would have negligible impacts to waterbirds because little suitable habitat is present.

*WILDFIRE*

Under this alternative the level of impacts from wildfires would be the same (negligible) as for Alternative B for ROIs Three and Two. Within ROI One, the level of impact to waterbirds from wildfire is expected to be negligible, but more potential waterbird habitat is present.

*OTHER HUMAN DISTURBANCE*

No increase in human activity would occur within ROIs Three and Two. Human activity and, therefore, human disturbance to waterbirds would increase within ROI One, but impacts are expected to be negligible.

#### 4.8.9.4 ALTERNATIVE D — JUNIPER BUTTE

In general, potential types of impact sources to waterbirds under Alternative D would be similar to those discussed under Alternative B (Clover Butte). There is slightly less potential waterbird habitat within the Alternative D training range compared to the Alternative B training range (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2).

*NOISE*

Sources of noise and level of impacts to waterbirds are similar to Alternative B (Clover Butte). However, waterbird species diversity and abundance may be slightly lower under this alternative than under Alternative B (Clover Butte) and Alternative C (Grasmere).

*GROUND DISTURBANCE*

As in Alternatives B and C, no ground disturbance would occur within ROIs Three and Two under Alternative D.

Within ROI One, impacts to waterbirds due to direct loss of potential waterbird habitat due to ground disturbance from the construction and use would be negligible. The few small ephemeral pools and intermittent streams provide little if any nesting habitat and are probably only used by very low numbers of a few waterbird species during spring migration. Impacts to waterbirds from loss of habitat under this alternative would be negligible.

*WILDFIRE*

Under this alternative, the level of impacts from wildfires would be the same (negligible) as for Alternative B (Clover Butte) for ROIs Three and Two. Within ROI One, the level of impact to waterbirds from wildfire also would be low because the potential for wildfire occurring within ROI One is negligible and little aquatic habitat is present. The impact of wildfire on waterbirds is the same as for Alternative B, but slightly less potential waterbird habitat is present at Juniper Butte.

*OTHER HUMAN DISTURBANCE*

No increase in human activity would occur within ROIs Three and Two. Human activity and disturbance to waterbirds will increase within ROI One, but impacts are expected to be negligible.

## 4.8.10 Raptors and Other Birds

Nineteen raptor and 78 other bird species (non-protected or sensitive species) nest, migrate, or winter within the general region of the proposed action and alternatives (section 3.8.10, Raptors and Other Birds). Potential consequences to these bird species may include direct morality, change in activity patterns and habitat use, and reduced reproductive success. Potential impacts to protected and sensitive raptors (7 species) and other birds (24 species) are discussed in section 4.8.5, Protected and Sensitive Wildlife Species.

### 4.8.10.1 ALTERNATIVE A — NO-ACTION

The general potential impact sources to raptors and other birds under Alternative A would be the same as those described for protected and sensitive wildlife species (section 4.8.5.1). These sources would include noise, human disturbance, and habitat modification due to ground disturbance and wildfire. Habitat modification would result from continued use and maintenance of existing roads, use of the SCR, and from wildfires. Most noise would be associated with continued overflights. In addition, noise from ground activities such as road and emitter use, and use of SCR also would continue. Human disturbance includes disruption of wildlife foraging, breeding, resting, or movements caused by human presence or activities. No additional proposal-related impacts to raptors and other game birds are anticipated under this alternative.

*NOISE*

The frequency of overflights and potential for exposure to high SELs under the No-Action Alternative would be the same for raptors and other birds as for large mammals (refer to section 4.8.5.1). The potential for exposure to sonic booms would not change under the No-Action Alternative.

Sensitivity to noise and other disturbances varies among raptor species and among individuals within species, due in part to differences in hearing acuity and previous exposure to noise. Sensitivity to noise is also dependent upon timing; raptors and other birds are typically most sensitive to disturbance during the nesting season.

Few studies have been conducted on the impacts of jet aircraft noise to raptors. An account of a single female northern harrier hunting within the target area of a Navy bombing range reported no change in hunting behavior despite jet noise of 80 to 87 dB at a distance of approximately 1,500 feet (Jackson et al. 1977). While suggesting that harriers are not sensitive

to noise disturbances caused by jet overflights or ordnance delivery, the report represents a single observation of an individual bird; extrapolation of this behavior to other harriers or to raptors in general may not be appropriate, particularly in areas where birds have not previously been exposed to aircraft noise.

In a two-year study of the effects of low-level jet aircraft flights on cliff-nesting raptors (Ellis et al. 1991), nests of eight raptor species were subjected to almost 1,000 overflights by military jets. Mid- to high-altitude sonic booms were also simulated using explosive devices. Noise levels in the study ranged from 82 to 114 dB(A) for overflights and 111 to 151 dB(A) for sonic booms. Raptor nests studied were primarily prairie falcon and peregrine falcon nests, but red-tailed hawk, Cooper's hawk, and golden eagle nests were also included. Birds were often noticeably alarmed and sometimes temporarily left nests in response to overflights and simulated booms. All significant responses (i.e., cowering, calling, fleeing, interruption of incubation, or feeding young) were observed when jets passed within 500 feet of the nest; adults showed alarm when jets were within 1,000 feet, but generally ignored jets more than 1,600 feet distant. Twenty of 22 nests fledged young after being disturbed, and 21 of 22 nests disturbed in the first year of the study were reoccupied during the second year. The results of this study indicate that low-level jet overflights and mid- to high-altitude sonic booms do not have long-term adverse impacts to nesting raptors. The authors note, however, that the birds in the study were not naïve (i.e., except for nestlings, they had all previously been subjected to moderate levels of low-altitude overflights). In addition, nests were exposed to an average of 11 overflights during the first year of the study (with a maximum of 32) and an average of 38 overflights (maximum 229) during the second year. It is not known whether higher numbers of low-level overflights would cause more severe responses, particularly in naïve birds.

### *GROUND DISTURBANCE*

The use of existing roads, emitters, and the SCR would continue in previously disturbed habitat. Continued disturbance to raptors and other birds would be limited to where roads currently abut or traverse foraging and nesting habitat. Continued impacts would include disturbing birds during foraging or nesting, or direct loss of foraging and nesting habitats by precluding use by birds. No additional raptor or other bird habitat would be disturbed as a result of No-Action Alternative and, therefore, no additional impacts are expected to occur.

### *WILDFIRE*

Potential sources of wildfire are discussed in section 4.8.5.2, Protected and Sensitive Wildlife Species. Fires caused by Air Force activities may destroy or degrade raptor and other bird nesting and foraging habitat. Impacts from wildfires to raptors and other birds are expected to be negligible under this alternative because the potential for fire is low (section 4.8.5.2, Protected and Sensitive Wildlife Species) and suitable bird habitat is relatively abundant and widely dispersed throughout all the ROIs.

*HUMAN DISTURBANCE*

No increase in human activity within the ROIs would occur as a result of the No-Action Alternative. Therefore, no additional impacts on raptors and other birds are expected to occur.

### 4.8.10.2 ALTERNATIVE B — CLOVER BUTTE

In general, potential impact sources to raptors and other birds under Alternative B would be similar to those discussed under Alternative A. These sources would include noise, habitat modification from ground disturbance, wildfire, and human disturbance. Assessment of direct impacts to habitat, potential habitat or wildlife species within the 12,000-acre training range is restricted to the 300-acre primary ordnance impact area and approximately 100 additional acres associated with road construction and maintenance buildings. Indirect impacts to habitat (refer to Wildlife Habitat, section 4.8.4) and wildlife species may occur beyond the perimeter of the primary ordnance impact area and roads from other activities associated with the proposed action. These indirect impacts are related to aircraft and ground equipment noise, vehicle movements, human presence, lights, and fugitive dust. Although ordnance has a low probability of skipping out of the primary impact area, it may facilitate habitat degradation or destruction within the training range through impact or from subsequent recovery operations. Outside of the training range, direct loss of habitat from construction would occur at emitter, new road, and powerline sites. Therefore, overall potential impacts would be low but greater under Alternative B when compared to the No-Action Alternative.

*NOISE*

The primary sources of noise impacts are aircraft overflights (general flight noise and sonic booms) and power generators at the 12,000-acre training range, emitter sites, and no-drop target areas. Detailed information of noise levels are discussed in Protected and Sensitive Wildlife Species (section 4.8.5) and Noise (section 4.2).

Estimated exposure to noise for raptors and other birds would be the same as for protected and sensitive species (section 4.8.5). In general, exposure to high SELs would increase in the vicinity of the proposed training range and Owyhee/Jarbidge north expansion and would decrease in other areas. The frequency of sonic booms would increase greatly at SCR and increase slightly in the Range Support and Jarbidge MOAs. Overall, impacts to large mammals would be low under the Clover Butte Alternative. Noise impacts from power generator operations would vary inversely with distance from generators. Generators considered for use produce sound levels of approximately 72 dB(A) at 100 feet and 57 dB(A) at 500 feet. Emplacement would result in new constant noise sources in the environment.

Overall, impacts to raptors and other birds from noise would be low under the Clover Butte Alternative.

The change in overflight noise in most of ROI Three including decreases in exposure to high SELs may reduce noise stress to raptors and other birds. Flights at less than 500 feet from nests and sonic booms of greater than 112 dB are most likely to exhibit biologically significant responses to stimuli (Ellis et al. 1991); long-term consequences of high-frequency exposure to these disturbances are unknown. According to Gladwin and McKechnie (1993), long-term reactivity to overflights may result in energy losses, which "could be a critical problem for animals that are somewhat energy-limited in the first place." While Ellis et al. (1991) did not demonstrate that elevated reactivity resulted in reductions in reproductive success, the overall effects of long-term disturbance are still uncertain because of the limited data available. Wintering or migrating birds, or nesting birds in drought or other low-prey situations, may be energy-limited, and may respond differently to overflight noise than the subject birds in the studies described above.

Noise from construction, maintenance, and use of range facilities would be greatest for ROI One. Holthuijzen (1989) indicated that prairie falcons were not adversely affected by construction activities, similar activities with associated noise, and other disturbances. Conversely, Andersen and others (1990) found that raptors temporarily avoided habitats during military training, which included ground traffic, bivouacs, and weapons firing, at a training site in southeastern Colorado. Army National Guard training within the Snake River Birds of Prey National Conservation Area (NCA) has been associated with increased foraging distances and temporary training area avoidance in prairie falcons (Marzluff et al. 1994). Increases in foraging distances may cause stress to birds by affecting the energetic costs of foraging.

Although levels of ground activity associated with the proposed training range would be lower than those described in the above studies, raptor and other bird use of ROI One may be at least temporarily reduced during training activities, especially when ground actions are occurring. Increased noise resulting from ground-based noise combined with an increase in frequency in aircraft noise events would have a low impact to raptors and other birds that use ROI One for nesting or foraging.

***GROUND DISTURBANCE***

There would be no ground disturbances in ROI Three (including the proposed expanded airspaces: Idaho and Nevada) and ROI Two.

Potentially seven raptor and 15 other bird species (refer to section 3.8.9, Raptors and Other Birds: nonprotected or sensitive species) could be found within ROI One. Species diversity for birds is generally higher in sagebrush communities than in grasslands in the SRP (Knick and Rotenberry 1995).

Within ROI One, loss of raptor and other bird habitat would be caused by ground disturbance from construction and use. Loss of habitat may include destruction or degradation of nesting, foraging, or roosting areas. In general, nesting habitat loss would be greater for ground-nesting

raptors such as short-eared owls than it would for golden eagles, red-tailed hawks, and other species that nest on cliffs or structures. However, cliff-nesting and migrating raptors forage in sagebrush and grassland areas where ground-nesting birds are found, and would be impacted by loss of foraging habitat. Songbirds and other birds that depend on shrubs and the ground for nesting and foraging would also be impacted by loss of these habitats. Impacts to raptors and other birds are expected to be low.

### *WILDFIRE*

Sources of wildfire and the impact wildfire may have on raptors and other birds would be the same as those discussed for the No-Action Alternative for ROIs Three and Two. The potential for wildfire occurring within ROI One is low (section 4.8.5.2, Protected and Sensitive Wildlife Species). If it occurred, wildfire would have a low impact on raptors and other birds because of potential species diversity and abundance present within ROI One.

### *OTHER HUMAN DISTURBANCE*

Types of impacts from human disturbance would be similar to those discussed for Alternative A (No-Action Alternative). No increase in human activity would occur within ROIs Three and Two. Human activity and, therefore, human disturbance will slightly increase within ROI One, particularly near emitter sites. Intermittent, irregular use of emitter sites under Alternative B may impact raptors if nests occur within 275 yards of emitter sites, and emitter use occurs during the breeding season. Under these conditions, impacts would be greatest for disturbance-sensitive species such as golden eagles or ground-nesting species (northern harriers, short-eared owls). However, emitter sites were selected for areas without known raptor nests or high-quality habitat, and impacts are expected to be low to raptors and other birds.

Under this alternative, 17 miles of above-ground powerline would be constructed to provide power from existing lines to the 12,000-acre target area (section 2.0, Description of Proposed Action and Alternatives).

Raptors are attracted to powerpoles because they provide above-ground perching (for roosting or hunting) and nesting substrate, which is not common in the area. Although powerpoles can be beneficial, numerous raptors, primarily golden eagles, have died from electrocution (Beecham and Kochert 1975, Boeker and Nickerson 1975). Raptors perched on powerpoles also are more vulnerable to shooting.

To minimize raptor deaths due to electrocution, powerline poles will be constructed using Idaho Power's "eagle-safe" design (refer to Figure 2.3-10). Because topographical features dictate powerpole configuration, a small portion of the powerpoles cannot accommodate the eagle-safe design. All powerpoles, however, would have vertical wire spacing that would minimize risk of electrocution. Overall, the powerline would result in low adverse impacts to raptors.

### 4.8.10.3 ALTERNATIVE C — GRASMERE

In general, potential types of impact sources to raptors and other birds under Alternative C would be similar to those discussed under Alternative B. Overall impact levels would be low under Alternative C. However, habitat diversity is greater and, therefore, species diversity is greater in the ROI One 12,000-acre training range under Alternative C than it is in the Alternative B 12,000-acre training range (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2).

#### *NOISE*

Sources of noise and level of impacts to raptors and other birds are similar to Alternative B (Clover Butte). However, a greater diversity and abundance of raptor and other bird species would be affected under Alternative C.

#### *GROUND DISTURBANCE*

As in Alternative B, no ground disturbance would occur within ROIs Three and Two under Alternative C.

Potentially, 15 raptor species and 76 other bird species (refer to section 3.8.10, Raptors and Other Birds: nonprotected or sensitive species) may occur in ROI One.

Within ROI One under this alternative, the type of impacts would be the same as discussed for Alternative B. The impact level (low) is the same as for Alternative B; however, a greater diversity and abundance of species and their habitats would be impacted.

#### *WILDFIRE*

Under this alternative, the level of impacts from wildfires would be the same (low) as for Alternative B for ROIs Three and Two. The potential for wildfire occurring within ROI One is low (section 4.8.5.2, Protected and Sensitive Wildlife Species). However, if it occurred, wildfire would have a moderate impact on raptors and other birds because of potential species diversity and abundance present within ROI One. This impact level is the same as for Alternative B, but a greater diversity and abundance of species and their habitats would be impacted.

#### *OTHER HUMAN DISTURBANCE*

Types of impacts from human disturbance would be similar to those discussed for Alternative A (No-Action Alternative). No increase in human activity would occur within ROIs Three and Two. Human activity, and therefore, human disturbance will slightly increase within ROI One. Impacts are expected to be low to raptors and other birds.

### 4.8.10.4 ALTERNATIVE D — JUNIPER BUTTE

In general, potential types of impact sources to raptors and other birds under Alternative D would be similar to those discussed under Alternative B. The overall potential level of impacts under Alternative D would be low (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2).

#### *NOISE*

Sources of noise and level of impacts to raptors and other birds are similar to Alternative B (Clover Butte). Raptor and other bird species diversity and abundance is similar to Alternative B (Clover Butte) and lower than under Alternative C (Grasmere). Impact levels would be low.

#### *GROUND DISTURBANCE*

As in Alternatives B and C, no ground disturbance would occur within ROIs Three and Two under Alternative D.

Within ROI One, the types of impacts to raptors and other birds would be the same as discussed in Alternative B. Potentially, 10 raptor and 22 other bird species (refer to section 3.8.10, Raptors and Other Birds: nonprotected or sensitive species) may occur in ROI One.

The potential impact to raptors and other birds as a result of habitat loss would be low. This impact level is the same as for Alternative B and Alternative D. However, raptor and other bird species diversity and abundance at Juniper Butte is similar to Clover Butte, but lower than Grasmere.

#### *WILDFIRE*

Under this alternative the level of impacts from wildfires would be the same as for Alternative B and Alternative C for ROIs Three and Two.

The potential for wildfire occurring within ROI One is low (refer to section 4.8.5.2, Protected and Sensitive Wildlife Species). However, if it occurred, wildfire would have a moderate impact on raptors and other birds because of potential species diversity and abundance present within ROI One. This impact level is the same as for Alternative B and Alternative C. However, raptor and other bird species diversity and abundance at Juniper Butte is similar to Clover Butte, but lower than Grasmere.

#### *OTHER HUMAN DISTURBANCE*

Types of impacts from human disturbance would be similar to those discussed for Alternative A. No increase in human activity would occur within ROIs Three and Two. Human activity and human disturbance will slightly increase within ROI One. Impacts are expected to be low to raptors and other birds.

As in Alternative B (Clover Butte), the powerline also is proposed under this alternative. The impact of the proposed powerline to raptors would be the same as in Alternative B.

## 4.8.11 Amphibians and Reptiles

Nineteen species of amphibians and reptiles without special status may occur within the ROIs of this alternative. Amphibians and reptiles can occur in all habitat types within the project area. Potential consequences to amphibians and reptiles may include direct mortality, destruction of hibernation or breeding sites, changes in activity patterns and habitat use, and reduced reproductive success. Potential impacts to six other amphibian and reptiles species are discussed in section 4.8.5 (Protected and Sensitive Wildlife Species).

### 4.8.11.1 ALTERNATIVE A — NO-ACTION

The general potential impact sources to amphibians and reptiles under Alternative A would be the same as those described for protected and sensitive wildlife species (section 4.8.5.1). These sources would include noise, habitat modification, wildfire, and human disturbance. Most noise would be associated with continued overflights. In addition, noise from ground activities such as use of roads, service of emitters, and use of the SCR would continue. Habitat modification would include continued disturbance of the existing target area from ordnance use. Levels of impact would remain the same.

*NOISE*

The frequency of overflights and potential for exposure to high SELs under the No-Action Alternative would be the same for amphibians and reptiles as for large mammals (refer to section 4.8.5.1). The potential for exposure to sonic booms would not change under the No-Action Alternative.

Although few field studies have been conducted to evaluate the impacts of noise on wild populations of amphibians and reptiles, Manci et al. (1988) summarized the results of several laboratory studies that demonstrated the sensitivity of amphibians and reptiles to sound. Desert iguanas and Mojave fringe-toed sand lizards were shown to experience hearing losses or decreases in hearing sensitivity after exposure to simulated off-highway vehicle (OHV) noise of 95 to 114 dB. Neotropical treefrogs redistributed their calls to fall within spaces between tone bursts of up to 41 dB. Spadefoots, which appear to use auditory cues (such as thunderstorms) to emerge from hibernation, emerged from burrows after exposure to motorcycle sounds of 95 dB. Emergence during a period when water is not available may negatively impact spadefoot populations in arid regions. These studies indicate that exposure to high noise levels at certain times of year may cause amphibians and reptiles to respond inappropriately or with reduced sensitivity to auditory stimuli.

*GROUND DISTURBANCE*

As discussed in section 4.8.5.1, use and maintenance of existing roads would remain the same as currently used. In general, potential impacts to amphibians and reptiles would include reduced quality of habitat near roads; alteration of thermal environment complexity and quality; and loss of cover, hibernation sites, breeding areas, and foraging habitat.

There would be no additional habitat disturbance under Alternative A. Road maintenance, target use, and target area clean-up activities would continue to disturb previously disturbed habitat. Habitat in the SCR target area is highly disturbed and of low quality for amphibians and reptiles. Therefore, impacts would be the same as current levels.

*WILDFIRES*

Impacts from wildfires to amphibian and reptile species under Alternative A would remain at current levels. General fire-related impacts to amphibian and reptile species would include direct mortality, alteration of thermal environment complexity and quality; and loss of vegetative cover, burrows, hibernation sites, breeding areas, and foraging habitat. Exotic grassland communities that develop after fire are generally devoid of diverse reptile populations.

*OTHER HUMAN DISTURBANCE*

No increase in human activity potentially resulting in increased human disturbance impacts is expected under Alternative A. Impacts related to increased human activity include road kills, short-term stress related to ordnance clean-up activities, collection of herptiles and recreational as well as other depredation events. Undesirable human-reptile (rattlesnake) interactions within ROIs may lead to hibernation den eradication. Snake denning areas on or very near emitter sites may be destroyed as a result of construction or disturbed during emitter site use.

### 4.8.11.2 ALTERNATIVE B — CLOVER BUTTE

In general, potential sources of impact on amphibians and reptiles under Alternative B would be similar to those discussed under Alternative A. These sources would include noise, habitat modification, wildfire, and human disturbance. Assessment of direct impacts to habitat, potential habitat, or wildlife species within the 12,000-acre training range is restricted to the 300-acre primary ordnance impact area and approximately 100 additional acres associated with road construction and maintenance buildings. Indirect impacts to habitat (refer to Wildlife Habitat, section 4.8.4) and wildlife species may occur beyond the perimeter of the primary ordnance impact area and roads from other activities associated with the proposed action. These indirect impacts are related to aircraft and ground equipment noise, vehicle movements, human presence, lights, and fugitive dust. Although ordnance has a low probability of skipping out of the primary impact area, it may facilitate habitat degradation or destruction within the training range through impact or from subsequent recovery operations. Outside of

the training range, direct loss of habitat from construction would occur at emitter, new road, road improvement, and powerline sites. Therefore, overall potential impacts would be negligible.

### *NOISE*

The primary sources of noise impacts are aircraft overflights (general flight noise and sonic booms) and power generators at the 12,000-acre training range, emitter sites, and no-drop target areas. Detailed information of noise levels are discussed in Protected and Sensitive Wildlife Species (section 4.8.5) and Noise (section 4.2).

Estimated exposure to noise for amphibians and reptiles would be the same as for protected and sensitive species (section 4.8.5). In general, exposure to high SELs would increase in the vicinity of the proposed training range and Owyhee/Jarbidge north expansion and would decrease in other areas. The frequency of sonic booms would increase greatly at SCR and increase slightly in the Range Support and Jarbidge MOAs. Overall, impacts to large mammals would be low under the Clover Butte Alternative. Noise impacts from power generator operations would vary inversely with distance from generators. Generators considered for use produce sound levels of approximately 72 dB(A) at 100 feet and 57 dB(A) at 500 feet. Emplacement would result in new constant noise sources in the environment.

Overall, impacts to amphibians and reptiles from noise would be negligible under the Clover Butte Alternative.

### *GROUND DISTURBANCE*

There would be no ground disturbances in ROI Three including the proposed expanded airspace units (Jacks Creek and Nevada). Within ROIs Two and Three, impacts for amphibians and reptiles would be negligible. The types of impacts to amphibians and reptiles would be similar to those described under the No-Action Alternative related to habitat loss, degradation and fragmentation. The impacts in ROI One may be nominally greater compared to the No-Action Alternative because of the additional road construction and use. Because of low habitat quality, impacts to amphibians would be negligible. Unless emitter sites, generator emplacements, or new roads coincide with reptile hibernation areas, impacts would be negligible to reptiles because the overall amount of habitat disturbed would be low.

Several isolated seasonal ponds that lie in association with existing roads within the 12,000-acre training range may be indirectly impacted. These ponds have the potential to support breeding populations of spadefoots. Shrub communities on the 12,000-acre training range site could support reptile species. These habitat types are adequate for breeding, foraging and supplying cover. Vegetation disturbance would remove this habitat. Rocky areas are limited to a single basaltic remnant lip of an ancient shield volcano. Because of the northern aspect of this exposure it is unlikely that it supplies over-wintering habitat for reptile species. Information on

reptile hibernation site locations for either emitter sites or the 12,000-acre training range is not currently available.

*WILDFIRES*

Impacts from wildfires would be similar to those discussed for Alternative A in section 4.8.5.2, Protected and Sensitive Wildlife Species. A limited potential for wildfires would exist for ROIs Three and Two. Although the potential for fire to occur in ROI One is low, if it did occur, impacts to amphibians or reptiles would be negligible.

*OTHER HUMAN DISTURBANCE*

Types of impacts from direct human disturbance would be similar to those discussed for Alternative A. A low potential for direct human disturbance would exist for ROIs Three and Two. This impact cannot be quantified but may be considered negligible for amphibians and reptiles. Within ROI One, this impact would be negligible for amphibian species and low for reptile species. As stated previously, hibernation site habitat is very poor in the Clover Butte 12,000-acre training range. It is highly unlikely that hibernacula occur here. Because of this, humans encountering large numbers of reptiles during ground operations is unlikely.

### 4.8.11.3 ALTERNATIVE C — GRASMERE

In general, potential types of impact sources to amphibians and reptiles under Alternative C would be similar to those discussed under Alternative B (Clover Butte). However, overall habitat quality is better on the Alternative C Grasmere site (ROI One) than on the Alternative B Clover Butte site (ROI One) (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2). For reptiles, the vegetative community has more structural complexity and potential denning areas exist on the Grasmere escarpment and basalt outcrops on Poison Butte (both within ROI One). Therefore, overall potential impacts would be low.

*NOISE*

Sources of noise and level of impacts to amphibians and reptiles are similar to Alternative B (Clover Butte). However, a greater diversity and abundance of amphibian and reptile species would be affected under Alternative C. The types and levels of impact of noise to amphibians under Alternative C would be similar in all ROIs as discussed for Alternative B except that the Grasmere site has high-quality wetland habitat.

*GROUND DISTURBANCE*

There would be no increased ground disturbances in ROI Three and ROI Two. The types and level of impacts to amphibians and reptiles in ROI Three and Two would be the same as those described under Alternative B.

Within ROI One, amphibian and reptile species may be displaced or destroyed from construction and use of sites. The diversity and quality of habitats on the Grasmere site is high relative to the Clover Butte area. Included in the habitat that could be indirectly affected is approximately 8.5 acres of non-jurisdictional wetlands. Impacts to amphibians and reptiles would be greater compared to Alternative B because higher quality habitat could be lost or degraded. Within ROI One for Alternative C, impacts to amphibian and reptile species would be low.

*WILDFIRE*

Impacts from wildfires would be similar to those discussed for Alternative B for ROIs Three and Two. Within ROI One, the process of plant community change associated with fire would have a greater impact on the Grasmere 12,000-acre training range than on Clover Butte. In addition, wildfire sweeping up draws and small canyons would lead to direct mortality of amphibians and reptiles and destruction of den sites. The probability of fire related to the proposed action would be low; however, the occurrence of fire would be potentially devastating to a high-quality habitat area. For this reason, impacts of fire to amphibians and reptiles would be low.

*OTHER HUMAN DISTURBANCE*

Types and levels of impacts from direct human disturbance would be similar to those discussed for Alternative B. Undesirable human-reptile (rattlesnake) interactions are more likely on Alternative C training range. Reptile hibernation den eradication may occur on Poison Butte or the Grasmere escarpment. Impact on species would be considered negligible in ROIs Three and Two and low in ROI One.

### 4.8.11.4 ALTERNATIVE D — JUNIPER BUTTE

In general, potential types of impact sources to amphibians and reptiles under Alternative D would be similar to those discussed under Alternative B (Clover Butte). Overall habitat quality is similar on the Alternative D Juniper Butte 12,000-acre training range (ROI One) compared to the Alternative B Clover Butte range (ROI One) with the exception of Juniper Draw, an area of high relief that terminates in a substantial canyon (refer to Wildlife Habitat, section 4.8.4 and Table 4.8-2). Impact levels for reptile and amphibian species across all ROIs and impact types are considered negligible. Rocky exposures and topographic relief associated with Juniper Draw would enhance habitat complexity and provide potential hibernation sites for reptile species.

*NOISE*

Sources of noise and level of impacts to amphibians and reptiles are similar to Alternative B (Clover Butte). Amphibian and reptile species diversity and abundance is similar to Alternative B (Clover Butte) and lower than under Alternative C (Grasmere).

*GROUND DISTURBANCE*

There would be no increased ground disturbances in ROI Three and Two.

Within ROI One, amphibian and reptile species may be affected by implementation of Alternative D (refer to section 3.8.11.5). It is likely that similar numbers of reptiles would be displaced or lost from construction and use under Alternative D and Alternative B. Less sagebrush habitat and no wetland habitat would be affected and, therefore, the diversity of species affected probably would be less, although rocky exposures in Juniper Draw may provide hibernation sites for reptile populations. Impact would be negligible for amphibians and reptiles within ROI One.

*WILDFIRE*

Impacts from wildfires would be similar to those discussed for Alternative B (Clover Butte).

*OTHER HUMAN DISTURBANCE*

Types and levels of impacts from direct human disturbance would be similar to those discussed under Alternative B. Reptile hibernation den eradication may occur.

## 4.8.12 Shoshone-Paiute Concerns About Biological Resources

As discussed at the beginning of chapter 3.0, native plants and animals are considered by members of the Shoshone-Paiute Tribes to be essential to the maintenance and practice of their culture. Some Tribal members believe that past aircraft overflights and other military activity in southwestern Idaho may have contributed to a decline in the populations of California bighorn sheep, sage grouse, and other native species. These species are very important to the Tribes and are considered by Tribal members to be traditional cultural resources (see sections 3.9 and 4.9). As part of an ongoing effort to work with the Shoshone-Paiute Tribes, the Air Force is sponsoring a study of ethnobotanical and ethnozoological resources in southwestern Idaho and adjacent areas. The Tribes and the Air Force have agreed that the results of the study remain confidential.

Potential impacts to biological resources from aircraft noise, ground disturbance, and other aspects of the ETI proposal are discussed throughout section 4.8. The following briefly summarizes the anticipated impacts to two species in particular: sage grouse and California bighorn sheep. Refer to the earlier discussions in section 4.8.5 for more detail on impacts to these two species.

SAGE GROUSE

Fragmentation and loss of sagebrush habitat is the primary cause of sage grouse population declines in southern Idaho, and ground disturbance associated with the range development alternatives could potentially contribute to a small loss of habitat. A relationship between

overflights and the decline of sage grouse has not been demonstrated. Therefore, aircraft and other noise associated with the alternatives would have a low impact on sage grouse.

A historic lek is located at emitter site AI, and sage grouse droppings have been observed at emitter sites BD and AQ. These emitter sites are components of Alternatives B, C, and D.

Sage grouse have been observed at the proposed Clover Butte training range and one historical lek that is not currently active is located in the area. Ground disturbance in the Clover Butte target area would be limited mainly to the primary ordnance impact area, and there would be little potential for disturbing sage grouse in that location. Therefore, impacts to sage grouse would be low.

Sage grouse are known to occur at the proposed Grasmere training range during the nesting and brood rearing seasons, and at least three active leks are present in the area. Ground disturbance in the Grasmere target area would be limited mainly to the primary ordnance impact area, and there would be little potential for disturbing sage grouse in that location. Therefore, direct impacts to regional sage grouse populations would be low.

At least three historic leks are located in the vicinity of the proposed Juniper Butte training range. However, because little sage grouse habitat currently exists at Juniper Butte, impacts to sage grouse from construction and use of this proposed training range would be low.

**BIGHORN SHEEP**

Section 4.8.5 includes a discussion of the potential effects of aircraft overflights on California bighorn sheep and also discusses the Air Force's long-term study of bighorn sheep in southwestern Idaho.

Neither California bighorn sheep nor suitable habitat are known to occur in the vicinity of the no-drop target areas, powerline corridor, roads, or emitter sites. There would be no impact to bighorn sheep in these areas.

There are no bighorn sheep and no potential habitat in the Clover Butte area. Therefore, Alternative B would have no impacts in this area.

This species and suitable habitat are found within the western portion of the Grasmere training range. Noise from training activities would have a low impact. Increased human presence in the area would have a moderate impact on the local bighorn sheep population.

California bighorn sheep and appropriate habitat have not been observed at Juniper Butte, so there would be a negligible impact in that location.

### 4.8.13 Cumulative Impacts

Impacts to biological resources are anticipated as a result of the ETI proposal. All aspects of the proposal, including potential effects of ground disturbance, increased human presence, and military aircraft overflights were analyzed.

Construction associated with the ETI project would affect biological resources. These potential impacts are addressed in the previous sections. Construction associated with future projects would occur in previously developed areas and would not affect critical habitat, wetlands, or sensitive plant and animal species. As such, construction for these proposed future actions would not adversely impact these resources either on a regional or local basis.

No protected or sensitive animal species were found during field surveys and examination of field literature of the proposed wind turbine site; therefore, no direct impacts are expected to these species as a result of the proposed action. Indirect impacts are likely to be greatest for raptors that forage in or migrate through the proposed project area. Mortality of raptors or other birds may result from collision with wind turbine towers or rotor blades, but because of the small scale of the proposed wind energy development, mortality rates are expected to be negligible. Potential impacts to raptors would be minimized by constructing tubular-type turbine towers or by installing perch guards on lattice-type towers. A BLM Sensitive plant species, *Astragalus salmonis*, was found at the site. The regional distribution of this species is not known, but loss of a portion of the population due to ground disturbance and habitat loss may represent a moderate impact to the species in the region. *A. salmonis* was not found at any of the ETI components that may be subject to ground disturbance; therefore, ETI would not contribute to impacts to this species associated with construction or use of the wind turbines at the Grasmere EC site. Slick spot peppergrass, which may be impacted by Alternative D of the ETI proposal, would not be affected by other foreseeable future actions.

The foreseeable actions do not include changes in use of existing or proposed airspace units. While it appears that some wildlife species may not be sensitive to jet overflights or sonic booms, the long-term effects of overflight noise on wildlife populations are largely unknown (Lamp 1989). However, some studies suggest that if impacts do occur they are likely to be short term for a limited number of wildlife species under a limited set of circumstances.

In recent history, large portions of sagebrush-steppe habitat in southern Idaho have been fragmented or degraded by livestock grazing, wildfire, and land conversion (Braun et al. 1976, Yensen 1980, Woods 1994). Resulting modification of sagebrush-steppe habitat has consequently led to declines in sage grouse populations (*Idaho Sage Grouse Management Plan* 1997) and in the distribution and abundance of other shrub-obligate species such as loggerhead shrikes and other passerine species (Saab and Groves 1993, Knick and Rotenberry 1995, Woods and Cade 1996). Because shrub-steppe habitat generally does not recover from disturbance due to the establishment of annual grasslands and subsequent increases in fire frequency, continued modification of shrub-steppe habitat may affect the persistence of shrub-obligate species (Knick and Rotenberry 1995). Implementation of the ETI project would result in the direct loss of some

sagebrush-steppe habitat and an increase in annual grasslands within the 12,000-acre withdrawal area for Alternatives B or C. These habitat modifications would contribute to localized fragmentation of sagebrush-steppe habitat if a catastrophic event would occur.

The cumulative impacts from the various potential sources of disturbance (noise, ground disturbance, and human disturbance) associated with the proposed ETI range were evaluated using a qualitative approach. For the ETI EIAP, relative qualitative cumulative impacts to biological resources for each alternative are presented in Table 4.8-2. A relative ranking of the baseline habitat conditions present at each alternative are presented in Table 3.8-12. This relative qualitative approach was used to assess potential cumulative impacts at the individual 12,000-acre range alternatives since some wildlife species, such as bighorn sheep, do not occur at all of the alternatives. This precluded a quantifiable comparison of cumulative impacts among the alternatives. The overall relative cumulative impacts would be highest at the Grasmere Alternative due to the higher diversity of available habitats and wildlife species currently occurring at the Grasmere Alternative. The overall relative cumulative impacts to the habitat and wildlife species present at Grasmere would be moderate, and low at both the Juniper and Clover Butte Alternative. The Grasmere site is already very accessible for the general public and human presence, either from recreationists or livestock producers, is relatively high compared to the Juniper and Clover Butte Alternatives. There are numerous camp sites scattered in the Grasmere escarpment. Cumulative impacts could occur from an increased rate of conversion of native habitats to annual grasses and weeds. A disruption or conversion from native vegetation communities would have the greatest impact at the Grasmere Alternative. Additional loss of the shrub-steppe vegetation community will contribute to the habitat fragmentation and loss of biodiversity that is occurring in southwest Idaho. More frequent fires have converted the native shrub-steppe habitat throughout the region into large expanses of annual grasses and forbs. These conditions will remain whether or not an ETI action alternative is selected. The Air Force has included multiple actions to reduce the potential for fire or to reduce the severity of fires if they start. The cumulative impact from the proposed ETI range would be low to moderate due to the low probability or potential of significant impacts. However, if a large-scale fire was to occur, the cumulative impacts could be significant.

