

EGLIN AIR FORCE BASE Florida

TEST AREA C-72 AND LINE OF SIGHT

FINAL RANGE ENVIRONMENTAL ASSESSMENT (REA), REVISION 1



July 2011

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FINDING OF NO SIGNIFICANT IMPACT
FOR
TEST AREA C-72 AND LINE-OF-SIGHT
RANGE ENVIRONMENTAL ASSESSMENT
ON EGLIN AIR FORCE BASE, FLORIDA

RCS 98-579 Revision 1, 2011

This finding, and the analysis upon which it is based, was prepared pursuant to the President's Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA) and its implementing regulations as promulgated at 40 Code of Federal Regulations Part 1500 (40 CFR 1500-1508) plus USAF *Environmental Impact Analysis Process* as promulgated at 32 CFR Part 989.

The Department of the Air Force has conducted a Range Environmental Assessment (REA) of the potential environmental consequences associated with testing activities and line-of-sight tree clearing activities at Test Area (TA) C-72 on Eglin Air Force Base, Florida (Eglin). That July 2011 REA is hereby incorporated by reference into this finding.

PURPOSE AND NEED

REA Section 1.2, page 1-3

The purpose of and need for the Proposed Action is twofold:

1. Purpose: To quickly and efficiently process new programs requesting access to TA C-72 during both routine and crisis situations.

Need: To provide military users a quick response to priority needs during war or other significant military involvement, as well as maintain the current approval process for routine uses.

2. Purpose: To update the NEPA analysis by reevaluating the mission activities and performing a cumulative environmental analysis of all mission activities.

Need: The need associated with this item is multifaceted and is described below.

Eglin previously performed environmental analysis on mission activities at TA C-72 in the 1999 *Test Area C-72 Final Programmatic Environmental Assessment*. Some of Eglin's mission activities have changed since the original environmental analysis was done, requiring performance of new environmental analysis. Currently, when approval for a new mission is requested, it may be categorically excluded from additional environmental analysis if it is similar in action to a mission that has been previously assessed and the assessment resulted in a finding of no significant impact (FONSI). The categorical exclusion (CATEX) designation is in

accordance with NEPA and Air Force (AF) regulations, 32 CFR 989.13 and AF Instruction 32-7061.

Since the time that some of these ongoing mission activities, as well as some mission activities used for CATEX purposes, were originally assessed, changes have occurred at Eglin that could affect environmental analysis. These changes, outlined below, create a need to reevaluate the NEPA analysis individually and cumulatively.

- Additional species have been given federal and state protected status.
- Species that were not previously known to exist at Eglin have been discovered.
- Additional cultural resources have been discovered and documented.
- The population of communities along Eglin's borders has increased with encroachment as a concern.
- Air Force regulations have changed.
- Military missions and weapons systems have evolved.

The analysis in this report provides a cumulative look at the impact on TA C-72 receptors from all mission activities. The environmental analysis is accomplished by evaluating the effect that the military mission activities and expendables have on Eglin's natural, physical and cultural environment. By implementing an authorized level of activity, range management will be streamlined and cumulative environmental impacts will be more fully considered.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Proposed Action (REA Section 1.2, pages 1-1 to 1-3)

The Proposed Action is for the 46th Test Wing to establish a new authorized level of activity for TA C-72 that is based on an anticipated maximum usage in addition to line-of-sight tree clearing activities. Demonstrating that the individual and cumulative effects of this usage level do not have significant environmental impact is the method for establishing the maximum threshold baseline, which is being identified as the Range Environmental Impact Analysis Process Baseline. The environmental analysis is accomplished by evaluating the effect that the military mission activities and expendables have on Eglin's natural, physical and cultural environment.

Neither Alternative 1 nor the No Action Alternative are expected to be sufficient to account for the expected growth of testing and training activities at Eglin over the next 10 years. Therefore, Alternative 4 (a combination of Alternatives 2 and 3) was selected as the Preferred Alternative to adequately cover the environmental analysis needed to support potential increased testing and training requirements as they occur as well as authorize line-of-sight tree clearing activities.

No Action Alternative (REA Section 2.2.1, page 2-1)

This alternative is defined as authorizing the level of activity approved in the 1999 TA C-72 Programmatic Environmental Assessment, which authorized a 100 percent increase in test and

training missions and associated expendables over the baseline level captured in the *Fiscal Year 1995-1997 (FY1995-1997) Range Utilization Report* and anticipated mission additions.

Alternative 1 (REA Section 2.2.2, page 2-3)

Alternative 1 would authorize the current level of activity plus foreseeable future activities. The current level of activity is defined as the maximum annual expenditure for each type of expendable from FY1998 through FY2008; this approach accounts for periods of low or no activity of a certain mission. Future TA C-72 expenditures will include increased munition expenditures associated with ground training activities from new user groups, including the 7th Special Forces Group and the Joint Strike Fighter. Air-to-ground and ground-to-ground munitions testing and training constitute the majority of missions on TA C-72, but other testing and training missions also occur on TA C-72. This alternative would be implemented using management actions identified in the REA.

Alternative 2 (REA Section 2.2.3, page 2-3)

This alternative is defined as authorizing the level of activity as described under Alternative 1, plus an increase in mission activity to achieve an optimum usage level, including management actions identified in the REA. The optimum usage level was chosen as a likely maximum surge increase in military testing during a national defense contingency.

Alternative 3 (REA Section 2.2.4, pages 2-3 to 2-6)

This alternative authorizes line-of-sight tree clearing and maintenance activities. Tree clearance is required because video tracking sites are obstructed from viewing test missions. It was recognized that a failure to remove the trees could result in valuable data loss on Eglin test missions. Four different methods have been proposed which are described in more detail in Section 2.2.4: (1) Harvest trees, (2) cut all trees with a Gyro-Trac machine, (3) apply herbicide and (4) cut trees and leave them in place. One or more of these methods may be utilized depending on the terrain and proximity to sensitive areas such as creeks and wetlands. Forestry operations outside the test area that fall within proposed line-of-sight tree clearing areas would continue, provided that operations are conducted in accordance with Eglin's *Integrated Natural Resources Management Plan*.

Alternative 4 (REA Section 2.2.5, page 2-6)

Alternative 4 proposes all of the activities described in Alternatives 2 and 3. This involves an increase in TA C-72 operations over the current level of activity to achieve an optimum usage level plus foreseeable future activities as described under Alternative 2 and line-of-sight tree clearing and maintenance as described under Alternative 3.

Preferred and Selected Alternative (REA Section 2.4, pages 2-10 to 2-11)

The Preferred and Selected Alternative is Alternative 4, which allows an increase in TA C-72 operations over the current level of activity to achieve an optimum usage level plus foreseeable

future activities and line-of-sight tree clearing activities. Implementation of management actions will allow a surge in test and training activities while minimizing impacts to environmental and natural resources.

ENVIRONMENTAL IMPACTS

Analysis was conducted to determine the potential impacts to the human and natural environments resulting from the Proposed Action and Alternatives. No significant impacts to resources have been identified under any of the alternatives (REA Section 2.3, pages 2-6 to 2-10), provided the management actions detailed in Section 2.5 (pages 2-11 to 2-19) of the REA are implemented.

Chemical Materials/Range Debris (REA Section 4.1, pages 4-1 to 4-7)

Munition fragments and residue would result from testing and training missions. Releases to the environment from munitions utilized in proficiency and qualification training require reporting to the U.S. Environmental Protection Agency (USEPA) under the *Emergency Planning and Community Right-to-Know Act's* Toxic Release Inventory (TRI) program. Eglin has developed procedures to comply with TRI reporting requirements and would track ordnance use associated with the proposed alternatives. Although the release of some chemicals would increase from the previously assessed baseline (or No Action Alternative), no new TRI thresholds would be exceeded and adverse effects are not anticipated under any of the alternatives. Under Alternative 3, Option 3, extensive expenditures of potentially toxic chemical herbicides would be dispensed into the environment. However, only qualified, licensed and trained professionals would be permitted to dispense herbicide. Also, all herbicide applications would follow the strict guidelines, mitigations and management actions set forth in the *Environmental Assessment for Long-Term Vegetation Control on Eglin*. No adverse impacts are expected if all applicable restrictions, mitigations and management actions are followed.

Soils (REA Section 4.2, pages 4-7 to 4-19)

No significant impacts to soils are expected under any of the alternatives. Munitions residue concentrations in the soil would be below Eglin background and USEPA risk-based concentrations. Munitions training and foot and vehicle traffic could cause soil erosion, particularly on sparsely vegetated slopes. However, adherence to management practices would decrease erosion potential. Tree-clearing and maintenance activities under Alternatives 3 and 4 could induce erosion. However, adherence to management practices would decrease the potential.

Water Resources (REA Section 4.3, pages 4-19 to 4-27)

No significant impacts to water resources are expected under any of the alternatives. Expendables residue would not likely contaminate groundwater or surface waters. Wetland impacts and sedimentation due to erosion would be controlled by management requirements. No actions would modify the floodplain. Line-of-sight tree clearing and maintenance activities under

Alternatives 3 and 4 could affect water resources by inducing erosion or introducing herbicides. However, adherence to management practices would decrease the potential for such impacts.

Biological Resources (REA Section 4.4, pages 4-27 to 4-49)

Potential impacts to biological resources are not expected from any of the alternatives. Direct physical impacts to Okaloosa darters, Florida black bears, gopher tortoises and red-cockaded woodpeckers (RCWs) are possible from munitions and vehicles; however, the likelihood of one of these animals being struck is extremely low.

Noise associated with mission activities may affect RCWs; however, the species continues to thrive on and near TA C-72. The presence of suitable habitat appears to outweigh any negative influences associated with mission-related noise. Wildfires are possible from munitions, pyrotechnics and ground operations. Check-in procedures prior to hot missions will minimize the probability of a damaging hot wildfire.

Potential impacts from tree-clearing actions under Alternatives 3 and 4 may impact biological resources. Implementation of management actions is essential to minimize potential impacts to sensitive species and their habitats. Adherence to procedures and restrictions near Okaloosa darter stream habitat would reduce the possibility of potential negative impacts on the species. Tree-clearing actions must be completed in accordance with avoidance and minimization measures described in REA Section 2.5, including following the Florida Department of Agriculture and Consumer Services' (FDACS's) *Best Management Practices for Silviculture*. Adherence to procedures and restrictions within RCW habitat would reduce the possibility of potential negative impacts to the species.

Overall, impacts to biological resources from the Proposed Action and Alternatives would not be significant and are not likely to adversely affect sensitive species and their habitats. Implementation of management actions would minimize any negative effects from mission activities. Eglin's Natural Resources Section (96 CEG/CEVSN) has conducted an *Endangered Species Act* Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) (REA Appendix G).

Cultural Resources (REA Section 4.5, pages 4-49 to 4-50)

No adverse effects to cultural resources would occur under any of the alternatives.

Air Quality (REA Section 4.6, pages 4-50 to 4-57)

Impacts to air quality are not expected to be adverse under any of the alternatives. The emission concentrations are within federal standards and would not cause adverse effects to the regional air quality. Also, emissions would make up less than one percent of Walton County's emissions. The increase in fugitive dust would be short-term and temporary.

Noise (REA Section 4.7, pages 4-57 to 4-59)

The munitions used on TA C-72 would cause noise levels of less than 115 P-weighted (impulse sound) decibels, and receptors would not be adversely affected by noise under any of the alternatives. Noise from tree-clearing operations under Alternatives 3 and 4 would increase the amount of noise; however, this level of noise is not expected to attenuate beyond the Eglin range borders or adversely affect the public.