The recent trend in conversion from the native shrub-steppe vegetation community to a community dominated by exotic annual grasses and forbs has a cumulative effect of altering available habitat, decreasing forage nutritional quality and quantity, increasing habitat fragmentation, reducing biodiversity, and forcing some wildlife species to abandon portions of their existing home range. This trend in converting native shrub-steppe habitat to exotic annual grasses and forbs will likely continue regardless of the decision on the ETI proposal.

Air Force biological projects conducted or ongoing in southwestern Idaho are designed to document or reverse habitat fragmentation and to maintain biodiversity. These projects range from rare plant surveys to estimating the carrying capacity of a habitat for bighorn sheep. Studies in the sagebrush-steppe ecosystem of southwestern Idaho include: 1) a comparison of

shrub obligate passerines present in native and annual vegetation communities; 2) a vegetation rehabilitation project that will rehabilitate disturbed lands that annual grasses and forbs have invaded, back to native bunchgrasses and shrubs; and 3) Mountain Home AFB biodiversity training that will present information on topics ranging from vegetation to herptiles to large mammals that occur in areas where Air Force personnel spend considerable time and instruct personnel on data recording techniques that will add to the existing databases (IDFG, BLM).

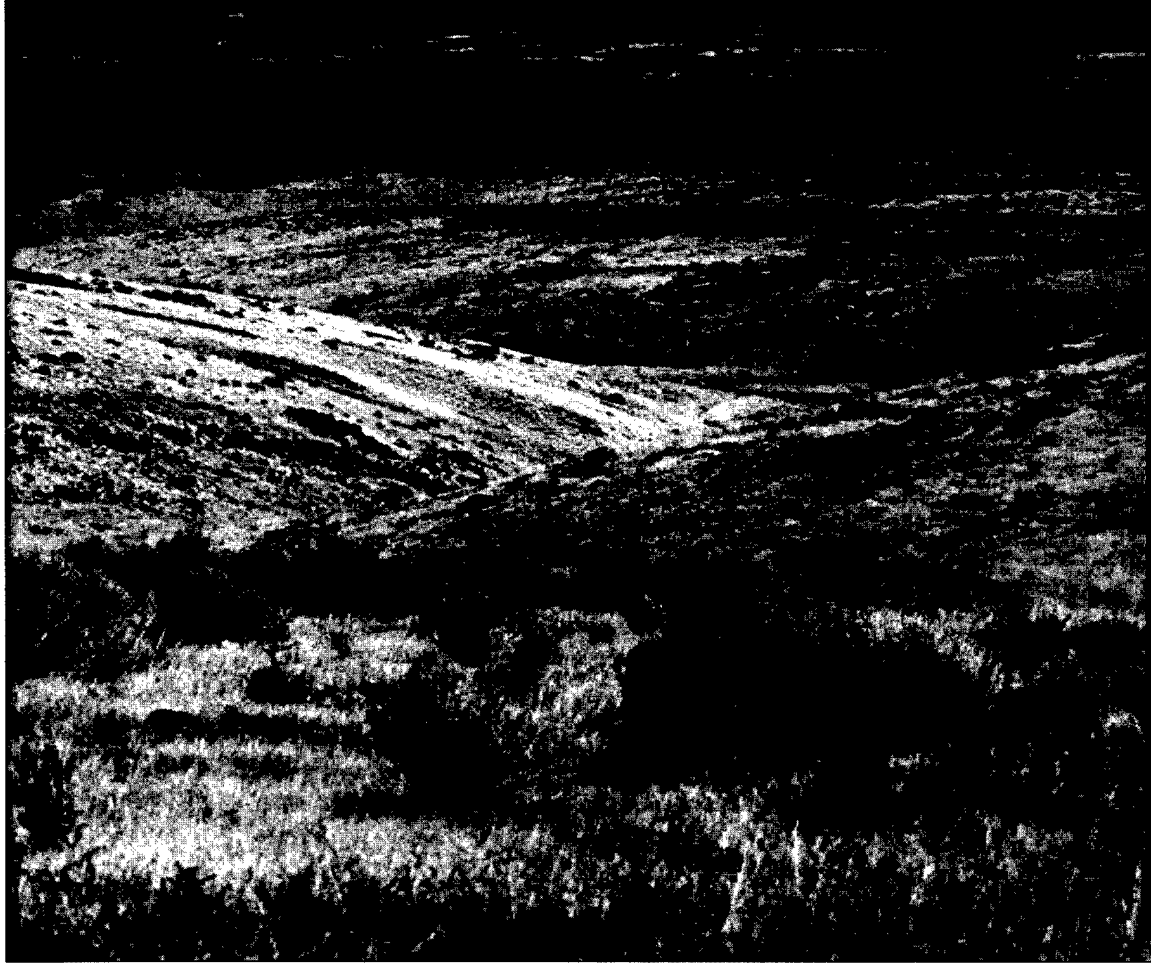
For the past four years, the Air Force has been conducting studies on efficient methodologies for rehabilitating native vegetation communities on SCR. The Air Force is gathering expertise from various agencies and universities to assist it in wise resource stewardship on Air Force training ranges. This is in response to ongoing training operations. The knowledge gained from the past four years of Air Force projects is being disseminated to other federal agencies concerned with southwest Idaho rehabilitation efforts.

# CULTURAL RESOURCES

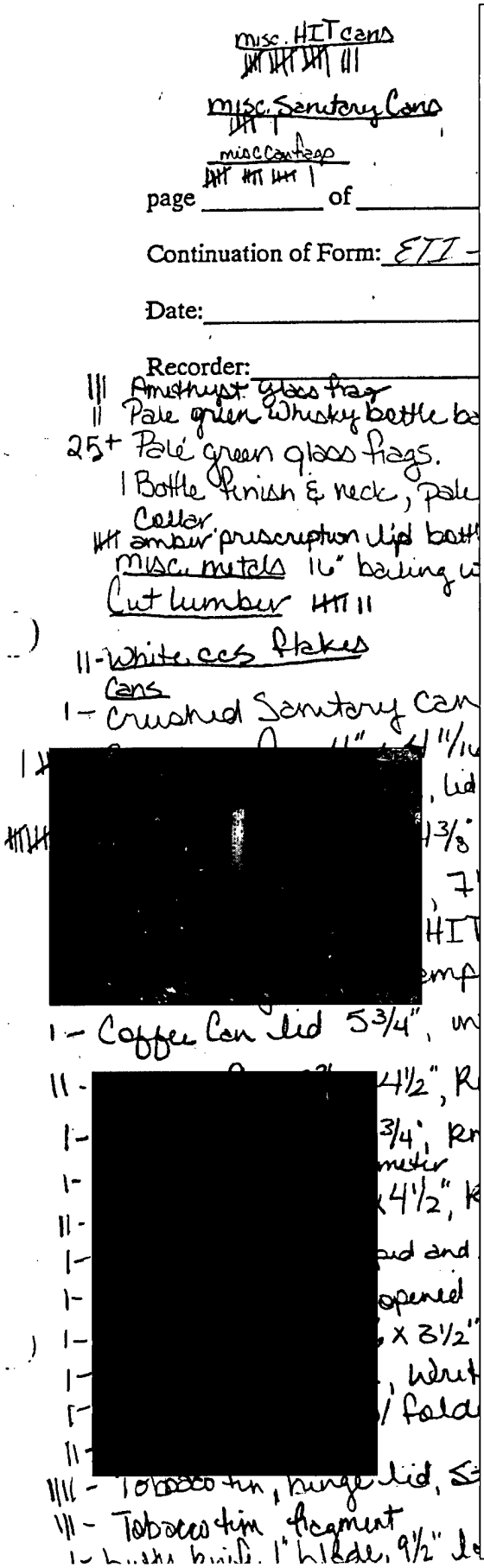
Impacts on most cultural resources are evaluated based on two factors: the National Register eligibility of the resource, and the level of effect to the resource. The potential for adverse effects is the primary focus of this analysis. There are many ways to impact a cultural resource. Impacts may be classified as direct or indirect. An example of a direct impact is the destruction of an archaeological site by building a road. An example of an indirect impact is damage to the site caused by vandalism brought about by people using the road.

Project activities have the potential to adversely impact different types of cultural resources:

- archaeological resources,
- historic architectural resources, and
- traditional cultural resources



4.9




An initial survey was performed to help identify and, where possible, avoid sensitive sites. This survey included a review of all previously recorded cultural resources in each area. The locations of cultural resources that could not be completely avoided were compared to the locations of proposed new facilities and areas of increased traffic.

Where impacts are identified, the Air Force will work with the Idaho State Historic Preservation Office to decide how to lessen the impacts to adversely affected archaeological and architectural sites. Once a course of action is agreed to, a Memorandum of Agreement will be written outlining an agreement and specifying whether cultural resources should be excavated by archaeologists, documented by historians, avoided, or otherwise protected.

The Air Force will also meet with the Shoshone-Paiute Tribes whose traditional territory includes the range alternatives. Potential cultural resource impacts associated with each alternative are summarized as follows:

## Clover Butte:

Ground disturbance at the 300-acre primary ordnance impact area could possibly affect a few National Register-eligible archaeological sites. A moderate number of eligible sites could be within the 12,000-acre training range alternative. Traditional resources west of Highway 51 could be potentially impacted. Traditional resources may also exist east of the highway. Non-eligible early Native American archaeological sites at Clover Butte may also be traditional resources.

## Grasmere:

Ground disturbance at the 300-acre primary ordnance impact area could possibly affect a few National Register-eligible sites. A relatively high number of eligible sites could be within the 12,000-acre training range alternative or along an access road. Traditional resources west of Highway 51 could be potentially impacted. Traditional resources may also exist east of the highway. Non-eligible early Native American archaeological sites at Grasmere may also be traditional resources.

## Juniper Butte:

Based on sample data, it is likely that no National Register-eligible sites would be impacted within the training range, although there is one eligible site along a proposed access road. Traditional resources west of Highway 51 could be potentially impacted. Non-eligible early Native American archaeological sites at Juniper Butte may also be traditional resources.

There is one site with architectural and archaeological components that could be adversely affected by bridge construction under each of the range development alternatives.

# 4.9 CULTURAL RESOURCES

This section begins with the general nature of impacts to cultural resources and how to assess them. First, there is a description of the impact assessment process in relation to archaeological, architectural, and traditional cultural resources. Because the three alternatives proposing training ranges (Clover Butte – Alternative B, Grasmere – Alternative C, and Juniper Butte – Alternative D) have common elements, potential impacts are addressed in general in this section. Section 4.9.2 discusses completion of the Section 106 process defined under the National Historic Preservation Act (NHPA) of 1966. Sections 4.9.3 through 4.9.6 examine specific impacts under each alternative, including the No-Action Alternative (Alternative A). These sections also include concerns about cultural resources that were raised by representatives of the Shoshone-Paiute Tribes of the Duck Valley Reservation. Section 4.9.7 discusses cumulative impacts.

## 4.9.1 Impact Assessment Process

Overall, impacts to cultural resources were assessed by (1) identifying the nature and location of all elements of the alternatives; (2) comparing those locations with identified cultural resource locations, areas considered sensitive, and surveyed locales; (3) determining the known or potential significance of cultural resources that could be affected; (4) determining the extent, intensity, and context of the effects; and (5) assessing the potential for adequate mitigation. The impact assessment process for cultural resources, as outlined in federal historic preservation laws and regulations, centers on the concept of cultural resource significance. Federal law protects cultural resources only if they are significant (refer to section 3.9).

As part of this process, the Air Force has initiated consultation with the Idaho, Oregon, and Nevada State Historic Preservation Officers (SHPOs), with the Shoshone-Paiute Tribes at the Duck Valley Reservation in Idaho and Nevada, and with the Shoshone and Paiute Tribes at the Fort McDermitt Reservation in Oregon and Nevada regarding the potential effects on cultural resources within ROIs One, Two, and Three. This process included identification of known cultural resources potentially affected by the proposed action. Determinations of eligibility for cultural resources found within the areas affected by on-the-ground disturbance (ROI One), summarized in section 3.9 and below, are detailed in a Cultural Resources Technical Report submitted to the BLM.

The impact analysis for archaeological and architectural resources employed the guidelines and standards set forth in the Section 106 process (see section 4.9.2). This process requires identifying significant cultural resources potentially affected by an action, determining the effect of that action, and implementing, where appropriate, measures to avoid, reduce, or otherwise mitigate those effects.

An action results in adverse effects, or impacts, to a cultural resource eligible to the National Register of Historic Places (National Register) when it alters the resource's characteristics,

including relevant features of its environment or use, that qualify it for inclusion in the National Register (36 CFR 800.9[b]). Potential impacts could include

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from, or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of the property.

Impacts can be categorized according to the source of the impact. Potential sources of impacts to National Register-eligible archaeological and architectural resources that were considered for this EIS include

- Ground disturbance resulting from construction, operations, or maintenance;
- Noise, vibrations, and visual impacts resulting from construction, operations, or maintenance;
- Access-related impacts resulting from increased vandalism due to improved access, or from restriction of Native American access to certain resources; and
- Changes in land status that result in reduced legal protection for significant cultural resources.

#### 4.9.1.1 General Sources of Impacts to Archaeological and Architectural Resources

Potential sources of impacts to archaeological and architectural resources under Alternative A, No-Action, are restricted to noise, vibrations, and visual intrusions from overflights within existing airspace. Potential sources of impacts to cultural resources under Alternatives B, C, and D are more varied than for Alternative A but are similar among themselves.

Within ROI One, sources of impacts common to Alternatives B, C, and D include

- Within the fenced, approximately 12,000-acre training range:
  - Construction, maintenance, and use of targets (within a combined 300-acre area), including delivery of BDU-33 practice ordnance (the 300-acre primary

ordnance impact area is larger than the area that would be directly affected by construction);

  - Construction, use, and maintenance of maintenance facilities within one 3-acre area;
  - Placement and clearing of scoring system sites (eight 50-by-50 foot areas);
  - Improvement or construction of access roads within the tactical range;
  - Installation of fences;
  - Construction of the less than one-acre above-ground reservoir as a mitigation measure (Alternatives B and D only).

- For the no-drop target areas:
  - Placement of targets in four fenced 5-acre no-drop target areas;
  - Placement of targets in one fenced 640-acre no-drop target area.
- For the emitter locations:
  - Construction of fencing, a parking area, monopole communications antenna, and associated facilities at ten 1-acre emitter locations;
  - Construction of small parking areas at 20 one-quarter-acre emitter locations;
  - Improvement or construction of access roads to many of these locations.
- For the powerline:
  - Installation of power poles.
- For the proposed bridge reconstruction:
  - Removal of existing bridge and other features;
  - Grading, excavating, and filling within the construction site.
- Noise, vibrations, and visual intrusions from overflights, construction, and maintenance activities;
- Possible increased access to some sensitive locations within ROI One by construction and maintenance workers, recreationists, and others; and

- Changes in land jurisdiction for State of Idaho lands leased to the Air Force (lands transferred from BLM to Air Force control would remain under federal jurisdiction).

Within ROI Two, potential sources of impacts common to Alternatives B, C, and D include

- Noise, vibrations, and visual intrusions from overflights and from construction or use of various facilities; and

- Possible increased access to some locations in the general area.

Within ROI Three, potential sources of impacts common to all three range development alternatives include

- Noise, vibrations, and visual intrusions from overflights, including those occurring within the expanded airspace areas (noise in some locations would decrease).

According to the NHPA, changes in land status can sometimes adversely affect a significant cultural resource if, under the new owner, the resource is protected by less stringent historic preservation laws or is not protected at all. Under the proposed action and alternatives, jurisdiction for most lands would change from BLM to the Air Force. Cultural resources currently protected under the NHPA and other federal laws and regulations would continue to be protected under any of the three range development alternatives despite the change in jurisdiction. Cultural resources on lands currently owned by the State of Idaho that would be leased to the Air Force would actually receive greater legal protection under federal law than under state law.

***GROUND DISTURBANCE***

Within each alternative's suite of facilities – the training range, the no-drop target areas, the emitter locations, the powerline, and the access roads – the principal direct impacts to cultural resources would be associated with ground disturbance. Such disturbance would include delivery of inert ordnance on tactical targets, building maintenance facilities and equipment storage areas, ground preparation (i.e., removing vegetation, boulders, and soil) for installing targets and building parking areas, installing fences, and building new access roads or improving existing roads.

On the proposed training range, approximately 315 acres would be subject to direct impacts: the combined 300-acre primary ordnance impact area, the 3-acre maintenance facility, the eight scoring system sites, and the access roads. Impact areas associated with targets within the training range have been defined using an Air Force-approved statistical analysis of the patterning of ordnance delivery impacts. Using that analysis (refer to section 2.3), it has been determined that most of the ordnance would impact and come to rest within the 300-acre primary ordnance impact area. There is a slight statistical probability that some ordnance may fall within the impact area, but come to rest outside of the impact area although still within the 12,000-acre training range. There is an extremely slight possibility that cultural resources

outside of the primary ordnance impact area, but within the training range, could be directly disturbed by ordnance impacts.

The inert ordnance proposed for use under the proposed action, the BDU-33, causes about 4-square feet of damage to the ground. Given the proposed delivery on the range of approximately 6,300 BDU-33s per year for 20 years, no more than 12 discontiguous acres would be disturbed, even if each BDU-33 happened to fall in a different spot within the 300-acre impact area. These 12 acres would include locations already disturbed by the construction of targets. Observations made at SCR (Peter 1988, 1989), which uses nonexplosive ordnance exclusively, indicate that the greatest amount of ground disturbance in the EUA occurs within 300 feet of a target (i.e., in an area of about 6.5 acres). Less disturbance occurs between 300 and 1,000 feet from the target (i.e., in an area smaller than 75 acres). Only sporadic instances of ground disturbance were observed at SCR more than 1,000 feet from the target. Nevertheless, for this impact assessment, it has been assumed that each cultural resource within the 300-acre combined primary ordnance impact area has an equal likelihood of being disturbed by ordnance, even though it is likely that, in reality, resources more than 1,000 feet from the targets would never be impacted. It is also assumed that the probability of ordnance-related ground disturbance outside of the primary ordnance impact area would be very low.

Ground disturbance can also occur during the construction of new roads or during the improvement of existing roads, should that improvement require, for example, road widening. Grading, filling, the excavation of ditches, and the installation of culverts can all potentially disturb cultural resources.

*NOISE AND VIBRATION*

Studies have established that subsonic noise-related vibration damage to structures, even historic buildings, requires high decibel levels generated at close proximity to the structure and in a low frequency range (USFS 1992; cf. Battis 1983, 1988). Aircraft must generate at least 120 dB at a distance of no more than 150 feet to potentially result in structural damage (Battis 1988) and, even at 130 dB, structural damage is unlikely (see Appendix K).

A study by Wyle Laboratories (Sutherland 1990) indicated that a large, high-speed aircraft flying directly over a building had less than a 0.3 percent chance of damaging fragile structures such as wooden buildings. In other words, the probability of an aircraft, such as a B-1B, operating at 200 feet AGL at 540 knots true airspeed (KTAS) directly over such a structure is extremely unlikely to cause damage. (Note: The minimum altitude for B-1B training in Idaho is 500 feet AGL). Operations at higher elevations would have a lower potential for causing damage, and structures offset from the flight track have an even lower probability of being affected by low-flying aircraft.

In a report to Congress on *Potential Impacts of Aircraft Overflights of National Forest System Wildernesses*, the USFS examined the issue of noise effects on historic resources. While observing that "concerns that aircraft noise causes damage are based on speculation" and that the

"evidence of potential damage risk is more theoretical than empirical" (USFS 1992), the study goes on to indicate that most damage could be expected in already fragile and susceptible structures, such as adobe buildings. In this type of building, cosmetic cracks that possibly could be caused by a number of factors, including weathering and natural settling, as well as noise vibrations, could be potentially worsened through repeated exposure to noise. However, to cause immediate damage, the noise would have to have extremely high pressure levels (such as a sonic boom) and to have originated close to the structure, or to have a frequency that coincides with one or more of the structure's natural frequencies (USFS 1992).

Noise effects on buildings have been difficult to test and document in the field. However, thresholds for noise effects to architectural resources are generally agreed to "be specifically oriented to the frequency range below 30 Hz" (USFS 1992). A vibration study on a historic building at White Sands National Monument, New Mexico, determined that "medium level vibrations (1-20 millimeters [mm]/sec at 1-30 Hertz) were the most dangerous" (King et al. 1988).

It is possible for sonic booms to adversely affect some cultural resources. Individual sonic booms vary considerably, with the average boom pressure on the ground being 1 pound per square foot (psf). Window breakage for overpressures on the order of 2 psf would be approximately 75 broken panes per million. Maximum overpressures of even 6 psf have an extremely low potential to damage structures or displace rocks (Battis 1983) (see section 4.2 and Appendix K). Therefore, while there is some potential for sonic booms to cause window breakage in historic buildings, there is very low potential for structural damage to architectural resources or for displacement and breakage of the components of most archaeological resources.

The effects of noise on cultural resources may also be related to setting. Noise that affects setting may be caused by construction and maintenance of facilities and by machinery or vehicles. Aircraft noise and overflights can also potentially affect setting. To be adversely affected, the setting of a resource must be an integral part of the characteristics that qualify that resource for listing in or eligibility to the National Register. Because of modern development, this is often not the case for significant cultural resources, especially in urban or semi-urban environments. Even in rural areas, noise intrusions from vehicles, farm machinery, and snowmobiles may create a noise environment that is unlikely to be consistent with the original setting of the property. If, however, the audible and visible aspects of the setting are fundamental to the resource's significance, the nature and magnitude of the potential impact from audible or visual intrusions on that setting can be evaluated. Intrusions sufficient to alter the setting can adversely affect the resource. The nature and magnitude of the impacts depend upon the characteristics of the affected cultural resource, the amount by which the sound level exceeds baseline noise levels, the other types of noise sources in the vicinity of the cultural resource, and the frequency at which people visit the resource. Noise levels considered in this EIS are those reflected in Section 4.2, which were modeled based on the distribution of sortie-operations shown in Table 4.0-1.

*ACCESS*

Changes in access to resources within ROI One or ROI Two could have two effects. First, access to some cultural resources could be restricted or denied by fences and gates. Second, access to other cultural resources might be made easier through road construction. Both of these seemingly opposite effects of range development could be adverse.

Under the ETI proposal, the selected training range, no-drop target areas, and 1-acre emitter sites would be fenced. This could potentially limit access by the Shoshone-Paiute to traditional cultural resources, if such resources are found in the area. Visiting traditional cultural resources may be an important part of some Shoshone-Paiute religious activities. The Air Force will continue to accommodate their need to visit these areas.

On the other hand, road improvements could potentially provide routes to a few areas previously considered by some people to be inaccessible and could lead to more frequent visits by vandals. In a study of vandalism on archaeological sites in Colorado (Nickens et al. 1981), proximity to unpaved access roads proved to be a predictor for rates of vandalism. However, unpaved roads already exist in the ETI study area, so the potential effects of new roads or road improvements would have to be assessed on a case-by-case basis. Purposefully destructive actions, such as "pot-hunting" (unauthorized excavations and artifact theft), defacement, and illegal OHV use, are prime sources of adverse impacts to cultural resources (USACE 1992). Cultural resources could also be disturbed through inadvertent actions, such as people driving over a site.

Awareness of the possibility for this type of adverse impact has fostered a number of in-depth studies, including Williams (1978), Lyneis et al. (1980), Lightfoot and Francis (1978), Reid (1979), Warren et al. (1980), and Scott (1980). Increased vandalism could affect the types of cultural resources (e.g., a historic building, a large site, a rockshelter, or rock art) most likely to be determined eligible for listing on the National Register, because these are typically more visible than small lithic scatters or isolates.

### 4.9.1.2 GENERAL SOURCES OF IMPACTS TO TRADITIONAL CULTURAL RESOURCES

Most potential sources of impacts to traditional cultural resources, including those that do not qualify for National Register eligibility, are essentially the same as those associated with archaeological and architectural resources: ground disturbance; noise, vibrations, and visual intrusions; access-related impacts; and changes in land status. However, the significance or severity of the impact must be assessed in part through consultation with representatives of the concerned Native American groups. Certain areas are frequently used for traditional purposes, while others are used on a less frequent basis and may be of less immediate concern to Tribal members.

As in the case for archaeological and architectural resources, impact analysis for traditional cultural resources requires identifying significant traditional resources potentially affected by an

action, determining the effects of that action, and implementing, if possible, measures to avoid or mitigate adverse effects. The Air Force has discussed and will continue to discuss the potential effects of the ETI alternatives with members of the Shoshone-Paiute Tribes.

*Ground Disturbance.* Aspects of the three range development alternatives that could disturb the ground have the potential to disturb traditional cultural resources in the area. Early Native American archaeological sites are often traditional resources, but non-archaeological traditional resources (e.g., natural features, native animal species) may also be disturbed.

*Access.* Two aspects of access are of concern to the Shoshone-Paiute. First, many Shoshone-Paiute do not want restrictions placed on their access to traditional cultural resources. Second, they are concerned that improved roads in some locations may cause increased visitation to sensitive locations by non-Indians. This could lead to vandalism and to interference with ceremonies.

*Noise, Visual, and Other Intrusions*

Noise may potentially affect traditional cultural resources in a variety of ways. For example, traditional ceremonies and rituals by the Shoshone-Paiute often depend on isolation, solitude, and silence. An aircraft flying overhead, even at very high altitudes, may be deemed an intrusion by members of the Tribes if it occurs during a ceremony or another inappropriate time. Overflights can be very disruptive for Tribal members engaged in ceremonial activities, sometimes preventing these activities from being conducted at certain locations. It should be noted that military aircraft have been flying over southwest Idaho since 1942.

Shoshone-Paiute representatives have also expressed concerns about the visual intrusions caused by existing Air Force and commercial facilities near the Duck Valley Reservation. For example, the existing Grasmere EC site and the town of Grasmere may both be visible from several sacred sites. Even at a considerable distance, a view of such facilities is felt by some Shoshone-Paiute to be undesirable. Also, tribal members have stated that placing electronic equipment on or near locations they consider sacred may cause spirits to abandon them. It is sometimes possible to reduce the effects of a visual intrusion in a rural setting by using cedar fencing, desert color paint, or agricultural style buildings.

As will be discussed in section 4.11, a survey of wilderness visitors by the USFS and NPS (USFS 1992) established that annoyance with overflights was more strongly related to noise exposure than to the visibility of the aircraft or their condensation trails. Also, military aircraft have been flying over southwest Idaho since 1942.

Shoshone-Paiute representatives have also expressed the opinion that aircraft overflights and other military activity in southwestern Idaho may be contributing to a decline of various native animal populations, such as bighorn sheep and sage grouse. These concerns are addressed in both sections 4.8 and 4.9.

### 4.9.2 Completion of the Section 106 Process

In preparing this EIS, the Air Force is complying with the National Environmental Policy Act (NEPA) and with the NHPA and associated regulations (36 CFR 60.4, 36 CFR 800) that require that effects to cultural resources from federal actions be taken into consideration as part of the decisionmaking process. To comply with the NHPA, federal undertakings go through the Section 106 review process. This process consists of inventory (site identification), evaluation of each cultural resource's eligibility for listing in the National Register, determination of effect, and avoidance or mitigation of impacts.

If a range development alternative is selected, completion of the Section 106 process would entail the following:

1. *Survey.* The Air Force would complete a Class III (100 percent) cultural resources survey of all remaining unsurveyed lands in the selected alternative that would be potentially impacted by ground disturbance. Investigations conducted in preparation of this EIS have included sample surveys of the alternative training ranges.

2. *Evaluation.* The Air Force would formally evaluate, according to National Register criteria, all identified cultural resources within the primary ordnance impact area or in areas directly affected by the action. This might require test excavations of some sites to assess significance and integrity. Other cultural resources, especially isolates and extremely low-density archaeological sites, might be evaluated through surface inspection alone.

   The goal of the formal evaluation would be to identify all sites as either eligible or not eligible for the National Register. The surveys conducted so far have provided information on the number, location, nature, and distribution of cultural resources within the affected areas. This information permitted recommendations that resources were either eligible or not eligible for the National Register. The BLM has made formal determinations of eligibility, and the Idaho SHPO has concurred with these findings, with a few modifications. These determinations are made to allow an assessment of environmental impacts from the alternatives. It should be noted that National Register eligibility of a specific resource could change as new information about the resource becomes available.

3. *Mitigation Plan.* The Air Force, in consultation with the BLM, Idaho SHPO, the Advisory Council on Historic Preservation (ACHP), and the Shoshone-Paiute Tribes, would develop a mitigation plan designed to implement avoidance or mitigation measures for those eligible resources adversely affected by the action. The NHPA recognizes that adverse effects to National Register-eligible cultural resources may become nonadverse under the following conditions:

- By conducting research when the value of the cultural resource is for its potential contribution to archaeological, historical, or architectural research;
- By rehabilitating buildings and structures in a manner that preserves the historical and architectural value of the property; and
- When the impact is due to the transfer of property and adequate restrictions are included to ensure preservation of significant historic features.

A mitigation plan typically would include the preparation of a research design, a data recovery plan, and other mitigations, which would be spelled out in detail.

Implementation of the plan might not prevent all cultural resources from being disturbed, but would recover scientific and historical data from affected sites, which would mitigate their loss. (Data recovery might not mitigate the loss of a traditional cultural resource.) A mitigation plan would also include the following:

- Address long-term management of cultural resources, including monitoring, stabilization and protection, public awareness, and implementation of scientific studies.
- Ensure that cultural resources are not inadvertently damaged by other activities and that necessary appropriate mitigating measures would be taken to minimize such damage to cultural resources.
- Provide measures to prevent or reduce vandalism.

4. *Memorandum of Agreement.* A Memorandum of Agreement would be developed and signed by the Air Force, BLM, SHPO, and ACHP to provide for ongoing and future management of cultural resources within the training range and associated facilities. The mitigation plan would accompany the Memorandum of Agreement.

5. *Monitoring.* If appropriate, the Air Force would develop a set of procedures for monitoring cultural resources for:

   - Evidence of vandalism, and
   - Damage to sites outside the primary ordnance impact areas to ensure that they are not affected by training operations.

   As discussed previously, cultural resources within the combined 300-acre primary ordnance impact areas are more likely to be adversely effected by ordnance use and by construction and maintenance activities. Cultural resources located outside the primary ordnance impact area but within the boundaries of the training range, would be unlikely to be impacted by these activities. Therefore, the Air Force would

conduct data recovery at eligible cultural resources within the primary ordnance impact area and would monitor cultural resources outside the impact area but within the training range for possible damage. Monitoring of sites outside of the impact areas would help preserve these resources for future generations. Monitoring would consist of regular visits to potentially affected sites within the training range to search for any signs of damage from construction, use, or maintenance. The results of the surveys and recommendations for mitigating adverse effects would be submitted to the SHPO for review.

## 4.9.3 Alternative A — No-Action Alternative

Under this alternative, no realty action, new construction, target development, or additional maintenance is planned. Also, the number of sorties and the amount of ordnance use would be unchanged relative to baseline.

### 4.9.3.1 Archaeological Resources

#### *ROI Three*

As explained in section 4.9.1, it is unlikely that aircraft noise and vibrations, or even sonic booms, could physically damage archaeological sites in southern Idaho. However, changes in the audible setting potentially could be an adverse effect of an action if setting were an important aspect of the National Register-eligibility of a specific archaeological resource.

Under the No-Action Alternative, neither the total number of sortie operations within existing MOA airspace nor the anticipated noise levels would change, and there would be no change in the audible setting near any archaeological resources. Therefore, implementation of the No-Action Alternative would create no impact on archaeological resources within ROI Three.

#### *ROI Two*

Potential impacts within ROI Two are addressed under traditional cultural resources (section 4.9.3.3).

#### *ROI One*

Use and maintenance of SCR over the past 53 years since the range was established have been sufficient to thoroughly disturb or destroy any archaeological sites that may have been present at existing targets within the EUA (Peter 1988). Such disturbance would have eliminated the integrity of the resources at the target areas, thus precluding any potential for their being considered eligible for the National Register. The Idaho SHPO has concurred that the existing targets within the EUA at SCR lack significant cultural resources. Also, according to the information presented in section 4.9.1, it is unlikely that noise and vibrations from overflights could affect archaeological resources.

Under Alternative A, neither the number of sorties nor the amount of ordnance used at SCR would change. Therefore, the No-Action Alternative would create no specific impacts to archaeological resources at SCR.

### 4.9.3.2 HISTORIC ARCHITECTURAL RESOURCES

#### *ROI THREE*

Only one known National Register-listed architectural resource — Wickahoney Station — has been recorded within ROI Three.

As discussed in section 4.9.1, it is very unlikely that subsonic aircraft noise could structurally damage an architectural resource. Changes in the audible setting potentially could be an adverse effect of an action if setting were an important aspect of the National Register-eligibility of a specific building or structure.

Under the No-Action Alternative, neither the total number of sortie-operations within existing MOA airspace nor the anticipated noise levels would change, and there would be no change in the audible setting near any building. Therefore, continuation of the No-Action Alternative would create no impact on architectural resources within ROI Three.

#### *ROI TWO*

Potential impacts within ROI Two are addressed under traditional cultural resources (section 4.9.3.3).

#### *ROI ONE*

At SCR, the entire 12,000-acre EUA and 15,650 acres (16 percent) of the remainder of the range outside the EUA have been surveyed for cultural resources. There are no architectural resources within the EUA at SCR, and none have been identified in the surveyed portions of the buffer zone. Available evidence from cultural resource surveys indicates that the range, as a whole, has a very low potential for architectural resources. Therefore, no impacts to architectural resources are anticipated under the No-Action Alternative.

### 4.9.3.3 TRADITIONAL CULTURAL RESOURCES

#### *ROI THREE*

There would be no changes in airspace configuration or use under the No-Action Alternative. Members of the Shoshone-Paiute Tribes have expressed concerns to the Air Force about the current frequency of overflights in some portions of the existing airspace. For example, overflights sometimes disturb the solitude of, or interfere with ceremonies at, sacred locations. The Shoshone-Paiute would have the same concerns about the level of utilization under the No-Action Alternative. The Air Force and the Shoshone-Paiute will continue to discuss any

concerns about the current aircraft noise levels. Nonetheless, because sortie numbers in ROI Three would not change, impacts to traditional cultural resources under the No-Action Alternative would be no greater than baseline conditions.

***ROI TWO***

Representatives of the Shoshone-Paiute Tribes have expressed concerns about traditional cultural resources in the portion of ROI Two west of Highway 51. There might also be traditional cultural resources east of the highway. Under the No-Action Alternative, sortie numbers and noise levels would not change in these locations. Therefore, there would be no change in impact to these resources.

***ROI ONE***

Members of the Shoshone-Paiute Tribes have visited SCR and inspected archaeological sites there. As yet, the Tribes have not identified specific traditional cultural resources within SCR that they consider sensitive to overflights or to ordnance delivery. Given the level of past disturbance to the targets within the EUA at SCR, and given that ordnance use and sortie numbers would not change, impacts to traditional resources within ROI One under Alternative A are unlikely.

## 4.9.4 Alternative B — Clover Butte

### 4.9.4.1 ARCHAEOLOGICAL RESOURCES

Within all components of the Clover Butte Alternative, a moderate number of known archaeological sites and isolates could potentially be affected by ground disturbance caused by the construction, use, and maintenance of the training range, no-drop target areas, emitter sites, associated access roads, and other facilities. Most of these sites and none of the isolates have been determined eligible for the National Register. The Idaho SHPO concurs with these determinations. Based on the results of the sample survey at Clover Butte (see section 3.9.3.1), it is estimated that the surveyed and unsurveyed areas within this alternative could contain a moderate density of archaeological sites and isolates, of which about 20 percent might be eligible for listing in the National Register.

***ROI THREE***

Almost three thousand known archaeological resources are located under the airspace associated with this alternative. Of these, most are under existing airspace, several are located beneath the Owyhee North and Jarbidge North expansion, and a few are located under the Paradise East Expansion. Records indicate that several hundred sites (most under existing airspace and several under the proposed expansions) are listed in, eligible for, or recommended as eligible for the National Register.

As explained in section 4.9.1, it is unlikely that aircraft noise and vibrations, or even sonic booms, could physically damage the types of archaeological sites found in southern Idaho. However, if setting were an important aspect of the National Register-eligibility of a specific archaeological resource, then changes in the audible setting could be an adverse effect of an action.

In the Owyhee North Expansion and Jarbidge North Expansion, cumulative noise levels ($L_{dnmr}$) would increase by 7 dB (refer to Table 4.2-3). The archaeological sites and components previously recorded in these two expansions could be exposed to greater noise levels than they are currently. Of these sites, several – all within a portion of the Camas and Pole Creeks Archaeological District – are listed on the National Register.