Safety/Restricted Access (REA Section 4.8, pages 4-59 to 4-62)

There are no adverse effects to safety under any of the alternatives. TA C-72 is located in an area that is permanently closed to the public. Areas surrounding TA C-72 could potentially be restricted to the public during certain training and testing operations and in areas where tree-clearing procedures would take place. However, any adverse impacts associated with temporary closures to public-access locations are anticipated to be minor and temporary, lasting only for the duration of the activities under all alternatives. Policies and procedures are already in place to ensure the safety of Eglin personnel during missions.

Socioeconomics (REA Section 4.9, pages 4-63 to 4-64)

Minor and temporary noise impacts to the community are anticipated under all of the alternatives. Frequency of mission activities would increase under Alternative 1 and would be more frequent under Alternative 2, potentially resulting in a greater number of noise complaints. To minimize potential impacts, weather conditions should be considered prior to any detonation of explosive material and monitored during testing and training activities to prevent noise propagation beyond base boundaries. Under Alternative 3 no adverse noise impacts to the public would be anticipated from tree-clearing activities. TA C-72 is permanently closed to the public, and public access to areas outside TA C-72 would be restricted during tree-clearing activities. Thus, there would be no adverse impacts to the public under Alternative 3.

Alternative 4 presents the most potential for noise impacts to the public from expenditures and tree-clearing activities described under Alternative 2 and Alternative 3. However, the noise associated with both Alternative 2 and Alternative 3 are not anticipated to attenuate beyond the range boundaries above 115 decibels. To minimize potential undesirable noise levels to public areas outside the reservation boundary, environmental and weather conditions should be taken into consideration prior to detonation of explosive materials and monitored during any testing and training activities.

PUBLIC NOTICE

A public notice was published in the *Northwest Florida Daily News* on 6 April 2011 inviting the public to review and comment on the Draft REA and Draft FONSI. The public comment period closed on 21 April, and no public comments were received. State agency comments were received and have been addressed in Appendix H, *Public Involvement*, of the Final REA.

Permits (REA Section 1.6, page 1-9)

None required.

Management Actions (REA Section 2.5, pages 2-11 to 2-19)

This REA was prepared with consideration that the following management requirements will be employed for all TA C-72 missions. The proponents are responsible for ensuring these management requirements are met.

Test and Training Activities:

General

- Comply with all requirements stated in Eglin Instruction 13-212, *Range Planning and Operations*.

Ordnance and Noise

- Observe a restriction of a maximum of 140-decibel noise level leaving the Eglin Reservation boundary. An approximate calculation is:
$$600 \times \text{the cube root of the net explosive weight (NEW)}$$
$$= \text{distance to the reservation boundary (in feet)}.$$
- No detonation can produce a seismic shock of more than one inch per second peak particle velocity when reaching any structure. An approximate calculation is:
$$60 \times \text{the square root of the NEW}$$
$$= \text{distance to the structure (in feet)}.$$
- Prior to detonation of explosive materials, consider the effects of current weather, as well as other safety parameters outlined in the test directive.
- All inert weapons on or near the surface, including practice bombs with spotting charge, must be recovered, removed and destroyed.
- Follow regulations for cleanup of debris and hazardous materials.
- Qualified personnel (described in individual test directives) will supervise the use of all pyrotechnic devices.
- Do not try to remove flag pyrotechnic devices that fail to detonate. Explosive ordnance disposal staff will be notified for dud disposal (described in individual test directives).

Pyrotechnics

- Prior to mission initiation, obtain the daily fire danger rating and follow restrictions per the *Eglin Wildfire Specific Action Guide*.
- Clean up debris (mandatory as described in individual test directives).
- Do not release chemicals or metals into streams indirectly by releasing toxic aerosols in the vicinity of streams.
- Do not release chemicals, metals or toxic aerosols within or near stands of mature longleaf pines.

- Adhere to the *Eglin Wildfire Specific Action Guide's* restrictions for pyrotechnics use.
- Release flares at altitudes that would ensure they burn completely prior to reaching the surface. Prior to testing, coordinate with 96 CEG/CEVSN concerning the fire weather index.
- Allow no deployment of flares when surface winds exceed 15 knots or when the fire index presents an unacceptable hazard.

Tactical Vehicle Operations

- All vehicles used as immobile targets must be rendered environmentally safe by removal of all fuels, oils and other chemical materials.
- Tactical vehicles must be moved only on range roads.

Soil Resources

- Design vegetation control practices to minimize surface disturbance and create implementation strategies for increasing vegetative cover.
- Control the location and design of mission activities to avoid creating adverse slope shapes or gradients and/or reducing vegetative cover.
- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Establish low-growing grassland communities on severely disturbed erosion response units.
- Design concave slope segments on newly constructed targets.
- Reduce the gradients of severely eroding slopes to the degree possible and revegetate.

Water Resources

- Conduct target and ordnance debris removal and disposal of solid debris from blanks, chaff, smokes and flares in accordance with AF regulations.
- Within 200 feet of water bodies, do not conduct digging or off-road driving, use pyrotechnics/munitions or detonate explosives.
- Use established roads to cross streams.
- Do not alter stream flow or withdraw water from TA C-72 streams.
- Do not drive within 100 feet of the slopes of headwater streams.

Biological Resources

- Ensure all mission personnel are informed of restrictions regarding protected species, either in verbal or written form. Provide maps when necessary.
- All vehicles and personnel must cross identified darter streams only at established crossings or on bridges.
- Contact 96 CEG/CEVSN when any munitions land in darter streams.

- Comply with hunting, trapping and fishing regulations established by 96 CEG/CEVSN and the Florida Fish and Wildlife Conservation Commission (FWC), unless 96 CEG/CEVSN and the FWC grant specific authorization to do otherwise.
- Do not remove any species of tree (exceptions can be made for Navy land survival training).
- Limit tree cutting to sand pine, slash pine, live oak (for tree thinning only) and scrub oak.
Do not cut down or alter longleaf pines for any reason.
- Coordinate with 96 CEG/CEVSN for all military activities within or near stands of mature longleaf pine and also those scheduled during RCW nesting season (late April through July).
- Adhere to the *Eglin Wildfire Specific Action Guide* restrictions regarding forest fire danger ratings for munitions and pyrotechnics. Per the guide, if fire danger is:
 - Moderate: There are no restrictions on pyrotechnics. A fire watch must be posted for a minimum of 20 minutes after use of pyrotechnics has been completed.
 - High: Use caution with pyrotechnics. Post a fire watch for a minimum of 30 minutes after use of pyrotechnics has been completed.
 - Very High: Restrict pyrotechnics to hand-thrown simulators or smoke grenades. NO FLARES are allowed below 1,000 feet above ground level. Limit BDU 33s and other munitions that may start fires to “safe” areas. Use simulators or grenades only on roads or in pits. Cleared areas for pyrotechnics should be a minimum of 1.5 times the blast radius.
 - Extreme: NO PYROTECHNICS are allowed without prior approval from the Wildland Fire Program Manager or designee at 96 CEG/CEVSNP (phone: 882-6233, fax: 882-5321).
- Fire danger can be determined by calling the dispatcher or on the Environmental Management website: (<https://em.eglin.af.mil/ems/emsn/emsn/>).
- Immediately notify Eglin’s Fire Department Dispatch of any wildfire.
- Do not drive nails or other objects into trees for any reason, unless there is special authorization to do so.
- Provide personnel with a description of the indigo snake and its behaviors and protections under federal law, and give them instructions not to injure, harm or kill this species.
- **Stop activities** if an eastern indigo snake is sighted and allow the snake to move away from the site before resuming activities.
- Comply with the USFWS standard protection measures as described in the *Programmatic Biological Assessment for the Eastern Indigo Snake*.
- Prior to land clearing or establishment of a new target area, contact 96 CEG/CEVSN for a gopher tortoise/indigo snake survey.
- Avoid gopher tortoise burrows by a minimum of 25 feet.
- Contact 96 CEG/CEVSN for relocation of any gopher tortoise burrows in imminent danger from munitions testing or training..
- Follow the FWC’s *Gopher Tortoise Permitting Guidelines* for relocation of gopher tortoises and commensals (i.e., indigo snake).
- Allow only transient (lasting less than two hours) foot traffic and vehicular traffic on established roads/trails within a 200-foot buffer around marked RCW trees. In addition,

halt activities if a black bear or gopher tortoise is sighted and allow the animal to move away from the site before resuming activities.

- When conducting ground training activities, follow the U.S. Army's Management Guidelines for the Red-Cockaded Woodpecker on Army Installations.
- Log and report sightings of endangered species (e.g., indigo snake) to 96 CEG/CEVSN.
- Do not use explosives or munitions within or near stands of mature longleaf pines.

Chemical Materials/Range Debris

- Examine areas in which small arms, including blank ammunition, are expended and pick up casings. Recycle blank cartridge casings (as described in individual test directives).

Cultural Resources

- Leave untouched any archaeological artifacts and immediately report their location to the Eglin Cultural Resources Branch (96 CEG/CEVSH) (described in individual test directives). However, should any inadvertent discoveries of archaeological material be made during the course of construction or demolition, all actions in the immediate vicinity will immediately cease and efforts shall be taken to protect the find from further impact. 96 CEG/CEVSH shall be contacted immediately when a discovery occurs.
- Report American Indian artifacts of any kind (e.g., arrowheads and pottery) to 96 CEG/CEVSH so the area can be marked.
- Areas marked or designated as cultural resource sites will be avoided and designated as restricted access areas.

Line-of-Sight Tree Clearing:

Water Resources

- Consult Eglin Environmental Management if tree clearing and/or line-of-sight maintenance activities are conducted in the vicinity of a wetland, including stream banks.
- In the vicinity of a wetland, including stream banks, hand-cut trees, where cut trees are left in place.
- Ensure that activities in wetlands do not significantly change the hydrologic condition of wetlands or the overall drainage pattern of the site.
- Do not significantly alter the natural drainage or flow patterns on forest lands immediately adjacent to wetlands.
- Do not conduct intensive site preparation such as bedding, raking and windrowing in wetlands.
- Conduct other activities in wetlands, such as tree harvesting, skidding and mat logging in accordance with requirements in FDACS's *Best Management Practices for Silviculture*.
- Establish appropriate buffer zones along perennial and intermittent streams, wetlands and flowing bodies of water.
- Conduct on-site pesticide handling (e.g., tank mixing, loading and rinsing equipment) away from streams, ponds, wells and roadside ditches.