Importance to history, rather than setting, was the primary consideration when the Camas and Pole Creeks Archaeological District was nominated to the National Register in 1985. However, even if the anticipated noise increase were to affect setting to some degree, the transitory nature of aircraft noise suggests that impacts to setting would be infrequent and temporary. Furthermore, setting would not be impacted unless a person happened to be visiting the site and experiencing quiet and solitude at the moment an aircraft flew by. The estimated average number of flights per day (30) in the Owyhee MOA under this alternative and the low number of visitors to the area (see section 4.11) indicate that impacts to setting from aircraft overflights would be infrequent.

In the Paradise East Expansion, there would be no change in noise levels under this alternative. Therefore, no impacts to archaeological resources in this area would occur.

Beneath the existing MOA airspace, changes in $L_{dnmr}$ under Alternative B could vary from a decrease of 10 dB to an increase of 7 dB, depending on the specific location (see Table 4.2-3). Because the cultural resources under the existing airspace – including those currently listed on the National Register – are already exposed to aircraft noise, impacts to the setting of these archaeological resources are unlikely from changes in noise conditions.

### *ROI Two*

Potential impacts within ROI Two are addressed under traditional cultural resources (section 4.9.4.3).

### *ROI One*

#### *Training Range*

A moderate number of sites and isolates have been identified in the surveyed portion of the proposed training range, of which most sites have been determined as eligible for the National Register. With approximately 44 percent of the training range surveyed, it is possible to extrapolate the total number of archaeological sites likely to be present in the remaining 56

percent. It is estimated that a moderate density of sites and isolates could exist in the entire 11,840-acre area, of which about 20 percent may be eligible.

As discussed in section 4.9.1.3, impacts to archaeological resources on the training range would be most likely to occur within the 300-acre primary ordnance impact area. Ground disturbance on the training range would be far less likely to occur outside the primary ordnance impact area. Seventy-five percent of the impact area was surveyed and, based on the sample survey data, it is estimated that within the entire primary ordnance impact area for the Clover Butte Alternative, there could be only a few sites and isolates. It is further estimated that the sites could be eligible for listing in the National Register. Therefore, construction, use, and maintenance of the proposed primary ordnance impact area for the Clover Butte Alternative could adversely affect a small number of significant archaeological resources. A moderate number of National Register-eligible sites could exist elsewhere within the training range. Impacts to these would be unlikely, but additional survey and monitoring would further reduce any potential for damage.

In response to public and agency concerns about fire risks, the Air Force proposes to build a less than one-acre above-ground reservoir in a corner of the 12,000-acre training range for Alternative B. The specific location of the proposed reservoir has not been identified. This location will be surveyed for cultural resources prior to construction. In siting the above-ground reservoir, if it is not feasible to avoid a National Register-eligible cultural resource, the Air Force will comply with Section 106 of the NHPA by consulting with the Idaho SHPO, the BLM, and the Shoshone-Paiute Tribes and by developing and implementing appropriate mitigation measures.

*No-Drop Target Areas*

The no-drop target areas and associated access roads were completely surveyed for cultural resources. No archaeological sites and only a few isolates were recorded in the no-drop target areas proposed for Alternative B. None of the isolates is considered eligible for the National Register, so construction and use of the no-drop target areas and access roads would have no impact on significant archaeological resources.

*Emitter Sites*

The emitter sites and associated new or improved access roads were completely surveyed for cultural resources. No archaeological sites and one isolate were recorded. The isolate is not considered eligible for the National Register; therefore, construction and use of emitter sites would have no impact on archaeological resources.

*Other Facilities*

The proposed powerline was surveyed for cultural resources. No cultural resources were found. Construction of the powerline would, therefore, have no impact on significant archaeological resources.

At the location of the bridge proposed for construction, there is one National Register-eligible site and one isolate. Construction of the bridge and road realignment could adversely affect the archaeological site. Because the isolate is not eligible for the National Register, it would not be adversely affected by bridge construction, use, or maintenance.

### 4.9.4.2 HISTORIC ARCHITECTURAL RESOURCES

#### *ROI THREE*

One known architectural resource - Wickahoney Station - has been documented under ROI Three. As was discussed in section 4.9.1.2, there is little evidence that subsonic aircraft noise and vibrations could damage architectural resources. Cumulative noise levels near Wickahoney Station could increase by only 1 dB. There could be an increase in the frequency of noise events over 65 dB of less than one per day. Also, under this alternative, the number of sonic booms per day near Wickahoney Station would not change from baseline. Therefore, the proposed airspace changes under the Clover Butte Alternative would have no impact on architectural resources.

#### *ROI TWO*

Potential impacts within ROI Two are addressed under traditional cultural resources (section 4.9.4.3).

#### *ROI ONE*

Only one historic architectural resource has been identified within ROI One of the Clover Butte Alternative. This resource, a small bridge and associated irrigation features, is eligible for the National Register. Construction of the bridge and associated road realignment could adversely affect this architectural resource.

### 4.9.4.3 TRADITIONAL CULTURAL RESOURCES

#### *ROI THREE*

Representatives of the Shoshone-Paiute Tribes have expressed concerns about the effects on traditional cultural resources of Air Force use and expansion of airspace. These concerns have centered on:

- The possible interference by Air Force overflights of Tribal ceremonies and rituals at various locations within ROI Three.
- Disturbance to the peace and solitude at TCP-A and TCP-B. These are traditional cultural properties that have been recommended as eligible to the National Register, and are among the most important sites in Shoshone-Paiute history.

- Possible adverse effects of aircraft noise on sage grouse, bighorn sheep, and other wildlife that inhabit the area under existing and proposed MOA airspace. Because of their traditional importance to the Shoshone-Paiute Tribes, native species are considered cultural resources.

Many Shoshone-Paiute are concerned about the current frequency of overflights in the affected airspace, and they have similar concerns with the level of utilization proposed for Alternative B. Continued discussions between the Air Force and the Shoshone-Paiute Tribes will address existing noise levels.

Beneath the existing MOA airspace, changes in $L_{dnmr}$ under Alternative B could vary from a decrease of 10 dB to an increase of 7 dB, depending on the specific location (refer to Table 4.2-3). In the vicinity of TCP-A, cumulative noise levels would actually decrease 2 dB under Alternative B. Near the Duck Valley Reservation, cumulative noise levels would either remain the same or would decrease by as much as 10 dB. This is partly because an existing concentration of aircraft operations along an east-west corridor north of the Reservation would be eliminated under the Clover Butte Alternative (refer to Section 4.2.3.3). Overall, potential impacts to Shoshone-Paiute ceremonies and traditional cultural resources beneath existing MOA airspace within ROI Three could possibly be reduced under this alternative.

In the Owyhee North and Jarbidge North expansions, $L_{dnmr}$ would increase by 7 dB (refer to Table 4.2-3). In the Paradise East Expansion, there would be no change. Therefore, only in the two northern expansions would there be a greater potential for disturbance to sacred sites or interference with ceremonies. The Air Force has agreed to reschedule or relocate training activities, to the greatest extent practicable, when they are notified that these activities interfere with Shoshone-Paiute ceremonies (refer to section 1.4.4.2). This agreement would remain in place under Alternative B.

Section 4.8.5.2 discusses the potential impacts of the Clover Butte Alternative on wildlife. Despite the low potential for such impacts, members of the Shoshone-Paiute Tribes have expressed the opinion that overflights are adversely affecting some species (refer to Section 4.8). While a cause-and-effect relationship has not been demonstrated, the Shoshone-Paiute believe that the decline of some game populations may be related to disturbance from aircraft.

As part of an ongoing effort to work with the Tribes on a variety of issues, the Air Force is supporting a study of ethnobotanical and ethnozoological resources in southwest Idaho and adjacent areas. Specific information about the study, and information collected during the study, is confidential, as requested by the Tribes and agreed to by the Air Force.

### *ROI Two*

Representatives of the Shoshone-Paiute Tribes have stated concerns about potential adverse effects to traditional cultural resources in the vicinity of some of the no-drop targets areas and

emitter sites west of Highway 51. There might also be traditional cultural resources east of the highway. These concerns include the following:

- Visual impacts and other intrusions to spiritual locations caused by the emitter sites and some training activities.

- The possibility that road improvements could lead to increased vandalism at archaeological sites and might increase the number of unwelcome visitors at certain ceremonial areas.

The specific locations of many traditional cultural resources within ROI Two have not been revealed to the Air Force. The proposed emitter sites and no-drop target areas were selected by the Air Force with input from the Tribes to reduce potential adverse effects to traditional cultural resources. Despite these efforts, there still remains some potential for visual impacts to traditional cultural resources within ROI Two (see section 4.11).

As discussed in section 4.11.2, road improvements proposed for Alternative B are not expected to increase the level of recreation in the area. The primary access roads west of Highway 51 would not be improved, and the road improvements to emitter sites and no-drop target areas would not lead to specific recreation areas. Therefore, there should be no access-related impacts to traditional cultural resources within ROI Two.

### *ROI ONE*

In conversations with representatives of the Shoshone-Paiute Tribes, concern has been expressed about several components of the Clover Butte Alternative located west of Highway 51. Fewer concerns have been raised about project components located east of the highway. To date, their concerns about traditional cultural resources in ROI One have centered on:

- Disturbance to archaeological sites. Many Shoshone-Paiute believe that all Native American archaeological resources may be significant traditional cultural resources because they were created by their ancestors and have spiritual importance.

- Fences and other barriers might restrict members of the Tribes from visiting certain traditional cultural resources or carrying out rituals in particular locations.

If fencing off some areas within ROI One limits access by the Shoshone-Paiute to traditional cultural resources or other important spiritual locations, the Air Force would accommodate their need to visit these places.

#### *Training Range*

The Shoshone-Paiute have expressed only a few concerns about traditional cultural resources on the proposed training range for the Clover Butte Alternative. As discussed in section 4.9.4.1, there is a moderate number of archaeological sites and isolates in this area. It is estimated that

most of the sites and isolates are likely to be early Native American and, therefore, potential traditional cultural resources as well. Impacts to cultural resources on the training range would most likely occur within the 300-acre primary ordnance impact area. Resources within the training range, but outside the primary ordnance impact area, would be much less likely to be adversely affected. Based on the sample survey data, it is estimated that, within the primary ordnance impact area for the Clover Butte Alternative, there may be only a few sites and isolates. For the purposes of this EIS, it is assumed that most of these possible resources could be early Native American and would qualify as traditional cultural resources. Therefore, it is estimated that the training range alternative at Clover Butte could physically impact a few traditional cultural resources.

*No-Drop Target Areas*

The no-drop target areas were surveyed in their entirety. A few early Native American isolates were identified, all of which may be traditional cultural resources that could be impacted by implementation of Alternative B.

*Emitter Sites*

The emitter sites and access roads contain an early Native American archaeological resource; it may also be a traditional cultural resource.

*Other Facilities*

The proposed powerline right-of-way crosses no identified cultural resources. A few early Native American resources were identified at the location of a proposed bridge realignment. These could be traditional cultural resources that could be adversely affected by implementation of Alternative B.

## 4.9.5 Alternative C — Grasmere

### 4.9.5.1 Archaeological Resources

Within all components of the Grasmere Alternative, a moderate number of known archaeological sites and isolates could potentially be affected by ground disturbance caused by the construction, use, and maintenance of the training range, no-drop target areas, emitter sites, associated access roads, and other facilities. Most of these sites and none of the isolates have been determined eligible for the National Register. The Idaho SHPO concurs with these findings. Based on the results of the sample survey at Grasmere (refer to section 3.9.3.1), it is estimated that the surveyed and unsurveyed areas within this alternative contain a relatively large number of archaeological sites and isolates, of which 25 percent might be eligible for listing in the National Register.

### *ROI THREE*

Around three thousand known archaeological resources are located under the airspace associated with this alternative. Of these, most are under existing airspace, several are located beneath the Owyhee North and Jarbidge North Expansion, and a few are located under the Paradise East Expansion. Records indicate that several hundred sites (most under existing airspace and several under the proposed expansions) are listed in, eligible for, or recommended as eligible for the National Register.

As explained in sections 4.9.1 and 4.9.4.1, it is unlikely that aircraft noise and vibrations, or even sonic booms, could physically damage the types of archaeological sites found in southern Idaho and adjacent areas. However, changes in audible setting could be an adverse effect of an action if setting were an important aspect of the National Register-eligibility of an archaeological resource.

In the Owyhee North Expansion and Jarbidge North Expansion, $L_{dnmr}$ would increase by 5 dB (refer to Table 4.2-3). Thus, the archaeological sites and components previously recorded in these two expansions could be exposed to greater noise levels than they are currently. Of these sites, several – all within the Camas and Pole Creeks Archaeological District – are listed on the National Register.

Importance to history, rather than setting, was the main consideration when the Camas and Pole Creeks Archaeological District was nominated to the National Register in 1985. However, even if the anticipated noise increase under Alternative C were to affect setting, the transitory nature of aircraft noise would mean that impacts to setting would be infrequent and temporary. Furthermore, setting would not be impacted unless someone happened to be experiencing the quiet and solitude of the site when an aircraft flew by. The estimated average number of flights per day (30) and the low number of visitors to the area (see section 4.11) suggest that impacts to setting from aircraft overflights would be infrequent.

In the Paradise East Expansion, there would be no change in cumulative noise levels. Therefore, no impacts to archaeological resources in this area would occur.

Beneath the existing MOA airspace, changes in $L_{dnmr}$ under Alternative C would decrease at most reference points (see Table 4.2-2). Because the cultural resources under the existing airspace – including those currently listed on the National Register – are already exposed to aircraft noise, impacts to the setting of these archaeological resources are unlikely from the anticipated changes in noise conditions.

### *ROI Two*

Potential impacts within ROI Two are addressed under traditional cultural resources (section 4.9.5.3).

### *ROI ONE*

#### *Training Range*

Many sites and isolates have been identified in the surveyed portion of the training range, of which most sites have been determined eligible for the National Register. With approximately 28 percent of the training range surveyed, it is possible to extrapolate the total number of archaeological sites likely to be present in the remaining 72 percent. It is estimated that a total of moderate to large number of sites and isolates could exist in the entire 11,000-acre area, of which about 25 percent may be eligible.

As discussed in sections 4.9.1.2 and 4.9.4.1, impacts to archaeological resources on the training range would be most likely to occur within the 300-acre primary ordnance impact area. Ground disturbance in the training range would be much less likely to happen outside the primary ordnance impact area. Forty percent of the impact area was surveyed and, based on the stratified random sample survey data, it is estimated that within the entire primary ordnance impact area for the Grasmere alternative, there could be several sites and isolates. It is further estimated that most of the sites could be eligible for listing in the National Register. Therefore, construction, use, and maintenance of the proposed training range for the Grasmere Alternative could adversely affect a few significant archaeological resources. A large number of additional National Register-eligible sites could exist elsewhere within the training range. Impacts to these would be unlikely, but additional survey and monitoring would further reduce any potential for damage.

#### *No-Drop Target Areas*

The no-drop target areas and associated access roads were completely surveyed for cultural resources. A few archaeological sites and isolates were recorded in the no-drop target areas and access roads proposed for Alternative C. An archaeological site is recommended as eligible for listing on the National Register. None of the isolates is considered eligible for the National Register, so construction of the no-drop target areas and access roads could have impact on one significant archaeological resource.

#### *Emitter Sites*

The emitter sites and associated new or improved access roads were completely surveyed for cultural resources. No archaeological sites and one isolate were recorded during the survey. The isolate is not eligible for the National Register. Therefore, construction and use of the proposed emitter sites would have no impact on significant archaeological resources.

#### *Other Facilities*

The proposed powerline corridor was surveyed for cultural resources, but none were found. Therefore, construction of the powerline would have no impacts on significant archaeological resources.

At the location of a bridge proposed for replacement, there is one National Register-eligible site and one isolate. Construction of the bridge and road realignment could adversely affect the archaeological site. Because the isolate is not eligible for the National Register, it would not be adversely affected.

### 4.9.5.2 HISTORIC ARCHITECTURAL RESOURCES

#### *ROI THREE*

One known architectural resource – Wickahoney Station – has been documented under ROI Three and is located a short distance north of the proposed training range. As was discussed in section 4.9.1.2, there is little evidence that subsonic aircraft noise and vibrations could damage architectural resources. Cumulative noise levels near Wickahoney Station would increase, perhaps by as much as 10 dB. There would also be an increase in the frequency of noise events by about 3.2 events per day. Also, under this alternative, the number of sonic booms per day near Wickahoney Station could increase slightly. While the noise environment near Wickahoney Station would be altered, the proposed airspace changes under the Grasmere Alternative would probably have no impact on architectural resources. Noise levels ($L_{max}$) on the order of 120 or 130 dB would be necessary for there to be a potential for structural damage (see Appendix K).

#### *ROI TWO*

Potential impacts within ROI Two are addressed under traditional cultural resources (section 4.9.5.3).

#### *ROI ONE*

One National Register-eligible architectural resource has been identified within ROI One of the Grasmere Alternative. This resource is a small bridge and associated irrigation features. Construction of the proposed bridge could impact the architectural resource.

Also, improvement is proposed for an access road that leads in the direction of Wickahoney Station, located north of the proposed range. Wickahoney Station is a well-known National Register-listed historic stage stop and post office and has received a significant number of visitors, now and in the past. Unfortunately, it has also been badly vandalized, having suffered a serious fire and other damage. The improved road would end one mile short of Wickahoney, and access to the site is already possible by two-wheel drive vehicle. Therefore, it is unlikely that the proposed changes to the roads would lead to more vandalism at this resource. For additional information on recreational access, refer to section 4.11.

In conclusion, implementation of the Grasmere Alternative might cause adverse effects to one National Register-eligible architectural resource.

### 4.9.5.3 TRADITIONAL CULTURAL RESOURCES

#### *ROI THREE*

Representatives of the Shoshone-Paiute Tribes have expressed concerns about the effects on traditional cultural resources of Air Force use and expansion of airspace. These concerns have centered on:

- The potential interference by Air Force overflights of Tribal ceremonies and rituals at various locations within ROI Three.
- Disturbance to the peace and solitude at TCP-A and TCP-B. These are among the most important sites in Shoshone-Paiute history and are traditional cultural properties that have been recommended as eligible to the National Register.
- Possible adverse effects of aircraft noise on sage grouse, bighorn sheep, and other wildlife that inhabit the area under existing and proposed MOA airspace. Because of their traditional importance to the Shoshone-Paiute Tribes, native species are considered cultural resources.

Many Shoshone-Paiute are concerned about the current frequency of overflights in the affected airspace, and they have similar concerns with the level of utilization proposed for Alternative C. Continued discussions between the Air Force and the Shoshone-Paiute Tribes will address existing noise levels.

Beneath the existing MOA airspace, changes in $L_{dnmr}$ under Alternative C would decrease at most reference points (see Table 4.2-2). In the vicinity of TCP-A, cumulative noise levels would decrease 3 dB under Alternative C. Near the Duck Valley Reservation, cumulative noise levels would either remain the same or would decrease by as much as 6 dB. Overall, potential impacts to Shoshone-Paiute ceremonies and traditional cultural resources beneath existing MOA airspace within ROI Three could possibly be reduced under this alternative.

In the Owyhee North and Jarbidge North expansions, $L_{dnmr}$ would increase by 5 dB (refer to Table 4.2-3). In the Paradise East Expansion, there would be no change in cumulative noise levels. Therefore, only in the Owyhee North and Jarbidge North expansions would there be a greater potential for disturbance to sacred sites or interference with ceremonies. The Air Force has agreed to reschedule or relocate training activities, to the greatest extent practicable, if they are notified in advance that these activities would interfere with Shoshone-Paiute ceremonies (see section 1.4.4.2). This agreement would remain in effect under Alternative C.

Section 4.8.5.3 discusses the potential impacts of the Grasmere Alternative on wildlife. Despite the low potential for such impacts, members of the Shoshone-Paiute Tribes are concerned that overflights could adversely affect some species (see Section 4.8). Research has not demonstrated

a cause-and-effect relationship. However, some Shoshone-Paiute still believe that a decline of the populations of some game animals may be related to disturbance from overflights.

As part of an ongoing effort to work with the Tribes, the Air Force is supporting a study of ethnobotanical and ethnozoological resources in southwest Idaho and adjacent areas. Specific information about the study, and information collected during the study is confidential, as requested by the Tribes and agreed to by the Air Force.

### *ROI Two*

Representatives of the Shoshone-Paiute Tribes have expressed concerns about potential adverse effects to traditional cultural resources in the vicinity of the training range, no-drop targets areas, and emitter sites west of Highway 51. There might also be traditional cultural resources east of the highway. These concerns include the following:

- Visual and noise impacts to spiritual locations caused by the emitter sites and training activities.
- The possibility that road improvements could lead to increased vandalism at archaeological sites and might increase the number of unwelcome visitors at certain ceremonial areas.

The Tribes have not revealed the specific locations of many traditional cultural resources within ROI Two to the Air Force. The proposed emitter sites and no-drop target areas were selected by the Air Force with input from the Tribes to reduce potential adverse effects to traditional cultural resources. Despite these efforts, there still remains potential for visual impacts to traditional cultural resources within ROI Two from some emitter sites, no-drop target areas, and the training activities. The Air Force has developed a plan to reduce visual impacts (see section 4.11).

As discussed in sections 4.9.5.2 and 4.11.2, road improvements proposed for Alternative C are not expected to increase the level of recreation in the area. Therefore, there should be no access-related impacts to traditional cultural resources within ROI Two.

### *ROI One*

In conversations with representatives of the Shoshone-Paiute Tribes, concern has been expressed about the various components of the Grasmere Alternative located west of Highway 51. Fewer concerns have been raised about project components located east of the highway. To date, their concerns about traditional cultural resources in ROI One have centered on the following:

- Disturbance to archaeological sites. Many Shoshone-Paiute believe that all Native American archaeological resources may be significant traditional cultural resources because they were created by their ancestors and have spiritual importance.

- Fences and other barriers might restrict members of the Tribes from visiting certain traditional cultural resources or carrying out rituals in particular locations.

If fencing off some areas within ROI One limits access by Tribal members to traditional cultural resources or other important spiritual locations, the Air Force will work with the Tribes to accommodate their need to visit these places.

*Training Range*

As discussed in section 4.9.5.1, there could be a large number of archaeological sites and isolates in this area. It is estimated that many of the sites and isolates are likely to be early Native American. These would be potential traditional cultural resources as well. Impacts to cultural resources on the training range would most likely occur within the 300-acre primary ordnance impact area. Resources within the training range but outside the primary ordnance impact area, would be much less likely to be adversely affected. Based on the sample survey data, it is estimated that within the primary ordnance impact area for the Grasmere Alternative, there may be several sites and isolates. For the purposes of this EIS, it is assumed that most of these possible resources could be early Native American and would qualify as traditional cultural resources. Therefore, the training range alternative at Grasmere could physically impact several traditional cultural resources.

*No-Drop Target Areas*

The no-drop target areas and access roads were surveyed in their entirety. A few early Native American archaeological sites and isolates were identified, all of which may be traditional cultural resources that could be impacted by implementation of Alternative C.

*Emitter Sites*

The emitter sites and access roads were surveyed found to contain one early Native American archaeological resource. This resource can also be considered a potential traditional cultural resource.

*Other Facilities*

The proposed powerline right-of-way crosses no known cultural resources. There are a few early Native American archaeological resources at the location of a proposed bridge realignment. These can be considered potential traditional cultural resources that could be impacted by implementation of Alternative C.

## 4.9.6 Alternative D — Juniper Butte

### 4.9.6.1 Archaeological Resources

Within all components of the Juniper Butte Alternative, only a few known archaeological sites and isolates could potentially be affected by ground disturbance caused by the construction, use,

and maintenance of the training range, no-drop target areas, emitter sites, powerlines, associated access roads, and other facilities (Table 4.9-3). Even fewer of these resources have been determined eligible for the National Register. The Idaho SHPO concurs with these findings. Based on the results of BLM and Air Force surveys at Juniper Butte (see section 3.9.3.1), it is estimated that the surveyed and unsurveyed areas within this alternative could contain a relatively small number of archaeological sites and isolates, very few of which would be likely to be eligible for listing on the National Register.

### *ROI THREE*

Around three thousand known archaeological resources are located under the airspace associated with this alternative. Of these, most are under existing airspace, several are located beneath the Owyhee North and Jarbidge North Expansion, a few are located under the Paradise East Expansion, and a few hundred are under the Jarbidge East Expansion. Records indicate that several hundred sites (most under existing airspace and several under the proposed expansions) are listed in, eligible for, or recommended as eligible for the National Register.

As explained in sections 4.9.1 and 4.9.5.1, it is unlikely that aircraft noise and vibrations, including sonic booms, could physically damage most types of archaeological sites found in southern Idaho and adjacent areas. However, changes in audible setting could be an adverse effect of an action if setting were an important aspect of the National Register-eligibility of particular archaeological resources.

In the Owyhee North Expansion and Jarbidge North Expansion, $L_{dnmr}$ would increase by 6 dB (refer to Table 4.2-3). Thus, the archaeological sites and components previously recorded in the Owyhee North and Jarbidge North expansions could be exposed to greater noise levels than they are currently. Of these sites, several — all within the Camas and Pole Creeks Archaeological District — are listed on the National Register.

Importance to history, rather than setting, was the main consideration when the Camas and Pole Creeks Archaeological District was nominated to the National Register. However, even if the anticipated noise increase under Alternative D were to affect setting, the transitory nature of aircraft noise would mean that impacts to setting would be infrequent and temporary. Furthermore, setting would not be impacted unless someone happened to be experiencing the quiet and solitude of the site when an aircraft flew by. The estimated number of flights per day (30), on average, and the low number of visitors to the area (see section 4.11) suggest that impacts to setting from aircraft overflights would be infrequent.

In the Jarbidge East Expansion, $L_{dnmr}$ would increase by only 2 dB or decrease by 6 to 7 dB, depending on the specific location, and in the Paradise East Expansion Area, there would be no change in cumulative noise levels. Therefore, no impacts to archaeological resources in these two areas would occur under Alternative D.

Beneath the existing MOA airspace, changes in $L_{dnmr}$ under Alternative D would decrease at most reference points (see Table 4.2-2). Because the cultural resources under the existing airspace – including those currently listed on the National Register – are already exposed to aircraft noise, impacts to the setting of these archaeological resources are unlikely from changes in noise conditions.

### *ROI Two*

Potential impacts within ROI Two are addressed under traditional cultural resources (section 4.9.6.3).

### *ROI One*

#### *Training Range*

Few sites and isolates have been identified in the surveyed portion of the training range, none of which have been determined eligible for the National Register. With approximately 28 percent of the training range surveyed, it is possible to extrapolate the total number of archaeological sites likely to be present in the remaining 72 percent. It is estimated that relatively few sites and isolates could exist in the entire 11,560-acre area, none of which may be eligible.

As discussed in section 4.9.1.2, impacts to archaeological resources on the training range would be most likely to occur within the 300-acre primary ordnance impact area. This impact area was completely surveyed for cultural resources, but only one isolate was found. It is not eligible for listing in the National Register. Ground disturbance on the proposed training range would be less likely to occur outside the primary ordnance impact area. It is estimated that no National Register-eligible sites exist elsewhere within the target area. Therefore, construction, use, and maintenance of the proposed training range for the Juniper Butte Alternative could adversely affect no significant archaeological resources. Additional survey in areas where fencing would be built would be necessary to confirm this conclusion.

As a mitigation to address public and agency concerns regarding fire risk, the Air Force proposes to build a less than one-acre above-ground reservoir in a corner of the 12,000-acre training range for Alternative D. The specific location of the proposed reservoir has not been identified. This location will be surveyed for cultural resources prior to construction. In siting the proposed reservoir, if it is not feasible to avoid a National Register-eligible cultural resource, the Air Force will comply with Section 106 of the NHPA by consulting with the Idaho SHPO, the BLM, and the Shoshone-Paiute Tribes, and by developing and implementing appropriate mitigation measures.

#### *No-Drop Target Areas*

The no-drop target areas and associated access roads were completely surveyed for cultural resources. A few archaeological sites and isolates were recorded in the no-drop target areas proposed for Alternative D. The archaeological site is eligible for listing on the National

Register. None of the isolates is considered eligible for the National Register, so construction of the no-drop target areas and access roads could impact one significant archaeological resource.

*Emitter Sites*

The emitter sites and associated new and improved access roads were completely surveyed for cultural resources. No archaeological sites and one isolate were recorded. The isolate is not eligible for the National Register. Therefore, the emitter sites would have no impact on significant archaeological sites.

*Other Facilities*

The proposed powerline was surveyed for cultural resources. One isolate was found; it is not eligible for the National Register. Construction of the powerline would therefore have no impact on significant archaeological resources.

At the location of a bridge proposed for reconstruction and a road realignment, there is one National Register-eligible site and one isolate. Reconstruction of the bridge could adversely affect the archaeological site. Because the isolate is not eligible for the National Register, it would not be adversely affected by the bridge construction, use, or maintenance.

#### 4.9.6.2 HISTORIC ARCHITECTURAL RESOURCES

***ROI THREE***

One known architectural resource - Wickahoney Station - has been documented under ROI Three. As was discussed in previous sections, there is little evidence that subsonic aircraft noise and vibrations could damage architectural resources. Cumulative noise levels near Wickahoney Station would not change. Under this alternative, the number of sonic booms per day near the building would not increase. Therefore, the proposed airspace changes under the Juniper Butte Alternative would have no impact on architectural resources.

***ROI TWO***

Potential impacts within ROI Two are addressed under traditional cultural resources (section 4.9.6.3).

***ROI ONE***

One National Register-eligible architectural resource has been identified within ROI One of the Juniper Butte Alternative. This resource is a small bridge and associated irrigation features. Construction of the proposed bridge realignment could impact this resource.

### 4.9.6.3 TRADITIONAL CULTURAL RESOURCES

#### *ROI THREE*

Representatives of the Shoshone-Paiute Tribes have stated that they have concerns about the effects on traditional cultural resources of Air Force use and expansion of airspace. In particular, the representatives have mentioned the following:

- The potential interference by Air Force overflights of Tribal ceremonies and rituals within ROI Three.
- Disturbance to the solitude of TCP-A and TCP-B. These are two of the most important locations in Shoshone-Paiute history and are traditional cultural properties that have been recommended as eligible to the National Register.
- Possible adverse effects of aircraft noise on sage grouse, bighorn sheep, and other wildlife that inhabit the area under existing and proposed MOA airspace. Because of their traditional importance to the Shoshone-Paiute Tribes, they consider native species to be traditional cultural resources.

Many Shoshone-Paiute are concerned about the current frequency of overflights in the affected airspace, and they have similar concerns about the proposed level of utilization under Alternative D. The Air Force and the Shoshone-Paiute Tribes will continue to discuss existing noise levels.

Beneath the existing MOA airspace, changes in $L_{dnmr}$ under Alternative D would decrease at most reference points (refer to Table 4.2-2). In the vicinity of TCP-A, cumulative noise levels would decrease 4 dB under Alternative D. Near the Duck Valley Reservation, cumulative noise levels would decrease or stay the same at all four reference points (R, S, AA, AB) (refer to Table 4.2-4). Overall, potential impacts to Shoshone-Paiute ceremonies and traditional cultural resources beneath existing MOA airspace within ROI Three could possibly be reduced under this alternative.

In the Owyhee North and Jarbidge North expansions, $L_{dnmr}$ would increase by 6 dB (refer to Table 4.2-2). In the Jarbidge East Expansion Area, $L_{dnmr}$ would increase by 2 dB or decrease by 6 to 7 dB. In the Paradise East Expansion, there would be no change in cumulative noise levels. Only in the two northern expansions would there be a greater potential for disturbance to sacred sites or interference with ceremonies. The Air Force has agreed to reschedule or relocate training activities, to the greatest extent practicable, if they are notified in advance that these activities would interfere with Shoshone-Paiute ceremonies (refer to section 1.4.4.2). This agreement would remain in effect under Alternative D.

Section 4.8.5.4 summarizes the potential impacts of the Juniper Butte Alternative on wildlife. Despite the low potential for such impacts, members of the Shoshone-Paiute Tribes are

concerned that overflights could adversely affect some species (refer to Section 4.8). Research has not demonstrated a cause-and-effect relationship between overflights and the decline of game species. However, some Shoshone-Paiute still believe that this decline may be related to disturbance from overflights.

As part of an ongoing effort to work with the Tribes, the Air Force is supporting a study of ethnobotanical and ethnozoological resources in southwest Idaho and adjacent areas. Specific information about the study, and information collected during the study, is confidential, as requested by the Tribes and agreed to by the Air Force.

### *ROI Two*

Representatives of the Shoshone-Paiute Tribes have expressed concerns about potential adverse effects to traditional cultural resources in the vicinity of the no-drop targets areas and emitter sites west of Highway 51. These concerns include:

- Visual and noise impacts to spiritual locations caused by the emitter sites and training activities.
- The possibility that road improvements could lead to increased vandalism at archaeological sites and might increase the number of unwelcome visitors at certain ceremonial areas.

The Tribes have not revealed the specific locations of many traditional cultural resources within ROI Two to the Air Force. The proposed emitter sites and no-drop target areas were selected by the Air Force with input from the Tribes to reduce potential adverse effects to traditional cultural resources. Despite these efforts, there still remains potential for visual impacts to traditional cultural resources within ROI Two from some emitter sites and no-drop target areas. The Air Force has developed a plan to reduce visual impacts (see section 4.11).

As discussed in section 4.11.2, road improvements proposed for Alternative D are not expected to increase the level of recreation in the area. Therefore, there should be no access-related impacts to traditional cultural resources within ROI Two.

### *ROI One*

In conversations with representatives of the Shoshone-Paiute Tribes, concern has been expressed about the various components of the Juniper Butte Alternative located west of Highway 51. Fewer concerns have been raised about project components located east of the highway. To date, their concerns about traditional cultural resources in ROI One have centered on the following:

- Disturbance to archaeological sites. Many Shoshone-Paiute believe that all Native American archaeological resources may be significant traditional cultural resources because they were created by their ancestors and have spiritual importance.

- Fences and other barriers might restrict members of the Tribes from visiting certain traditional cultural resources or carrying out rituals in particular locations.

If fencing off some areas within ROI One limits access by Tribal members to traditional cultural resources or other important spiritual locations, the Air Force will accommodate their need to visit these places.

*Training Range*

As discussed in section 4.9.6.1, there could be a relatively small number of archaeological sites and isolates in this area. It is estimated that many of the sites and isolates are likely to be early Native American. These would be potential traditional cultural resources as well. Impacts to cultural resources on the training range would most likely occur within the 300-acre primary ordnance impact area. Resources within the training range but outside the primary ordnance impact area would be much less likely to be adversely affected. Based on complete survey data, it is known that within the primary ordnance impact area for the Juniper Butte Alternative, there are no early Native American resources. Therefore, it is anticipated that the training range alternative at Juniper Butte would probably not physically impact traditional cultural resources.

*No-Drop Target Areas*

The no-drop target areas were surveyed in their entirety. A few early Native American archaeological sites and isolates were identified, all of which may be traditional cultural resources that could be impacted by implementation of Alternative D.

*Emitter Sites*

The emitter sites and access roads were surveyed. One emitter location contains a single early Native American archaeological isolate that may also be determined to be a traditional cultural resource.

*Other Facilities*

The proposed powerline right-of-way crosses no cultural resources. There are a few early Native American archaeological resources at a proposed bridge realignment. These can be considered potential traditional cultural resources that could be impacted by implementation of Alternative D.