- Where available, check reports of depth to groundwater and avoid application of herbicides to test areas having shallow groundwater (10 feet or less below the surface).
- Evaluate weather conditions (e.g., temperature, wind speed and precipitation), equipment capabilities and pesticide formulations to avoid pesticide drift into the water body buffer zone.
- Adhere to instructions on herbicide labels during handling, mixing and application.
- Require that all herbicide applicators who conduct treatment activities on Eglin must be Department of Defense- or state-certified pesticide applicators, or qualified individuals under direct supervision of a certified applicator.
- Employ a general 300-foot buffer zone around surface waters, wetlands and floodplains (unless using an herbicide labeled for water use), or determine the soil erodibility, slope and surface water width of a particular area and use that information along with that in Appendix F of the FDACS's *Best Management Practices for Silviculture* to create a smaller buffer zone (minimum 35 feet) as appropriate in areas with lower soil erodibility and slope—**only if the buffer is not already predetermined by a sensitive species or habitat.**

Biological Resources

Comply with the following avoidance and minimization measures to minimize potential erosion into darter streams:

- Follow FDACS's *Best Management Practices for Silviculture*.
- Provide all land-clearing personnel with restrictions regarding protected species, either in verbal or written form. Provide maps when necessary.
- Brief all land-clearing personnel on potential endangered species concerns before tree-clearing activities in endangered species habitat; contracts for such work must include clauses requiring coordination with an endangered species biologist from 96 CEG/CEVSN.
- Coordinate all forestry operations near Okaloosa darter streams with 96 CEG/CEVSN's forest management and wildlife elements, as well as the erosion control program manager.
- Visually monitor, for three years, the areas where tree clearing has occurred and take corrective action to control any erosion.
- Cut by hand and leave in place any trees within the primary special management zone (SMZ) that must be removed (i.e., no heavy machinery or road development).
- Prior to commencement of activities, ensure implementation of any modifications or conditions resulting from consultation with the USFWS (Appendix G).
- Comply with the following management criteria within primary SMZs, as defined by the FDACS's *Best Management Practices for Silviculture*:
- Clearcut harvesting is always prohibited within 35 feet of all perennial waters.
- Selective harvesting may be conducted to the extent that 50 percent of a fully stocked stand is maintained. The residual stand must conform to the following:
 - Trees are left to maintain the approximate proportion of diameter classes and species present prior to harvesting, except that oaks (other than water oaks) and

- den trees may be favored. However, in mixed pine/hardwood forests the residual stand may be composed of up to 90 percent hardwood and 10 percent pine, and den trees may be favored.
- Repeated entry into a harvested primary SMZ in brief intervals for additional harvesting is prohibited.
 - No trees will be harvested in stream channels or on the immediate stream bank.
 - Special emphasis should be given to the protection of very large trees and/or old trees, snags and cavity trees, and trees where any part of the canopy overhangs the water.
 - The following forestry activities are prohibited:
 - Mechanical site preparation
 - Loading decks or landings and log bunching points
 - Main skid trails, except to approach a designated stream crossing
 - Aerial application, mist blowing or operational application of pesticides or fertilizer, including any drift from nearby applications
 - Cleaning spray equipment or discharging rinse water from pesticide or fertilizer applications
 - Road construction except when crossing a water body
 - Site preparation burning on slopes of 18 percent or greater
 - Within any *secondary* SMZ, comply with the following management criteria as defined by FDACS's *Best Management Practices for Silviculture*. There are no timber harvesting limitations within the secondary SMZ (unrestricted selective harvesting and clearcut harvesting are both allowed.) However, the following operational restrictions apply:
 - No mechanical site preparation
 - No main skid trails (except for stream crossings), loading decks, or landings
 - No cleaning of spray equipment or discharging of rinse water from pesticide and fertilizer applications
 - No road construction except for stream crossings
 - No plowed firelines except during fire suppression
 - No site preparation burning on slopes of 18 percent or greater
 - When possible, plant longleaf pine seedlings on harvested interstitial areas.
 - Require all vehicles and personnel to cross identified darter streams only at established crossings or on bridges.
 - Comply with the following avoidance and minimization measures to minimize potential impact to RCWs:
 - Proposed tree-clearing areas must be surveyed prior to tree removal to ensure no undocumented cavity trees have been recently excavated.
 - No tree-clearing activities would be conducted within 200 feet of an active RCW tree during nesting season.
 - Proponent must ensure all mission and land-clearing personnel are informed of restrictions regarding protected species, either in verbal or written form. This will include maps when necessary.
 - All land-clearing personnel must be briefed on potential endangered species concerns before tree-clearing activities in endangered species habitat; contract

clauses will require coordination with a 96 CEG/CEVSN endangered species biologist.

- All inactive RCW trees must be surveyed and screened prior to tree cutting to ensure no birds are living in the cavities.
- In areas where the use of prescribed fire may be limited, use herbicides or mechanical means to maintain RCW foraging habitat.
- 96 CEG/CEVSN will continue monitoring of RCWs in the area.
- Prior to commencement of activities, ensure implementation of any modifications or conditions resulting from consultation with the USFWS (REA Appendix G).
- Provide personnel with a description of the indigo snake, its behaviors and protection under federal law and instruct them not to injure, harm or kill this species.
- Comply with the USFWS standard protection measures as described in the *Programmatic Biological Assessment for the Eastern Indigo Snake*.
- Log and report sightings of endangered species (e.g., the indigo snake) to 96 CEG/CEVSN.
- Personnel should stop activities if a black bear or gopher tortoise is sighted and allow the animal to move away from the site before resuming activities.
- Obtain approval from the 96 CEG/CEVSN's forest management element for any herbicide treatments in outstanding natural areas, significant botanical sites or high quality natural communities, or near aquatic preserves, Gulf sturgeon critical habitat or essential fish habitat, including specifics on application method, herbicide type, buffers and timing.
- Digitally map sensitive habitats using global positioning system/geographic information system tools and provide the maps to aerial herbicide applicators so they can avoid the areas unless otherwise specifically approved by the 96 CEG/CEVSN's forest management element.
- Restrict aerial application of nonaquatic-labeled pesticides near aquatic sensitive habitats.
- Time the application of herbicides to avoid upcoming rain events.
- Adhere to herbicide label instructions and USEPA-suggested mitigations during handling, mixing and application of herbicides.
- Require herbicide applicators conducting treatment activities on Eglin to be DoD- or state-certified pesticide applicators, or qualified individuals under direct supervision of a certified applicator.
- During the planning process, consider the objectives of the proposed activity and potential impacts from actions that disturb the soil surface or impact water quality.
- Identify sensitive areas and applicable best management practices to be used during herbicide applications.
- Continue herbicide treatments as needed to control vegetation, but reduce the intensity of treatments after the initial application and use prescribed fire for long-term maintenance.
- Brief the applicators (including contractors and their staff) regarding any potential endangered species concerns and applicable avoidance and minimization measures before the application of herbicide in endangered species habitat.
- Prohibit herbicide applications within 1,500 feet of ponds and sampling points located within a Florida Natural Areas Inventory (FNAI) Category 1 area (habitat known to

- support flatwoods salamanders) or FNAI Category 2 area (habitat with a strong potential to support flatwoods salamanders). Provide maps showing these areas to applicators.
- Prohibit applications of herbicides within 300 feet of known dusky gopher frog habitat or known Florida bog frog habitat.
 - Around designated Gulf sturgeon-critical habitat and Okaloosa darter streams, require a 300 foot buffer for nonaquatic-labeled herbicides that are toxic to fish and herbicides that are highly mobile and have the potential to contaminate groundwater.
 - Prohibit direct application of herbicides to water around designated Gulf sturgeon-critical habitat and in Okaloosa darter streams.
 - Prohibit herbicide applications within 1,500 feet of a bald eagle nest site during the breeding season (1 October through 15 May).
 - Do not allow ground application of herbicides using mechanized equipment within an RCW cluster during the nesting season.
 - In the event of manual application of herbicides within an RCW cluster, follow procedures outlined in the consultation for *Hexazinone Application on Interstitial Areas* (25 September 2001) or further coordinate with the USFWS.
 - Prohibit aerial applications of herbicides known to cause eye damage; permit only ground applications of these herbicides.

Air Quality

- To decrease potential for drift, do not allow aerial application of herbicides if wind speeds are greater than 10 miles per hour.

Environmental Justice and Risks to Children

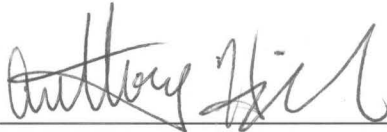
- Properly plan herbicide application missions to prevent the release of approved chemicals near populated areas.
- As per safety protocols, close areas on Eglin used for recreational purposes (hunting, fishing, camping, etc.) prior to application of herbicides and until applied herbicides have degraded to safe levels (dependant on labeled chemical persistence).

Safety

- Adhere to herbicide label instructions during handling, mixing, and application.
- Require all herbicide applicators conducting treatment activities on Eglin to be DoD- or state-certified pesticide applicators or qualified individuals under direct supervision of a certified applicator.
- For areas used by recreationists or other persons, post signs at the entrances of areas to be treated; on the sign, include the reason and time and duration of closure.
- Schedule herbicide application so that herbicides minimize impacts to hunting.
- Dispose of or recycle pesticide containers and/or excess pesticides according to local, state, and federal regulations and label requirements.
- Clean up and/or contain any pesticide spill immediately.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and the environmental analysis contained in the attached REA, and as summarized above, I find the proposed decision of the AF to implement the Preferred and Selected Alternative (Alternative 4), will not have a significant impact on the human or natural environment; therefore, an environmental impact statement is not required. This analysis fulfills the requirements of the NEPA, the President's Council on Environmental Quality and 32 CFR Part 989.



ANTHONY A. HIGDON, Colonel, USAF
Commander, 96th Civil Engineer Group

28 Jul 11

Date

**TEST AREA C-72
AND LINE OF SIGHT**

**FINAL RANGE ENVIRONMENTAL
ASSESSMENT (REA), REVISION 1**

Submitted to:

**96 CEG/CEVSP
Environmental Analysis Section
Eglin Air Force Base, Florida**

JULY 2011



PRINTED ON RECYCLED PAPER

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

46 TW	46th Test Wing
96 CEG/CEVSH	96th Civil Engineer Group/Cultural Resources Section
96 CEG/CEVSN	96th Civil Engineer Group/Natural Resources Section
96 CEG/CEVSP	96th Civil Engineer Group/Environmental Analysis Section
96 CES/CED	96th Civil Engineering Squadron
AAC	Air Armament Center
AFB	Air Force Base
AFI	Air Force Instruction
BA	Biological Assessment
BMP	best management practice
cal	caliber
CFR	Code of Federal Regulations
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dbh	diameter at breast height
dBp	P-weighted decibel
DDS	Data Delivery System
DNL	Day-Night Average Sound Level
DNL_{mr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
DoD	Department of Defense
EA	Environmental Assessment
EA/FBI	Eglin Air Force Base Instruction
EBD	Environmental Baseline Document
EF	Emission Factor
EFH	Essential Fish Habitat
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDEP	Florida Department of Environmental Protection
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
FWC	Florida Fish and Wildlife Conservation Commission
FY	fiscal year
GIS	geographic information system
GPS	global positioning system
HEI	high-explosive incendiary
Hz	Hertz
INPS	invasion non-native plant species
INRMP	Integrated Natural Resources Management Plan
INS	invasive non-native species
IWR	Impaired Waters Rule
JSF	Joint Strike Fighter
kg	kilogram
kg/m³	kilograms per cubic meter
LD	lethal dose
LDP	legacy debris pit
LUC	Land Use Controls
MAJCOM	Major Command
µg/m³	Micrograms Per Cubic Meter
mg/L	Milligrams Per Liter

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS, CONT'D

mm	millimeter
MOA	Military Operating Area
MOAB	Massive Ordnance Air Blast
MRTFB	Major Range Test Facility Base
MSL	mean sea level
MTR	military training route
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NEW	net explosive weight
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_x	nitrogen oxide
NRHP	National Register of Historic Places
NRS	Eglin Natural Resources Section (a.k.a. 96 CEG/CEVSN)
ORM	Operational Risk Management
PEA	Programmatic Environmental Assessment
pH	Potential of Hydrogen (a measure of acidity)
PK₁₅	Peak Noise Exceeded by 15 Percent of Firing Events
POL	Petroleum, Oil, and Lubricant
ppm	parts per million
RBC	Risk-Based Criteria
RCRA	Resource Conservation and Recovery Act
RCW	red-cockaded woodpecker
RDT&E	Research, Development, Test, and Evaluation
RDX	A type of explosive material
REA	Range Environmental Assessment
ROA	Range Operating Authority
ROI	region of influence
SBS	Significant Botanical Site
SDZ	Surface Danger Zone
SEL	Sound Exposure Level
SFG	Special Forces Group
SHPO	State Historic Preservation Officer
SMZ	Special Management Zone
SO₂	Sulfur Dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SPL	sound pressure level
TA	Test Area
TNT	2,4,6 Trinitrotoluene
TP	Target Practice
TRI	Toxic Release Inventory
TRI-DDS	TRI-Data Delivery System
TT	Test Target
TW	Test Wing
U.S.	United States
UESPA	U.S. Environmental Protection Agency
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UTTR	Utah Test and Training Range
UXO	Unexploded Ordnance

1. PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The Eglin Military Complex, located in the northwest Florida panhandle (Figure 1-1), is one of 19 component installations categorized as a Department of Defense (DoD) Major Range Test Facility Base (MRTFB). Eglin Air Force Base (AFB) is primarily situated among three counties: Santa Rosa County, Okaloosa County, and Walton County. In addition, Cape San Blas, part of a peninsula in Gulf County, is part of Eglin AFB.

Eglin AFB's primary function is to support research, development, test, and evaluation (RDT&E) of conventional weapons and electronic systems. It also provides support for individual and joint training of operational units. The Eglin Military Complex currently comprises four components (U.S. Air Force, 2001), which do not include the cantonment or main base areas:

- 1) Test areas/sites
- 2) Interstitial areas (areas beyond and between the test areas)
- 3) Eglin Gulf Test and Training Range
- 4) Airspace (overland and water)

The U.S. Air Force Air Armament Center (AAC) has responsibility for the Eglin Military Complex and for all its users, which include DoD, other government agencies, foreign countries, and private companies. For Range operations, the AAC provides environmental analyses and necessary National Environmental Policy Act (NEPA) documentation to ensure compliance with U.S. Air Force policy and applicable federal, state, and local environmental laws and regulations.

The AAC includes two wings and four directorates that collectively operate, manage, and support all activities on the Eglin Military Complex. The AAC accomplishes its Range operations through the 46th Test Wing (46 TW) with support from the 96th Air Base Wing. The 46 TW commander is responsible for day-to-day scheduling, executing, and maintaining of this national asset. Test Area (TA) C-72 makes up a portion of the Eglin Military Complex and supports a variety of test and training missions. The continued DoD utilization of the Eglin Military Complex requires flexible and unencumbered access to land ranges and airspace, which support all of Eglin AFB's operations.

1.2 PROPOSED ACTION

The Proposed Action is for the 46 TW to establish a new authorized level of activity for TA C-72 that is based on an anticipated maximum usage in addition to line of sight tree-clearing activities.



Figure 1-1. Land and Water Ranges of the Eglin Military Complex

The military mission has been broadly identified as the *effector* of environmental impacts and Eglin AFB's environment has been identified as the *receptor*. Evaluation and quantification of this effector/receptor relationship is the scientific basis for the environmental analysis performed in this report.

The purpose of and need for the Proposed Action is twofold:

1. Purpose: to quickly and efficiently process new programs requesting access to TA C-72 during both routine and crisis situations.
Need: to provide military users a quick response to priority needs during war or other significant military involvement, as well as maintain the current approval process for routine uses.
2. Purpose: to update the NEPA analysis by reevaluating the mission activities and by performing a cumulative environmental analysis of all mission activities.
Need: the need associated with this item is multifaceted and is described below.

Eglin AFB previously performed environmental analysis on mission activities at TA C-72 in the 1999 *Test Area C-72 Final Programmatic Environmental Assessment* (PEA) (U.S. Air Force, 1999a). Some of Eglin AFB's mission activities have changed since the original environmental analysis was done, requiring new environmental analysis to be performed. Currently, when approval for a new mission is requested, it may be categorically excluded from additional environmental analysis if it is similar in action to a mission that has been previously assessed and the assessment resulted in a finding of no significant impact (FONSI). The categorical exclusion (CATEX) designation is in accordance with NEPA and Air Force regulations, 32 Code of Federal Regulations (CFR) 989.13, and Air Force Instruction (AFI) 32-7061.

Since the time that some of these ongoing mission activities, as well as some mission activities used for CATEX purposes, were originally assessed, changes have occurred at Eglin AFB that could affect environmental analysis. These changes, outlined below, create a need to reevaluate the NEPA analysis individually and cumulatively.

- Additional species have been given federal and state protected status.
- Species that were not previously known to exist at Eglin AFB have been discovered.
- Additional cultural resources have been discovered and documented.
- The population of communities along Eglin AFB's borders has increased with encroachment as a concern.
- Air Force regulations have changed.
- Military missions and weapons systems have evolved.

The analysis in this report provides a cumulative look at the impact on TA C-72 receptors from all mission activities. The environmental analysis is accomplished by evaluating the effect that the military mission activities and expendables have on Eglin AFB's natural, physical, and cultural environment. By implementing an authorized level of activity, Range management will be streamlined and cumulative environmental impacts will be more fully considered.

1.3 SCOPE OF THE PROPOSED ACTION

The region of influence (ROI) for this analysis is TA C-72, which is located on the eastern side of the Eglin Range Complex in Walton County, about 13 miles northeast of Eglin Main Base as shown in Figure 1-2. TA C-72 is bisected by two major streams and is 5.33 miles long. The test area provides over 4,585 acres of continuous land test area. Laser operations are analyzed cumulatively in the Electromagnetic Radiation REA (U.S. Air Force, 2009). Air operations that occur in the airspace overlying TA C-72 are not included as part of the scope for this Range Environmental Assessment (REA), as air operations are analyzed cumulatively in the Overland Air Operations REA (U.S. Air Force 1998a). However, this REA does address expendables released during air operations as they impact TA C-72 and the vicinity.

TA C-72 is suitable for scored testing of air-to-ground and ground-to-ground munitions. The tests supported range from small submunitions to 2,000-pound bombs and missiles. This test area is also equipped to support testing of ground-launched weapons and ground testing of aircraft launchers, rockets, and dispensing systems. Through the support of various test sites, users may perform ground tests of rockets, launchers, and systems with real-time video, weather, laser, camera control, and time-space-position information. Various combinations of targets are also available including laser scoring and hardened high-value structures. TA C-72 also provides a 500-foot inclined rocket sled track for lobbing test items. This track has been inactive for many years and would need significant refurbishment before use. Additional information on TA C-72 facilities, target areas, and instrumentation are provided in Appendix A.

Missions on TA C-72 are scheduled and monitored by the 46 TW. TA C-72 supports a variety of user groups and testing and training activities, which are summarized in Table 1-1 and detailed in Appendix A.

Table 1-1. Summary of Missions by Category

Mission Category	Testers/Trainees	Typical Aircraft
Air-to-surface testing	46 TW, 53 Wing (AWC), Army	F-15s, F-16s, any Army helicopter, A-10s
Surface-to-surface testing	46 TW, Navy	F-15s, F-16s, E-9s, UN-1s, CH-53s
Air operations testing	46 TW, 53 Wing (AWC), AFSOC	F-15s, F-16s, AC/MC-130s, A-10s
Ground operations testing	Various	N/A
Air-to-surface training	46 TW, 53 Wing (AWC), Army	F-15s, F-16s, A-10, any Army helicopter with exception of H-57
Surface-to-surface training	U.S. Army	Micro-drones
Air operations training	33rd Fighter Wing, Special Operations	Almost all
Anti-armor tracking training	7SFG(A)	N/A

7SFG(A) = U.S. Army 7th Special Forces Group (Airborne); AFSOC = Air Force Special Operations Command; AWC = Air Warfare Center; N/A = not applicable; TW = Test Wing

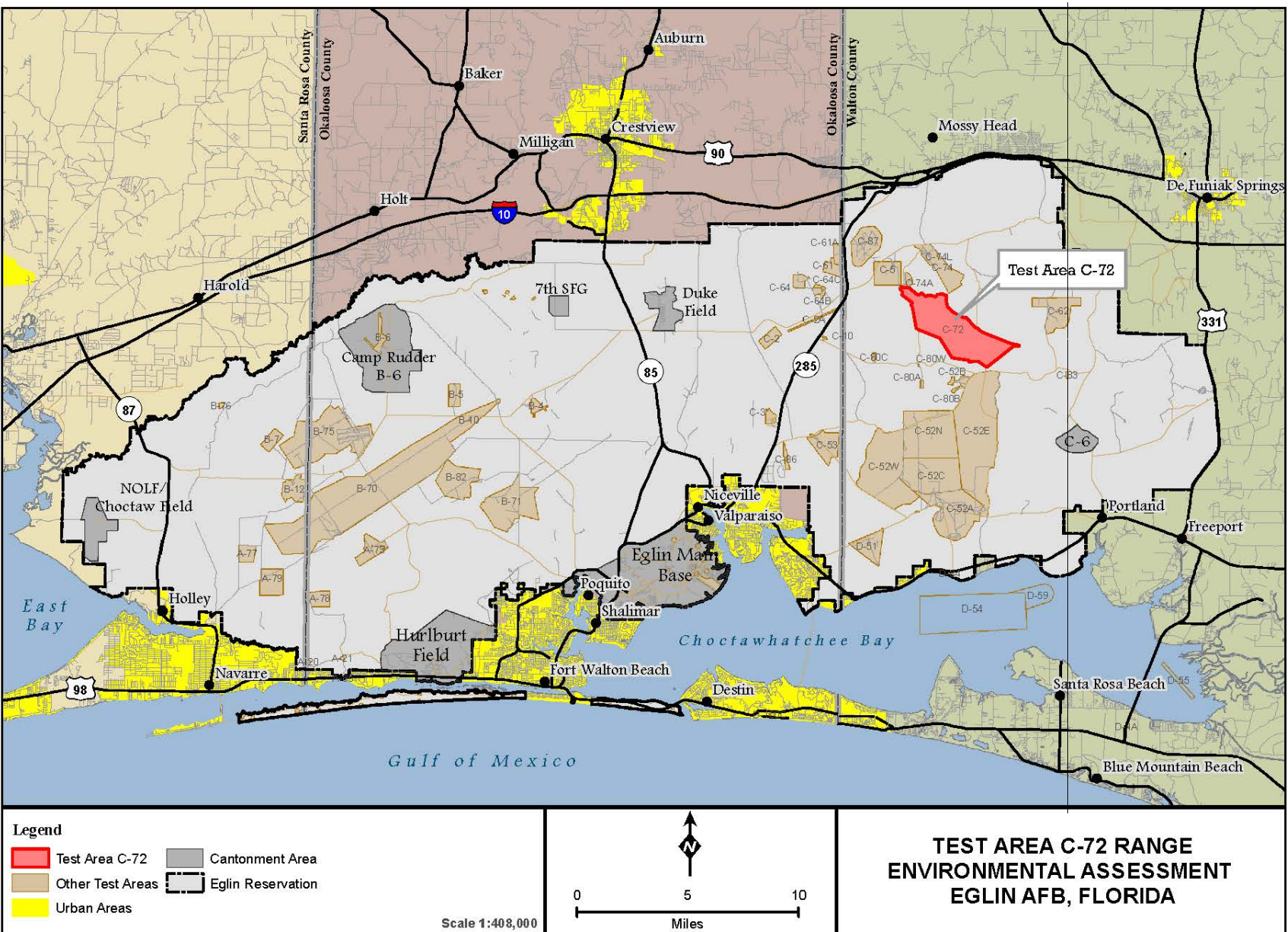


Figure 1-2. Test Area C-72 Region of Influence

1.4 DECISION DESCRIPTION

The proponent (46 TW) desires to authorize a new level of activity for TA C-72, replacing the current authorized level, which is discussed in Section 2.4. By authorizing a new level of activity and analyzing the effects of that level of activity, future similar actions may be categorically excluded from further environmental analysis. Additionally, a decision will be made on how line-of-sight tree clearing and maintenance will occur. This will save both time and money in the review of proposed actions and enable users to access TA C-72 more quickly and efficiently. Authorization of a new level of activity will streamline the environmental process, enhancing Eglin AFB's ability to quickly respond to high-priority or crisis requirements.

1.5 ISSUES

Specifically, an issue may be the result of a mission activity or land use activity that may directly or indirectly impact physical, biological, and/or cultural environment resources. A *direct* impact is a distinguishable, evident link between an action and the potential impact, whereas an *indirect* impact may occur later in time and/or may result from a direct impact.