## 4.9.7 Cumulative Impacts

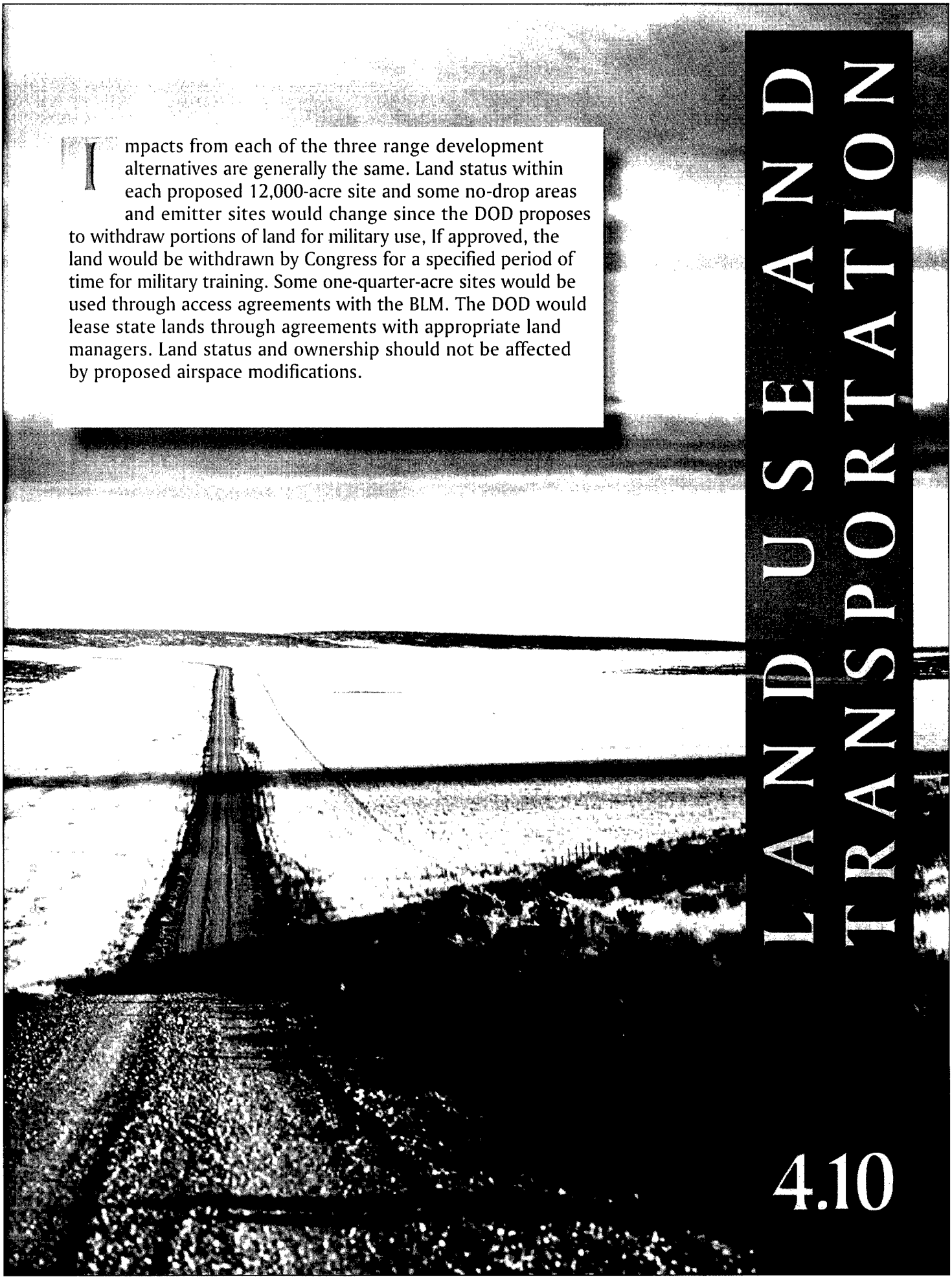
All aspects of the ETI proposal, including potential effects of ground disturbance, increased human disturbance, and military aircraft overflight were analyzed. The change to the current airspace structure and associated construction activities associated with the ETI project would affect cultural resources. The results of this change are addressed in the previous sections.

Identified construction programs associated with the foreseeable projects would not require the physical modification or disturbance of any known archaeological or architectural resource eligible for listing on the National Register. In some cases, currently unidentified archaeological and architectural resources could be discovered or affected. However, each of the foreseeable projects is a federal undertaking and would occur on federal lands. The identification and evaluation of cultural resources, as described in Section 106 of the NHPA, would be required, and appropriate measures to avoid or mitigate adverse effects would be implemented. Thus, the elements of these actions would not be expected to cumulatively impact archaeological and architectural resources.

As discussed in section 4.2.8, the other foreseeable projects would not contribute to overall noise levels resulting from the ETI project. Therefore, no potential cumulative impact would result to traditional cultural resources from noise.

Members of the Shoshone-Paiute Tribes at the Duck Valley Reservation have expressed concerns about intrusions of certain elements of ETI on traditional cultural resources. Some of the foreseeable projects could potentially cause similar intrusions. Therefore, there may possibly be a cumulative impact on traditional cultural resources associated with these intrusions.

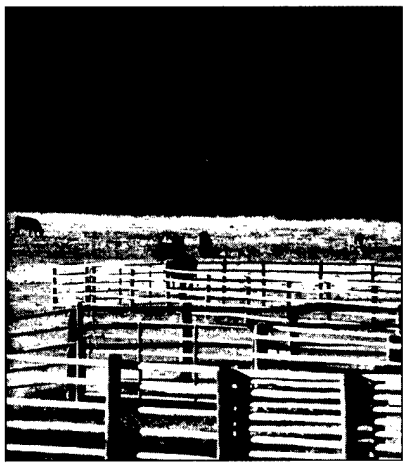
Finally, the Shoshone-Paiute have also expressed concerns about increased visitation to sensitive areas containing traditional cultural resources for recreation and other purposes. While the cumulative impact to recreation is not anticipated to be significant, even a slight increase in the number of visitors to certain specific locations or to traditional cultural resources in general may be undesirable. However, it is unlikely that the selected ETI alternative would contribute to a cumulative impact to traditional cultural resources associated with improved access to some areas.



# LAND USE AND TRANSPORTATION

Impacts from each of the three range development alternatives are generally the same. Land status within each proposed 12,000-acre site and some no-drop areas and emitter sites would change since the DOD proposes to withdraw portions of land for military use, If approved, the land would be withdrawn by Congress for a specified period of time for military training. Some one-quarter-acre sites would be used through access agreements with the BLM. The DOD would lease state lands through agreements with appropriate land managers. Land status and ownership should not be affected by proposed airspace modifications.

4.10



The dominant land use of the region is ranching. BLM permittees are authorized to graze their livestock on public land allotments for specified periods each year.



Unimproved roads that access a selected 12,000-acre training range will be improved to support maintenance vehicles.

## Land Use Patterns

Establishment of any range alternative would have minimal impact on land use. Land use in this region is primarily grazing. Grazing would no longer occur within a selected 300-acre primary ordnance impact area. The 300-acre area, roads, and emitter sites consist of less than 0.1 of one percent of the total acreage available for grazing in ROI Two. Such a small alteration is not expected to affect the dominance of grazing as a land use in the region.

Proposed airspace modifications should not affect land use. Adjacent land underneath existing airspace has experienced military aircraft activity without changes in land use.

## Special Use Areas

Special use areas are units of land within BLM resource areas given special management consideration. Within the ROI Three area being studied for proposed enhanced training, there are:

- Wilderness Study Areas
- Special Recreation Management Areas
- National Conservation Area
- Wild and Scenic Rivers
- Areas of Critical Environmental Concern
- Other identified areas

Figures 3.10-4, 3.10-5, and 3.10-6 demonstrate that initial siting of ETI alternatives avoided all BLM special use areas.

There are no special use areas within alternative training range sites (ROI One). Noise levels in the airspace are generally expected to decrease except at the selected alternative and within the added airspace. Avoidance of special use areas and the fact that most special use areas were so designated while they were already underlying military airspace, render it unlikely that any alternative will have an impact on special use designations or management.

## Transportation Resources

Transportation resources include the road and highway network that provides access to ROI One training range alternatives, including emitter sites and no-drop targets. These roads are under the jurisdiction of the BLM, Owyhee County, or the Three Creek Good Roads District. These roads are typically unimproved and infrequently traveled.

Construction of new roads, improvement of existing roads and target site construction could cause some temporary delays to ranchers or recreationists. The new roads and improvements to existing roads would marginally enhance the road quality although no improved road would lead directly to a ranch or recreational site.

Air Force pickup trucks and semi-trailers would transport emitters to sites. The emitter sites would receive intermittent use, with five to eight in use daily and approximately 15 in use for two to three days during monthly composite wing exercises.

ROI Two road use is expected to continue at low levels and road conditions are not expected to be degraded by project activities.

# 4.10 LAND USE AND TRANSPORTATION

The land use discipline is interrelated with other resource areas discussed in this chapter, including Noise (section 4.2), Biological Resources (section 4.8), Recreation and Visual Resources (section 4.11), and Socioeconomics (section 4.12). Full analyses of the impacts on these resources are discussed in their respective sections. This section focuses on the impacts of the proposed land withdrawal and airspace modifications on land ownership or land status, general land use patterns, land management plans, special use areas, and roads.

Any modification to land ownership or status is considered for possible impact. Assessment of impacts on individual land uses requires identification of those uses and determination of the degree to which those uses would be affected. Similarly, modification of use or management of these lands is analyzed for impact. Economic impacts on grazing, the major land use in the region, are addressed in section 4.12, Socioeconomics.

Within BLM resource areas lie special use areas with unique management objectives. These include WSAs, ACECs, Special Recreation Management Areas (SRMAs), and others, as discussed in section 3.10.3. Impacts on management and status of these areas are considered. Effects on users of recreation areas within the WSAs and other special use areas are discussed in section 4.11, Recreation and Visual Resources. Overflight impacts on wildlife are discussed in section 4.8, Biological Resources. Each of these resource areas considered the effects of developing, constructing, and operating the range, as well as the effects of modifying airspace configuration and the changed levels of sortie-operations shown in Table 4.0-1.

Transportation impacts, specifically to roads, are also considered. The transportation impact analysis includes the consideration of both user and facility impacts. User impacts can be measured by changes in levels of service and an increase in accidents. Facility impacts stem from either an increase in maintenance or the necessity for providing new or improved roadways and/or other related facilities.

## 4.10.1 Alternative A — No-Action

Under the No-Action Alternative, land use and land status would remain unchanged and would be as described for baseline conditions in section 3.10. Grazing would continue to be the predominant land use in the region, and public lands would not be withdrawn for military use. Land management plans would remain unchanged, and special use areas would continue to be managed under the appropriate resource management plan (RMP), management framework plan (MFP), or other land management plan as described in section 3.10. Transportation activity would continue at the current low level, and jurisdiction of roads would remain unchanged. Therefore, implementation of the No-Action Alternative would create no specific impacts to land use or transportation.

## 4.10.2 Alternative B — Clover Butte

### 4.10.2.1 Land Status and Land Use Patterns

*Land Withdrawal*

The proposed Clover Butte Alternative would include a 12,000-acre training range, five no-drop target areas, and 30 emitter sites. All of the sites for facilities under this alternative are currently located on state or public (BLM) land as discussed in section 3.10.1.3. Airspace would be modified as described in section 2.3.3.1.

Land status would be altered as a result of the Clover Butte Alternative, since DoD proposes to withdraw public lands for military use. To effect this change, DoD submitted a land withdrawal application in accordance with the Engle Act, which states that withdrawals of public land of more than 5,000 acres for defense purposes must be approved by Congress. The BLM currently manages the subject land area and also maintains the responsibility of coordinating the withdrawal process as outlined in the Federal Land Policy and Management Act (FLPMA) of 1976. This process is described in section 2.3.1.1. Table 4.10-1 shows the approximate acreages proposed for withdrawal for each alternative.

**Table 4.10-1. Approximate Acreages of Withdrawn Land for Each Alternative**

| *Alternative Component* | *Clover Butte* | *Grasmere* | *Juniper Butte* |
|---|---|---|---|
| 12,000-acre training range | 11,200 | 8,600 | 10,600 |
| 640-acre target area | 640 | 640 | 640 |
| 5.0-acre target areas | 15 | 15 | 20 |
| 1.0-acre emitter sites | 9 | 9 | 9 |
| 0.25-acre emitter sites | 0 | 0 | 0 |
| Total | 11,864 | 9,264 | 11,269 |

The status of the no-drop and emitter sites that are not included in the withdrawal application would not change. Rather DoD would enter into appropriate agreements with the current land manager. For lands owned by the State of Idaho, a lease would be required; for lands managed by the BLM, a right-of-way would be required. The provisions for rights-of-way are outlined in Title V of FLPMA.

Establishment of the Clover Butte training range and associated no-drop target areas and emitter sites would have a minimal impact on existing land use patterns. Since the area is currently used for livestock grazing, the introduction of a military target area and facilities would be an addition to the existing land use; however, grazing would continue (with some

schedule restrictions) throughout all of the range, except within the primary ordnance impact areas totaling 300 acres. Grazing would also continue on the 640-acre no-drop target site, although the area would be fenced. Grazing would be prohibited on the four five-acre no-drop target areas and the ten one-acre emitter sites; these sites would be fenced to discourage vandalism. Since the one-quarter-acre no-drop emitter sites would be gravelled, no grazing would occur on these sites. In all, a total of approximately 335 acres would no longer be used for livestock grazing (Table 4.10-2).

**Table 4.10-2. Approximate Acreages of Land within Alternative Components Where Grazing Would be Eliminated**

| *Alternative Component* | *Acreage* |
|---|---|
| 12,000-acre training range | 300 |
| 640-acre target area | 0 |
| Four 5-acre target areas | 20 |
| Ten 1.0-acre emitter sites | 10 |
| Twenty one-quarter-acre emitter sites | 5 |
| **Total** | **335** |

With over 4.5 million acres of rangeland in Owyhee County, such a small alteration of grazing practices should not affect the dominance of this land use in the region. The economic impact of Alternative B on livestock grazing activities is discussed in section 4.12, Socioeconomics.

Within the proposed Clover Butte Alternative, approximately 646.5 acres are state endowment lands. Military use of these lands would be permitted through a lease agreement with the State of Idaho, Department of Lands. Although military use would be an addition to existing use of these lands, current grazing practice would continue; therefore, impacts would be minimal.

### *AIRSPACE MODIFICATION*

Land ownership patterns should not be affected by the proposed airspace modifications. Surrounding areas have historically been exposed to aircraft activities and their associated noise without precipitating changes in ownership or use. In addition, lands underlying the proposed modifications are already exposed to military and civil overflight activity. The area which includes the proposed Jarbidge and Owyhee MOAs expansion currently experiences overflights by military aircraft transiting to and from the existing MOAs and Mountain Home AFB. Approximately 35 percent of the expanded airspace of the Paradise East MOA is currently underlain by segments of two MTRs. As described in section 3.1, military training activity consistent with the Owyhee and Jarbidge MOAs would extend over the Jacks Creek area. These airspace changes and associated military training activities are not expected to

precipitate changes in current land use patterns or ownership of the Jacks Creek area, since lands underlying the existing MOAs have historically experienced this activity without resulting in changes to the regional land use pattern.

### 4.10.2.2 Land Management Plans

Once the lands associated with this alternative are withdrawn, they would be outside of the BLM's jurisdiction and would, therefore, not be discussed or provided for within BLM's resource management plans.

As part of the land withdrawal application, in accordance with FLPMA, DoD would submit a RMP that would describe the environmental conditions associated with the affected lands and prescribe management objectives for them. This approach is consistent with management plans that DoD develops, adopts, and implements on installations and ranges throughout the world. All aspects of such a plan would conform to information provided in and decisions resulting from this EIS. An outline describing the contents of the RMP is provided as Appendix M. The plan itself would not be prepared until the Record of Decision (ROD) identifies the lands to be withdrawn.

### 4.10.2.3 Special Use Areas

#### *Ground Disturbance*

No special use areas are located on the lands associated with the proposed Clover Butte Alternative. The 12,000-acre training range, the 640-acre no-drop target site, the 5-acre no-drop target areas, the emitter sites, the powerlines, and all roads slated for construction or use are located in areas outside of special land designations; therefore, no impacts on special use areas are anticipated as a result of the location of the Clover Butte Alternative.

#### *Airspace Modification*

Special use areas underlying the proposed and existing airspace associated with the Clover Butte Alternative are discussed in section 3.10.3. These areas include WSAs, Wild and Scenic Rivers, ACECs, SRMAs, Herd Management Areas (HMAs), the Snake River Birds of Prey NCA, and the Idaho Centennial Trail. This section analyzes impacts on some of these areas. For a discussion of impacts on bighorn sheep habitat, refer to section 4.8, Biological Resources, and for a discussion of impacts on the Idaho Centennial Trail and other recreational uses, refer to section 4.11, Recreation and Visual Resources.

#### *Wilderness Study Areas*

WSAs are designated based on their outstanding qualities, including naturalness, size, solitude, and other special features, and are managed under the BLM's Interim Management Policy (IMP) for Lands under Wilderness Review (BLM 1995b). Specific policy guidance is provided in this manual to assist in the administration of WSAs. This includes a discussion of

"nonimpairment," or evaluation of proposed activities to assure that they do not negatively affect the lands' suitability for designation as Wilderness. The manual provides a further delineation of specific activities by resource. These include recreation, cultural resources, lands actions (disposals, rights-of-way, etc.), forestry, wildlife, fire management, watershed management, rangeland management, and mineral uses. These sections were reviewed to determine how the proposed action might affect management under the IMP.

In evaluating potential indirect impacts from aircraft overflights and training on WSAs underlying the airspace modifications area, the following three factors were considered:

- The extent to which these activities may affect the attributes that render an area suitable for preservation as Wilderness;
- Relationship to land management practices, including the application of the IMP, and whether the impacts would conflict with management policies; and
- Constraint on congressional decision regarding Wilderness Area designation.

Concern has been expressed that increased military activity over the WSAs would diminish the wilderness qualities of these areas. The attributes evaluated to determine these qualities include naturalness, special features, and opportunities for solitude or primitive and unconfined recreation. The types of activities considered to affect naturalness are physical intrusions within the WSA, such as fences, wells, or mine scars and increased noise.

As discussed under Ground Disturbance, no activities would be expected to disturb or alter the features or physical resources of the WSAs. In the airspace overlying portions of the Little Jacks Creek and Big Jacks Creek WSAs, increased noise could affect opportunities for solitude and primitive recreation. Average noise levels are generally expected to decrease or remain unchanged over all other WSAs. Table 4.10-3 compares the predicted changes in average noise levels (as calculated in section 4.2, Noise) in four representative WSAs located throughout ROI Three.

**Table 4.10-3. Comparison of Average Predicted Noise Levels at Representative WSAs by Alternative**

| *WSA* | *Point in Noise Analysis*[1] | *Baseline/ No-Action* | *Clover Butte* | *Grasmere* | *Juniper Butte* |
|---|---|---|---|---|---|
| Owyhee River Canyon | O | 59 | 54 | 53 | 50 |
| Jarbidge River | C | 69 | 59 | 56 | 56 |
| Little Jacks | M | 46 | 53 | 51 | 52 |
| North Fork of the Owyhee River | L | 55 | 52 | 50 | 50 |

Note: 1. These points correspond with those depicted in Figure 3.2-1 and described in section 3.2.2.1.

Although most of the WSAs in ROI Three were defined underneath existing MOA airspace, portions of the Little Jacks Creek and Big Jacks Creek WSAs lie under proposed MOA airspace (Figure 4.10-1). All of these WSAs have been exposed to aircraft overflights for many years, including the periods before and during their designation (refer to section 4.10.2.1 for a full description). It is estimated that an average of more than 7,000 sorties used the airspace over some of these WSAs from 1972 through 1986.

The environmental documentation prepared by the BLM supporting WSA recommendations indicates that military overflights are not a reason to consider the areas inappropriate for future Wilderness Area designation. The Final EIS for the Jarbidge and Bruneau River-Sheep Creek WSAs (BLM 1987e) recognized that frequent low-level military overflights formed part of the existing conditions in these areas. However, the effects of these overflights were not considered sufficient to preclude recommending the areas for Wilderness status. The Final EIS for the Owyhee Canyonlands Wilderness (BLM 1989d), which considers multiple WSAs under the MOAs, indicates that low-level military overflights would not preclude designation of the WSAs as Wilderness. The Final EIS for Oregon Wilderness (BLM 1989c) states that the influence of these low-level military flights "on a visitor's perception of solitude is quite temporary, but extreme for a short period of time (one minute or less). These flights do not have a significant, long-lasting, adverse effect on a visitor's opportunity to find solitude." With this precedent, it is unlikely that the airspace modification overlying portions of the Little Jacks Creek and Big Jacks Creek WSAs would affect the BLM management of these lands.

With respect to management policies for WSAs, Alternative B appears to meet the nonimpairment criteria of the IMP, which require that impacts be temporary, reclaimable, and not constrain the Secretary of the Interior's recommendations and, ultimately, Congress' decision on Wilderness designation. The noise levels and associated aircraft overflights effects are temporary and reversible by nature, leaving no permanent evidence of human use. Therefore, the proposed action should not conflict with nonimpairment management policies.

The ultimate disposition of WSAs in the ROI will be decided by Congress. It is not possible to predict congressional actions. Factors likely to influence Congress' decisions include the report and suitability recommendations by the BLM provided in the 1991 Idaho Wilderness Study Report (BLM 1991b), as well as current and projected military activities. Concern has been expressed that Congress's decision on designation would be influenced by the sizable investment made to construct the range. However, the decisionmaking process would also consider the effect of military use of the airspace even without development of the range.

Congress may conclude that, due to their transitory nature, the overflights would not impair the natural and solitude qualities associated with Wilderness designation. Congress may also choose to specifically provide that Wilderness designation not preclude low-level overflights of military aircraft, as it did when it passed the Nevada Wilderness Protection Act of 1989 (section 11; Public Law 101-195). In summary, Congress has not made a decision that can be applied to predict the outcome in this case.

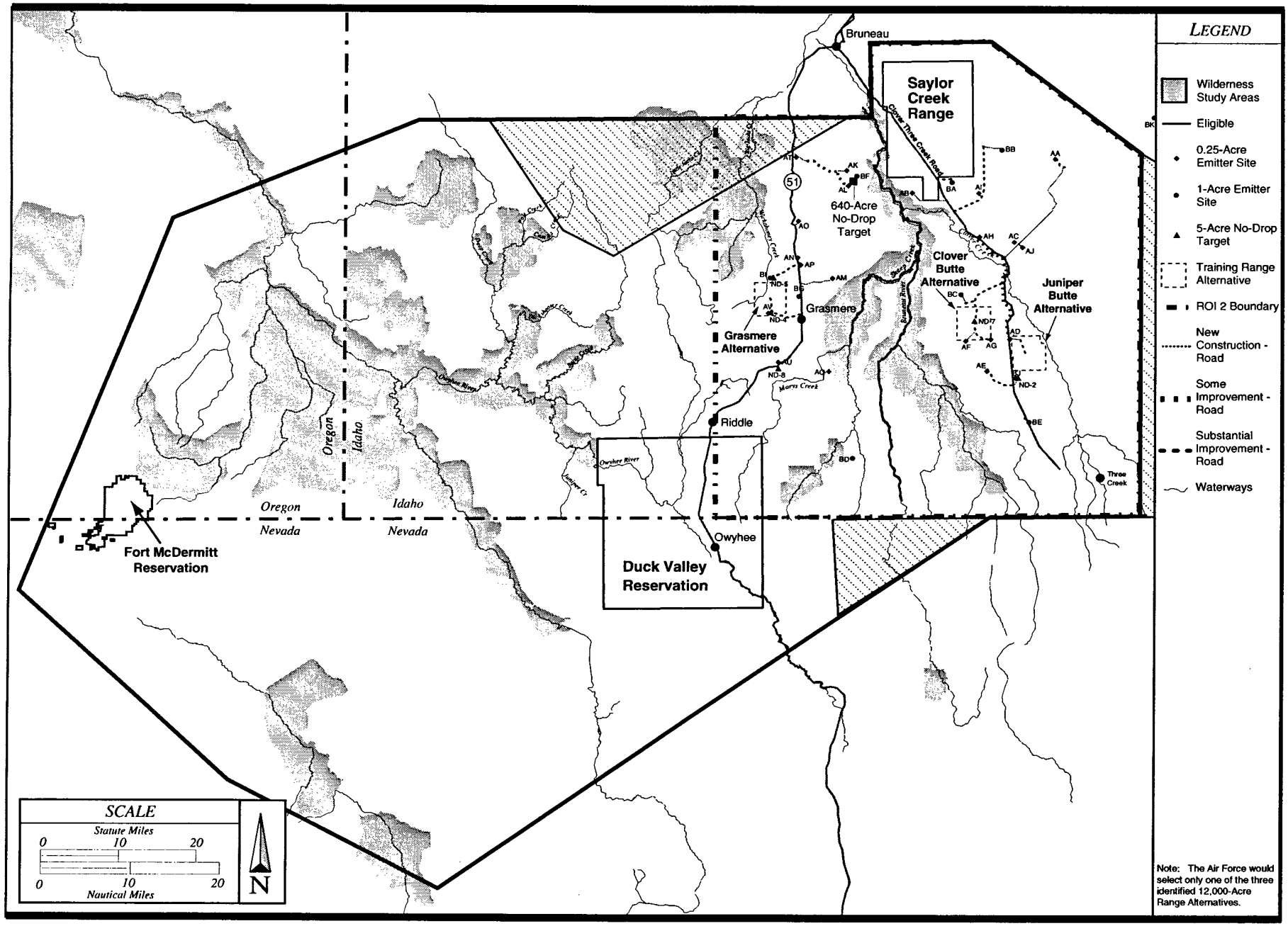



**Figure 4.10-1 Wilderness Study Areas and Wild and Scenic Rivers in Relation to Alternative Components**

*Wild and Scenic Rivers*

Although there are no wild and scenic rivers underlying the proposed Clover Butte airspace modifications, the BLM is studying several river segments underneath the existing airspace for this designation (refer to Figure 4.10-1). Concern has been expressed that a river's eligibility for potential Wild and Scenic River status may be affected by the attributes of Alternative B. A river's eligibility is based on its outstandingly remarkable values in at least one of the following areas: scenery, geology, recreation, fish, and wildlife. To address this concern, each of these elements is addressed below.

Scenic quality would continue to be affected by the visual intrusions of aircraft overflights of canyons, although these overflights are very short in duration. Components of the training range, no-drop targets, and emitter sites would not be visible from the canyon areas and would be constructed far away from the canyons where they would not be anticipated to affect the geological values of the canyons.

In regard to biological values, these rivers are known for their wildlife such as bighorn sheep, raptors, redband trout, and bats, as well as providing riparian habitat and crucial mule deer winter range. The potential impacts from the training range are not likely to reduce the quality of biological resources since construction activities and use of the components would not affect the diverse and multiple habitats directly associated with these rivers. For additional discussion on potential impacts to wildlife and habitat, refer to section 4.8, Biological Resources.

Since noise levels are generally expected to decrease, the outstandingly remarkable recreation value of these rivers should not be impaired. For additional discussion on potential impacts to recreation, see section 4.11, Recreation and Visual Resources.

*Other Special Land Uses*

No other special land uses are located underneath the proposed airspace modifications for Clover Butte; however, special land uses under the existing MOA airspace include the ACECs, SRMAs, HMAs, and NCA discussed in section 3.10.3. These areas were so designated to address management considerations to preserve and enhance characteristics unique to these areas. In the case of ACECs, these characteristics include cultural or scenic values, fish and wildlife, or other natural systems. SRMAs, on the other hand, were established to address the management of recreational resources, and HMAs were established to maintain populations of wild horse herds.

None of the special use areas in ROI Three would be exposed to ground disturbance as a result of Alternative B, although they would continue to experience overflight activity. Although this may affect resources (biological and recreation) within these areas to varying degrees, the focused management attention provided by the BLM should continue unchanged. The direct resource effects are not considered sufficiently adverse to preclude continued management of those areas as special use areas under existing BLM management policies.

### 4.10.2.4 ROADS

The proposed Clover Butte Alternative site is located approximately 2 miles from Clover-Three Creek Road, one of the more accessible roads in the ROI. Emitter sites and no-drop target areas associated with Alternative B are located along each side of Highway 51 and Clover-Three Creek Road, as depicted on Figure 2.3-1.

As detailed in section 2.3.2.4, two types of roads (light duty and medium duty) would be necessary for the actions associated with Alternative B. Light duty roads, which would service the one-quarter-acre emitter sites, would be used by one or two small pickup trucks with trailers each training day, approximately 50 to 260 days per year. Medium duty roads, which would serve the training range, no-drop target areas, and one-acre emitter sites, would be used by heavy duty trucks and construction equipment. Once the areas are constructed, use levels on these roads would range from zero vehicles per week for some emitter sites, to as many as 32 trips for a five-day period during cleanup and maintenance activities at the 12,000-acre training range. Roads to emitter sites would receive intermittent use during training exercises, during which a maximum of eight emitters would be used daily. (For 12 days of the year approximately 15 emitter sites would be used.) Roads to the training range would be used more frequently.

The following road improvements are anticipated to accommodate this alternative; they are depicted on Figure 2.3-1:

- Substantial improvements on 6 miles of existing roads for light duty use and on 28 miles of existing roads for medium duty use.
- Some improvements on 25 miles of existing roads for medium duty use.
- New construction of 8 miles of light duty roads and 11 miles of medium duty roads.

The Air Force would also reconstruct the existing bridge at Clover Crossing to accommodate heavier equipment use during construction. It would also support routine vehicular traffic associated with the range and emitter sites.

Construction of the roads, target areas, fencing, emitter sites, and powerline described in section 2.3.2.4, would be phased over a period of four years. This extended period of construction activity would reduce the likelihood of congestion or significant delay due to presence of construction vehicles. However, some delays may still be experienced. Heavy equipment would only be necessary during the construction period. New vehicular use on the range would be limited to movement of personnel associated with range operations in passenger trucks, trailers, vans, or cars.

Proposed modifications to the roadway network would have a slight beneficial effect on the transportation facilities in the region. They would enhance the quality of travel within ROI Two without appreciably increasing access to remote areas. Public access inside the training

range would be prohibited, but access to surrounding areas would remain unimpaired. Currently, no substantial roads traverse the proposed range. The road crossing the 640-acre no-drop area would remain open to the public, but it would be fenced on either side to enclose the military facility.

Within ROI Two, increases in use levels associated with military activity would be minor. Personnel associated with this proposal would be fewer than 12 individuals. These individuals would not reside on the range but would drive from Mountain Home AFB. The small number of trips associated with this activity would not cause delays or degrade road conditions. However, during range clean-up and other maintenance activities, as many as 32 trips for a five-day period could occur. During this period, some travelers may experience slight delays on the minor roads. Vehicular flow on State Highway 51 and Clover-Three Creek Road should not be affected.

Road use during periods of snow or extreme precipitation would be limited, so deterioration of the roads would be negligible. Maintenance of roads associated with this alternative would be coordinated with the Air Force, Owyhee County, BLM, and the Three Creek Good Roads District.

## 4.10.3 Alternative C —Grasmere

### 4.10.3.1 Land Status and Land Use Patterns

The Grasmere Alternative would include a 12,000-acre training range, five no-drop target areas, and 30 emitter sites. All of the sites for facilities under this alternative are currently located on state or public (BLM) land as discussed in section 3.10.1.3. Airspace would be modified as described in section 2.3.3.1.

Land ownership status would be altered as described for Alternative B, in section 4.10.2.1. The no-drop target areas and emitter sites that are not included in the withdrawal application would not change ownership. Rather, DoD would enter into appropriate agreements with the current land manager as described for Alternative B in section 4.10.2.1. Table 4.10-1 shows the changes in land ownership for each alternative.

Establishment of the Grasmere training range and associated no-drop and emitter sites would have a minimal impact on current land use patterns. These impacts are the same as those for Alternative B, discussed in section 4.10.2.1. The proposed airspace modification should not affect current land status or use patterns. Lands underlying the proposed MOA reconfiguration are already exposed to some military and civil overflight activity. As described in section 3.1, military training activity consistent with the Owyhee and Jarbidge MOAs would extend over the Jacks Creek area. Similarly, the expanded airspace of the Paradise East MOA is currently underlain by segments of two MTRs that already support military training activity. These airspace changes and associated military training activities are not expected to precipitate changes in current land use patterns or ownership, since lands underlying the existing MOA

have historically experienced this activity without resulting in changes to the regional land use pattern.

Within the proposed Grasmere Alternative, approximately 2,406.5 acres are state endowment lands. Use of these lands would be permitted through a lease agreement with the State of Idaho, Department of Lands.

### 4.10.3.2 Special Use Areas

#### *Ground Disturbance*

No special use areas are located on the lands associated with the proposed Grasmere Alternative. The 12,000-acre training range, the 640-acre no-drop target site, the 5-acre no-drop target areas, the emitter sites, and all roads slated for construction or use are located in areas outside of special land designations; therefore, no impacts on special use areas are anticipated as a result of the Grasmere Alternative.

#### *Airspace Modifications*

Special use areas underlying the proposed and existing airspace associated with the Grasmere Alternative are discussed in section 3.10.3 (refer to Figure 4.10-1). These areas include WSAs, Wild and Scenic Rivers, ACECs, SRMAs, HMAs, the Snake River Birds of Prey NCA, and the Idaho Centennial Trail. For a discussion of impacts on bighorn sheep habitat, refer to section 4.8, Biological Resources, and for a discussion of impacts on the Idaho Centennial Trail and other recreational uses, see section 4.11, Recreation and Visual Resources.

Since the activities and their consequences for the Grasmere Alternative on WSAs would match those discussed for Alternative B in section 4.10.2.3, the impacts are expected to be the same. As shown in Table 4.10-3, noise levels at representative points in WSAs underlying the airspace are expected to decrease as a result of the proposed Grasmere training range except within the proposed range support MOA expansion. Impacts on wild and scenic rivers and other special land uses as a result of the Grasmere Alternative are expected to be the same as those discussed for Alternative B in section 4.10.2.3.

### 4.10.3.4 Roads

The Grasmere Alternative site is located about 2 miles from Highway 51, one of the more accessible roads in the ROI. Emitter sites and no-drop target areas associated with Alternative C are located along each side of Highway 51 and Clover-Three Creek Road, as depicted on Figure 2.3-1.

The types of road improvements anticipated for Alternative C would be the same as those discussed for Alternative B in section 4.10.2.4.

The following road improvements are anticipated to accommodate this alternative; they are depicted on Figure 2.3-1:

- Substantial improvements on 6 miles of existing roads for light duty use and on 30 miles of existing roads for medium duty use.
- Some improvements on 25 miles of existing roads for medium duty use.
- New construction of 8 miles of light duty roads and 11 miles of medium duty roads.

The Air Force would also reconstruct the existing bridge at Clover Crossing to accommodate heavier equipment use for construction of the emitter sites and transport of the larger emitter trailers.

Construction activities anticipated for Alternative C are the same as those discussed for Alternative B in section 4.10.2.4.

Proposed modifications to the roadway network would have a slight beneficial effect on the transportation facilities in the region. They would enhance the quality of travel within ROI Two without appreciably increasing access to remote areas. Public access inside the training range, including access to an existing north-south route through the site, would be prohibited, but access to surrounding areas would remain unimpaired. Alternative access is available to the Wickahoney and other sites. The road crossing the 640-acre no-drop target area would remain open to the public, but it would be fenced on either side to enclose the military facility.

Use levels within ROI Two associated with military activity would be the same as those discussed for Alternative B in section 4.10.2.4. Road use during periods of snow or extreme precipitation would be limited so deterioration of the roads would be negligible. Maintenance of roads associated with this alternative would be coordinated with the Air Force, Owyhee County, BLM, and the Three Creek Good Roads District.

### 4.10.4 Alternative D — Juniper Butte

The Juniper Butte Alternative would include a 12,000-acre training range, five no-drop target areas, and 30 emitter sites. All of the proposed sites are currently located on state or BLM land as discussed in section 3.10.1.3. Airspace would be modified as described in section 2.3.3.1.

Land ownership status would be altered as described for Alternative B, in section 4.10.2.1. The no-drop target areas and emitter sites that are not included in the withdrawal application would not change ownership. Rather, DoD would enter into appropriate agreements with the current land manager as described for Alternative B in section 4.10.2.1. Table 4.10-1 shows the changes in land ownership for each alternative.

Establishment of the Juniper Butte training range and associated no-drop and emitter sites would have a minimal impact on current land use patterns. These impacts are the same as

those for Alternative B, discussed in section 4.10.2.1. The proposed airspace modification should not affect current land status or use patterns. Lands underlying the proposed MOA reconfiguration are already exposed to some military and civil overflight activity. As described in section 3.1, military training activity consistent with the Owyhee and Jarbidge MOAs would extend over the Jacks Creek area. Similarly, the expanded airspace of the Paradise East MOA is currently underlain by segments of two MTRs that already support military training activity. These airspace changes and associated military training activities are not expected to precipitate changes in current land use patterns or ownership, since lands underlying the existing MOA have historically experienced this activity without resulting in changes to the regional land use pattern.

### 4.10.4.1 Land Status and Land Use Patterns

The Juniper Butte Alternative would include a 12,000-acre training range, five no-drop target areas, and 30 emitter sites. All of the sites for facilities under this alternative are currently located on state or public (BLM) land as discussed in section 3.10.1.3. Airspace would be modified as described in section 2.3.3.1.

Land ownership status would be altered as described for Alternative B, in section 4.10.2.1. The no-drop target areas and emitter sites that are not included in the withdrawal application would not change ownership. Rather, DoD would enter into appropriate agreements with the current land manager as described for Alternative B in section 4.10.2.1. Table 4.10-1 shows the changes in land ownership for each alternative.

Establishment of the Juniper Butte training range and associated no-drop and emitter sites would have a minimal impact on current land use patterns. These impacts are the same as those for Alternative B, discussed in section 4.10.2.1. The proposed airspace modification should not affect current land use patterns. Lands underlying the proposed MOA reconfiguration are already exposed to some military and civil overflight activity. As described in section 3.1, military training activity consistent with the Owyhee and Jarbidge MOAs would extend over the Jacks Creek area. Similarly, the expanded airspace of the Paradise East MOA is currently underlain by segments of two MTRs that already support military training activity. These airspace changes and associated military training activities are not expected to precipitate changes in current land use patterns, since lands underlying the existing MOA have historically experienced this activity without resulting in changes to the regional land use pattern.

Within the proposed Juniper Butte Alternative, approximately 960 acres are state school endowment lands. Use of these lands would be permitted through a lease agreement with the State of Idaho, Department of Lands.

### 4.10.4.2 Land Management Plans

Impacts to land management plans would be the same as described for Alternative B.

### 4.10.4.3 Special Use Areas

*Ground Disturbance*

No special use areas are located on the lands associated with the proposed Juniper Butte Alternative. The 12,000-acre training range, the 640-acre no-drop target site, the 5-acre no-drop target areas, the emitter sites, and all roads slated for construction or use are located in areas outside of special land designations; therefore, no impacts on special use areas are anticipated as a result of the Juniper Butte Alternative.

*Airspace Modifications*

Special use areas underlying the proposed and existing airspace associated with the Juniper Butte Alternative are discussed in section 3.10.3 (Figure 4.10-1). These areas include WSAs, Wild and Scenic Rivers, ACECs, SRMAs, HMAs, the Snake River Birds of Prey NCA, and the Idaho Centennial Trail. For a discussion of impacts on bighorn sheep habitat, refer to section 4.8, Biological Resources, and for a discussion of impacts on the Idaho Centennial Trail and other recreational uses, see section 4.11, Recreation and Visual Resources.

Since the activities and their consequences for the Juniper Butte Alternative on WSAs would match those discussed for Alternative B in section 4.10.2.3, the impacts are expected to be the same. As shown in Table 4.10-3, noise levels at representative points in WSAs underlying the airspace are expected to decrease as a result of the proposed Juniper Butte training range except within the proposed range support MOA expansion. Impacts on wild and scenic rivers and other special land uses as a result of the Juniper Butte Alternative are expected to be the same as those discussed for Alternative B in section 4.10.2.3. The eastern addition of airspace to the Twin Falls County line does not encompass any special use areas and would, therefore, not impact any of these areas.

### 4.10.4.4 Roads

The Juniper Butte Alternative site is located on Clover-Three Creek Road, one of the more accessible roads in the ROI. Emitter sites and no-drop target areas associated with Alternative D are located along each side of Highway 51 and Clover-Three Creek Road, as depicted on Figure 2.3-1.

The types of road improvements anticipated for Alternative D would be the same as those discussed for Alternative B in section 4.10.2.4.

The following road improvements are anticipated to accommodate this alternative; they are depicted on Figure 2.3-1:

- Substantial improvements on 10 miles of existing roads for light duty use and on 27 miles of existing roads for medium duty use.

- Some improvements on 25 miles of existing roads for medium duty use.
- New construction of 8 miles of light duty roads and 5 miles of medium duty roads.

The Air Force would also reconstruct the existing bridge at Clover Crossing to accommodate heavier equipment use during construction. It will also support routine vehicular traffic associated with the range and emitter sites.

Construction activities anticipated for Alternative D are the same as those discussed for Alternative B in section 4.10.2.4.

Proposed modifications to the roadway network would have a slight beneficial effect on the transportation facilities in the region. They would enhance the quality of travel within ROI Two without appreciably increasing access to remote areas. Public access inside the training range would be prohibited, but access to surrounding areas would remain unimpaired. Currently, a road traverses the Juniper Butte site that would not be accessible to the public should the range be developed. Access is available, however, by alternative routes. The primitive road along the East Fork of the Bruneau River (along the northeast corner of the proposed range site) would be reconstructed to lie outside the range's perimeter, and thus be accessible to the public. The road crossing the 640-acre no-drop target area would remain open to the public, but it would be fenced on either side to enclose the military facility.

Use levels within ROI Two associated with military activity would be the same as those discussed for Alternative B in section 4.10.2.4.

Road use during periods of snow or extreme precipitation would be limited so deterioration of the roads would be negligible. Maintenance of roads associated with this alternative would be coordinated with the Air Force, Owyhee County, BLM, and the Three Creek Good Roads District.

### 4.10.5 Shoshone-Paiute Concerns About Land Use

Members of the Shoshone-Paiute Tribes of the Duck Valley Reservation continue to use their historic territory surrounding the Reservation and within ROI Three for a variety of traditional subsistence and religious activities. These lands are managed for the most part by the BLM. None of the alternatives would have any effect on access by members of the Tribes to locations within ROI Three.

The Shoshone and Paiute Tribes continue to claim lands in southwestern Idaho that fall outside the Duck Valley Reservation. These claims are based on the Treaty of Ruby Valley (1863), the Boise River Treaty (1864), and the Bruneau Treaty (1866) (see section 3.9.1). The resolution of land claims is beyond the control of the Air Force and is not addressed in this EIS.

### 4.10.6 Cumulative Impacts

All aspects of the proposal, including potential effects of ground disturbance, increased human presence, and military aircraft overflight were analyzed. Only minor impacts to land use and transportation are anticipated as a result of the ETI proposal. In addition, the foreseeable future actions would be consistent with current activities within the area and would not precipitate changes in land use patterns, ownership, or management practices.

Construction and personnel changes associated with some of the activities may cause some incidental effects on the road network in ROI Two. However, they would not be anticipated to result in more than an occasional delay.

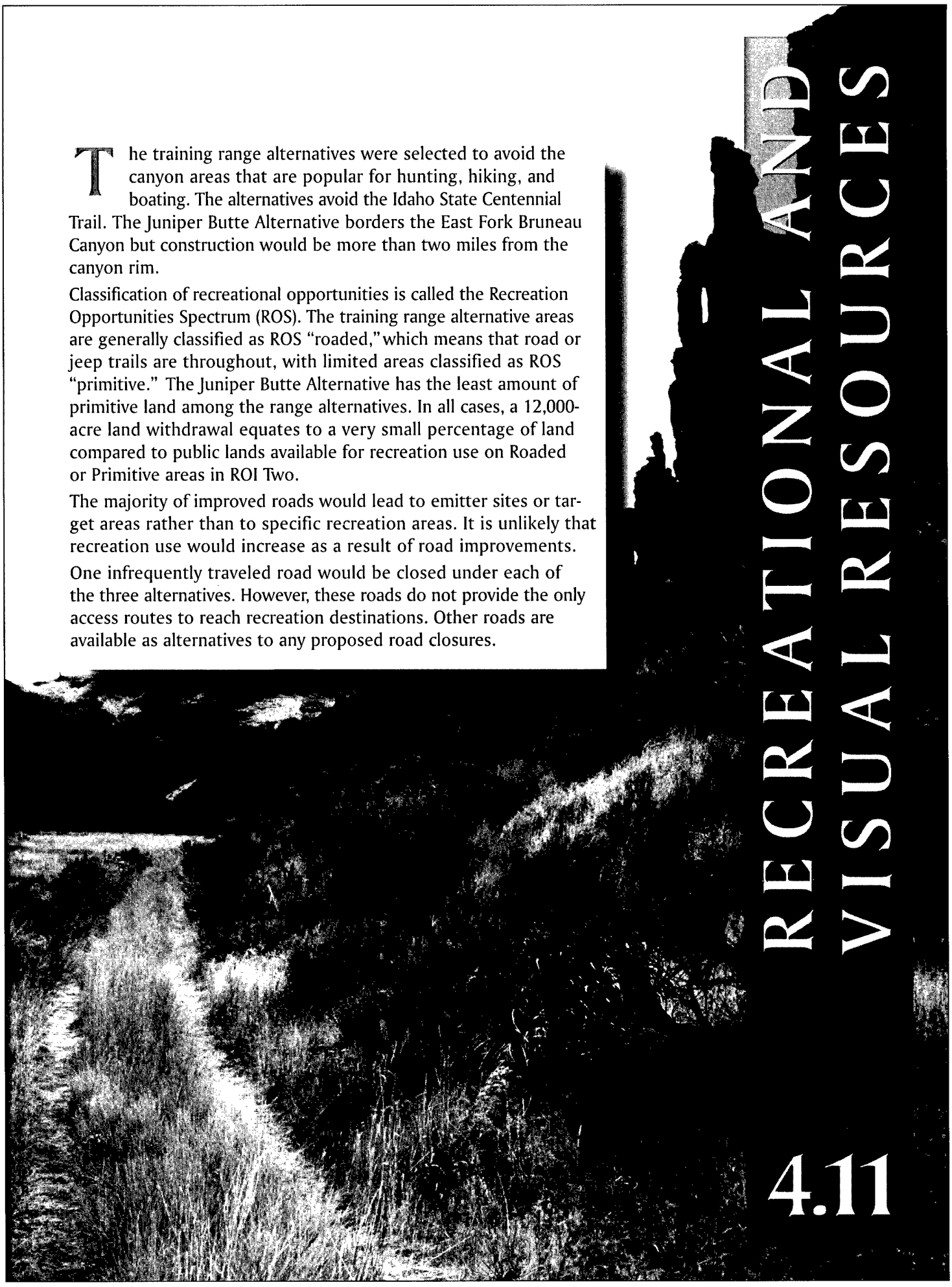
# 4.11 RECREATIONAL AND VISUAL RESOURCES

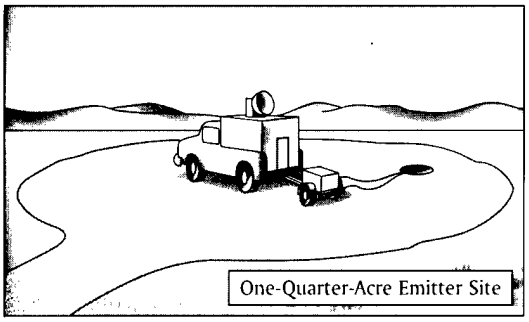
The training range alternatives were selected to avoid the canyon areas that are popular for hunting, hiking, and boating. The alternatives avoid the Idaho State Centennial Trail. The Juniper Butte Alternative borders the East Fork Bruneau Canyon but construction would be more than two miles from the canyon rim.

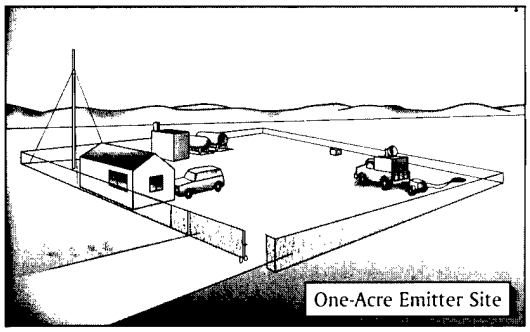
Classification of recreational opportunities is called the Recreation Opportunities Spectrum (ROS). The training range alternative areas are generally classified as ROS "roaded," which means that road or jeep trails are throughout, with limited areas classified as ROS "primitive." The Juniper Butte Alternative has the least amount of primitive land among the range alternatives. In all cases, a 12,000-acre land withdrawal equates to a very small percentage of land compared to public lands available for recreation use on Roaded or Primitive areas in ROI Two.

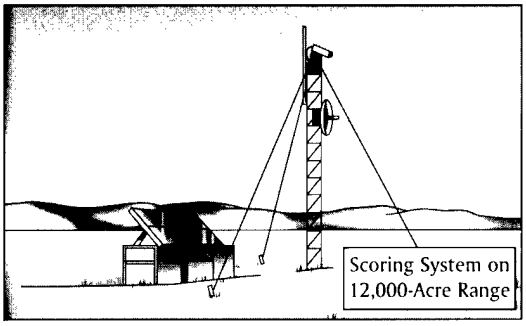
The majority of improved roads would lead to emitter sites or target areas rather than to specific recreation areas. It is unlikely that recreation use would increase as a result of road improvements.

One infrequently traveled road would be closed under each of the three alternatives. However, these roads do not provide the only access routes to reach recreation destinations. Other roads are available as alternatives to any proposed road closures.




One-Quarter-Acre Emitter Site


One-Acre Emitter Site


Scoring System on 12,000-Acre Range

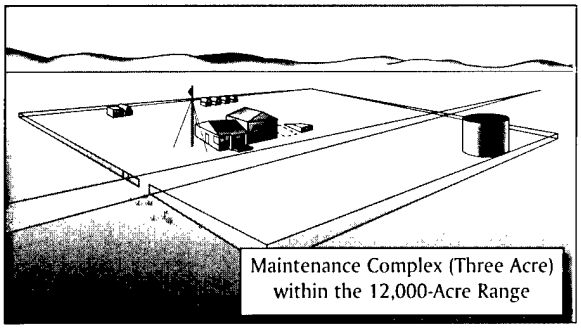
Visual Resources within the study area are characterized by broad rolling upland plains cut by numerous drainages and deep canyons.

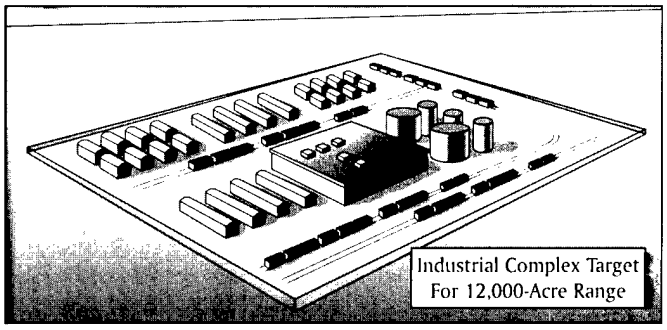
The BLM classifies visual areas using a Class I through Class IV Visual Resource Management (VRM) system. The objective of this classification is to document and, whenever possible, protect scenic values. For example, the major river systems in ROI Three are managed as Class I, the highest visual area that is managed to protect the resources. The sagebrush and grassland areas are managed as visual Class III and IV, which allow changes to visual areas.

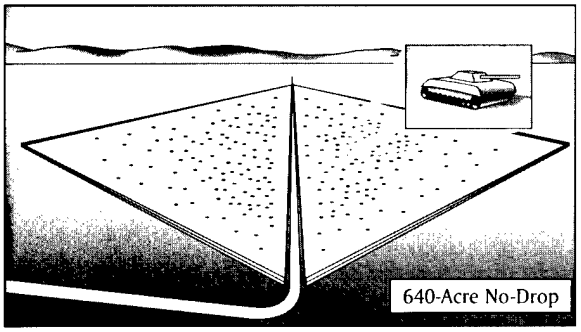
The alternatives are not expected to have a significant impact to visual resources. All range alternatives are located within VRM Classes III and IV and would be developed to meet VRM objectives. No alternative range structure would be visible from any canyon areas or from the Bruneau Scenic Overlook. Most range facilities would be in the visual middle ground or background where structures would not dominate the view.

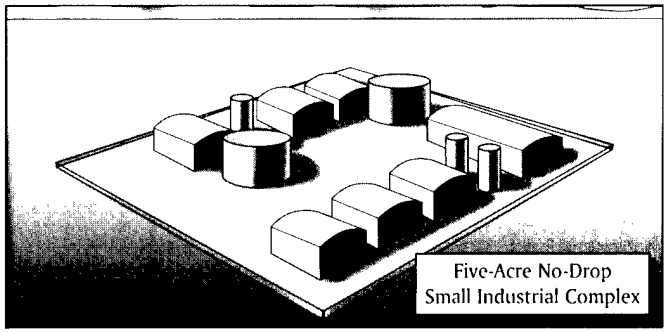
Agricultural style buildings, similar to those used by rural ranching operations, would be used. All buildings would be painted "desert beige" to blend into the surrounding area and prevent reflection.

Clover Butte, Grasmere, and Juniper Butte would generate similar insignificant impacts to recreational and visual resources. The land withdrawal would remove approximately 12,000 acres that currently provide few recreation opportunities and uses compared to other areas in the region. Both recreational and visual resources will be affected on a limited basis by the range alternatives; however, these impacts are not expected to be significant.


Maintenance Complex (Three Acre) within the 12,000-Acre Range


Industrial Complex Target For 12,000-Acre Range


640-Acre No-Drop


Five-Acre No-Drop Small Industrial Complex

# 4.11 RECREATION AND VISUAL

Eastern Owyhee County attracts visitors drawn to its natural beauty, solitude, and freedom from the structure and regulations of urban areas. Recreation and visual issues and concerns associated with the alternatives stem from the preservation of these attributes. Specifically, issues and concerns arising from proposed implementation are as follows:

- Change in recreation use due to either increased access through improved roads or decreased access through road closures or other limitations placed on groups due to military activity.
- Potential loss of primitive recreational land due to the proposed target areas.
- Potential loss of solitude and serenity often sought in primitive and wilderness settings.
- Potential loss of wilderness characteristics.
- Potential degradation of the visual qualities of the landscape as a result of target and emitter site construction.
- Potential alteration of visual settings in the airspace as a result of the proposed increase in flight activity.

## Methodology for Impact Analysis

The methodology for determining impacts on recreation resources focuses on (1) determining the existing users and use levels, (2) determining the noise and visual impacts on recreational use due to an increase in sorties (refer to Table 4.0-1), (3) identifying reduced or lost recreational opportunities and access due to the proposed target area, (4) determining an increase in recreation use due to an upgrade in access roads, and (5) identifying a change in the ROS.

The methodology to determine impacts to visual resources involved review of VRM guidelines used in the ROIs. VRM is used by the BLM to identify the existing visual character of the landscape and define the allowable extent and type of development or modification which should be permitted in a given landscape. The VRM system is an expression of scenic quality, sensitivity, and remoteness (viewing distance from travel corridors) range from the most sensitive (VRM Class I) to the least sensitive (VRM Class IV). By defining the VRM in the ROI, impacts from the proposed action to the visual resources area can be determined. Mitigation measures, if an impact is determined, would be derived from those provided in the BLM Visual Resource Contrast Rating Handbook.

The viewpoint analysis also provides a line-of-sight or visibility analysis of range target components. Viewpoints in which the proposed range components may be visible were

identified through review of recreation resources in the area and agency contact. A total of 18 viewpoints, located along public access roads and scenic viewpoints that receive the highest visitor use of the area, were selected by the BLM and modeled for this analysis. These points represent a typical vista and a variety of viewing conditions in the area. These viewpoints were entered into a GIS database to determine the proposed range structure visibility. Using topographic data, distance zones, and height of range structure, the GIS model determined if a range structure could be seen from a particular viewpoint and, if so, how many of the structures could be seen. Distance zones were established based upon visual perception thresholds for perceiving change in form, line, texture, and color. With an increasing distance from a viewpoint, landscape elements tend to become less obvious and detailed. The elements of form and line become more dominant than color or texture at greater viewing distances. Distance thresholds were defined for this analysis as follows:

- Foreground (0 to 0.5 mile) – Object readily seen. All visual perception elements identifiable.
- Middleground (0.5 to 5 miles) – Object visible; however, perception of color and texture decrease with distance. Vegetative patterns begin to appear as outlines or patterns.
- Background (5 to 15 miles) – Object shape visible. Color and texture of object not perceptible or weak; the overall landform becomes the most dominant element.

At greater than 15 miles, objects are seldom seen and easily hidden by topography, vegetation, or atmospheric haze.

## Background

In reviewing the scoping comments received from the public on this proposal, the majority of comments relating to recreation focused on the noise impact of a proposed training range. However, limited data and research exists specifically on impacts of military aircraft overflights on recreation visitors.

In 1987, Congress in Public Law 100-91 directed the USFS and NPS to conduct studies of aircraft overflights that might be impacting visitors of the National Forest System wilderness and National Parks and reported the results to Congress. The *Potential Impacts of Aircraft Overflights of National Forest System Wildernesses* (USFS 1992) is the only large-scale study in which a concerted effort has been made to apply quantitative methods to the problems of measuring outdoor recreationists' reactions to aircraft noise exposure in wildernesses. The major emphasis of this study was to determine the effects of aircraft overflights on visitor enjoyment. Wilderness visitors were interviewed during and shortly after their wilderness visits to assess the actual impact from exposure to aircraft overflights while using wilderness areas. This was done rather than assessing the general public's opinion about the philosophical

question of whether aircraft overflights are compatible with the wilderness experience. Their results provide the background in reviewing noise on recreation visitors.

Some key findings of the study established the following:

- Aircraft noise intrusions did not appreciably impair surveyed wilderness users' overall enjoyment of their visits to Wilderness Areas or reduce their reported likelihood of repeat visits.

- The majority of users interviewed were not annoyed by overflights. Visitors, in general, did not notice aircraft even when they were present; this is especially true for high-altitude aircraft. However, low-altitude, high-speed aircraft were reported as the most annoying type of aircraft to hear or see. This was attributed to the "startle effect." The startle effect occurs when a very loud noise (e.g., low-altitude jet aircraft) is experienced in a setting where it is not expected (e.g., a wilderness area), and when there is no visual or audible warning of the noise source.[1]

- Annoyance associated with overflights was more strongly related to noise exposure than to the visibility of aircraft or their condensation trail. Aircraft were rarely noticed unless accompanied by noise.

Different settings were used for the study to account for the many different landscapes compromising wilderness areas. For example, the setting for the USFS study included the Superstition Wilderness, which is characterized by desert with no vegetative canopy. Respondents were also exposed to a number of different types of aircraft. For example, respondents interviewed in the Golden Trout Wilderness were susceptible to overflights by aircraft flying day and night at very low altitudes producing SEL values well in excess of 100 dB.

Although the frequency or numbers of overflights by low-altitude, high-speed aircraft was low, a greater number of respondents reported that they did not notice any aircraft at all during their wilderness visits than reported noticing any particular type of aircraft. In the USFS study, the aircraft noticed most often were high-altitude jet aircraft. Comparably small percentages of respondents (about 10 to 13 percent) reported noticing both helicopters and low-flying jets during their wilderness visits (cf. Tables 7 and 8, pages 2-16 and 2-17, USFS 1992). Thus, to the extent that noticing an aircraft overflight may be considered an interference with the enjoyment of solitude, low-altitude, high-speed jets were not the most frequent source of this form of interference with outdoor recreation in the USFS study.

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[1] The startle effect often occurs in canyon regions where a low-flying jet may not be heard until it suddenly appears directly overhead. In primitive wilderness areas, where visitors experience quiet periods, the startle effect can decrease the wilderness experience by disturbing the tranquillity and solitude of the outdoor setting. On open plateaus, where vegetation is low and visibility is unimpaired, the visual effects of low-flying aircraft may also impair the sense of solitude and naturalness for individuals seeking a primitive recreation experience. However, the intrusions from overflights are transitory and the overall opportunity for a visitor to find solitude can still be found.

Among the 10 to 13 percent of respondents who did notice low-flying jets or helicopters, the greater annoyance associated with low-flying jets was almost certainly attributable to the higher noise exposure levels that they create.

This study, however, is only one element of this analysis. While it forms the basis for analyzing noise impacts on wilderness users, other factors such as management, access, and recreation activities and opportunities must also be taken into account to address all concerns.

## 4.11.1 Alternative A — No-Action

### 4.11.1.1 Recreation Use and Opportunities

Under the No-Action Alternative, the conditions at SCR would remain the same. No range construction would occur. Recreation opportunities would remain the same as currently available. Access and road conditions would also remain the same. Under this alternative, the noise level would increase over particular areas. This analysis is discussed in section 4.2, Noise. There would be no change in recreation use and no changed impact to recreation opportunities or use associated with this alternative.

### 4.11.1.2 Visual Resources

With no range construction, the viewshed within the region would remain the same. Aircraft operations would continue as before over this area. With no change in the viewshed, no changed impact to visual resources is expected from this alternative.

## 4.11.2 Alternative B — Clover Butte

As discussed in section 3.11, the recreation and viewpoint analysis has two ROIs because of the direct and indirect effects from the proposed action. The smaller ROI Two is used for detailed analysis, because a change in access to a recreation area due to construction of support facilities for the range could affect recreation activities and visual resources directly. The large ROI Three consists of the land area under military airspace. ROI Three accounts for aircraft activity and associated noise that affects recreation and visual resources indirectly. The existing conditions for both of these areas are discussed in section 3.11.

### 4.11.2.1 Recreation Use and Opportunities (ROI Two)

The proposed Clover Butte site consists of sage-grasslands and is a small portion of a larger desert upland area. The site is not located within a specifically designated land use such as a WSA, SRMA, or ACEC, nor is it located within an area identified as having wilderness qualities. Specially designated areas often provide an attraction for visitors. Since Alternative B includes no components located in these areas, recreation use or designation of these areas is not expected to be affected. For further discussion of land use designation, refer to section 4.10.2.3.

The military would withdraw, lease, or obtain right-of-way to 12,515 acres of public lands in ROI Two. This would remove that amount of land for recreation purposes. Visitors seeking primitive settings might then concentrate in other remote areas, thus increasing use in those areas. However, the proposed land withdrawal provides very little recreation opportunities or use compared to other areas in the region. The proposed withdrawal area is part of a larger upland plateau where very little direct recreation use occurs. Access to the land withdrawal area is limited and difficult. In the regional canyons, recreation use such as hunting and boating occur more frequently. Less than 1 percent of hunters within the state use the local game management unit for deer hunting. A controlled hunt for California bighorn sheep is held in the canyon areas of the Bruneau-Jarbidge River system upstream from Indian Hot Springs. However, the proposed Clover Butte range is located over 5 miles from this hunting area. At this distance, the proposed range would not likely disturb this recreation use.

Other recreation activities that take place in the surrounding region include hiking, camping, rockhounding, etc. These actions would continue as before. The Idaho State Centennial Trail, located over 5 miles from the proposed Clover Butte range site, is not expected to be affected due to the distance between the target area and trail. No emitter sites would be located along this trail.

The proposed road improvements are unlikely to affect recreation use in the area. Approximately 13 miles of the Clover-Three Creek Road would have some improvements performed such as gravelling and, where appropriate, drainage culverts to prevent erosion. A bridge would also be built over a portion of the Clover-Three Creek Road. However, the majority of substantial road improvements lead to emitter sites or no-drop target areas and not to highly used specific recreation destinations. Since the Clover-Three Creek Road leads to Murphy Hot Springs, some increase to recreation use may occur due to the road improvements. However, Three Creek is already considered a good access road compared to other roads in the area. It is able to accommodate light or medium duty travel most of the year and does not require seasonal limitations. A substantial portion of the Clover-Three Creek Road would remain unimproved. With low visitor use in the region and the Clover-Three Creek Road's recognized quality compared to other roads, it is unlikely that recreation use would increase substantially as a result of the road improvements.

The other primary access roads, Grasmere, Wickahoney, and Sheep Creek, that lead into the inner desert area would not be improved.

Less than 4 miles of an access road located just north of the proposed Clover Butte site would be improved. This road is used particularly by boaters for access to the Bruneau River put-in/take-out point at Indian Hot Springs. The trend in river running has increased steadily in the 1990s. However, river running is also dependent on water levels. In low water years, very few boaters, if any, would use the road; in high water years, use would increase. With an increasing trend in boating and a 4-mile road improvement, more use of this put in-take out point may occur. However, more than 5 miles would remain undeveloped.

A dead-end road that crosses the Clover Butte site would be closed to public access. However, this road does not provide access to the canyon areas nor is it highly used. Access would be restricted along a dirt road that traverses through the proposed Clover Butte site. Other roads in the area could compensate or are better access roads for travel.

As discussed, military aircraft have overflown the general area for over 50 years. The noise levels have varied over these years. Recreation use has been increasing in the area even though these activities have occurred.

Noise levels would vary depending on the area. Section 4.2, Noise, provides a complete description of the changes in the noise environment. For the most part, the noise environment would change very little over the existing conditions except around the alternative site and over the proposed range support MOA. At the Clover Butte Range site, the noise level would increase from 61 $L_{dnmr}$ to 66 $L_{dnmr}$ and, at the range support MOA, noise levels would increase from 46 $L_{dnmr}$ to 53 $L_{dnmr}$. These represent the largest change in the noise environment for both ROI Two and ROI Three under this alternative. While these noise increases would be noticeable, little recreation use occurs in these areas. In the canyon and river areas where most recreation opportunities exist, the noise level would decrease from 69 $L_{dnmr}$ to 59 $L_{dnmr}$. Refer to Table 4.2-2 and Figure 4.2-3 for a description of the noise levels and reference locations used in the noise analysis.

***RECREATION OPPORTUNITY SPECTRUM***

Approximately 75 percent (approximately 8,870 acres) of the Clover Butte site is located within ROS Roaded classification and 25 percent (approximately 2,970 acres) within the Primitive classification. The Roaded classification is more lenient in terms of development and intrusions than the Primitive classification. In the Roaded classification, other developments, noise sources, roads, and signage would be evident or permissible. Management policies for the Primitive classification would preclude these types of development. The 11,840 acres to be used by the Air Force, however, represent an extremely small percentage of land compared to public land still available for recreation use on primitive and roaded areas. Without affecting the ROS classification, a more urban or developed recreation area can be located next to a primitive classified area. For the proposed Clover Butte range, the ROS would no longer apply as the Air Force would be the land manager. This change, however, is not expected to affect recreation use in the area.

### 4.11.2.2 VISUAL RESOURCES (ROI TWO)

The visual components of the proposed Clover Butte range would include target areas, maintenance buildings, scoring system and communication towers, and emitter sites. Range components consist of a 12,000-acre tactical training range, 1-acre emitter sites, one-quarter-acre emitter sites, five-acre no-drop target, a 640-acre Forward Edge of Battle Area (FEBA) no-drop target, and scoring system cameras. The following provides a brief description of these components for this alternative, as well as alternatives C and D. Section 2.3 provides a

complete description with example figures. Visual intrusion, from the Native American aspect, is discussed in section 4.11.5.

### *12,000-ACRE TACTICAL RANGE*

The 12,000-acre tactical training range consists of two surface-to-air (SAM) targets, an industrial target, a FEBA array, and a maintenance complex. The SAM targets consist of 6 missiles arranged in a circle within a 5-acre area. The missiles are about 30 feet long and 4 feet in diameter. They would be placed at an angle with the base on the ground and the end of the missile about 12 feet up from the ground. A 38-inch high wildlife fence would surround the area.

The industrial target would consist of various buildings and storage tanks located on about a 30-acre area surrounded by a wildlife fence. Within the 30-acre area, the industrial target would be arranged into six "city blocks" of buildings. These blocks of buildings would vary from four to eight structures and be dispersed over 5 acres. Figure 2.3-7 provides a diagram of these blocks. The buildings would consist of agricultural style structures similar to the ones used by ranchers. The height of four of the blocks is about 25 feet. The other two blocks are about 60 feet and 40 feet, respectively. One of the blocks consists of five round, simulated storage tanks. The industrial target would also include a simulated railyard area. The railyard would consist of 24 rail cars located on two parallel tracks approximately 0.75 mile in length.

The FEBA array would consist of 25 plastic tanks on a 1,000-by-3,000-foot site. Tanks are approximately 12 to 15 feet in height and would be arranged to simulate actual enemy formation.

The maintenance complex could consist of either one large building (6,800 square feet) or three smaller structures (still a total of 6,800 square feet). All buildings would be 15 feet in height. On top of one of the buildings would be a 15-foot look-out tower used for safety and observation. A water tank approximately 30 feet in height and able to hold approximately 50,000 gallons of water would also be constructed on site. Building material would consist of concrete block similar to the ones used at the existing Grasmere site. The maintenance complex would also require a 40-foot communications monopole. The monopole would be about 15 inches in diameter. A 6-foot chain link fence topped with additional 2-foot barbed-wire strands would surround the area.

The 12,000-acre target area would have a scoring system capability. The scoring system towers would consist of a small camera and microwave dish antenna mounted on a 50-foot guyed tower. Solar power panels and batteries would be located near the base of the tower. Each site would require a parcel measuring about 50-by-50 feet with the base of the tower surrounded by a 6-foot chain link fence.

With the use of agricultural-style buildings in the area, the 12,000-acre range site would resemble a large ranching operation or small commercial/industrial area. These structures

would dominate the viewshed if seen within the foreground. However, due to their low profile, it is unlikely the 12,000-acre range would dominate the viewshed in the middleground or from a distance.

Many concerns were expressed in public and agency comments on the DEIS regarding the possibility of range fires or disruption to ranching operations from increased human presence. In response to these concerns, the Air Force proposes to develop a less than one-acre above-ground reservoir within a corner of the Clover Butte 12,000-acre training range. The reservoir would have a very low profile and would most likely not be visible at a distance. However, the Air Force would consult with resource management agencies to minimize any potential impacts from siting and construction of the above-ground reservoir. The design of this reservoir could duplicate existing reservoirs or water impoundments in eastern Owyhee County to minimize visual impacts.

#### *ONE-ACRE EMITTER SITES*

The one-acre emitter sites would consist of one 400-square-foot building approximately 15 feet in height. Building material would be either concrete blocks or painted metal. A 40-foot monopole would also be located on these sites, if required. The site would also contain a generator building, a 2,000-gallon propane tank, and a 250-gallon AST. The emitters would be 17 feet tall and are mounted on trucks. Depending on the alternative, one of the three emitter sites, BB, BC, and BG, would have a 50-foot radio tower instead of the monopole. For Alternative B, emitter site BC would have the radio tower while the other two would contain the 40-foot monopole. The radio tower would consist of a 40-foot tower topped with four 10-foot microwave dishes. All sites would be surrounded by a 6-foot chain link fence topped with an additional 2 feet of barbed wire. Up close, these sites could draw attention of the viewer, as few developments exist in the surrounding region.

#### *ONE-QUARTER-ACRE EMITTER SITES*

The one-quarter-acre emitter sites would consist of a mobile emitter approximately 17 feet in height. Fencing would not be used to surround these smaller emitter sites. These sites would not dominate the viewshed and would look like a truck parked off the road.

#### *FIVE-ACRE NO-DROP TARGETS*

Three different types of facilities would be used for these no-drop targets: industrial site, SAM site, and an early warning radar installation. The industrial target would consist of about 15 buildings and storage tanks similar to the one described for the 12,000-acre target area. Four underground 2,000-gallon propane ASTs would also be located on site. The SAM site would be similar to that described for the 12,000-acre no-drop target except the missile sites would be completely enclosed by a 12-foot cedar fence. The early warning radar installation would consist of four 20-foot radar dishes mounted on earthen berms approximately 6 feet in height. One 2,000-gallon propane tank would also be located on this site. The SAM site would be

surrounded by a wildlife fence. The other sites would be surrounded by a 6-foot chain link fence. These sites would most likely dominate the viewshed in the foreground; however, due to their low profile, they would probably be subordinate to other landscape features in the middleground or background.

### *640-Acre No-Drop Target (ND-1)*

Approximately 200 plastic tanks, real tanks, or other military-type vehicles would be used to provide aircrews with a diverse target array simulating a FEBA. Targets would be arranged throughout the 640 acres to simulate actual enemy formation. Tanks are about 12 to 15 feet in height. Four 2,000-gallon propane tanks would be located within this area, but buried or placed in a vault. A visitor viewing this site from an elevated position would probably be surprised to see a large number of tanks in this area. From a flat area, however, the number of visible tanks would be fewer.

#### *Viewpoint Analysis*

As discussed, typical viewpoints from which the proposed Alternative B components may be seen were identified by the BLM. These viewpoints were entered into a GIS database to determine the visibility of the range components. Using topographic data and distance zones, and height of range structure, the GIS model determined if a particular range component such as maintenance area, emitter site, no-drop target, etc., could be seen.

Eighteen points were modeled for the analysis. Figure 4.11-1 depicts the location of viewpoints. Except for viewpoint 14 and 17, these points represent a typical vista in the area. As discussed in section 3.11.2, viewpoint 14 is from Bruneau Scenic Overlook and viewpoint 17 is from a WSA. Table 4.11-1 shows the results of the GIS viewpoint analysis. The table describes whether the project component is in the foreground, middleground, or background; the distance from the viewpoint to the range component; and the height of the structure. While visibility is possible, range components in the background would be difficult to see or identify. Also, the mottled background (sage brush to grasslands) would also prevent the range components from being distinguished clearly.

Three viewpoints, 14, 15, and 16, did not have any views of the proposed range structures because intervening topography blocked the view.