Potential environmental impacts of alternative actions on TA C-72 resource areas were identified through preliminary investigation. Resource areas eliminated from further analysis are discussed in Section 1.5.1. Resource areas identified for detailed analysis are described in Section 1.5.2, with narratives providing a summary of the preliminary screening for potential impacts.

1.5.1 Resource Areas Eliminated From Detailed Analysis

Environmental Restoration Program Sites

No Environmental Restoration Program (ERP) sites or sites subject to land use controls are located within TA C-72; therefore, there are no potential impacts to ERP sites.

Land Use and Recreation

Land use generally refers to human management and use of land. TA C-72 is solely utilized for military training and testing activities. No change to current land use is expected; therefore, land use is not analyzed further.

In addition, no recreational sites are part of this analysis. TA C-72 is closed to public access for safety reasons.

1.5.2 Resource Areas Identified for Detailed Analysis

Chemical Materials/Range Debris

Chemical materials encompass liquid, solid, or gaseous substances released into the environment as a result of mission activities; these include compounds that can produce a chemical change or toxicological effect to an environmental receptor. The chemical materials that can accumulate in the environment through repeated use represent the highest potential for environmental impact;

for TA C-72, this includes the aluminum from chaff fibers, phosphorus from flares, and lead from munitions.

Range debris includes the physical materials deposited on the surface of terrestrial or aquatic environments during mission activities. This category differs from chemical materials by focusing on the physical presence of materials rather than the chemical effects that could result from the residual materials. Examples of debris include shrapnel, chaff and flare cartridges, spent brass cartridges, and extant inert bombs. There are no major debris issues for TA C-72 because the debris is periodically removed from the test area in accordance with Eglin Standard Operating Procedures. The potential for the debris to strike an object or organism is covered under the appropriate resource area. Under current practice, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. These practices are necessary to comply with AFI 13-212, which requires the range to be cleared of munitions debris on a regular basis.

Soils

Soils within TA C-72 have the potential to be impacted from test and training activities and line of sight clearing (and maintenance) as a potential cause for erosion and sedimentation. Analysis addresses the potential for erosion from testing and training activities as well as for munitions residue to decrease soil quality by introducing new or additional organic and/or inorganic compounds into the soil matrix.

Water Resources

The Proposed Action has the potential to impact water resources within and around the TA C-72 ROI. Water resource analysis addresses the potential for impacts to surface waters, wetlands, floodplains, and groundwater from sedimentation and/or contamination from testing and training activities and associated expendables, vehicle use, range cleanup, and line of sight clearing (and maintenance) as a potential cause for erosion and sedimentation.

Biological Resources

Biological resources may be affected by the Proposed Action. Issues to be examined include potential impacts on wildlife and sensitive species and habitats from direct physical impact, habitat alteration, and noise. Direct physical impact is the physical harm that can occur to an organism (plant or animal) if it comes into contact with an effector, such as a bomb or shrapnel. The main direct physical impact issue for TA C-72 is the potential for gopher tortoises to be hit by a bomb or missile or otherwise affected by ground training activities.

Habitat alterations are described as the physical damage or perturbations to terrestrial and aquatic habitats, line of sight clearing (and maintenance) as a potential cause for erosion and sedimentation issues, and erosion into Okaloosa darter streams from munitions and/or munitions retrieval. Habitat alteration can occur as a result of fire started by flares or munitions or from soil disturbance associated with munitions. The major issue at TA C-72 for this category is the potential loss of gopher tortoise burrows, gopher frog ponds, potential flatwoods salamander ponds, and red-cockaded woodpecker (RCW) trees/foraging habitats from bombs, missiles, or ground testing and training exercises. Gopher tortoise burrows are used by several sensitive

species besides the gopher tortoise, including the gopher frog, indigo snake, and Florida pine snake.

Noise produced by surface-to-air missiles, munitions testing, and bomb testing may stress some wildlife species or cause hearing loss or damage. Scientific data correlating the effects of noise on humans are well documented; however, information regarding the effects of noise events on wildlife species is limited. Noise from line of sight clearing activities could also impact wildlife species, particularly in the vicinity of RCW foraging habitat and cavity trees.

Analysis focuses on identifying sensitive species and habitats within the TA C-72 ROI, analyzing the potential for impacts, and establishing management actions for the avoidance and/or minimization of identified potential impacts.

Cultural Resources

Potential effects to cultural resources would include disturbance or destruction of sites or artifacts. Physical disturbance and/or the destruction of cultural resources could occur from mission activities and line of sight clearing activities. Analysis focuses on cultural site locations and the likelihood of site disturbance and/or destruction.

Historic sites and structures are located within the TA C-72 test range. Due to these structures' association with a significant period and important events in U.S. history (i.e., the Cold War), they must be evaluated collectively for the National Register of Historic Places (NRHP). Any activities that may cause adverse effects to these structures must be vetted through the 96th Civil Engineer Group/Cultural Resources Branch (96 CEG/CEVSH).

Air Quality

Testing and training operations would release emissions from munitions use and range operations, including vehicle use. Analysis addresses the expected levels of emissions and compares these levels with what is currently permitted from all Eglin AFB sources and county emissions.

Noise

Noise is defined as the unwanted sound produced by mission activity and its associated expendables. Noise may directly inconvenience and/or stress humans and some wildlife species and may cause hearing loss or damage. Analyses of potential noise impacts include discussions of two noise components: the physical overpressure and the acoustic sound. Noise is produced by explosives used at TA C-72. Section 4.4 analyzes the potential for noise impacts to biological receptors, such as RCWs.

Safety/Restricted Access

Safety involves hazards to military personnel and the public resulting from mission activities. Restricted access is typically the result of safety considerations. Restricted access applies to the restriction of public access, described in terms of the availability of Eglin resources (such as test areas, interstitial/recreational areas, or public roads) to the general public. Receptors potentially

impacted include military personnel and the public desiring to use these areas. Guidance for restricted access is utilized to coordinate public and military use of airspace, water space (e.g., the Gulf of Mexico), and land areas within the Eglin ROI. Although TA C-72 is closed to all forms of public access, restricted access issues may result from brief closures of recreational areas that fall within the safety footprint of some missions.

Additionally, unexploded ordnance (UXO) poses a potential impact to safety, both during mission activities and LOS clearing activities. Test areas with known UXO require escort by explosive ordnance disposal (EOD) personnel, and regulations regarding UXO should remain in place and continue to be followed. Potential UXO issues are identified and associated safety regulations are outlined.

Socioeconomics

Potential socioeconomic impacts include those that would either expose low-income and minority populations to disproportionate negative impacts or pose special risks to children (under 18 years old) due to noise, pollutant transport, and other conditions in the TA C-72 ROI. The socioeconomic receptors include nearby communities and property that are impacted by the noise from Eglin AFB ordnance. Analysis focuses on the exposure of these communities to anticipated environmental effects and identifying whether potential concern areas were disproportionate to other communities in the region.

1.6 FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

A Section 7 informal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding impacts to federally listed species is necessary for future TA C-72 testing and training operations and line of sight clearing and maintenance. Consultation with the USFWS establishes appropriate management requirements to minimize impacts to threatened and endangered species. The Air Force has conducted a Section 7 informal consultation with the USFWS. The Biological Assessment and USFWS concurrence is included in Appendix G.

Some components of this action would take place within or otherwise may affect the jurisdictional concerns of the Florida Department of Environmental Protection (FDEP) and, therefore, would require a consistency determination with respect to Florida's Coastal Zone Management Plan under the federal Coastal Zone Management Act (CZMA) (Appendix F).

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2. ALTERNATIVES

2.1 INTRODUCTION

This section introduces the alternatives evaluated for potential environmental impacts in this REA for TA C-72. The proposed alternatives are:

- No Action Alternative: Baseline, as defined by the Preferred Alternative in the previous TA C-72 PEA (U.S. Air Force, 1999b)
- Alternative 1: Authorize current level of activity plus foreseeable future activities
- Alternative 2: Alternative 1 with mission surge
- Alternative 3: Line of sight tree clearing and maintenance
- Alternative 4 (Preferred Alternative): Combination of Alternative 2 and Alternative 3

A brief description of each alternative, including the alternative-specific expendables, is provided in the following section.

2.2 ALTERNATIVES CONSIDERED

The alternatives considered for analysis were determined during an interdisciplinary meeting at Eglin AFB, which included, but was not limited to, representatives from the 46 TW (46 RANSS), the 96th Civil Engineer Group (96 CEG)/Environmental Analysis Section (CEVSP), Cultural Resources Section (96 CEG/CEVSH), and Natural Resources Section (96 CEG/CEVSN). The alternatives were chosen as a result of discussions on how foreseeable future activities will expand Eglin AFB's testing and training requirements in the upcoming years. No alternatives were eliminated from detailed analysis.

2.2.1 No Action Alternative

This alternative is defined as authorizing the level of activity approved in the 1999 TA C-72 PEA (U.S. Air Force, 1999b), which authorized a 100 percent increase in test and training missions and associated expendables over the baseline level captured in the Fiscal Years 1995–1997 (FY 1995–1997) Range Utilization Reports and anticipated mission additions. This 100 percent increase included a surge in all missile, bomb, small arms, and ground operations training and testing operations at Test Area C-72. An estimated 28,750 rounds of 30-mm TP were allowed per year to be fired at the strafing target at Test Area C-72, and large static detonations were approved. Table 2-1 shows the level of activity under the No Action Alternative, which is the previously approved level of activity.

Table 2-1. Maximum Annual Expendables for TA C-72 Under the No Action Alternative, Alternative 1, Alternative 2, and Alternative 4

Expendable Category	Expendable	No Action Alternative	Alternative 1	Alternative 2	Alternative 4
Bomb (live)		636	268	804	804
Bomb (inert)		28	316	948	948
Grenades (smoke)		0	111	333	333
Guns (inert)	30 mm	0	180	540	540
	40 mm	0	2,998	8,994	8,994
	84 mm recoilless	128	400	1,200	1,200
	105 mm	40	0	0	0
Guns (live)	20 mm	1,800	4,000	12,000	12,000
	25 mm	0	296	888	888
	30 mm	0	29,520	88,560	88,560
	40 mm	0	290	870	870
	84 mm recoilless	158	0	0	0
	105 mm HE	0	46	138	138
	105 mm smoke WP	0	2	6	6
Missile (inert)		3	23	69	69
Missile (HE)		1,122	250	750	750
Rocket (HE)		30	2,060	6,180	6,180
Rocket (inert)		56	231	693	693
Small Arms (Inert)	7.62 mm blank	0	7,498	22,494	22,494
Small Arms (Live)	5.56 mm	0	2,402	7206	7206
	7.62 mm	2,360	150,000	450,000	450,000
	.50 cal	3,740	156,000	468,000	468,000
Other (Live)	Warhead	0	63	189	189
	Rocket motor	0	186	558	558
	Booster	0	1	3	3
	C-4, 1-lb HE	0	16,090	4,8270	48,270
	Blasting cap	0	90	270	270
	Cartridge, impulse	0	215	645	645
	Charge, demo (lb)	0	766	2,297	2,297
	High explosive 1 lb	0	1	3	3
	Igniter	0	42	126	126
	Cutter, HE	0	16	48	48
	Detonation cord (feet)	0	1,421	4,263	4,263
	Detonator	0	11	33	33
	Explosive bolts	0	12	36	36
	Flares	562	355	1,065	1,065
	Fuze	0	525	1,575	1,575
Other (Inert)	Chaff	2,996	660	1,980	1,980
	Fin assembly	0	28	84	84
	Unknown	0	14	42	42
	Retarder fin	0	66	198	198
	Laser ops, 1 hour ¹	0	90	270	270
Unknown	Unknown (inert)	0	29	87	87
Drones		0	2	6	6
GRAND TOTAL		13,659	377,574	1,132,721	1,132,721

Sources: U.S. Air Force, 2010a; Bufkin, 2010; U.S. Air Force, 2008c

1. The use of lasers is analyzed in the Electromagnetic Radiation REA (U.S. Air Force, 2009a).

lb = pounds; WP = white phosphorus; HE = high explosive

2.2.2 Alternative 1: Authorize Current Level of Activity Plus Foreseeable Future Activities

Alternative 1 would authorize the current level of activity plus foreseeable future activities. The current level of activity is defined as the maximum annual expenditure for each type of expendable from FY 1998 through FY 2009 (Table 2-1); this approach accounts for periods of low or no activity of a certain mission. Future TA C-72 expenditures will include increased munitions expenditures associated with ground training activities from new user groups, including the 7th Special Forces Group (7SFG) and the Joint Strike Fighter (JSF) (Bufkin, 2010; U.S. Air Force, 2008c). This alternative would implement management actions detailed in Chapter 4 and summarized in Section 2.5, Management Requirements.

2.2.3 Alternative 2: Alternative 1 With Mission Surge

This alternative would involve authorizing the level of activity as described under Alternative 1, plus an increase in mission activity (testing and training) to achieve an optimum usage level (Table 2-1), including management actions detailed in Chapter 4 and summarized in Section 2.5, Management Requirements. The optimum usage level was chosen as a likely maximum surge increase in military testing and training during a national defense contingency.

This alternative includes authorization of the proposed level of activity and performance of a comprehensive environmental analysis to ensure that TA C-72 can support this level of activity without suffering significant environmental impact. This alternative authorizes an expected maximum level of activity, which allows better responsiveness to the customer while ensuring that cumulative environmental effects do not cause significant impact.

2.2.4 Alternative 3: Line of Sight Tree Clearing and Maintenance

In June 2005, Eglin AFB proposed line of sight tree clearing and maintenance (Project #RCS 05-586) for the south side of TA C-72. Tree clearance is required because video tracking sites are obstructed from viewing test missions. It was recognized that a failure to remove the trees could result in valuable data loss on Eglin test missions. The areas that would be cleared and maintained are shown in Figure 2-1. Forestry operations outside of the test area that fall within proposed line of sight tree-clearing areas would continue, provided that operations are conducted in accordance with the Eglin Integrated Natural Resources Management Plan (INRMP). Four different methods have been proposed. One or more of these methods may be utilized depending on the type of terrain and proximity to sensitive areas, such as creeks and wetlands.

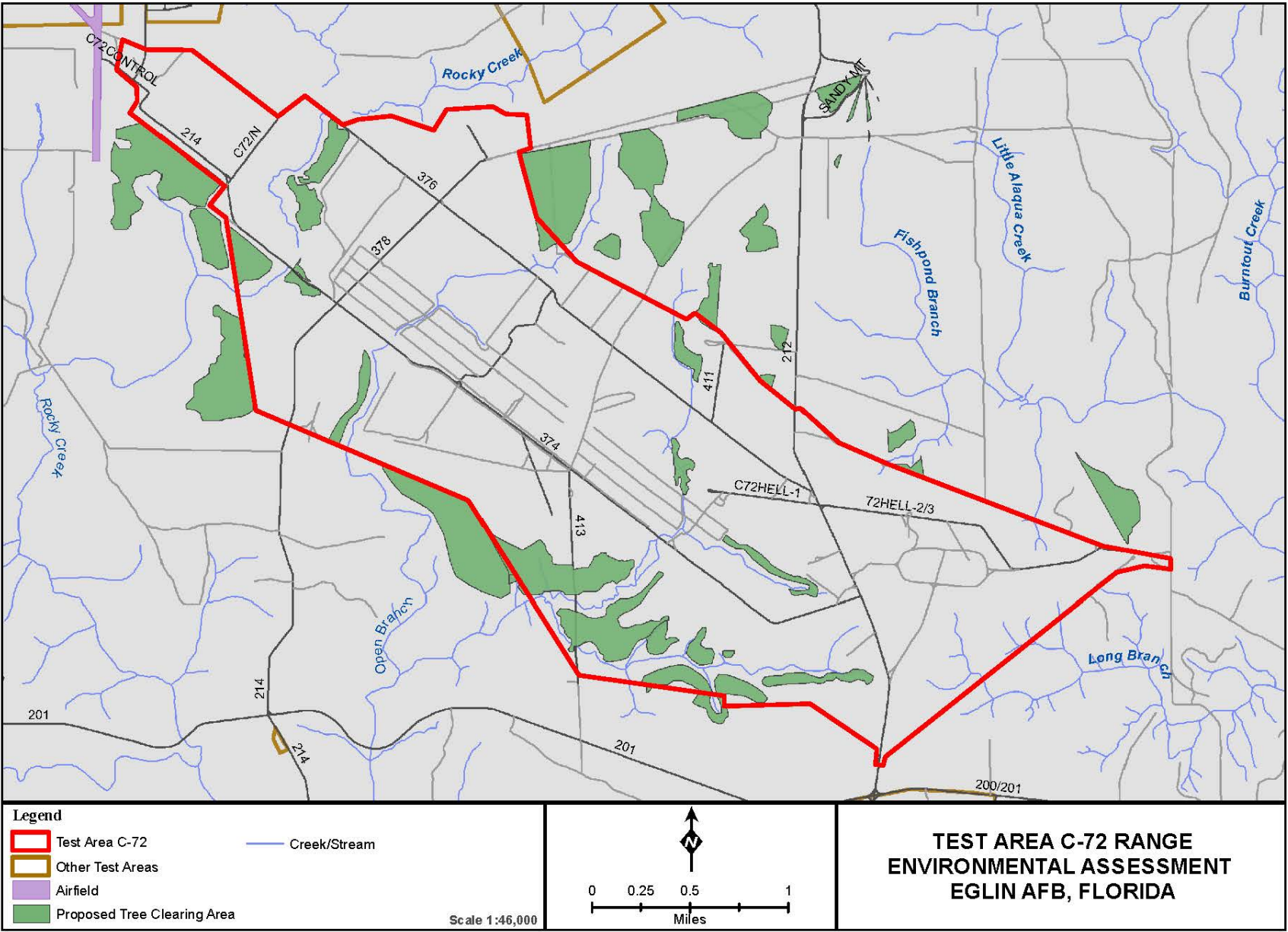


Figure 2-1. Alternative 3 Proposed Line of Sight Tree Clearing and Maintenance Areas

Option 1 – Harvest Trees

Eglin Natural Resources Section (NRS) provides direct support to the Range and is tasked when necessary with manipulating forest structure for a specific area adjacent to TAs for a mission test or training need (U.S. Air Force, 2009b). Under this alternative, timber salvage operations involving small quantities of unwanted but merchantable trees would occur. Trees would be hand cut and gathered for removal and sale. Under this alternative, an interdisciplinary team would identify and evaluate salvage areas presented in Figure 2-1, and then provide recommendations on harvesting marketable trees. A contractor would then remove all timber, which would be sold on a price per ton basis through a forest products contract or cash sales contract.

Option 2 – Cut All Trees with Gyro-Trac Machines

Under this option, line of sight and tree clearing maintenance would be accomplished utilizing a Gyro-Trac mulching machine to clear suitable sight lanes. A Gyro-Trac is a tracked vehicle that has a ground pressure of 2.5 pounds per square inch with a front-mounted cutter head that will cut vegetation up to 4 inches in diameter. The vegetation is ground into mulch then deposited into a layer in front of the machine so that the tracks are seldom in contact with mineral soil. When a Gyro-Trac operates with the cutter heads close to the ground (a few inches) it typically operates with minimal soil and root mat disturbance. Eglin began using the Gyro-Trac in response to conservation recommendations set forth in the 2002 USFWS Biological Opinion to construct fuel breaks between Eglin managed forests and populated areas (U.S. Air Force, 2003a).

Option 3 – Herbicide Application

Eglin currently is approved to use herbicides and prescribed fire to manage vegetation at test areas and interstitial areas (U.S. Air Force, 2007a). Table 2-2 provides a list of approved herbicides that may be used at TA C-72 with approved management practices.

Table 2-2. Herbicides Approved for Use

Herbicide	Example Trade Names
2,4-D amine	Aqua-Kleen [®]
Aminopyralid	Milestone [™]
Fluroxypyr	Vista [®]
Fosamine	Krenite [®]
Glyphosate	Accord [®] XRT
	Rodeo [®] (aquatic)
Imazapic	Plateau [®]
Imazapyr	Arsenal
	Chopper
	Habitat [®] (aquatic)
Metsulfuron	Escort [®]
Sulfometuron methyl	Oust [®] XP
Triclopyr	Garlon [®] 3a
	Garlon 4 Ultra
	Renovate [®] 3 (aquatic)

Source: U.S. Air Force, 2007, Appendix B, Active Ingredient Fact Sheets

Standards are in place to implement standard avoidance and minimization measures for sensitive habitat protection; spill prevention, cleanup, and containment; strict adherence to herbicide labels and instructions during handling, mixing, and application of herbicides; and health and safety precautions.

Option 4 – Cut and Leave in Place

Under this sub-alternative, trees would be hand cut and left where they fall to allow for natural decomposition of the trees. This would prevent ground disturbance that usually accompanies logging activity due to tree removal.

2.2.5 Alternative 4 (Preferred Alternative): Combination of Alternative 2 and Alternative 3

Alternative 4 proposes all of the activities described in Alternatives 2 and 3. This involves an increase in TA C-72 operations over the current level of activity to an achieve optimum usage level plus foreseeable future activities as described under Alternative 2 and line of sight tree clearing and maintenance as described under Alternative 3.

2.3 COMPARISON OF ALTERNATIVES

Potential impacts under each alternative are summarized in Table 2-3.

Table 2-3. Summary of Potential Impacts Under All Alternatives

Resource	Summary of Impacts
Chemical Materials/Range Debris	
No Action	Munitions fragments and residues would be generated as a result of testing and training missions. Releases to the environment from munitions utilized in proficiency and qualification training require reporting to the USEPA under the Emergency Planning and Community Right-to-Know Act TRI program. Eglin AFB has developed procedures to comply with TRI reporting requirements and would track ordnance use associated with the proposed alternatives. Although the release of some chemicals would increase from the previously assessed baseline under the No Action Alternative. No new TRI thresholds would be exceeded and adverse effects are not anticipated.
Alternative 1	Under Alternative 1, the release of toxic chemicals would increase over the No Action Alternative. However, no new TRI thresholds would be exceeded and adverse impacts to the environment are not anticipated.
Alternative 2	Under Alternative 2, ordnance expenditures would increase over Alternative 1, and therefore the release of hazardous chemicals would increase. Despite this, no new TRI thresholds would be exceeded and adverse impacts to the environment are not anticipated.
Alternative 3	Under Options 1, 2, and 4 there would be no increase in range expenditures or debris, so no environmental impacts would be expected. Under Option 3, extensive expenditures of potentially toxic chemical herbicides would be dispensed into the environment. However, only qualified, licensed, and trained professionals would be permitted to dispense herbicide. Also, all herbicide applications would follow the strict guidelines, mitigations, and management actions set forth in the Long-Term Vegetation Control EA (U.S. Air Force, 2007a). No adverse impacts are expected if all applicable restrictions, mitigations and management actions are followed.