The viewpoints provide representation of what a typical visitor might see in this particular area. For the majority of vistas, the most visible components of Alternative B are the emitter sites. Visibility of these components would be expected as the emitters are located closest to the main roads and usually situated to provide 360-degree viewing. These areas would look like a truck parked off the road. Although few people use the area for recreation or management purposes, a parked truck would not be that uncommon. Due to the dispersed nature of the emitter site locations as well as the other range components, limited visible clustering of structures would occur. For example, one emitter site may be located within the foreground

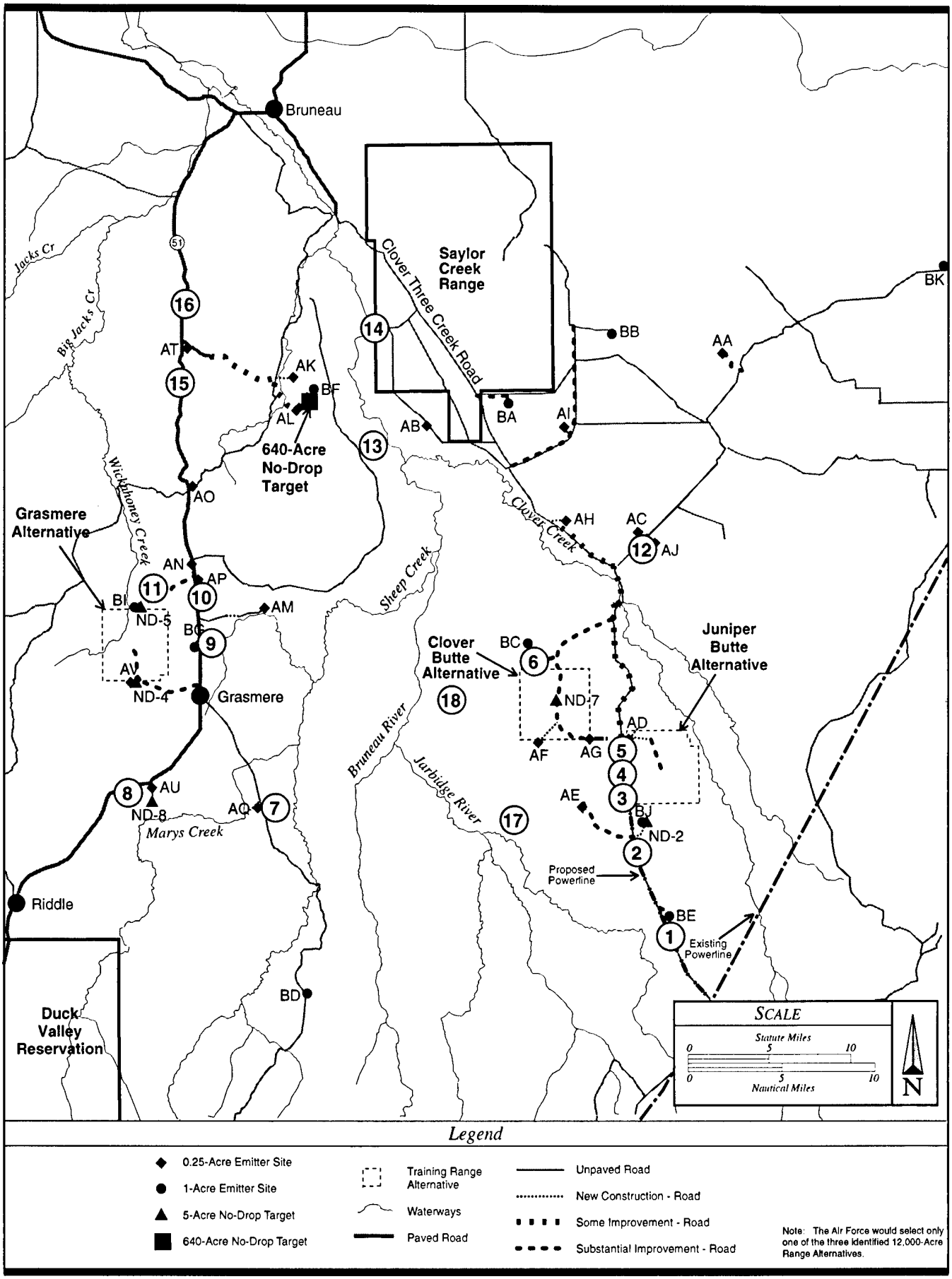



**Figure 4.11-1 Representative Viewpoints for Visual Analysis**

**Table 4.11-1. Visibility of Alternative B Components (Page 1 of 2)**

| *View Point* | *Alternative Component* | *Height (feet)* | *Approximate Distance (miles)* | *Distance Threshold* |
|---|---|---|---|---|
| 1 | Emitter BE | 40 | 0.5 | Foreground |
| 1 | Powerline | 40 | .02 | Foreground |
| 2 | SAM Site | 12 | 10.5 | Background |
| 2 | Industrial Complex | 60 | 10 | Background |
| 2 | FEBA | 15 | 10 | Background |
| 2 | Emitter BC | 50 | 14 | Background |
| 2 | Emitter AF | 17 | 8.8 | Background |
| 2 | Emitter BJ | 40 | 1.8 | Middleground |
| 2 | Powerline | 40 | .03 | Foreground |
| 3 | Emitter BC | 50 | 11.6 | Background |
| 3 | Emitter AD | 17 | 4 | Middleground |
| 3 | Emitter AE | 17 | 3 | Middleground |
| 3 | Powerline | 40 | .11 | Foreground |
| 4 | Industrial Complex | 60 | 2.3 | Middleground |
| 4 | Emitter AC | 17 | 14 | Background |
| 4 | Emitter AJ | 17 | 13.6 | Background |
| 4 | Emitter BC | 50 | 9.5 | Background |
| 4 | Emitter AD | 17 | 1.5 | Middleground |
| 4 | Emitter BJ | 40 | 3.6 | Middleground |
| 4 | Powerline | 40 | .06 | Foreground |
| 5 | Maintenance Complex | 40 | 0.5 | Foreground |
| 5 | Emitter AD | 17 | 0.3 | Foreground |
| 5 | Emitter AG | 17 | 2.3 | Middleground |
| 5 | Emitter AF | 17 | 5.4 | Background |
| 5 | Emitter BJ | 40 | 4.9 | Middleground |
| 5 | Powerline | 40 | .05 | Foreground |
| 6 | Industrial Complex | 60 | 2.7 | Middleground |
| 6 | SAM Site | 12 | 3 | Middleground |
| 6 | Emitter AF | 17 | 4.9 | Middleground |
| 6 | Emitter AE | 17 | 9.3 | Background |
| 6 | Emitter BJ | 40 | 11.8 | Background |
| 6 | Powerline | 40 | 5.7 | Background |

**Table 4.11-1. Visibility of Alternative B Components (Page 2 of 2)**

| *View Point* | *Alternative Component* | *Height (feet)* | *Approximate Distance (miles)* | *Distance Threshold* |
|---|---|---|---|---|
| 7 | Emitter BG | 40 | 10.5 | Background |
| 7 | Emitter AQ | 17 | 0.4 | Foreground |
| 7 | Emitter BD | 40 | 11.7 | Background |
| 9 | Emitter AN | 17 | 4.4 | Middleground |
| 9 | Emitter AP | 17 | 3.4 | Middleground |
| 10 | Emitter BI | 40 | 4 | Middleground |
| 10 | Emitter BG | 40 | 3.9 | Middleground |
| 10 | ND-5 | 26 | 3.7 | Middleground |
| 11 | Emitter AN | 17 | 3.7 | Middleground |
| 11 | Emitter AM | 17 | 7.3 | Background |
| 11 | Emitter BI | 40 | 0.7 | Middleground |
| 12 | Emitter BB | 40 | 12.5 | Background |
| 12 | Emitter BA | 40 | 11.7 | Background |
| 12 | Emitter AI | 17 | 8.3 | Background |
| 12 | Emitter AC | 17 | 0.5 | Foreground |
| 12 | Emitter AJ | 17 | 0.5 | Foreground |
| 12 | Emitter BC | 50 | 9.6 | Background |
| 13 | Emitter AK | 17 | 2.6 | Middleground |
| 13 | Emitter BF | 40 | 1.2 | Middleground |
| 13 | Emitter BA | 40 | 10.8 | Background |
| 13 | Emitter AB | 17 | 6.1 | Background |
| 17 | Industrial Complex | 60 | 8.5 | Background |
| 17 | Emitter BC | 50 | 11.2 | Background |
| 17 | Emitter BJ | 40 | 9 | Background |
| 17 | ND-2 | 26 | 9.1 | Background |
| 17 | Powerline | 40 | 7.77 | Background |
| 18 | Industrial Complex | 60 | 6.6 | Background |
| 18 | Emitter BC | 50 | 5.8 | Background |

while other emitter sites or range structures would be in the middle ground or background. In the vicinity of the 12,000-acre range, however, some clustering of range components would occur. At no-drop targets ND-2, ND-4, ND-5 and ND-8, an emitter site is located within one-quarter mile of the facilities. In these cases, the no-drop targets would dominate the viewshed over the emitter site; however, none of these sites are located in the foreground and therefore would not likely draw the viewer's attention or remain insubordinate to other elements in the viewshed.

The 640-acre no-drop target consists of an array of tanks dispersed over the entire area. These tanks would appear incongruous with the surrounding region, particularly from an elevated position. The road traversing this area would remain open to public access, but it does not provide access to a recreation destination and receives very little use. While this area could not be seen from Viewpoint 13, the 640-acre complex could be visible from other vantage points.

The maintenance structures associated with the 12,000-acre range would be visible from the road and probably represent a contrast with the general undeveloped nature of the area. To reduce the visual intrusion, all range structures would be similar to those types found in the surrounding region. All buildings would be painted desert beige or other earth tones to blend structures into the surrounding area and prevent reflection. The maintenance facility and powerline may be visible, but only in the background from Viewpoint 17, which is taken from a WSA. Due to the great distance between the viewpoint and range structure, distinguishable range components would be unlikely. No floodlights would be used on the 12,000-acre range, and only task lighting and localized safety lights would be used. No lighting would be used for no-drop target or emitter sites.

The proposed powerline associated with this alternative intersects the existing powerline and runs along Three Creek Road to the southeast corner of the proposed Clover Butte site. The powerline would be visible in the foreground from the road and visual points 1, 2, 3, 4, and 5. Although evidence of some development exists along this area (i.e., fences, stockponds), the proposed powerline would contrast with the remote area. However, a powerline along the side of roads is not unexpected and would probably be subordinate to the road itself. Since few travelers use this road, the visual sensitivity would be low and is not expected to change the VRM of the area. However, the powerline may be viewed as a visual intrusion by some travelers.

None of the range components would be seen from the Bruneau scenic overlook (Viewpoint 14) under this alternative.

### *VRM Analysis*

The Clover Butte site is located within VRM Class IV area. Class IV area settings tend to be homogenous in terms of shape, form, and color. While the skyline extends into the distance, no topographic or vegetative features stand out forming a simple vista. Class IV areas are the least sensitive or have been previously modified. However, in this area, much of the vista has not

been modified. Fences from ranching operations and roads are the most typical evidence of development.

Emitter sites associated with this alternative are located in VRM Class III and Class IV areas. Class III areas also tend to be homogenous in terms of shape, form, and color. VRM Class III objectives suggests that changes in the landscape should remain subordinate to the existing landscape. None of the emitter sites or target areas associated with this project are visible from within the canyon areas. Table 4.11-2 provides the proposed alternative components and the VRM Classification.

Overall, the VRM classification would no longer apply to the withdrawn lands as the Air Force becomes the land manager. This change in land status, however, is not expected to affect visual resource management in the area.

While some range components would be visible and contrast with the surrounding region, visitor use of the area is very low. Therefore, visual sensitivity in the area would be low. The range components would only be visible in the middleground or background from Class I or highly sensitive areas. Agricultural style buildings similar to those used in the region and muted colors would be used to reduce and blend the structures into the surrounding area.

#### 4.11.2.3 Recreation Use and Opportunities (ROI Three)

Since proposed range components and the immediate airspace surrounding the area were analyzed in ROI Two above, the focus of the impact analysis for ROI Three is a change in the noise environment.

In the MOA areas in Oregon and Nevada, the noise levels would remain the same as under existing conditions; therefore, the proposed action would not significantly impact recreation in these areas. High-altitude sorties would increase by 9 to 10 percent in the Paradise East and West MOAs and the Saddle MOA.

In Idaho (Owyhee and Jarbidge MOAs and SCR), the noise levels vary depending on the area. Section 4.2, Noise, discusses the changes in the noise environment. The greatest increase in noise is over the proposed alternative range sites and the range support MOA expansion. However, in many other areas, the noise levels would decrease or remain the same as the baseline condition. As expected, the greatest change occurs within the proposed range support MOA in Idaho. The proposed addition is located over two WSAs. Currently, the southern portion of these WSAs are under the MOA and have experienced low-altitude military overflight since they were established. The northern portions have not previously experienced low-altitude military aircraft overflights. They have, however, experienced medium- to high-altitude overflight as discussed in section 4.10.2.3. The noise level is expected to increase over this area (refer to section 4.2, Noise). While no significant adverse impact is expected, with this new airspace over the WSA, it is likely some degree of solitude would be lost and more visitors may be startled by the low-flying aircraft transiting the area. The change in noise levels for the proposed new airspace in Nevada is not as great as in Idaho because an MTR

| Table 4.11-2 VRM Classifications of Alternative B Range Components | | | |
|---|---|---|---|
| *Proposed Range Component* | *VRM Classification* | *Proposed Range Component* | *VRM Classification* |
| Clover Butte Tactical Range | 3 | **Emitters (Cont.)** | |
| 640 Acre FEBA (ND-1) | 3&4 | AN | 3 |
| ND-2 | 3 | AO | 3 |
| ND-4 | 4 | AP | 3 |
| ND-5 | 3 | AQ | 3 |
| ND-8 | 3 | AT | 3 |
| Powerline | 3 | AU | 3 |
| **Emitters** | | AV | 4 |
| AA | 4 | BA | 4 |
| AB | 4 | BB | 4 |
| AC | 4 | BC | 4 |
| AD | 3 | BD | 3 |
| AE | 4 | BE | 3 |
| AF | 4 | BF | 4 |
| AG | 4 | BG | 3 |
| AH | 3 | BI | 4 |
| AI | 4 | BJ | 4 |
| AJ | 4 | BK | 4 |
| AK | 4 | | |
| AL | 4 | | |
| AM | 3 | | |

already traverses this area. Refer to Table 4.2-2 and Figure 4.2-3 for a description of the noise levels and reference locations used in the noise analysis.

Overall, the ROS would no longer apply on the withdrawn lands as the Air Force would become the land manager. However, this change in land status is not expected to affect recreation management in the region.

#### 4.11.2.4 VISUAL RESOURCES (ROI THREE)

Impacts from aircraft overflights on the visual environment of an area are very difficult to identify. The difficulty lies in not being able to separate the visual impacts from the noise of the aircraft overflight. In most conceivable instances, aircraft overflight is noticed primarily because of the accompanying noise.

Military aircraft are transitory fixtures in a landscape. The nature of the impact depends on the sensitivity of the resource affected, the distance from which they are viewed, and the length of time they are visible. Altitude relative to the viewer also plays a key role in determining impacts from aircraft overflights. People's eyes are typically drawn to the horizon more than overhead and they are, therefore, less likely to notice aircraft at higher altitudes. In deep canyon areas, such as those traversing through the MOAs, most views would be screened or extremely brief. In such areas, the lower the altitude, the more likely it is that views of the passing aircraft would be screened.

In the open plains, aircraft would be visible, however only briefly. The most prevalent aircraft using the MOA is the F-16. An F-16 traveling at an average speed of 480 KTAS would travel 1.5 miles in 10 seconds, 4.6 miles in 30 seconds, and 9.2 miles in one minute. At these high speeds, the visual impact of an aircraft would be temporary and very short. Military aircraft are also painted a muted gray and are very difficult to pick out against a blue or gray sky.

The most visually sensitive areas in ROI Three include Wild and Scenic River canyons, VRM Class I areas, WSAs, and in canyon areas such as the Bruneau, Jarbidge, and Owyhee (which also correspond to most VRM Class I areas). Most views of overflying military aircraft would be screened due to the steep vertical walls of the canyons. Where the terrain is hilly or undulating, views are of short duration. In areas of flat terrain, however, the views can be expansive, and military aircraft can occasionally be detected.

This new airspace over the WSA is likely to cause some visual disturbance. Although most views would be screened in canyon areas, on hilltops where the vista offers expansive views of the area, aircraft would be visible, even if for only a short period of time.

On the open plains area where vegetation is low and visibility unimpaired, the visual effects of low-flying aircraft may also impact the sense of solitude and naturalness for individuals seeking a primitive recreation experience.

Areas that have the greatest potential of being affected by a decrease in solitude are WSAs. Although solitude may be expected in other areas surrounded the WSAs such as SRMAs, multiple uses also generate noise (i.e., snowmobiles, trailbikes, gun discharges).

## 4.11.3 Alternative C — Grasmere

### 4.11.3.1 Recreation Use and Opportunities (ROI Two)

The proposed Grasmere training range is similar to the Clover Butte site, consisting of sage-grasslands within a large desert upland area. This site is also not located within a specifically designated land use such as a WSA, SRMA, or ACEC, nor is it located within an area identified as having wilderness qualities. The area is similar to the surrounding region and is not a noteworthy recreation area and recreational use is low. Since Alternative C does not include any specially designated areas, recreational use or designation of these areas is not expected to be affected. For further discussion of land use designation, see section 4.10, Land Use and Transportation.

For Alternative C, the military would withdraw, lease, or obtain right-of-way to 11,675 acres of publicly owned lands. This would remove that amount of land for recreation purposes. As discussed, visitors seeking primitive settings might concentrate in other remote areas. The proposed Grasmere range site provides very few recreational opportunities compared to other areas such as the canyons in the region. The proposed withdrawal area is part of a larger upland plateau where very little direct recreational use occurs. In this region, hunting and boating occur more frequently in the canyons. As in Alternative B, less than 1 percent of hunters within the state use game management unit 41 for deer hunting. A controlled hunt for California bighorn sheep is held in the Bruneau-Jarbidge River system upstream from Indian Hot Springs. The proposed Grasmere range is located over 10 miles from this hunting area and would not likely affect hunter use.

Other activities that take place in the surrounding region such as hiking, camping, rockhounding, etc., would continue as before. The Idaho State Centennial Trail, located over 10 miles from the proposed Grasmere range, is not expected to be affected due to the distance between the target area and trail. No emitter sites would be located along this trail.

Road improvement is proposed for an access road leading to the Wickahoney Station, a cultural site. Upgrade of this road could lead to more visitors to this historic site, which could lead to further vandalism. A dirt access road dissecting the proposed Grasmere site would be closed. This would prevent access to the Wickahoney Station from the south. However, most visitors to this area use the access road just north of the proposed training range; therefore, it is unlikely that closure of this road would affect access to the Wickahoney station.

As discussed under Alternative B, the majority of the other road improvements lead to emitter sites or no-drop targets and not to a specific recreation area. As roads are improved, this remote region would become more accessible, potentially leading to more use. However, none

of the primary roads leading into the interior desert uplands would be substantially improved. With very little recreation use in the immediate vicinity except for the canyon areas, it is unlikely that recreation use would increase noticeably.

Under the ROI, noise levels vary depending on the area. Section 4.2, Noise, discusses the changes in the noise environment. For the most part, the noise environment would change very little over the existing conditions except around the alternative site and the range support MOA. At the Grasmere Range site and under the range support MOA (in Idaho), the noise levels would increase from 56 $L_{dnmr}$ to 66 $L_{dnmr}$ and 46 $L_{dnmr}$ to 51 $L_{dnmr}$, respectively. These represent the largest changes in the noise environment for both ROI Two and ROI Three under this alternative. While these noise increases would be noticeable, little recreation use occurs in these areas. In the canyon regions where most recreation opportunities exist, the noise levels would decrease from 69 $L_{dnmr}$ to 59 $L_{dnmr}$. Refer to Table 4.2-2 and Figure 4.2-4 for a description of the noise levels and reference locations used in the noise analysis.

***RECREATION OPPORTUNITY SPECTRUM***

Approximately 67 percent (approximately 7,325 acres) of the Grasmere site is located within ROS Roaded classification and 33 percent (approximately 3,675 acres) within the Primitive classification. The Roaded classification is more lenient in terms of development and intrusions than the primitive classification. In the Roaded classification, other developments, noise sources, roads, and signage would be evident or permissible. Management policies for the Primitive classification would preclude these types of development. The 11,000 acres to be used by the Air Force, however, represent an extremely small percentage of public land withdrawn as compared to the total land available for recreation on primitive and roaded areas. Without affecting the ROS classification, a more urban or developed recreation area can be located next to a primitive classified area. For the proposed Grasmere Alternative, the ROS would no longer apply for these lands because the Air Force would become the land managers. This change, however, is not expected to affect recreation use in the surrounding area.

### 4.11.3.2 VISUAL RESOURCES (ROI TWO)

As with Alternative B, the visual components of the proposed Grasmere Alternative would include target areas, maintenance buildings, scoring system and communication towers, and emitter sites. Target components are described in section 4.11.2.2. All emitter sites would be arranged in the same manner, regardless of the alternative. The no-drop targets associated with this alternative would also change. Under this alternative, emitter site BG would contain the 50-foot radio tower. A complete description of the target components and configuration is found in section 2.3. Visual intrusions from the Native American aspect is discussed in section 4.11.5.

The landscape within the Grasmere range is similar to Alternative B, Clover Butte. The existing five-acre Grasmere electronic combat site, fences, roads, and water troughs are located in the

vicinity of the proposed range. The existing Grasmere electronic combat site is located off Highway 51.

The less than one-acre above-ground reservoir would not be required at the Grasmere 12,000-acre training range since alternate sources of water are currently available.

*VIEWPOINT ANALYSIS*

As described is Section 4.11.2, viewpoints within ROI Two that may have visibility of the proposed project components were identified by the BLM and entered into a GIS database to determine the visibility of range components. Table 4.11-3 shows the results of the GIS viewpoint analysis. The table describes whether the project component is in the foreground, middleground, or background; the distance from the viewpoint to the range component (the maintenance area, emitter site, no-drop target, etc.); and the height of the structure. Figure 4.11-1 depicts the location of the viewpoints.

Three viewpoints, 14, 15, and 16, did not have any views of the proposed range structures, because intervening topography blocked the view. As in Alternative B, emitter sites are the most readily identifiable components of Alternative C because they are located closest to the roads. These emitter sites would appear like a truck parked off the road. While few people use the road, a parked truck would not be that uncommon. Due to the dispersed nature of the emitter site locations, as well as the other range components, limited visible clustering of structures would occur. For example, one emitter site may be located within the foreground while other emitter sites or range structures would be in the middleground or background. In the vicinity of the 12,000-acre range, however, some clustering of range components would occur. At no-drop targets ND-2, ND-6, ND-7, and ND-8, an emitter site would be located within one-quarter mile of the facility. In these cases, the no-drop targets would dominate the viewshed over the emitter site.

The 640-acre no-drop target would appear incongruous with the surrounding region. The analysis for this no-drop target is the same as for Alternative B.

The 12,000-acre range facilities would not be visible from Viewpoint 17, which is taken from a WSA, due to distance and topographic screening. However, to reduce the visual contrast of the range from other vistas, all structures would be painted "Desert Beige" to blend structures further into the background and prevent reflection. No floodlighting would be used on the 12,000-acre range site; only task lighting and localized safety lighting would be used. No lighting would be used for the no-drop targets and emitter sites.

None of the range components would be seen from the Bruneau scenic overlook (Viewpoint 14) under this alternative.

**Table 4.11-3. Visibility of Alternative C Components (Page 1 of 2)**

| *View Point* | *Alternative Component* | *Height (feet)* | *Approximate Distance (miles)* | *Distance Threshold* |
|---|---|---|---|---|
| 1 | Emitter BE | 40 | 0.5 | Foreground |
| 2 | ND-7 | 26 | 10.1 | Background |
| 2 | Emitter BC | 40 | 14 | Background |
| 2 | Emitter AF | 17 | 8.8 | Background |
| 2 | Emitter BJ | 40 | 1.8 | Middleground |
| 3 | ND-6 | 26 | 3 | Middleground |
| 3 | Emitter BC | 40 | 11.6 | Background |
| 3 | Emitter AD | 17 | 4 | Middleground |
| 3 | Emitter AE | 17 | 3 | Middleground |
| 4 | Emitter AC | 17 | 14 | Background |
| 4 | Emitter AJ | 17 | 13.6 | Background |
| 4 | Emitter BC | 40 | 9.5 | Background |
| 4 | Emitter AD | 17 | 1.5 | Middleground |
| 4 | Emitter BJ | 40 | 3.6 | Middleground |
| 5 | Emitter AD | 17 | 0.3 | Foreground |
| 5 | Emitter AG | 17 | 2.3 | Middleground |
| 5 | Emitter AF | 17 | 5.4 | Background |
| 5 | Emitter BJ | 40 | 4.9 | Middleground |
| 6 | ND-6 | 26 | 9.4 | Background |
| 6 | ND-7 | 26 | 2.8 | Middleground |
| 6 | Emitter AF | 17 | 4.9 | Middleground |
| 6 | Emitter AE | 17 | 9.3 | Background |
| 6 | Emitter BJ | 40 | 11.8 | Background |

**Table 4.11-3. Visibility of Alternative C Components (Page 2 of 2)**

| *View Point* | *Range Component* | *Height (feet)* | *Approximate Distance (miles)* | *Distance Threshold* |
|---|---|---|---|---|
| 7 | Emitter BG | 50 | 10.5 | Background |
| 7 | Emitter AQ | 17 | 0.4 | Foreground |
| 7 | Emitter BD | 40 | 11.7 | Background |
| 9 | Emitter AN | 17 | 4.4 | Middleground |
| 9 | Emitter AP | 17 | 3.4 | Middleground |
| 10 | Emitter BI | 40 | 4 | Middleground |
| 10 | Emitter BG | 50 | 3.9 | Middleground |
| 11 | Emitter AN | 17 | 3.7 | Middleground |
| 11 | Emitter AM | 17 | 7.3 | Background |
| 11 | Emitter BI | 40 | 0.7 | Middleground |
| 12 | Emitter BB | 40 | 12.5 | Background |
| 12 | Emitter BA | 40 | 11.7 | Background |
| 12 | Emitter AI | 17 | 8.3 | Background |
| 12 | Emitter AC | 17 | 0.5 | Foreground |
| 12 | Emitter AJ | 17 | 0.5 | Foreground |
| 12 | Emitter BC | 40 | 9.6 | Background |
| 13 | Emitter AK | 17 | 2.6 | Middleground |
| 13 | Emitter BF | 40 | 1.2 | Middleground |
| 13 | Emitter BA | 40 | 10.8 | Background |
| 13 | Emitter AB | 17 | 6.1 | Background |
| 17 | Emitter BC | 40 | 11.2 | Background |
| 17 | Emitter BJ | 40 | 9 | Background |
| 17 | ND-2 | 26 | 9.1 | Background |
| 17 | ND-6 | 26 | 5.4 | Background |
| 18 | Emitter BC | 40 | 5.8 | Background |

*VRM ANALYSIS*

The proposed Grasmere target area is located within VRM Class IV area. Class IV area settings tend to be homogenous in terms of shape, form, and color. While the skyline extends into the distance, no topographic or vegetative features stand out, forming a simple vista. Class IV areas are the least sensitive or have been previously modified. The existing Grasmere Radar Site is located in the nearby vicinity. Other modifications to the area include fences, water troughs, and small ranching stations.

Emitter sites associated with this alternative are located in VRM Class III and Class IV areas. Class III areas also tend to be homogenous in terms of shape, form, and color. VRM Class III objectives suggest that changes in the landscape should remain subordinate to the existing landscape. None of the emitter sites or target areas associated with this project are visible from within the canyon areas. Table 4.11-4 provides the proposed alternative components and the VRM Classification.

Overall, the VRM classification would no longer apply to the withdrawn lands as the Air Force becomes the land manager. This change in land status, however, is not expected to affect visual resource management in the area.

While some range components would be visible and contrast with the surrounding region, visitor use of the area is very low; therefore, visual sensitivity of the area would be low. The range components would only be visible in the middleground or background from Class I or highly sensitive areas. Agricultural style buildings similar to those used in the region and muted colors would be used to reduce and blend the structures into the surrounding region.

#### 4.11.3.3 RECREATION USE AND OPPORTUNITIES (ROI THREE)

The analysis for this ROI is the same as for Alternative B.

#### 4.11.3.4 VISUAL RESOURCES (ROI THREE)

The viewpoint analysis is the same as presented for Alternative B.

### 4.11.4 Alternative D — Juniper Butte

#### 4.11.4.1 RECREATION USE AND OPPORTUNITIES (ROI TWO)

The proposed Juniper Butte site is similar to both Alternatives B and C, consisting of sage-grasslands within a large desert upland area. The Juniper Butte site is not located within a specifically designated land use such as a WSA, SRMA, or ACEC, nor is it located within an area identified as having wilderness qualities. The area is similar to the surrounding region and is not a noteworthy recreation area. As such, recreation use on the area is low. Since the alternative does not include any specially designated areas, recreation use or designation of

| Table 4.11-4. VRM Classifications of Alternative C Range Components | | | |
|---|---|---|---|
| *Proposed Range Component* | *VRM Classification* | *Proposed Range Component* | *VRM Classification* |
| Grasmere | 3 & 4 | **Emitters (cont.)** | |
| 640-Acre FEBA | 3 & 4 | AO | 3 |
| ND-2 | 3 | AP | 3 |
| ND-7 | 4 | AQ | 3 |
| ND-8 | 3 | AT | 3 |
| **Emitters** | | AU | 3 |
| AA | 4 | AV | 4 |
| AB | 4 | BA | 4 |
| AC | 4 | BB | 4 |
| AD | 3 | BC | 4 |
| AE | 4 | BD | 3 |
| AF | 4 | BE | 3 |
| AG | 4 | BF | 4 |
| AH | 3 | BG | 3 |
| AI | 4 | BI | 4 |
| AJ | 4 | BJ | 3 |
| AK | 4 | BK | 4 |
| AL | 4 | | |
| AM | 3 | | |
| AN | 3 | | |

these areas is not expected to be affected. For further discussion of land use designation, refer to section 4.10, Land Use and Transportation.

For Alternative D, the military would withdraw, lease, or obtain right-of-way to 12,235 acres of publicly owned lands. This would remove that amount of land for recreation purposes. However, the proposed Juniper Butte Alternative provides very few recreational opportunities compared to other areas in the region. The northeastern edge of the 12,000-acre site borders the Clover Creek (or East Fork Bruneau Canyon). This area, because of its scenic canyon walls and flowing stream, attracts hikers. The proposed range, however, would be located outside of this canyon. As in Alternative B, less than 1 percent of hunters within the state use game management unit 46 for deer hunting. A controlled hunt for California bighorn sheep is held in the Bruneau-Jarbidge River system upstream from Indian Hot Springs, which is over 12 miles from the Juniper Butte Alternative site. Bighorn sheep hunting does not occur in the East Fork Bruneau Canyon.

Other recreational activities that take place in the surrounding region, such as hiking, camping, rockhounding, etc., would continue as before. The Idaho State Centennial Trail, located over 12 miles from the Juniper Butte range, is not expected to be affected due to the distance between the target area and trail. No emitter sites would be located along this trail.

Due to low water levels, the East Fork Bruneau Canyon is not used by boaters. This canyon is used on a limited basis for hiking and hunting. However, due to its less spectacular scenery, this area is used less than the other canyons such as Jarbidge and Bruneau, and Sheep Creek. While scenic, it does not have the dramatic canyon depths as the other canyons.

As in Alternatives B and C, proposed road improvements are unlikely to affect recreation use significantly in the area. The majority of road improvements lead to emitter sites or no-drop target areas and not to a specific recreation area. As roads are improved, this remote region would become more accessible, potentially leading to more use. However, none of the primary roads leading into the interior desert uplands area would be improved. With very little recreation use in the immediate vicinity except for the canyon areas, it is unlikely that recreation use would increase noticeably.

One road would be closed to public access. Access would be restricted along a dead-end dirt road that dissects part of the Juniper Butte site. However, this road does not lead to a recreation site and is not used regularly for access to the interior of the upland plateau. A 1.5-mile portion of a primitive two-track road on the eastern edge of the Juniper Butte site would be diverted from its original course to allow continued public access.

Noise levels would vary depending on the area. Section 4.2, Noise, discusses the changes in the noise environment. For the most part, the noise environment would change very little over the existing conditions except around the alternative range site and proposed range support MOA. At the Juniper Butte range site, the noise level would increase from 57 $L_{dnmr}$ to 66 $L_{dnmr}$, and at the range support MOA (in Idaho), the noise level would increase from 46 $L_{dnmr}$ to 52 $L_{dnmr}$.

These represent the largest changes in the noise environment for both ROI Two and ROI Three under this alternative. While this noise increase would be noticeable, little recreation use occurs in these areas. In the canyon regions where most recreation opportunities exist, the noise levels would decrease from 69 $L_{dnmr}$ to 59 $L_{dnmr}$. Refer to Table 4.2-2 and Figure 4.2-5 for a description of the noise levels and reference location used in the noise analysis.

***RECREATION OPPORTUNITY SPECTRUM***

Approximately 86 percent (approximately 9,940 acres) of the Juniper Butte site is located within ROS Roaded classification and 14 percent (approximately 1,620 acres) within the Primitive classification. As discussed previously, the Roaded classification is more lenient in terms of development and intrusions than the Primitive classification. Management policies for the Primitive classification would preclude these types of development. The 11,560 acres to be used by the Air Force, however, represent an extremely small percentage of land compared to public land still available for recreation use on primitive and roaded areas. Without affecting the ROS classification, a more urban or developed recreation area can be located next to a primitive classified area. For Alternative D, the ROS would no longer apply as the Air Force would be the land manager. This change in ownership, however, is not expected to affect recreation use in the surrounding area.

### 4.11.4.2 VISUAL RESOURCES

As with Alternatives B and C, the visual components of the Juniper Butte Alternative would include target areas, maintenance buildings, scoring system and communication towers, and emitter sites. Target components are described in section 4.11.2.2. The emitter sites would be arranged in the same manner for all alternatives. The no-drop targets associated with this alternative would also change. Under this alternative, emitter site BC would contain the 50-foot radio tower. A complete description of the target components and configuration is found in section 2.3.

The Air Force proposes to develop a less than one-acre above-ground reservoir within a corner of the Juniper Butte 12,000-acre training range. The analysis for this alternative is the same as for Alternative B.

***VIEWPOINT ANALYSIS***

As described is Section 4.11.2, viewpoints within ROI Two that may have a view of the proposed project components were identified by the BLM. These viewpoints were entered into a GIS database to determine proposed range components visibility. Table 4.11-5 shows the results of the GIS viewpoint analysis. The table describes whether the project component is the foreground, middleground, or background, the distance from the viewpoint to the range component, and the height of the structure.

**Table 4.11-5. Visibility of Alternative D Components (Page 1 of 2)**

| *View Point* | *Alternative Component* | *Height (feet)* | *Approximate Distance (miles)* | *Distance Threshold* |
|---|---|---|---|---|
| 1 | Emitter BE | 40 | 0.5 | Foreground |
| 1 | Powerline | 40 | 0.02 | Foreground |
| 2 | Emitter BC | 50 | 14 | Background |
| 2 | Emitter AF | 17 | 8.8 | Background |
| 2 | Emitter BJ | 40 | 1.8 | Middleground |
| 2 | Powerline | 40 | 0.03 | Foreground |
| 3 | Maintenance Complex | 40 | 4 | Middleground |
| 3 | Emitter BC | 50 | 11.6 | Background |
| 3 | Emitter AD | 17 | 4 | Middleground |
| 3 | Emitter AE | 17 | 3 | Middleground |
| 3 | Powerline | 40 | 0.11 | Foreground |
| 4 | Maintenance Complex | 40 | 1.6 | Middleground |
| 4 | SAM Site | 12 | 2 | Middleground |
| 4 | Industrial Complex | 60 | 2.2 | Middleground |
| 4 | Emitter AC | 17 | 14 | Background |
| 4 | Emitter AJ | 17 | 13.6 | Background |
| 4 | Emitter BC | 50 | 9.5 | Background |
| 4 | Emitter AD | 17 | 1.5 | Middleground |
| 4 | Emitter BJ | 40 | 3.6 | Middleground |
| 4 | Powerline | 40 | .06 | Foreground |
| 5 | Maintenance Complex | 40 | 0.5 | Foreground |
| 5 | SAM Site | 12 | 2.6 | Middleground |
| 5 | Industrial Complex | 60 | 3 | Middleground |
| 5 | Emitter AD | 17 | 0.3 | Foreground |
| 5 | Emitter AG | 17 | 2.3 | Middleground |
| 5 | Emitter AF | 17 | 5.4 | Background |
| 5 | Emitter BJ | 40 | 4.9 | Middleground |
| 5 | Powerline | 40 | 0.05 | Foreground |
| 6 | Emitter AF | 17 | 4.9 | Middleground |
| 6 | Emitter AE | 17 | 9.3 | Background |
| 6 | Emitter BJ | 40 | 11.8 | Background |
| 6 | Powerline | 40 | 5.7 | Background |

**Table 4.11-5. Visibility of Alternative D Components (Page 2 of 2)**

| *View Point* | *Alternative Component* | *Height (feet)* | *Approximate Distance (miles)* | *Distance Threshold* |
|---|---|---|---|---|
| 7 | Emitter BG | 40 | 10.5 | Background |
| 7 | Emitter AQ | 17 | 0.4 | Foreground |
| 7 | Emitter BD | 40 | 11.7 | Background |
| 9 | Emitter AN | 17 | 4.4 | Middleground |
| 9 | Emitter AP | 17 | 3.4 | Middleground |
| 10 | Emitter BI | 40 | 4 | Middleground |
| 10 | Emitter BG | 40 | 3.9 | Middleground |
| 10 | ND-5 | 26 | 3.7 | Middleground |
| 11 | Emitter AN | 17 | 3.7 | Middleground |
| 11 | Emitter AM | 17 | 7.3 | Background |
| 11 | Emitter BI | 40 | 0.7 | Middleground |
| 12 | Emitter BB | 40 | 12.5 | Background |
| 12 | Emitter BA | 40 | 11.7 | Background |
| 12 | Emitter AI | 17 | 8.3 | Background |
| 12 | Emitter AC | 17 | 0.5 | Foreground |
| 12 | Emitter AJ | 17 | 0.5 | Foreground |
| 12 | Emitter BC | 50 | 9.6 | Background |
| 13 | Emitter AK | 17 | 2.6 | Middleground |
| 13 | Emitter BF | 40 | 1.2 | Middleground |
| 13 | Emitter BA | 40 | 10.8 | Background |
| 13 | Emitter AB | 17 | 6.1 | Background |
| 17 | Emitter BC | 50 | 11.2 | Background |
| 17 | Emitter BJ | 40 | 9 | Background |
| 17 | ND-2 | 26 | 9.1 | Background |
| 17 | Powerline | 40 | 8.35 | Background |
| 18 | Emitter BC | 50 | 5.8 | Background |

Three viewpoints, 14, 15, and 16, did not have any views of the proposed range structures because intervening topography blocked the view. As in Alternatives B and C, the emitter sites represent the most readily identifiable component of Alternative D because they are located closer to roads. These emitter sites would look like a truck parked off the road. While few people use the area, a parked truck would not be uncommon. Due to the dispersed nature of the emitter site locations as well as the other range components, limited visible clustering of structures occur. For example, one emitter site may be located within the foreground; other emitter sites or range structures would be in the middleground or background.