Table 2-3. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	Summary of Impacts
Chemical Materials/Range Debris, Cont'd	
Alternative 4	Under Alternative 4, the impacts would be the same as under Alternative 2 for chemical materials related to ordnance use and range training. No adverse environmental impacts are anticipated. Likewise, impacts from tree clearing would be the same as for Alternative 3. No impacts are anticipated associated with Options 1, 2, and 4, and impacts under Option 3 are not likely to be adverse with proper management practices implemented.
Soils	
No Action	No significant impacts to soils are expected under the No Action Alternative, Alternative 1, or Alternative 2. Munitions residue concentrations in the soil would be below Eglin background and EPA risk-based concentrations. Munitions training and foot and vehicle traffic could cause soil erosion, particularly on sparsely vegetated slopes. However, adherence to management practices would decrease erosion potential.
Alternative 1	
Alternative 2	
Alternative 3	No significant impacts to soils are expected under Alternative 3. Tree-clearing and maintenance activities could induce erosion. However, adherence to management practices would decrease the potential.
Alternative 4	Alternative 4 is a combination of Alternatives 2 and 3. No additional actions are associated with this alternative. No significant impacts to soils are expected. However, adherence to management practices would decrease the potential.
Water Resources	
No Action	No significant impacts to water resources are expected under the No Action Alternative, Alternative 1, or Alternative 2. Expendables residue would not likely contaminate groundwater or surface waters. Wetland impacts and sedimentation due to erosion would be controlled by management requirements. No actions would modify the floodplain.
Alternative 1	
Alternative 2	
Alternative 3	No significant impacts to water resources are expected under Alternative 3. Line of sight tree clearing and maintenance activities could affect water resources by inducing erosion or introducing herbicides. However, adherence to management practices would decrease the potential for such impacts.
Alternative 4	Alternative 4 is a combination of Alternatives 2 and 3. No additional actions are associated with this alternative. No significant impacts to water resources are expected. However, adherence to management practices would decrease the potential.
Biological Resources	
No Action	Potential impacts to biological resources are not expected from the No Action Alternative. Direct physical impacts to Okaloosa darters, Florida black bears, gopher tortoises, and red-cockaded woodpeckers (RCWs) are possible from munitions and vehicles; however, the likelihood of one of these animals to be struck is extremely low. Noise associated with mission activities may affect RCWs, however, the species continues to thrive on and near TA C-72. The presence of suitable habitat appears to outweigh any negative influences associated with mission-related noise. Wildfires are possible from munitions, pyrotechnics and ground operations. Check-in procedures prior to hot missions minimize the probability of a damaging hot wildfire. Overall, impacts to biological resources from the No Action Alternative would not be significant and are not likely to adversely affect sensitive species and their habitats.
Alternative 1	Increase in mission activity under Alternative 1 would not significantly increase the probability of impact to sensitive species. Implementation of Management Actions would minimize negative effects from mission activities. Summary of potential impacts due to direct physical impacts, noise, and wildfires would be the same as under the No Action Alternative. Overall, impacts to biological resources from Alternative 1 would not be significant and are not likely to adversely affect sensitive species and their habitats.

Table 2-3. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	Summary of Impacts
Biological Resources, Cont'd	
Alternative 2	A mission surge would increase probability of potential impacts to biological resources on or near TA C-72. Implementation of Management Actions would minimize negative effects from mission activities. Summary of potential impacts due to direct physical impacts, noise, and wildfires would be the same as under the No Action Alternative. Overall, impacts to biological resources from Alternative 2 would not be significant and are not likely to adversely affect sensitive species and their habitats.
Alternative 3	Potential impacts from tree-clearing actions may impact biological resources. Implementation of management actions is essential to minimize potential impacts to sensitive species and their habitats. Adherence to procedures and restrictions near Okaloosa darter stream habitat would reduce the possibility of potential negative impacts to the species. Tree clearing actions must be completed in accordance with avoidance and minimization measures described in Section 4.1.4 including following <i>Best Management Practices for Silviculture</i> (FDACS, 2009). Adherence to procedures and restrictions within RCW habitat would reduce the possibility of potential negative impacts to the species. Tree clearing actions must be completed in accordance with avoidance and minimization measures described in Section 4.1.4. Overall, impacts to biological resources from Alternative 3 are not likely to adversely affect sensitive species and their habitats.
Alternative 4	The combination of Alternatives 2 and 3 would further increase the possibility of potential impacts to biological resources. Implementation of Management Actions is essential to minimize potential impacts to sensitive species and their habitats. Summary of potential impacts due to direct physical impacts, noise and wildfires would be the same as under the No Action Alternative. As discussed under Alternative 3, adherence to procedures and restrictions within sensitive species habitat would reduce the possibility of potential negative impacts from tree clearing activities. Overall, provided that management actions as well as avoidance and minimization measures are followed, potential impacts to biological resources from Alternative 4 are not likely to adversely affect sensitive species and their habitats.
Cultural Resources	
No Action	No adverse effects to cultural resources would occur under any of the alternatives.
Alternative 1	
Alternative 2	
Alternative 3	
Alternative 4	
Air Quality	
No Action	Emissions compared to regional air quality and the federal National Ambient Air Quality Standards (NAAQS) would be negligible. No adverse impacts are expected.

Table 2-3. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	Summary of Impacts
Air Quality, Cont'd	
Alternative 1	Emissions for carbon monoxide (CO), nitrogen oxides (NO _x), and sulfur dioxide (SO ₂) would be negligible as compared to the NAAQS. Fugitive dust (particulate matter) is expected to temporarily increase in the local area but would still be well below the federal standards. All criteria pollutant emissions are expected to be less than the 10 percent threshold. No adverse impacts are expected.
Alternative 2	Emissions would be negligible for all criteria pollutants except particulate matter as compared to the federal NAAQS. These emission concentrations are still within federal standards and would not cause adverse affects to the regional air quality. Also, emissions would make up less than 1 percent of Walton County's emissions. The increase in fugitive dust would be short-term and temporary. No adverse impacts to regional air quality are expected.
Alternative 3	Emissions from tree clearing activities on C-72 would be negligible as compared to the federal NAAQS. No adverse impacts are expected to air quality.
Alternative 4	Impacts to air quality from the combined tree clearing and test and training activities on C-72 described under Alternatives 2 and 3 are not expected to be adverse. These emission concentrations are still within federal standards and would not cause adverse effects to the regional air quality. Also, emissions would make up less than 1 percent of Walton County's emissions. The increase in fugitive dust would be short-term and temporary.
Noise	
No Action	The munitions used on TA C-72 would cause noise levels of less than 115 dBP and receptors would not be adversely affected by noise.
Alternative 1	Alternative 1 uses more munitions than the No Action Alternative. The noise levels would not exceed 115 dBP and would have no adverse impacts to receptors.
Alternative 2	Alternative 2 would have increased munitions use, which would cause more noise events to occur but the noise levels would not be greater than those described in Alternative 1. No adverse impacts would occur to receptors.
Alternative 3	Noise from tree clearing operations would increase the amount of noise, however this level of noise is not expected to attenuate beyond the Eglin range borders or adversely affect the public. No adverse impacts from Alternative 3 are expected from noise.
Alternative 4	Alternative 4 has the most potential for noise, as it combines increased frequency of munitions testing with temporary tree clearing noise. The level of noise would not increase from Alternative 1 unless multiple operations are occurring simultaneously. No adverse impacts from noise are expected from operations at TA C-72.
Safety/Restricted Access	
No Action	There are no adverse effects to safety under the No Action Alternative. TA C-72 is located in an area that is permanently closed to the public. Areas surrounding TA C-72 could potentially be restricted to the public during certain training and testing operations and in areas where tree clearing procedures would take place. However, any adverse impacts associated with temporary closures to public access locations are anticipated to be minor and temporary lasting only for the duration of the activities under all alternatives.
Alternative 1	Under Alternative 1, the frequency and total quantity of munitions used would increase by a foreseeable amount. Despite this increase, the policies and procedures already in place would insure that safety of Eglin AFB personnel is not jeopardized. Due to the increased use of munitions, the likelihood of UXO encounter is increased, but because of the policies in place and the continued coordination with 96 CES/CEG, no new impacts to safety are anticipated.

Table 2-3. Summary of Potential Impacts Under All Alternatives, Cont'd

Resource	Summary of Impacts
Safety/Restricted Access, Cont'd	
Alternative 2	Under Alternative 2, the frequency and total quantity of munitions used would increase over Alternative 1. Despite this increase, the policies and procedures already in place would insure that safety of Eglin AFB personnel is not jeopardized. Due to the increased use of munitions, the likelihood of UXO encounter is increased, but because of the policies in place and the continued coordination with 96 CES/CEG, no new impacts to safety are anticipated.
Alternative 3	Under Alternative 3, there are no anticipated impacts to safety from tree clearing activities because the equipment used for such activities have high flotation tires that do not cause a soil disturbance. In addition, all participants associated with tree clearing activities will receive a safety briefing prior to any tree clearing activities.
Alternative 4	Under Alternative 4, there are no anticipated impacts to safety as described under Alternative 2 and Alternative 3. Policies and procedures are already in place would insure that safety of Eglin AFB personnel is not jeopardized. In additions, continued coordination with 96 CES/CEG, would minimize any potential adverse impacts to safety.
Socioeconomics	
No Action	Minor and temporary noise impacts to the community are anticipated under the No Action Alternative. To minimize impacts, weather conditions should be considered prior to any detonation of explosive material and monitored during testing and training activities to prevent noise propagation beyond base boundaries.
Alternative 1	Similar to the No Action Alternative, there would be potential for noise impacts to the community under Alternative 1. However, any noise impacts are anticipated to be minor and temporary lasting only for the duration of the activity. Since the frequency of mission activities would increase under Alternative 1, there could potentially be a greater number of noise complaints.
Alternative 2	Under Alternative 2, the potential for noise impacts are anticipated to be even more frequent than as described under Alternative 1 and also potentially result in a greater number of noise complaints. Noise impacts to the local community are anticipated to be minor and temporary lasting for the duration of the activity. To minimize any potential noise impacts, weather conditions should be considered prior to any detonation of explosive material and monitored during testing and training activities to prevent noise propagation beyond base boundaries.
Alternative 3	Under Alternative 3 there would be no adverse noise impacts anticipated to the public from tree clearing activities. In addition, TA C-72 is permanently closed to the public. Public access to areas outside TA C-72 would be restricted during tree clearing activities. Thus, there would be no adverse impacts to the public under Alternative 3.
Alternative 4	Under Alternative 4, there would be the most potential for noise impacts anticipated to the public from expenditures and tree clearing activities described under Alternative 2 and Alternative 3. However, the noise associated with both Alternative 2 and Alternative 3 are not anticipated to attenuate beyond the range boundaries above 115 dBP. To minimize potential undesirable noise levels to public areas outside the reservation boundary, environmental and weather conditions should be taken into consideration prior to detonation of explosive materials and monitored during any testing and training activities.

2.4 PREFERRED ALTERNATIVE

The Preferred Alternative is Alternative 4, which is a combination of activities proposed under Alternatives 2 and 3. Alternative 4 allows an increase in TA C-72 operations over the current level of activity to achieve an optimum usage level, plus foreseeable future activities (Alternative 2) and line of sight tree clearing and maintenance (Alternative 3). Implementation of management actions would allow a surge in test and training activities as well as line of sight

tree clearing and maintenance, while minimizing impacts to environmental and natural resources. The No Action Alternative, Alternative 1, Alternative 2, Alternative 3 are not expected to be sufficient or flexible enough on their own to account for the expected growth of testing and training activities at Eglin AFB over the next 10 years. Therefore, Alternative 4 was selected as the Preferred Alternative to adequately cover the environmental analysis needed to support potential increased testing and training requirements as they occur.

The need for additional management actions is driven by legislation, regulations, and policies that protect sensitive habitats, cultural resources, and threatened and endangered species (Appendix B). Legislation pertaining to sensitive habitats, sensitive species, and exotic species includes the Endangered Species Act; AFI 32-7064, *Integrated Natural Resources Management Plan*; Executive Order (EO) 11990, *Protection of Wetlands*; and EO 13112, *Invasive Species*. Regulations on treatment of threatened and endangered species, many of which are supported in sensitive habitats, will be further described in the Section 3.4. Several laws and regulations are pertinent to the treatment of cultural resources, such as the National Historic Preservation Act of 1966 (NHPA), as amended; the Archaeological Resources Protection Act of 1979; and AFI 32-7065, *Cultural Resources Management*, which specifies proper procedures for cultural resource management at Eglin AFB.