In the vicinity of the 12,000-acre range, however, some clustering of range components would occur. At no-drop targets ND-4, ND-5, and ND-8, an emitter site would be located within one-quarter mile of the facility. In these cases, the no-drop targets would dominate the viewshed over the emitter site.

The 640-acre no-drop target would appear incongruous with the surrounding region. The analysis for this no-drop target is the same as Alternative B.

The 12,000-acre range maintenance facility would be visible from Viewpoint 17, which is taken from a WSA. However, all the structures would be in the background. Distinguishable range components would be unlikely from the distance between the point and range structures. To reduce the visual contrast, all structures would be painted "Desert Beige" to blend structures further into the background and prevent reflection. No floodlights would be used on the 12,000-acre range site, only localized safety lights or task lights. No lighting would be used for the no-drop targets or emitter sites.

None of the range components would be seen from the Bruneau Scenic Overlook (Viewpoint 14) under this alternative. The proposed powerline associated with this alternative intersects the existing powerline and runs along Three-Creek Road to the southeast corner of the proposed Clover Butte site. The powerline would be visible in the foreground from the road and visual points 1, 2, 3, 4, 5, and 17. Although evidence of some development exists along this area (i.e., fences, stockponds), the proposed powerline would contrast with the remote area. However, a powerline alongside a road is not unusual and would probably be subordinate to the road itself. Since few travelers use this road, the visual sensitivity would be low.

### *VRM Analysis*

The Juniper Butte site is located within VRM Class IV area. Class IV area settings tend to be homogenous in terms of shape, form, and color. While the skyline extends into the distance, no topographic or vegetative features stand out forming a simply vista. Class IV areas are the least sensitive to change or have been previously modified. Other modifications to the area include fences and water troughs.

Emitter sites associated with this alternative are located in VRM Class III and Class IV areas. Class III areas also tend to be homogenous in terms of shape, form, and color. VRM Class III

objectives suggest that changes in the landscape should remain subordinate to the existing landscape. None of the emitter sites or target areas associated with this project are visible from within the canyon areas. Table 4.11-6 provides the proposed alternative components and the VRM Classification.

Overall, the VRM classification would no longer apply to the withdrawn lands as the Air Force becomes the land manager. This change in land status, however, is not expected to affect visual resource management of the area.

While some range components would be visible and contrast with the surrounding region, visitor use of the area is very low; therefore, visual sensitivity of the area would be low. The range components would only be visible in the middleground or background from Class I or highly sensitive areas. Agricultural style buildings similar to those used in the region and muted colors would be used to reduce and blend the structures into the surrounding region.

#### 4.11.4.3 Recreation Use and Opportunities (ROI Three)

The analysis for this ROI is the same as for Alternative B.

#### 4.11.4.4 Visual Resources (ROI Three)

The viewpoint analysis in the same as presented for Alternative B.

### 4.11.5 Shoshone-Paiute Concerns About Recreation and Visual Resources

Shoshone-Paiute concerns about recreation and visual resources have centered on two areas:

- The possibility that increased recreation in the region will lead to more vandalism of traditional cultural resources and to interference with religious ceremonies; and
- Visual intrusion on spiritual locations by electronic facilities and other modern structures.

#### 4.11.5.1 Vandalism and Interference with Ceremonies

Vandalism to archaeological resources, especially graves and rock art sites, and the collection of artifacts by hunters, hikers, and other visitors to Owyhee County have been a concern to the Shoshone-Paiute for many years. Studies in other states have shown that improved access to a previously remote region often leads to an increase in such activities (refer to section 4.9.1.1). Some Shoshone-Paiute have also expressed concerns about the frequency of intentional and unintentional visitors to their sacred sites. These visitors are often well-meaning, but the Shoshone-Paiute feel that the visits intrude on their privacy and on the sanctity of these locations. According to Tribal representatives, the frequency of visits and the number of visitors have increased over the past few years.

| Table 4.11-6 VRM Classifications of Alternative D Components | | | |
|---|---|---|---|
| *Proposed Range Component* | *VRM Classification* | *Proposed Range Component* | *VRM Classification* |
| Juniper Butte Tactical Range | 3 | **Emitters (cont.)** | |
| 640-Acre FEBA (ND-1) | 3&4 | AM | 3 |
| ND-4 | 4 | AN | 3 |
| ND-5 | 3 | AO | 3 |
| ND-7 | 4 | AP | 3 |
| ND-8 | 3 | AQ | 3 |
| Powerline | 3 | AT | 3 |
| **Emitters** | | AU | 4 |
| AA | 4 | AV | 4 |
| AB | 4 | BA | 4 |
| AC | 4 | BB | 4 |
| AD | 3 | BC | 4 |
| AE | 4 | BD | 3 |
| AF | 4 | BE | 3 |
| AG | 4 | BF | 4 |
| AH | 3 | BG | 3 |
| AI | 4 | BI | 4 |
| AJ | 4 | BJ | 3 |
| AK | 4 | BK | 4 |
| AL | 4 | | |

As discussed elsewhere in section 4.11, recreational use of the area is not likely to be affected by the implementation of the ETI proposal. Road improvements would be relatively few, and these would primarily be in areas having little recreational appeal. Therefore, it is unlikely that the level of vandalism of cultural resources would increase because of the development of one of the range alternatives. The number of other visitors to the areas is also unlikely to change significantly.

Shoshone-Paiute representatives have suggested that the Air Force could assist the Tribes in monitoring the area for signs of vandalism. The Air Force will work with the Duck Valley Reservation Tribal Council to define assistance measures that could be provided.

#### 4.11.5.2 VISUAL INTRUSIONS

In terms of visual resources, Shoshone-Paiute representatives are most concerned about the potential for intrusions on solitude and peacefulness at sacred sites and other traditional cultural resources located west of Highway 51. Components of the alternatives located east of the highway have not been mentioned as often by members of the Tribes. Also, a few components of the alternatives located west of the highway were not identified as intrusive.

As mentioned earlier in section 4.11, a survey of wilderness visitors by the USFS and NPS (USFS 1992) established that annoyance with overflights was more strongly related to noise exposure than to the visibility of the aircraft or their condensation trails. Also, military aircraft have been flying over southwest Idaho since 1942. Under Alternative A, No-Action, they will continue to have the same frequency noted for baseline. Under Alternatives B, C, and D, flight activity would be more dispersed.

In section 4.11, a viewpoint analysis and a VRM analysis are performed for each alternative. Various measures to reduce visual impacts (e.g., non-intrusive building colors, no flood lighting in the target areas, no lighting at the emitter sites or no-drop target areas) are also discussed.

The Air Force met with Tribal representatives in 1996 to discuss which specific components of the alternatives would be close to or visible from sensitive areas. These representatives specifically mentioned concerns about four potential emitter sites and three potential no-drop target areas. The proposed locations for four of these components were shifted to meet operational requirements and in consideration of Tribal concerns. However, there is still a likelihood that some components of Alternatives B, C, and D located west of Highway 51 could have a visual impact on some of the traditional practices of the Shoshone-Paiute.

### 4.11.6 Cumulative Impacts

All aspects of the ETI proposal including potential effects of ground disturbances, increased human presence, and military aircraft overflight were analyzed for the cumulative impact to recreation and visual resources.

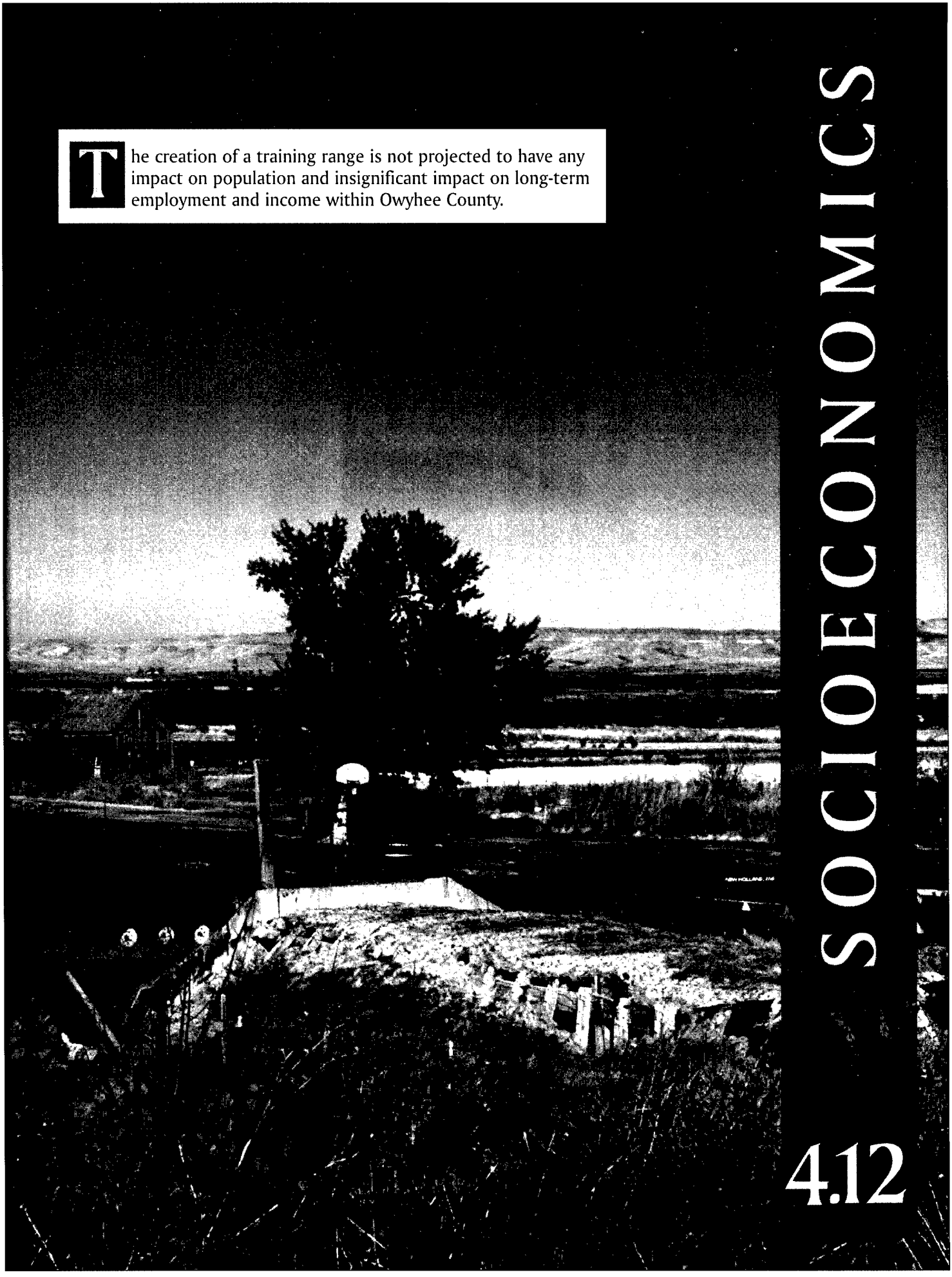
Constructing a training range would generate a change to access, noise levels, and visual resources beneath the overlying airspace. However, some to these changes are expected to affect recreation use. The results of this change are addressed in section 4.11. The foreseeable future actions would not affect access to, nor would they located on, any a specifically designated recreation site. Therefore, it is unlikely that these projects would contribute to a cumulative impact to recreation.

The proposed construction for the Grasmere wind turbine generator site is located within the vicinity of the existing Grasmere EC site and within the general region of ETI. It also calls for the construction of a 60-foot tower, thereby creating the potential for a cumulative visual impact. However, most of the proposed ETI components would occur in areas that are not visible from the Grasmere Alternative location, therefore no clustering of developments would be expected. The proposed wind turbine site is located within a VRM Class III area and a traffic influence zone. VRM Class III areas suggest that changes to the landscape should remain subordinate to the existing landscape.

As discussed in section 4.9.7, the Shoshone-Paiute have expressed concerns about increased visitation to sensitive areas containing traditional cultural resources for recreation and other purposes. While recreation is not expected to increase significantly with regard to the proposed action or future foreseeable projects, even a slight increase in the number of visitors to certain specific locations or to traditional cultural resources in general may be undesirable. However, it is unlikely that the selected ETI alternative would contribute to a cumulative impact to traditional cultural resources associated with improved access to some areas.

# SOCIOECONOMICS

The creation of a training range is not projected to have any impact on population and insignificant impact on long-term employment and income within Owyhee County.



# 4.12

Operation of a new training range could create new job opportunities and some of these individuals could live in Owyhee County. Withdrawal of 12,000 acres and changes in forage availability of approximately 1,000 acres from the 300-acre primary ordnance impact area, roads, and emitter sites would have minimal impact upon county resources but will impact the rancher who owns rights to the grazing allotment from which the land is withdrawn. No changes in recreational visitors to the area are projected and earnings are not projected to be affected. None of the socioeconomic impacts is expected to be substantial.



Owyhee County's economy is dominated by grazing, ranching, and farming, especially along water courses within the area.

Public services are not expected to be affected by the creation of a training range. Public finances would be impacted primarily through change in land status as lands change from BLM to Air Force management. Payments in lieu of taxes (PILT), currently made by the BLM to Owyhee County, are projected to cease for those lands transferred to the Air Force. The projected loss in revenues is not expected to have a significant impact on county operations.

Grazing fees collected will be minimally impacted by development of the training range. Leased state and withdrawn BLM lands on a selected alternative may no longer generate state or BLM grazing fees. Again, any such losses are not expected to cause substantial effects. The state lease of affected school endowment lands would, at a minimum, compensate the state for potential lost grazing fees.

Duck Valley Reservation lies under the MOAs and Shoshone-Paiute traditional resources have been identified in the vicinity of range alternatives. Details regarding the Air Force outreach program to learn Native American concerns and actions taken in response to these concerns are contained in Chapter 1.

The environmental impact analysis concluded that negligible impacts would occur as a result of the implementation of any of the three alternatives. It further concluded that neither Shoshone-Paiute, Hispanic, nor low-income populations residing within the county would experience any disproportionately high or adverse impacts.



# 4.12 SOCIOECONOMICS

For generations, the agriculture industry has been the dominant economic activity for Owyhee County residents. Ranching, as the region's way of life, has contributed to the relative stability of the social and economic factors that define Owyhee County. Increases in population in Boise's Treasure Valley and other communities of southwest Idaho have shifted the primary economy of the region from agriculture to industry. But in most of Owyhee County, the primary results of this regional growth is reflected only in recreational usage of the rivers and mountains.

In general, the creation of a training range is not projected to have any impact on population and insignificant impacts on long-term employment and income in Owyhee County. The potential economic effects evaluated involve direct and indirect impacts related to construction of range facilities, PILT, livestock grazing, and recreation activities. Short-term increases in employment and business activity generated by range construction would benefit the region's economies. Owyhee County would experience permanent losses in PILT payments for the lands withdrawn; however, the projected revenue losses would not be sufficient to affect county operations. Potential effects on recreational visitors to the area are not projected to reduce earnings in the region.

## 4.12.1 Alternative A — No-Action

Under the No-Action Alternative, operations at SCR would continue. No new lands would be acquired, nor would any land ownership or land uses change. Implementation of this alternative would not affect the socioeconomic resources and opportunities associated with the land in Idaho or at the remote ranges.

## 4.12.2 Alternative B — Clover Butte

The enhanced training range has been designed in recognition of the value of ranching and recreation in Owyhee County. The focus of the analysis for this alternative consists of the agricultural lands within the tactical training range, including public (approximately 11,200 acres) and state (640 acres) school endowment lands. The 640-acre no-drop target area, five-acre no-drop-sites, one-acre emitter sites, and one-quarter-acre emitter sites were not analyzed due to the negligible impact to grazing and loss of animal unit months (AUMs). The total approximate acreage analyzed for this alternative is 11,840 acres (11,200 public lands, 640 state lands).

### 4.12.2.1 Economic Activity

Direct personnel changes expected under any of the range development alternatives would not be of sufficient magnitude to generate any significant impacts to population, housing, or community services. Personnel involved in activities at the range would commute on a daily basis. In addition, any potential changes in long-term county employment are expected to be

so small that population would not be affected. Consequently, no population impacts are anticipated to occur under Alternative B.

Long-term employment impacts to Owyhee County under this alternative would be small. Changes in grazing capacity would have a negligible effect on county employment, decreasing by less than one full-time job. Under implementation of Alternative B, short-term increases in economic activity would be generated. Construction of range facilities would take place over a period of three to four years, creating employment opportunities in Owyhee County and contributing to business sales of construction-related goods and services. Although the total expenditures associated with construction of the proposed range were not known at the time this analysis was conducted, each $1 million in construction-related spending would generate about $600,000 in regional earnings and 28 new jobs during the period of construction. This three-to-four year boost in employment and business activity would benefit local economies in Owyhee County and the surrounding region.

Impacts to personal income for residents of Owyhee County would be expected to be nominal. Over the long-term, there may be a small increase in total earnings for county residents due to the additional demand for services such as food and gas by personnel working at the range. In addition, there may also be a short-term increase in earnings due to construction-related activities in developing the range. Potential declines in earnings related to reduced grazing activity are expected to minimal.

#### 4.12.2.2 Public Services and Public Finance

The impact analysis for public services and public finance was based on the following assumptions:

- PILT would not be paid to the county for lands transferred to DoD management for uses associated with the training range.
- The Air Force would lease lands from the State of Idaho.
- The Public Schools Income Fund would not be adversely impacted.
- County revenues would not be redistributed to compensate for tax losses in an impacted district.

Potential impacts to Owyhee County revenues resulting from implementation of Alternative B would be relatively minor. The projected change in county revenues, related entirely to reductions in PILT, would not be expected to result in any measurable effect on the county's ability to provide services. In addition, during the public comment period on the DEIS, ranchers and grazing permittees expressed concerns and a desire that they be compensated for disruption of ranching activities.

Owyhee County receives PILT as compensation for property tax losses due to government ownership of land within its boundaries. Under Alternative B, the Air Force proposes to withdraw 11,864 acres of public land required for development of the training range, no-drop target areas, and emitter sites. Transfer of these lands to the Air Force would result in the

permanent loss of approximately $1,385 in annual PILT revenues for Owyhee County. Annual county revenues amount to $3,455,559 of which $423,000 are PILT; therefore, a loss $1,385 represents less than 1 percent of PILT revenues and less than one-tenth of 1 percent of total county revenues.

No impacts to annual property tax revenues would be expected, as the land withdrawal proposed under Alternative B does not call for the acquisition of any private lands. Consequently, the only revenue losses anticipated are those related to PILT. Although county revenues are used to support services such as law enforcement, search and rescue, and county administrative agencies, these services would not be substantially affected by the small change in county revenues anticipated under Alternative B.

Development of roads related to the range development alternatives will be the responsibility of the Air Force, and would be coordinated with Owyhee County, BLM, and the Three Creek Good Roads District. Although inter-agency support agreements for road maintenance are currently being coordinated, at this time it is expected that Owyhee County and Three Creek Good Roads District would be compensated for the proportionate share of maintenance costs related to Air Force use of existing or new roads. Construction of range facilities would be phased over a period of three to four years, thereby minimizing impacts to roads. Furthermore, maintenance and operations personnel traveling to the range would be expected to ride-share, which would minimize road usage.

Public schools enrollment and school district revenues in Owyhee County would not be expected to experience any adverse impacts as a result of implementation of Alternative B.

#### 4.12.2.3 LIVESTOCK GRAZING

Public hearing comments identified a series of economic impacts that have decreased ranching operation viability. These include proposed grazing allotment reductions, increased operational costs, and fluctuations in market conditions. The cumulative impact of these economic factors has substantially stressed small ranching operations in southwest Idaho.

The Air Force is committed to insuring that the specific ranching operations affected by selection of a training range alternative is not adversely impacted. Specific Air Force and rancher agreements will be entered into to make the affected rancher operationally functional on a comparable basis to that which existed prior to selection of the alternative. These agreements are expected to cover direct compensation and/or compensation in kind including fencing, pipelines, and an above-ground less than one-acre water storage reservoir for the selected alternative and for grazing land agreed to as payment in-kind. The reservoir would reserve 50,000 gallons of water for fire suppression and provide for access both from within and outside the 12,000-acre training range for stock watering.

The impact to the livestock industry from the creation of a training range is assessed from the perspective that the quantifiable economic impacts are directly tied to the loss of forage in 1,000 acres, as well as the estimated economic impact to grazing operators of a 12,000-acre training

range alternative. There are also non-quantifiable impacts associated with establishment of a 12,000-acre training range. These impacts include:

- Disruption of ranching operations: each alternative is located within a grazing allotment and disrupts ranching operations by altering fencing, roads, and availability of forage.
- Additional risk to ranching operations from increased human access and presence including potential fire, accidents involving range animals, and potential illegal actions.
- Reduction in the carrying capacity of the specific livestock operation affected.

### *REGIONAL ECONOMIC CONSEQUENCES*

Implementation of any of the three proposed training ranges would require that certain lands in Owyhee County be set aside for the tactical range, no-drop target areas, and emitter sites. These lands, currently under the control of the BLM and the State of Idaho for school endowments, are primarily used for grazing and primitive recreation. While the 300-acre primary ordnance impact area in the center of the range would be restricted, much of the remaining area within the proposed 12,000-acre tactical training range would still be available for livestock grazing. In addition to the proposal to withdraw lands, the State of Idaho lands associated with this alternative would be leased by the Air Force. The analysis presented in the following sections assumes the removal of the 12,000 acres in its entirety from the existing grazing allotments. Use of the affected lands for grazing, following acquisition, would lessen or eliminate the livestock industry impacts. In regional economic terms, this means that the worst case for an operation would be removal of all 12,000 acres.

It is expected that approximately 11,000 acres of the 12,000 acres would continue to be used for livestock grazing. For the region as a whole, a new range would remove only about 1,000 acres from grazing, including the 300-acre primary ordnance impact area, roads, and emitter sites. The direct economic impact to livestock operations from a loss of 1,000 acres of rangeland would amount to a loss of less than $500 in net operating income and less than $400 in direct labor earnings (see Table 4.12-1). The total impact to regional economic activity, determined utilizing economic multipliers published by the Bureau of Economic Analysis (U.S. Department of Commerce 1992), is estimated to be a loss of approximately $4,000 in annual business activity, about $960 in annual earnings, and what would amount to about one-twentieth of one job. This total regional impact is believed to be not significant.

### *SITE SPECIFIC QUANTIFIABLE CONSEQUENCES*

Although the Air Force intends to permit grazing on the selected 12,000-acre training range, impacts are evaluated assumed removal of the entire 12,000 acres from the existing allotment. Continued use of the affected lands for grazing would lessen the magnitude of the impacts estimated in this section.

The quantifiable direct impact of reduced forage to Clover Butte ranching operations was estimated by assessing both the loss in grazing fee revenues and the change in net operating income of typical livestock operations. The change in net operating income is estimated assuming that the herd size is reduced proportionately to the lost forage. Net income, as defined in this analysis, does not consider the return on capital or on equity to its owners. A positive net income alone does not indicate the viability of an operation. The analysis does not attempt to determine whether current range activities are providing an adequate rate of return to their owners. Furthermore, the analysis does not evaluate the management practices or the economic structure of the affected operations.

**Table 4.12-1. Projected Direct, Indirect, and Induced Livestock Grazing Impacts on Livestock Industry from Removal of 1,000 Acres**

| | |
|---|---|
| Steer calves | -$994.43 |
| Heifer calves | -471.30 |
| Aged bulls | -90.88 |
| Cull cows | -372.75 |
| Replacement heifers | -68.52 |
| Alfalfa hay | -$381.70 |
| Feed barley | -32.16 |
| Protein supplement 20% | -34.29 |
| Federal range | -158.12 |
| Crop aftermath | -112.89 |
| Salt | -7.53 |
| Marketing | -39.97 |
| Veterinary medicine | -94.00 |
| Machinery (fuel, lube, repair) | -32.45 |
| Vehicles (fuel, repair) | -125.67 |
| Equipment (repair) | -1.92 |
| Housing and improvements (repair) | -33.51 |
| Hired labor | -234.87 |
| Owner labor | -159.89 |
| Interest on operating capital | -51.48 |

The net operating income analysis is based on typical cow and calf operations as determined by the University of Idaho Cooperative Extension System (Smathers et al. 1996). Typical operations in the Clover Butte area were based on an annual cow-calf budget for a 500-cow

herd grazing on public lands for a ten and a half month season of use. It is assumed that the number of permitted AUMs sets the size of the operation. The affected allotment acreage was combined and treated as a single operation to simplify estimates. The estimated reduction in herd size is based on the loss in forage (AUMs) associated with the lands to be withdrawn. This analysis assumes that disruption of operations and reduction in forage has the potential to reduce the carrying capacity of the livestock operation. The amount of land estimated to be required for the impact areas and the estimated AUMs is presented in Table 4.12-2.

**Table 4.12-2. Summary of Livestock Grazing Impacts — Alternative B**

| | |
|---|---|
| Affected acreage | 11,840 |
| Affected AUMs | 1,032 |
| Change in grazing fees | -$1,538 |
| Change in annual net operating income | -$5,563 |
| Change in annual direct labor earnings | -$4,415 |

Implementation of Alternative B would require the acquisition of approximately 11,840 acres of federal and state grazing allotment lands, as described in section 3.12.4.2. Assuming that AUMs are evenly distributed over each allotment, 1,032 AUMs would be affected by withdrawal of acreage for the Clover Butte Alternative. Based on 1996 grazing fees of $1.35 per AUM on public lands and $4.88 per AUM on state lands collected over a grazing season, fees collected by BLM and the state would be reduced by $1,338 and $200, respectively, for a total loss of $1,538. Compared to the total annual collected grazing fees of approximately $670,000 for BLM and the State of Idaho, the projected loss amounts to just under 1 percent of total fees for the county. The state lease of affected school endowment lands to the Air Force would, at a minimum, compensate the state for potential lost grazing fees.

During the past 10 years, the federal grazing fee has fluctuated by an amount of approximately 50 percent of the current fee (see Table 3.12-14). For this analysis, the BLM grazing fee impact was based on the current federal grazing fee, which is at a 10-year low. Therefore, depending on future variations in the fee, the potential lost grazing fees could be greater than the estimated loss of $1,338. Even taking this potential variation into account, however, the potential losses would amount to less than 1 percent of total grazing fees for Owyhee County.

The cow-calf budget used for this analysis, developed by the University of Idaho Cooperative Extension System (Smathers et al. 1996), provides a detailed accounting of the expected revenues and costs, on a per-head basis, of a typical 500-cow herd summered and wintered on public lands. Revenues for the typical cow-calf operation are the gross receipts received for steer calves, heifer calves, aged bulls, cull cows, and cull heifers. Operating costs include feed requirements, marketing, veterinary medicine, equipment maintenance and repair, and labor (see Table 4.12-1). An incremental change in the herd size of the operation affects both the

expected revenues and costs of the operation. The difference between the change in revenue and the change in operating costs is the change in net operating income for the affected ranch. The change in net operating income for a hypothetical ranching operation at Clover Butte is determined by applying the number of affected animal units associated with this alternative, which is determined by the number of affected AUMs, to the cow-calf budget model.

Based on the assumptions described above, the change in annual net operating income under Alternative B is estimated to be a reduction of $5,563. Reducing herd size to accommodate reduced forage also reduces the level of direct labor needed to support the operation. The net income analysis yields a change in labor earnings amounting to an annual loss of approximately $4,415. Consequently, employment losses under Alternative B would be less than one full-time job.

#### 4.12.2.4 MINING

The mineral survey conducted for this EIS indicates that no economically viable mineral deposits are known to exist on lands affected by implementation of Alternative B. In addition, access to all currently existing claims would not be impaired by development of the range. Consequently, no negative impact on mining is anticipated given that mineral right holders continue to be granted reasonable access to their claims.

#### 4.12.2.5 RECREATION

Construction or operation of the Clover Butte Alternative would remove an approximate 12,000-acre fenced area from recreational hunting. The hunting includes game birds and other species. The extent of the area affected is not significant compared to surrounding areas and the potential impact is not considered adverse or significant. Consequences to recreation economics are comparable to those noted in section 4.12.2.5.

The economics of recreational activities including rafting and hunting were cited as potentially impacted by aircraft overflights during public hearings. Neither the general reduction in lower level overflights and lower noise levels throughout most of Owyhee County nor the increase in overflights near a selected alternative or over Jacks Creek were projected to result in significant environmental impacts.

### 4.12.3 Alternative C — Grasmere

Implementation of Alternative C would require that certain lands in Owyhee County be set aside for the tactical training range, no-drop target areas, and emitter sites. These lands, currently under the control of the BLM and the State of Idaho, are primarily used for grazing and primitive recreation. In addition to the proposal to withdraw lands, State of Idaho school endowment lands would be leased to the Air Force. Socioeconomic impacts anticipated under Alternative C are generally similar to those expected under Alternative B.

The focus of the analysis for this alternative consists of the lands within the tactical training range, including public (approximately 8,640 acres) and state (2,360 acres) school endowment lands. The 640-acre no-drop target area, five-acre no-drop sites, one-acre emitter sites, and one-quarter-acre emitter sites were not analyzed due to the negligible impact to grazing and loss of AUMs. The total acreage analyzed is 11,000 acres (approximately 8,640 public lands, 2,360 state lands).

### 4.12.3.1 Economic Activity

Implementation of Alternative C would generate similar effects on population and employment as those expected under Alternative B. Economic activity in the region would increase during construction of range facilities, estimated to be phased over a three-to-four year period. Longer-term impacts to population, employment, and income would not be significant under this alternative.

### 4.12.3.2 Public Services and Public Finance

Several assumptions were made for estimating training range impacts on public services and public finance. These assumptions are described in section 4.12.2.2.

Potential impacts to Owyhee County revenues resulting from implementation of Alternative C would be relatively minor. The projected change in county revenues, related entirely to reductions in PILT, are not expected to result in any measurable effect on the county's ability to provide services. Impacts to other public service and public finance resources would be the same as described in section 4.12.2.2.

Owyhee County receives PILT as compensation for property tax losses due to government ownership of land within its boundaries. Under Alternative C, the Air Force proposes to withdraw approximately 9,264 acres of public land required for development of the training range, no-drop target areas, and emitter sites. Transfer of these lands to the Air Force would result in the permanent loss of approximately $1,081 in annual PILT revenues for Owyhee County. Annual county revenues amount to $3,455,559 of which $423,000 are PILT; therefore, a loss $1,081 represents less than 1 percent of PILT revenues and less than one-tenth of 1 percent of total county revenues.

### 4.12.3.3 Livestock Grazing

#### *Regional Economic Consequences*

The regional economic consequences of Alternative B are essentially equivalent to those preserved for Alternative C. The total regional consequences of loss of 1,000 acres of grazing land are not expected to exceed $4,000 annually.

### *SITE SPECIFIC QUANTIFIABLE CONSEQUENCES*

The net operating income analysis is based on typical cow and calf operations. The financial budgets used in conducted the analysis were provided by the University of Idaho Cooperative Extension System (Smathers et al. 1996). Typical operations in the Grasmere area were based on an annual cow-calf budget for a 500-cow herd grazing on public lands for a ten and a half month season of use. It is assumed that the number of AUMs permitted set the size of the operation. The affected allotment acreage was combined and treated as a single operation to simplify estimates. The estimated reduction in herd size is based on the loss in forage (AUMs) associated with the lands to be withdrawn or leased for the tactical training range.

The Air Force is committed to insuring that the specific ranching operations affected by selection of a training range alternative is not adversely impacted. Specific Air Force and rancher agreements will be entered into to make the affected rancher operationally functional on a comparable basis to that which existed prior to selection of the alternative. These agreements are expected to cover direct compensation and/or compensation in kind including fencing, pipelines, and storage reservoirs for the selected alternative and for grazing land agreed to as payment in-kind.

Impacts from the creation of a training range at Grasmere are similar to those for Clover Butte. Disruptions to ranching operations are comparable. The land estimated to be required for the Grasmere impact areas and the estimated AUMs is presented in Table 4.12-3.

**Table 4.12-3. Summary of Livestock Grazing Impacts — Alternative C**

| | |
|---|---|
| Affected acreage | 11,000 |
| Affected AUMs | 983 |
| Change in grazing fees | -$2,092 |
| Change in annual net operating income | -$5,297 |
| Change in annual direct labor earnings | -$4,203 |

Implementation of Alternative C would require the acquisition of approximately 11,000 acres of federal and state grazing allotment lands, as described in section 3.12.4.2. Assuming that AUMs are evenly distributed over each allotment, 983 AUMs would be affected by withdrawal of acreage for the proposed Grasmere training range. Based on 1996 grazing fees of $1.35 per AUM on public lands and $4.88 per AUM on state lands collected over a six-month grazing season, fees collected by BLM and the state would be reduced by $1,034 and $1,058, respectively, for a total loss of $2,092. The state lease of affected school endowment lands to the Air Force would, at a minimum, compensate the state for potential lost grazing fees.

During the past 10 years, the federal grazing fee has fluctuated by an amount of approximately 50 percent of the current fee (see Table 3.12-14). For this analysis, the BLM grazing fee impact was based on the current federal grazing fee, which is at a 10-year low. Therefore, depending on future variations in the fee, the potential lost grazing fees could be greater than the estimated loss of $1,034. Even taking this potential variation into account, however, the potential losses would amount to less than 1 percent of total grazing fees for Owyhee County.

The cow-calf budget used for this analysis, developed by the University of Idaho Cooperative Extension System (Smathers et al. 1996), provides a detailed accounting of the expected revenues and costs, on a per-head basis, of a typical 500-cow herd summered and wintered on public lands. Revenues for the typical cow-calf operation are the gross receipts received for steer calves, heifer calves, aged bulls, cull cows, and cull heifers. Operating costs include feed requirements, marketing, veterinary medicine, equipment maintenance and repair, and labor (see Table 4.12-1). An incremental change in the herd size of the operation affects both the expected revenues and costs of the operation. The difference between the change in revenue and the change in operating costs is the change in net operating income for the affected ranch. The change in net operating income for a hypothetical ranching operation at Grasmere is determined by applying the number of affected animal units associated with this alternative, which is determined by the number of affected AUMs, to the cow-calf budget model.

Based on the assumptions described in the previous paragraph, the change in annual net operating income to the livestock industry under Alternative C is estimated to be $5,297. Reducing herd size to accommodate reduced forage also reduces the level of direct labor needed to support the operation. The net income analysis yields a change in labor earnings amounting to an annual loss of approximately $4,203. Consequently, employment losses in the livestock industry under Alternative C would be less than one full-time job.

The livestock grazing impacts described in the preceding paragraphs represent the potential effects associated with removal of the 12,000-acre training range from grazing. In actuality, all but about 1,000 acres, including the 300-acre primary ordnance impact area, roads, and emitter sites, would be grazed at some level. Therefore, the estimated impacts represent an absolute worst-case scenario, which would likely be mitigated to some extent by continued grazing that would take place on the balance of the withdrawn lands.

#### 4.12.3.4 MINING

The mineral survey conducted for this study indicates that no economically viable mineral deposits are known to exist on lands affected by implementation of Alternative C. In addition, that access to all currently existing claims would not be impaired by development of the range. Consequently, no negative impact on mining is anticipated given that mineral right holders continue to be granted reasonable access to their claims.

#### 4.12.3.5 RECREATION

In addition to the recreational hunting of game birds, water resources within the fenced area of the Grasmere Alternative have the potential for supporting a low level of seasonal recreational hunting of waterfowl. The 30 acres of surface water removed from recreational use would not have a significant or adverse impact on recreational economies.

### 4.12.4 Alternative D — Juniper Butte

Implementation of Alternative D would require that certain lands in Owyhee County be set aside for the tactical range, no-drop target areas, and emitter sites. These lands, currently under the control of the BLM and the State of Idaho, are primarily used for grazing and primitive recreation. In addition, the proposal to withdraw lands, State of Idaho school endowment lands associated with this alternative would be leased to the Air Force. Socioeconomic impacts anticipated under Alternative D are generally similar to those expected under Alternative B, except as noted in the following sections.

The focus of the analysis for this alternative consists of the lands within the tactical training range, including public (10,600 acres) and state (960 acres) school endowment lands. The 640-acre no-drop target area, five-acre no-drop sites, one-acre emitter sites, and one-quarter-acre emitter sites were not analyzed due to the negligible impact to grazing and loss of AUMs. The total acres analyzed for this alternative are 11,560 (10,600 public, 960 State).

#### 4.12.4.1 ECONOMIC ACTIVITY

Implementation of Alternative D would generate similar effects on population and employment as those expected under Alternative B. Economic activity in the region would increase during construction of range facilities, estimated to be phased over a three-to-four year period. Longer-term impacts to population, employment, and income would not be significant under this alternative

#### 4.12.4.2 PUBLIC SERVICES AND PUBLIC FINANCE

Several assumptions were made for estimating impacts of Alternative D on public services and public finance. These assumptions are described in section 4.12.2.2.

Potential impacts to Owyhee County revenues resulting from implementation of Alternative D would be relatively minor. The projected change in county revenues, related entirely to reductions in PILT, are not expected to result in any measurable effect on the county's ability to provide services. Impacts to other public service and public finance resources would be the same as described in section 4.12.2.2.

Owyhee County receives PILT as compensation for property tax losses due to government ownership of land within its boundaries. Under Alternative D, the Air Force proposes to

withdraw approximately 11,269 acres of public land required for development of the training range, no-drop target areas, and emitter sites. Transfer of these lands to the Air Force would result in the permanent loss of approximately $1,315 in annual PILT revenues for Owyhee County. Annual county revenues amount to $3,455,559 of which $423,000 are PILT; therefore, a loss $1,315 represents less than 1 percent of PILT revenues and less than one-tenth of 1 percent of total county revenues.

### 4.12.4.3 LIVESTOCK GRAZING

#### *REGIONAL ECONOMIC CONSEQUENCES*

The regional economic consequences of Alternative D are essentially equivalent to those preserved for Alternative C. The total regional consequences of loss of 1,000 acres of grazing land are not expected to exceed $4,000 annually.

#### *SITE SPECIFIC QUANTIFIABLE CONSEQUENCES*

The net operating income analysis is based on typical cow and calf operations on the directly impacted allotment. The financial budgets used in conducting this analysis were provided by the University of Idaho Cooperative Extension System (Smathers et al. 1996). Typical operations in the Juniper Butte area were based on an annual cow-calf budget for a 500-cow herd grazing on public lands for a ten and a half month season of use. It is assumed that the number of AUMs permitted set the size of the operation. The affected allotment acreage was combined and treated as a single operation to simplify estimates. The estimated reduction in herd size is based on the percentage loss in forage (AUMs) associated with the lands to be withdrawn or leased for the tactical training range.

The Air Force is committed to insuring that the specific ranching operations affected by selection of a training range alternative is not adversely impacted. Specific Air Force and rancher agreements will be entered into to make the affected rancher operationally functional on a comparable basis to that which existed prior to selection of the alternative. As noted for Clover Butte (section 4.12.2.3), these agreements are expected to cover direct compensation and/or compensation in-kind including fencing, pipelines, and an above-ground less than one-acre water storage reservoir for the selected alternative and for grazing land agreed to as payment in-kind.

The impacts from the creation of a training range at Juniper Butte are comparable to those described for Clover Butte. Ranching operations would be disrupted as described for Clover Butte. The amount of land estimated to be required for the impact areas and the estimated AUMs is presented in Table 4.12-4.

| Table 4.12-4. Summary of Livestock Grazing Impacts — Alternative D | |
|---|---|
| Affected acreage | 11,560 |
| Affected AUMs | 1,171 |
| Change in grazing fees | -$2,103 |
| Change in annual net operating income | -$6,312 |
| Change in annual direct labor earnings | -$5,010 |

Implementation of Alternative D would require the acquisition of approximately 11,560 acres of federal and state grazing allotment lands, as described in section 3.12.4.2. Assuming that AUMs are evenly distributed over each allotment, 1,171 AUMs would be affected by withdrawal of acreage for the proposed Juniper Butte training range. Based on 1996 grazing fees of $1.35 per AUM on public lands and $4.88 per AUM on state lands collected over a grazing season, fees collected by BLM and the state would be reduced by $1,381 and $722, respectively, for a total loss of $2,103. The state lease of affected school endowment lands to the Air Force would, at a minimum, compensate the state for potential lost grazing fees.

During the past 10 years, the federal grazing fee has fluctuated by an amount of approximately 50 percent of the current fee (see Table 3.12-14). For this analysis, the BLM grazing fee impact was based on the current federal grazing fee, which is at a 10-year low. Therefore, depending on future variations in the fee, the potential lost grazing fees could be greater than the estimated loss of $1,381. Even taking this potential variation into account, however, the potential losses would amount to less than 1 percent of total grazing fees for Owyhee County.

The cow-calf budget used for this analysis, developed by the University of Idaho Cooperative Extension System (Smathers et al. 1996), provides a detailed accounting of the expected revenues and costs, on a per head basis, of a typical 500-cow herd summered and wintered on public lands. Revenues for the typical cow-calf operation are the gross receipts received for steer calves, heifer calves, aged bulls, cull cows, and cull heifers. Operating costs include feed requirements, marketing, veterinary medicine, equipment maintenance and repair, and labor (see Table 4.12-1). An incremental change in the herd size of the operation affects both the expected revenues and costs of the operation. The difference between the change in revenue and the change in operating costs is the change in net operating income for the affected ranch. The change in net operating income for a hypothetical ranching operation at Juniper Butte is determined by applying the number of affected animal units associated with this alternative, which is determined by the number of affected AUMs, to the cow-calf budget model.

Based on the assumptions described above, the change in annual net operating income to the livestock industry under Alternative D is estimated to be $6,312. Reducing herd size to accommodate reduced forage also reduces the level of direct labor needed to support the

operation. The net income analysis yields a change in labor earnings amounting to an annual loss of approximately $5,010. Consequently, employment losses under Alternative D would be less than one full-time job.

#### 4.12.4.4 MINING

The mineral survey conducted for this study indicates that no economically viable mineral deposits are known to exist on lands affected by implementation of Alternative D. Access to all currently existing claims would not be impaired by development of the range. Consequently, no negative impact on mining is anticipated given that mineral right holders continue to be granted reasonable access to their claims.

#### 4.12.4.5 RECREATION

The Juniper Butte Alternative is comparable to Clover Butte. This alternative supports a limited game bird population but the impacts to the recreation economics are not considered significant. Consequences to recreational economics are comparable to Clover Butte.

### 4.12.5 Shoshone-Paiute Concerns About Socioeconomics

Section 3.12.7 summarizes the current socioeconomic conditions on the Duck Valley Reservation. As concluded in the previous sections, socioeconomic impacts are not anticipated within Owyhee County. Implementation of any of the alternatives is not expected to generate significant or adverse impacts to the socioeconomic resources of the Duck Valley Reservation. There would be only relatively minor impacts to employment and community resources, and these would not be expected to disproportionately affect the residents of the Reservation (see section 4.12.6).

### 4.12.6 Environmental Justice

Executive Order 12898, titled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* 59 Federal Register 7629 (1994), directs federal agencies to incorporate environmental justice in their decision-making process. As such, federal agencies are specifically directed to identify and address, as appropriate, any disproportionately high and adverse environmental effects of their programs, policies, and activities on minority or low-income populations.

Within this EIS, environmental issues that could fall under the ethnic or economic groups considered in environmental justice have been addressed in detail in the respective environmental resource sections. For example, chapter 4.0 includes environmental resource issues raised by Shoshone-Paiute representatives that have been addressed in each respective resource section. The following socioeconomic discussion presents economic data that records income levels within the county with a special emphasis upon the Duck Valley Reservation and is followed by a summary of natural and cultural resource issues.

*Socioeconomic Summary.* Of the total 1990 population in Owyhee County, 82.6 percent were reported to be White, 3.3 percent Native American, less than 1.0 percent Black, less than 1.0 percent Asian or Pacific Islander, and 12.9 percent other race. Just over 15 percent of the population identify themselves as being of Hispanic origin; however, the majority of the Hispanic population resides in the northern part of the county (primarily in Homedale and Marsing), which is outside the region where potential impacts of any alternative would occur.

Census County Divisions (CCDs) were evaluated to provide more detail on the geographic distribution of ethnic groups in the region near or under military training airspace (see Table 4.12-5). CCDs are subdivisions of a county that are delineated by the Census Bureau for statistical purposes. The boundaries of CCDs usually are delineated to follow visible geographic features, and in most cases coincide with census tract or block numbering area boundaries. The name of each CCD is based on a place, county, or well-known local name that identifies its location. CCD data was considered more representative than census tract data because the CCD boundaries more closely follow the airspace boundaries.

The Native American population residing under the airspace is concentrated in the Western Shoshone Division of Owyhee County and the Mountain City Division of Elko County. Together, these two CCDs encompass the entire Duck Valley Reservation. The Mountain City Division includes the entire northwest quadrant of Elko County, while the Western Shoshone Division in Owyhee County is limited to the Duck Valley Reservation boundaries. Census data document that Native Americans account for 97 percent of the population in the Western Shoshone Division and 62 percent of the population in the Mountain City Division. The Hispanic population, which may include persons of any race, is concentrated in the Bruneau Division of Owyhee County (30 percent) and the Glenns Ferry Division of Elmore County (23 percent).

The population on the Duck Valley Reservation is approximately in the center of the MOA airspace. In recognition of potential impacts from military training overflights to residents of the Duck Valley Reservation, the Air Force has entered into an agreement that provides flight restrictions to protect Reservation residents (see section 1.4.4.2). In addition, the proposed ETI airspace expansion reduces noise effects north of the Reservation as described in section 4.2.7.

As described above, concentrations of ethnic populations do exist within the ROI. Actions already taken by the Air Force and the proposed redistribution of training overflights associated with ETI airspace are projected to result in no disproportionately high or adverse human health or environmental effects to these populations.

An estimated 7.1 percent of families and 9.4 percent of individuals in the county were living below the poverty level in 1990 as compared to state averages of 7.3 percent for families and 10.2 percent for individuals. The socioeconomic impacts analysis concluded that negligible

## Table 4.12-5. Ethnic Distribution of Population in Census County Divisions under Airspace[1] (ROI Three)

| | Owyhee County, ID | | | | Elmore County, ID | Elko County, NV | | Humboldt County, NV | Malheur County, OR | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Bruneau Division* | *Grand View Division* | *Murphy Division* | *Western Shoshone Division* | *Glenns Ferry Division* | *Mountain City Division* | *Jarbidge Division* | *McDermitt Division* | *Jordan Division* | *Total* |
| TOTAL | 592 | 954 | 194 | 188 | 1,214 | 1,323 | 132 | 1,206 | 921 | 6,724 |
| White | 441 | 830 | 181 | 3 | 987 | 447 | 117 | 677 | 898 | 4,581 |
| Black | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| American Indian | 21 | 12 | 2 | 183 | 9 | 824 | 0 | 394 | 12 | 1,457 |
| Asian | 0 | 0 | 3 | 0 | 14 | 2 | 0 | 6 | 2 | 27 |
| Other | 130 | 112 | 8 | 2 | 204 | 50 | 15 | 129 | 9 | 659 |
| Hispanic Origin[2] | 179 | 207 | 8 | 26 | 372 | 81 | 15 | 209 | 117 | 1,214 |
| | | | | | | | | | | |
| White | 74% | 87% | 93% | 2% | 81% | 34% | 89% | 56% | 98% | 68% |
| Black | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| American Indian | 4% | 1% | 1% | 97% | 1% | 62% | 0% | 33% | 1% | 22% |
| Asian | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% | 0% |
| Other | 22% | 12% | 4% | 1% | 17% | 4% | 11% | 11% | 1% | 10% |
| Hispanic Origin | 30% | 22% | 4% | 14% | 31% | 6% | 11% | 17% | 13% | 18% |

Notes: 1. Adjustments made to Grand View, Murphy, and Glenns Ferry Divisions to reflect population residing under the affected airspace.
2. Persons of Hispanic Origin of any race. This figure is not included in the Total as these individuals are already represented in the racial figures.

Source: Bureau of the Census 1990

economic impacts would occur as a result of implementation of any of the alternatives, and that the Hispanic and low-income populations residing within the county would not experience any disproportionately high or adverse impacts.

The relatively minor impacts to employment and community resources that may occur would also not be expected to disproportionately affect the residents of the Duck Valley Reservation (refer to section 4.12.5). Employment impacts associated with the range development alternatives are expected to result in the loss of less than one full-time job in the ROI. This minimal job loss is anticipated to be in the agriculture industry, specifically, livestock grazing. The agriculture industry accounts for 945 jobs in Owyhee County (30.3 percent of total county employment of 3,120 jobs) and 29 jobs at the Duck Valley Reservation (10.9 percent of total Duck Valley Reservation employment of 265 jobs). Therefore, the loss of even one full-time job represents a decline of less than 1 to 3 percent of agriculture employment and less than 0.1 percent of total employment in the county.

Under each of the range development alternatives, the three-to-four year period of construction of range facilities would create increased employment opportunities in Owyhee County and contribute to business sales of construction-related goods and services. In addition, operation of the range may generate minor changes in range support employment. However, it is not possible to determine whether these construction or operations jobs would be filled by members of the Shoshone-Paiute Tribes.

Construction jobs associated with range development have the potential for short-term socioeconomic benefits to county residents, including minority populations, but long-term socioeconomic effects are projected to be insignificant to minority or low-income populations.

*Natural and Cultural Resource Summary.* An objective of the ETI environmental justice analysis is to determine whether or not potential environmental impacts related to the ETI proposal would result in any disproportionately high and adverse impacts to minority and low-income populations within the ROI. Ideally, the identification of disproportionate impacts would be quantifiable or measurable. Some of the resource concerns expressed by members of the Shoshone-Paiute Tribes were not readily measurable but that fact did not in any way discount the environmental analysis within this EIS. The following summarizes the natural and cultural resources as they relate to environmental justice. The detailed environmental analysis in Chapter 4 for each respective resource is referenced.

Airspace

Shoshone-Paiute members expressed concern about the impacts of restricted airspace with any of the alternatives. The creation of restricted airspace associated with the development of Alternatives B, C, and D would not directly affect the Duck Valley Reservation. If the Grasmere Alternative were chosen, restricted airspace could affect flights to and near the Grasmere Airport. The ETI created airspace would not interfere with flights to and from the reservation, and

| | |
|---|---|
| | civilian aircraft would continue to use MOAs concurrently with military aircraft. No significant environmental effects to airspace are anticipated from the implementation of any of the alternatives; therefore, no disproportionately high and adverse environmental impacts to minority and low-income populations would occur. (See section 4.1.5) |
| Noise | Cumulative noise values ($L_{dnmr}$) for reference points near the Duck Valley Reservation and Fort McDermitt Reservation would decline or remain unchanged under each alternative. Depending upon which alternative is selected, cumulative noise levels could increase in specific locations that may potentially contain traditional cultural resources. Conversely, certain known traditional cultural properties could experience a decrease in cumulative noise levels. It is not expected that there would be any significant noise effects; therefore, no disproportionately high and adverse environmental impacts to minority and low-income populations would occur with the implementation of any of the alternatives. (See section 4.2.7) |
| Safety | The Air Force currently restricts overflights of the Duck Valley Reservation (see section 1.4.4.2). In addition, the statistical probability of an aircraft mishap underneath the affected airspace is very low for all alternatives. The controlled use of chaff and flares by the Air Force is not expected to create any health, or other significant environmental effects; therefore, no disproportionately high and adverse environmental impacts to minority and low-income populations would occur with the implementation of any of the alternatives. (See section 4.3.5) |
| Hazardous Materials and Solid Waste Management | No significant quantities of hazardous materials and solid waste would be generated under any of the alternatives; therefore, no disproportionately high and adverse environmental impacts to minority and low-income populations would occur with implementation of any of the alternatives. (See section 4.4) |
| Earth Resources | No potential environmental impacts to earth resources were identified by field studies or during scoping; therefore, no disproportionately high and adverse environmental impacts to minority and low-income populations would occur with implementation of any of the alternatives. (See section 4.5) |
| Water Resources | None of the range development alternatives would have significant impacts on surface water, floodplains, groundwater, or water rights; therefore, no disproportionately high and adverse environmental |

| | |
|---|---|
| | impacts to minority and low-income populations would occur with implementation of any of the alternatives. (See section 4.6.6) |
| Air Quality | Under any proposed alternative, air quality would not be significantly affected; therefore, no disproportionately high and adverse environmental impacts to minority and low-income populations would occur with implementation of any of the alternatives. (See section 4.7) |
| Biological Resources | Anticipated impacts to two species in particular (sage grouse and California bighorn sheep) are of special concern to the Shoshone-Paiute. Aircraft and other noise associated with the alternatives would not have a significant impact on sage grouse. Ground disturbance at the proposed Clover Butte and Grasmere Alternatives would be limited to the primary ordnance impact area, and there would be little potential for disturbing sage grouse in those locations. Neither California bighorn sheep nor suitable habitat for this species are known to occur in the Clover Butte or Juniper Butte areas or in the vicinity of the no-drop target areas, powerline corridor, roads, or emitter sites. Therefore, there would be no impact to bighorn sheep in these areas. California bighorn sheep are found within the western portion of the Grasmere Alternative. Ground disturbance within the primary ordnance impact area would have negligible impacts, but noise and human presence from training activities at Grasmere would have low to moderate impacts. Some members of the Shoshone-Paiute Tribes believe that Air Force overflights in the region have contributed to declines in some native species, and that any level of decline is significant. Scientific studies have indicated that various factors (e.g., loss of habitat) have contributed to these declines. The ETI biological resources analysis has concluded that some alternatives would have low to moderate impacts to sage grouse and California bighorn sheep. To the extent that the Shoshone-Paiute assign special cultural significance to these species, members of the Tribes may be particularly sensitive to such impacts. (See section 4.8.12) |
| Cultural Resources | Early Native American archaeological sites, some of which may be traditional cultural resources, would be adversely affected by any of the three range development alternatives, with the most resources affected at Grasmere, fewer at Clover Butte, and the fewest at Juniper Butte. To the extent that the Shoshone-Paiute assign special significance to these cultural resources, members of the Tribes may be particularly sensitive to such impacts. (See section 4.9) |

| | |
|---|---|
| Land Use and Transportation | The opportunity to pursue traditional activities within ROI Three would not be affected by land use or transportation issues associated with any of the alternatives. Improved roadways would lead to training range facilities, not to sensitive resource areas; therefore, no disproportionately high and adverse environmental impacts to minority and low-income populations would occur with implementation of any of the alternatives. (See section 4.10.5) |
| Recreation and Visual Resources | Recreational use of the area is not likely to be affected by any of the alternatives. Therefore, it is unlikely that recreation activities conducted by the Shoshone-Paiute would be affected, or that the level of vandalism of cultural resources by non-Native Americans would increase. Particular components of the range development alternatives located west of Highway 51 could have a visual impact on some of the traditional practices of the Shoshone-Paiute. To the extent that the visual intrusion on spiritual locations by electronic facilities and other modern structures affects the values that the Shoshone-Paiute place on the sanctity of these traditional cultural resources, they would be affected. (See section 4.11.5) |
| Socioeconomics | No significant socioeconomic impacts are anticipated within Owyhee County. Furthermore, implementation of any of the alternatives is not expected to generate significant or adverse impacts to the socioeconomic resources of the Duck Valley Reservation. There would be only minor impacts to employment and community resources, and these would not be expected to disproportionately affect the residents of the Duck Valley Reservation. (See section 4.12.6) |

### 4.12.7 Cumulative Impacts

As discussed in section 4.12, impacts to socioeconomic resources are not anticipated as a result of the ETI proposal. The foreseeable future projects are not expected to affect the economic activity, public services and public finance, livestock grazing, mining or recreation; therefore, cumulative impacts are not expected.

# 5.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

This chapter identifies any irreversible and irretrievable commitments of resources that would be involved if Enhanced Training in Idaho were constructed.

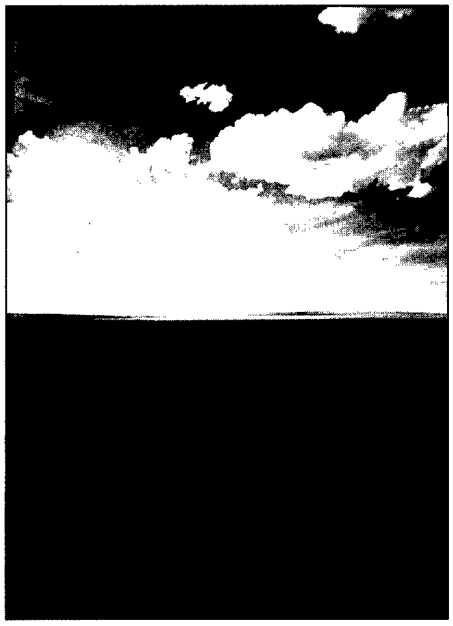
The National Environmental Policy Act (NEPA) requires that environmental analysis include identification of ". . . any irreversible and irretrievable commitment of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations.

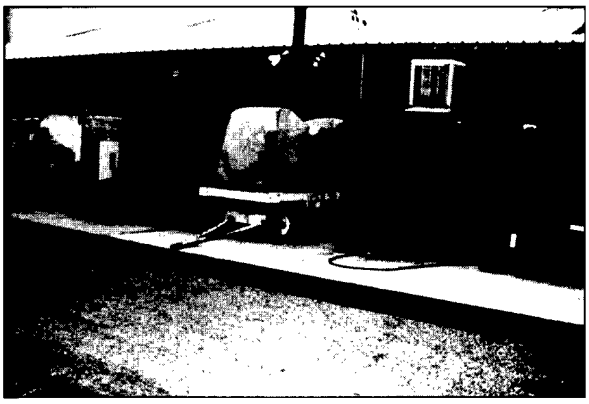
- Irreversible effects primarily result from use or destruction of a specific resource, such as energy and minerals, that cannot be replaced within a reasonable timeframe.
- Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action, such as disturbance of a cultural site. Unavoidable commitments of biological and cultural resources are identified.

The proposed training range would result in few direct and indirect commitments of resources. Most resource commitments are neither irreversible nor irretrievable. These would be related mainly to construction of the range components. Most impacts are short-term and temporary. Others that may have a longer effect can be reduced through appropriate measures. Those resources that may have a possible irreversible or irretrievable commitment are discussed in the following section.



Implementation of a training range alternative would commit resources to new and improved roadways, range, target, and emitter site construction, and maintenance of equipment. Construction would disturb some cultural resources and sensitive species that could not be avoided. This minor irreversible commitment of resources is primarily due to the Air Force's policy of mitigation by avoidance. Throughout the environmental process, the Air Force and cooperating agencies have endeavored to enhance training in Idaho while preserving the region's environmental resources.







# 5.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of ". . . any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site). The proposed training range would result in few direct and indirect commitments of resources; these would be related mainly to construction of the range components.

For the proposed alternatives, most resource commitments are neither irreversible nor irretrievable. Most impacts are short term and temporary. Others that may have a longer effect can be reduced through appropriate measures. Those resources that may have a possible irreversible or irretrievable commitment are discussed below.

The Shoshone-Paiute Tribes at the Duck Valley Reservation have expressed concern about possible disturbance to sacred sites and other traditional cultural resources. Although not precisely identified, the Shoshone-Paiute have indicated that locations of religious importance and traditional use would be impacted by construction and use of some emitter sites and no-drop targets. They have also expressed strong concerns about the effects of overflights on traditional resources. Impacts to sacred sites and measures that could potentially reduce or eliminate these impacts can be identified only through consultation with the affected Native American groups, as required by the American Indian Religious Freedom Act, the National Historic Preservation Act, the Archaeological Resources Protection Act, and Executive Order 13007. Efforts to consult with the Shoshone-Paiute Tribes have occurred and will continue. If avoidance or other mitigation measures are determined by the Shoshone-Paiute Tribes to be inadequate for eliminating impacts to traditional resources then the commitment of this resource may be irreversible or irretrievable.

Within the 12,000-acre training range, construction and use of the primary ordnance impact area and maintenance facility would have a high probability of an irretrievable commitment of vegetation. For Alternative B — Clover Butte, the loss of 24 acres of big sagebrush would constitute an irretrievable commitment of a resource. For Alternative C and D, approximately 15 and 169 acres, respectively, of shrubsteppe habitat would be lost. For Alternative D, the loss of individual slick spot peppergrass plants within 7.3 acres of the primary ordnance impact area, would result in an irretrievable commitment of resources.

Although it would be an outcome with a very low probability, conversion or loss of habitat for the entire 12,000-acre training range would result in a greater irretrievable commitment of the resource. If the entire 12,000-acre target area is considered lost habitat, then, under the Clover Butte Alternative, approximately 4,197 acres of big sagebrush would be an irretrievable commitment of resource. Both sage grouse and pronghorn antelope are dependent on shrubsteppe habitat. The amount of shrubsteppe habitat at Clover Butte is less than that found in the Grasmere Alternative but twice as much as that found in the Juniper Butte Alternative. No riparian habitat occurs in Clover Butte. For the Grasmere Alternative, about 6,553 acres of shrubsteppe habitat would be an irretrievable commitment of resource. The draws and canyons of the Grasmere site contain about 84.5 acres of riparian habitat that could potentially be lost. The wetland and riparian habitat found in Grasmere also are unique and surpass any other wetland or riparian habitat found in the other target areas in overall species diversity. Under the Juniper Butte Alternative, about 1,876 acres of shrubsteppe habitat would be an irretrievable commitment of resource. The shrubsteppe community is composed almost exclusively of rabbitbrush and is the least diverse among the target areas.

Construction and maintenance of targets and facilities during range development and use would require the consumption of limited quantities of aggregate, steel, concrete, petroleum, oil, and lubricants. The commitment of these resources would apply irrespective of the alternative selected.

Some soil disturbance and loss would occur as a result of the Enhanced Training in Idaho proposal. However, by following best management practices, the loss of soil would be very localized and slight.

Use of training ordnance during operations would involve a commitment of certain quantities of steel, concrete, and titanium tetrachloride. None of these items is considered rare and the long-term commitment of these resources would not have a substantial effect on their future availability. The commitment would apply irrespective of the alternative selected.

All alternatives, including the No-Action Alternative, would require fuel use by aircraft and surface vehicles. Training would continue under all alternatives so aircraft fuel use would potentially be similar regardless of the selected alternative.

Changing world situations and shifts in the strategies for national defense defined by the President and Congress dictate the training activities and support needs for all armed services. In the future, should such changes and shifts alter the training requirements, the Air Force would evaluate possible options to fulfill those requirements. Such changes could mean a removal or reduction of a range, as occurred when Department of Defense (DoD) returned over 300,000 acres of the old Saylor Creek Range to the public in 1963. If the range was no longer needed for training in the future, the Air Force would relinquish the withdrawn land to BLM. The Federal Land Policy Management Act describes this process for such relinquishment, including any appropriate site restoration, in accordance with the Resource Management Plan.

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AAA | Anti-Aircraft Artillery |
| AAMRL | Armstrong Aerospace Medical Research Laboratory |
| ACC | Air Combat Command |
| ACCI | Air Combat Command Instruction |
| ACEC | Area of Critical Environmental Concern |
| ACHP | Advisory Council on Historic Preservation |
| ACM | Air Combat Maneuver |
| AEF | Air Expeditionary Force |
| AESO | Aircraft Environmental Support Office |
| AFB | Air Force Base |
| AFI | Air Force Instruction |
| AFP | Air Force Pamphlet |
| AFOSH | Air Force Occupational Safety and Health |
| AFR | Air Force Regulation |
| AGL | Above Ground Level |
| AIRFA | American Indian Religious Freedom Act |
| ANG | Air National Guard |
| AQCR | Air Quality Control Region |
| ARPA | Archaeological Resources Protection Act |
| ARTCC | Air Route Traffic Control Center |
| AST | Aboveground Storage Tank |
| ATC | Air Traffic Control |
| ATCAA | Air Traffic Control Assigned Airspace |
| AUM | Animal Unit Month |
| AWACS | Airborne Warning and Control System |
| BAM | Bird Avoidance Model |
| BASH | Bird-Aircraft Strike Hazard |
| BBS | Breeding Bird Survey |
| BDU | Bomb Dummy Unit |
| BHB | Bruncan-Hardtrigger-Buncelvoir |
| BIA | Bureau of Indian Affairs |
| BLM | Bureau of Land Management |
| BOR | Bureau of Reclamation |
| BP | Babbington-Piline |
| BSU | Boise State University |
| CAA | Clean Air Act |
| CaO | calcium oxide |
| cc | cubic centimeters |
| CCD | Census County Division |
| CDNL | C-Weighted Day-Night Average Sound Level |
| CDP | Census Designated Place |
| CEQ | Council on Environmental Quality |
| CERCLA | Comprehensive Environmental Response Compensations and Liability Act |
| CERFA | Comprehensive Environmental Response Facilitation Act |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| CT | Continuation Training |
| CWA | Clean Water Act |
| CWT | Composite Wing Training |
| dB | Decibels |
| dB(A) | decibel (A-weighted) |
| dB(C) | CDNL in units of decibels |
| DEIS | Draft Environmental Impact Statement |
| DEQ | Division of Environmental Quality |
| DNL | Day-Night Average Sound Level |
| DoD | Department of Defense |
| DODI | Department of Defense Instruction |
| DOI | Department of the Interior |
| DOT | Department of Transportation |
| DRMO | Defense Reutilization and Marketing Office |
| DRMS | Defense Reuse Management System |
| EA | Environmental Assessment |
| EBS | Environmental Baseline Survey |
| EC | Electronic Combat |
| EDR | Environmental Data Resources, Inc. |
| EED | Electroexplosive Devices |
| EIAP | Environmental Impact Analysis Process |
| EIS | Environmental Impact Statement |
| E.O. | Executive Order |
| EOD | explosive ordnance disposal |
| EPCRA | Emergency Planning and Community Right-to-Know Act |
| ESA | Endangered Species Act |
| ESII | Envirosafe Services of Idaho |
| ETI | Enhanced Training in Idaho |
| EUA | Exclusive Use Area |
| F | Fahrenheit |
| FAA | Federal Aviation Administration |
| FEBA | Forward Edge of Battle Area |
| FEIS | Final Environmental Impact Statement |
| FEMA | Federal Emergency Management Agency |
| FFCA | Federal Facilities Compliance Act |
| FICON | Federal Interagency Committee on Noise |
| FIFRA | Federal Insecticide, Fungicide and Rodenticide Act |
| FIP | Federal Implementation Plan |
| FIS | Flood Insurance Study |
| FLPMA | Federal Land Policy and Management Act |
| FMZ | Fire Management Zone |
| FONSI | Finding of No Significant Impact |
| FTRC | Fallon Training Range Complex |
| FY | Fiscal Year |
| GAP | Gap Analysis Project |
| GCI | Ground Control Intercept |
| GIS | Geographic Information System |
| GYE | Greater Yellowstone Ecosystem |
| HAP | High Accident Potential |
| HASP | Health and Safety Plan |
| HAZMAT | Hazardous Materials |
| HMA | Herd Management Area |
| HSV | Hardtrigger-Snowmore-Vickery |
| ICDC | Idaho Conservation Data Center |
| IDANG | Idaho Air National Guard |
| IDARNG | Idaho Army National Guard |
| IDFG | Idaho Department of Fish and Game |
| IDHW | Idaho Department of Health and Welfare |
| IDWR | Idaho Department of Water Resources |
| IDL | Idaho Department of Lands |
| IFR | Instrument Flight Rules |

## LIST OF ACRONYMS AND ABBREVIATIONS (continued)

| | |
|---|---|
| IMACS | Intermountain Antiquities Computer Survey |
| IMP | Interim Management Policy |
| INPS | Idaho Native Plant Society |
| IR | Instrument Route |
| IRA | Indian Reorganization Act |
| ISHS | Idaho State Historical Society |
| ITD | Idaho Transportation Department |
| ITR | Idaho Training Range |
| KTAS | Knots True Airspeed |
| kW | kilowatt |
| Ldn | Day-Night Average Sound Level |
| Ldnmr | Onset Rate-Adjusted Monthly Day-Night Average Sound Level |
| Lmax | maximum sound level |
| MAILS | Multiple Aircraft Instantaneous Line Source |
| MCI | Major Command Instructions |
| MCL | maximum contaminant level |
| MFP | Management Framework Plan |
| mg/l | milligrams per liter |
| mm | millimeter |
| MOA | Military Operations Area |
| MRNMAP | MOA Range NOISEMAP |
| MRU | Military Radar Unit |
| MSL | Mean Sea Level |
| MTR | Military Training Route |
| MUA | Multiple Use Area |
| NAAQS | National Ambient Air Quality Standards |
| National Register | National Register of Historic Places |
| NATO | North Atlantic Treaty Organization |
| NAWC | Naval Air Warfare Center |
| NCA | National Conservation Area |
| NDOW | Nevada Department of Wildlife |
| NAFR | Nellis Air Force Range |
| NAGPRA | Native American Graves and Repatriation Act |
| NCDC | National Climatic Data Center |
| n.d. | no date |
| NEPA | National Environmental Policy Act |
| NGB | National Guard Bureau |
| NHPA | National Historic Preservation Act |
| NM | Nautical Miles |
| $NO_2$ | Nitrogen Dioxide |
| NOI | Notice of Intent |
| NPS | National Park Service |
| NWI | National Wetlands Inventory |
| $O_3$ | Ozone |
| ODFW | Oregon Department of Fish and Wildlife |
| OGOI | Operation Group Operating Instruction |
| OHV | off-highway vehicle |
| ONA | Outstanding Natural Area |
| ORE | Operational Readiness Exercise |
| ORI | Operational Readiness Inspection |
| PAA | primary assigned aircraft |
| Pb | Lead |
| PBR | Precision Bombing Range |
| PCB | polychlorinated biphenyl |
| PEL | Permissible Exposure Limit |
| PILT | Payments in Lieu of Taxes |
| PL | Public Law |
| $PM_{10}$ | particulates less than 10 microns in diameter |
| POD | Point of Diversion |
| POU | Place of Use |
| ppb | parts per billion |
| ppm | parts per million |
| PSD | Prevention of Significant Deterioration |
| psf | per square foot |
| RANS | Range Squadron |
| RAPCON | radar approach control |
| RCRA | Resource Conservation and Recovery Act |
| RF | Radio Frequency |
| RMP | Resource Management Plan |
| RNA | Research Natural Area |
| ROD | Record of Decision |
| ROI | Region of Influence |
| ROS | Recreation Opportunity Spectrum |
| RRP | Rubbleland-Rock outcrop-Pachic Argixerolls |
| RRTAC | Raptor Research and Technical Assistance Center |
| SAC | Strategic Air Command |
| SAM | Surface to Air Missile |
| SCR | Saylor Creek Range |
| SCS | Soil Conservation Service |
| SEAD | suppression of enemy air defenses |
| SECAF | Secretary of the Air Force |
| SEL | Sound Exposure Level |
| SHPO | State Historic Preservation Officer |
| SIP | State Implementation Plan |
| $SO_2$ | Sulfur Dioxide |
| SRMA | Special Recreation Management Area |
| SRP | Snake River Plain |
| SUA | Special-Use Airspace |
| SWDA | Solid Waste Disposal Act |
| TCP | Traditional Cultural Property |
| TDS | total dissolved solids |
| THC | Total Hydrocarbons |
| T.O. | Technical Order |
| TSCA | Toxic Substance Control Act |
| TSD | treatment, storage or disposal |
| TSP | Total Suspended Particulates |
| USACE | United States Army Corps of Engineers |
| USC | United States Code |
| USEPA | United States Environmental Protection Agency |
| USFS | United States Forest Service |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| UTTR | Utah Test and Training Range |
| VCA | Vertebrate Characteristics Abstract |
| VFR | Visual Flight Rules |
| VOC | Volatile Organic Compounds |
| VR | Visual Route |
| VRM | Visual Resource Management |
| WSA | Wilderness Study Area |
| WZ | Wickahoney-Zecanyon |