2.5 MANAGEMENT REQUIREMENTS

This REA was prepared with consideration that the following management requirements will be employed for all TA C-72 missions. The proponents are responsible for ensuring these management requirements are met.

Test and Training Activities

General

- Comply with all requirements stated in Eglin AFB Instruction 13-212, *Range Planning and Operations*.

Ordnance and Noise

- Observe a restriction of a maximum of 140-decibel (dB) noise level leaving the Eglin Reservation boundary. An approximate calculation is
$$600 \times \text{the cube root of the net explosive weight (NEW)} = \text{distance to the reservation boundary (in feet)}$$
- No detonation can produce a seismic shock of more than 1 inch per second peak particle velocity when reaching any structure. An approximate calculation is
$$60 \times \text{the square root of the NEW} = \text{distance to the structure (in feet)}$$
- Prior to detonation of explosive materials, consider the effects of current weather, as well as other safety parameters outlined in the test directive.
- All inert weapons on or near the surface, including practice bombs with spotting charge, must be recovered, removed, and destroyed.

- Follow regulations for cleanup of debris and hazardous materials.
- Qualified personnel (described in individual test directives) will supervise the use of all pyrotechnic devices.
- Do not try to remove flag pyrotechnic devices that fail to detonate. EOD staff will be notified for dud disposal (described in individual test directives).

Pyrotechnics

- Prior to mission initiation, obtain the daily fire danger rating and follow restrictions per the Eglin Wildfire Specific Action Guide (U.S. Air Force, 2008a).
- Clean up debris (mandatory as described in individual test directives).
- Do not release chemicals or metals into streams indirectly by releasing toxic aerosols in the vicinity of streams.
- Do not release chemicals, metals, or toxic aerosols within or near stands of mature longleaf pines.
- Adhere to Eglin's Wildfire Specific Action Guide restrictions for pyrotechnics use.
- Release flares at altitudes that would ensure complete they burn completely prior to reaching the surface. Prior to testing, coordinate with Jackson Guard concerning the fire weather index.
- Allow no deployment of flares when surface winds exceed 15 knots or when the fire index presents an unacceptable hazard.

Tactical Vehicle Operations

- All vehicles used as immobile targets must be rendered environmentally safe by removal of all fuels, oils, and other chemical materials.
- Tactical vehicles must be moved only on range roads.

Soil Resources

- Design vegetation control practices that minimize surface disturbance and create implementation strategies for increasing vegetative cover.
- Control the location and design of mission activities to avoid creating adverse slope shapes or gradients and/or to reduce vegetative cover.
- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Establish low-growing grassland communities on severely disturbed erosion response units.
- Design concave slope segments on newly constructed targets.
- Reduce the gradients of severely eroding slopes to the degree possible and revegetate.

Water Resources

- Conduct target and ordnance debris removal and disposal of solid debris from blanks, chaff, smokes, and flares in accordance with Air Force regulations.
- Within 200 feet of water bodies, do not conduct digging or off-road driving, use pyrotechnics/munitions, or detonate explosives.
- Use established roads to cross streams.
- Do not alter stream flow or withdraw water from TA C-72 streams.
- Do not drive within 100 feet of the slopes of headwater streams.

Biological Resources

- Ensure that all mission personnel are provided with restrictions regarding protected species, either in verbal or written form. Provide maps when necessary.
- All vehicles and personnel must cross identified darter streams only at established crossings or on bridges.
- Contact Eglin NRS (96 CEG/CEVSN) for any munitions that land in darter streams.
- Comply with the 96 CEG/CEVSN and the Florida Fish and Wildlife Conservation Commission (FWC) established hunting, trapping, and fishing regulations, unless the 96 CEG/CEVSN and the FWC grant specific authorization to do otherwise.
- Do not clear any species of tree (exception can be made for Navy land survival training).
- Limit tree cutting to sand pine, slash pine, live oak (for tree thinning only), and scrub oak. Do not cut down longleaf pines for any reason.
- Coordinate with the 96 CEG/CEVSN for all military activities within or near stands of mature longleaf pine and also those scheduled during RCW nesting season (late April-July).
- Adhere to Eglin AFB Wildfire Specific Action Guide restrictions regarding forest fire danger ratings for munitions and pyrotechnics. Per the guide, if fire danger is:
 - Moderate, there are no restrictions on pyrotechnics. A fire watch is required to be posted for a minimum of 20 minutes after use of pyrotechnics has been completed.
 - High, use caution with pyrotechnics and post a fire watch for a minimum of 30 minutes after use of pyrotechnics has been completed.
 - Very high, restrict pyrotechnics to hand-thrown simulators or smoke grenades. NO FLARES are allowed below 1,000 feet above ground level (AGL). Limit BDU 33s and other munitions that may start fires to “safe” areas. Use simulators or grenades only on roads or in pits. Cleared areas for pyrotechnics should be a minimum of 1.5 times the blast radius.
 - Extreme, NO PYROTECHNICS are allowed without prior approval from the Wildland Fire Program Manager or designee at Eglin AFB Natural Resources (Jackson Guard) (96 CEG/CEVSNP, phone: 882-6233, fax: 882-5321).

- Fire danger can be determined by calling the dispatch office or on the Environmental Management website in the Fire Management Section (<https://em.eglin.af.mil/ems/emsn/emsnr/>).
- Immediately notify Eglin AFB Fire Department Dispatch of any wildfire.
- Do not drive nails or other objects into trees for any reason, unless there is special authorization to do so.
- Provide personnel with a description of the indigo snake, its behaviors, and protection under federal law, and give them instructions not to injure, harm, or kill this species.
- Stop activities if an eastern indigo snake is sighted and allow the snake to move away from the site before resuming activities.
- Comply with the USFWS standard protection measures as described in the Programmatic Biological Assessment for the eastern Indigo Snake (U.S. Air Force, 2008b).
- Prior to land clearing or establishment of a new target area, contact Eglin Natural Resources Section for a gopher tortoise/indigo snake survey.
- Avoid gopher tortoise burrows by a minimum of 25 feet.
- For any gopher tortoise burrows in imminent danger from munitions testing or training, contact Eglin Natural Resources for relocation.
- Follow the gopher tortoise permitting guidelines (FWC, 2008) for relocation of gopher tortoises and commensals (i.e., indigo snake).
- Allow only transient (lasting less than 2 hours) foot traffic and vehicular traffic on established roads/trails within a 200-foot buffer around marked RCW trees. In addition, halt activities if a black bear or gopher tortoise is sighted and allow the animal to move away from the site before resuming activities.
- When conducting ground training activities, follow the Army guidelines for activities within RCW habitat (U.S. Army, 2006)
- Log and report sightings of endangered species (e.g., indigo snake) to the 96 CEG/CEVSN.
- Do not use explosives or munitions within or near stands of mature longleaf pines.

Chemical Materials/Range Debris

- Examine areas in which small arms, including blank ammunition, are expended and pick up casings. Recycle blank cartridge casings (as described in individual test directives).

Cultural Resources

- Leave untouched any archaeological artifacts and immediately report their location to the 96 CEG/CEVSH (described in individual test directives). However, should any inadvertent discoveries of archaeological material be made during the course of construction or demolition, all actions in the immediate vicinity would cease, and efforts would be taken to protect the find from further impact. The Eglin Cultural Resource

Branch, 96 CEG/CEVSH, should be contacted immediately should an unintended discovery occur.

- Report American Indian artifacts of any kind (e.g., arrowheads and pottery) to the 96 CEG/CEVSH at Eglin AFB so that the area will be marked.
- Areas marked or designated as cultural resource sites will be avoided and designated as restricted access areas.

Line of Sight Tree Clearing

Water Resources

- Consult Eglin AFB Environmental Management if tree clearing and/or line of sight maintenance activities are conducted in the vicinity of a wetland, including stream banks.
- In the vicinity of a wetland, including stream banks, hand cut trees, where cut trees are left in place.
- Ensure that activities in wetlands do not significantly change the hydrologic condition of wetlands or the overall drainage pattern of the site.
- Do not significantly alter the natural drainage or flow patterns on forest lands immediately adjacent to wetlands.
- Do not conduct intensive site preparation such as bedding, raking, and windrowing in wetlands.
- Conduct other activities in wetlands, such as tree harvesting, skidding, or mat logging, according to requirements in Florida's *Best Management Practices for Silviculture* (FDACS, 2009).
- Establish appropriate buffer zones along perennial and intermittent streams, wetlands, and flowing bodies of water.
- Conduct on-site pesticide handling (e.g., tank mixing, loading and rinsing equipment) away from streams, ponds, wells, and roadside ditches.
- Where available, check reports of depth to groundwater and avoid application of herbicides to test areas having shallow (groundwater (10 feet below surface or shallower)).
- Evaluate weather conditions (e.g., temperature, wind speed, and precipitation), equipment capabilities, and pesticide formulations to avoid pesticide drift into the water body buffer zone.
- Adhere to instructions on herbicide labels during handling, mixing, and application.
- Require all herbicide applicators conducting treatment activities on Eglin AFB must be DoD- or state-certified pesticide applicators or qualified individuals under direct supervision of a certified applicator.
- Employ a general 300-foot buffer zone around surface waters, wetlands, and floodplains (unless using an herbicide labeled for water use), or determine the soil erodibility, slope, and surface water width of a particular area and use that information along with that in Appendix F of the *Best Management Practices for Silviculture* (FDACS, 2009) to create

a smaller buffer zone (minimum 35 feet), as appropriate in areas with lower soil erodibility and slope—**only if the buffer is not already predetermined by a sensitive species or habitat.**

Biological Resources

- Comply with the following avoidance and minimization measures to minimize potential erosion into darter streams:
 - Follow *Best Management Practices for Silviculture* (FDACS, 2009).
 - Provide all land-clearing personnel with restrictions regarding protected species, either in verbal or written form. Provide maps when necessary.
 - Brief all land-clearing personnel on potential endangered species concerns before tree-clearing activities in endangered species habitat; contracts for such work must include clauses requiring coordination with an Eglin endangered species biologist.
 - Coordinate all forestry operations near Okaloosa darter streams with Eglin NRS forest management and wildlife elements, as well as the erosion control program manager.
 - Visually monitor the areas where tree clearing has occurred for three years, and take corrective action to control any erosion.
 - Cut by hand and leave in place any trees within the primary special management zone (SMZ) that must be removed (i.e., no heavy machinery or road development).
 - Prior to commencement of activities, ensure implementation of any modifications or conditions resulting from consultation with the USFWS (Appendix G).
- Comply with the following management criteria within primary SMZs, as defined by the *Best Management Practices for Silviculture* (FDACS, 2009):
 - Clearcut harvesting is always prohibited within 35 feet of all perennial waters.
 - Selective harvesting may be conducted to the extent that 50 percent of a fully stocked stand is maintained. The residual stand must conform to the following:
 - ◆ Trees are left to maintain the approximate proportion of diameter classes and species present prior to harvesting, except that oaks (other than water oaks) and den trees may be favored. However, in mixed pine/hardwood forests the residual stand may be composed of up to 90 percent hardwood and 10 percent pine, and den trees may be favored.
 - ◆ Repeated entry into a harvested primary SMZ in short time intervals for additional harvesting is prohibited.
 - ◆ No trees will be harvested in stream channels or on the immediate stream bank.
 - Special emphasis should be given to the protection of very large trees and/or old trees, snags and cavity tree, and trees where any part of the canopy overhangs the water.
 - The following forestry activities are prohibited:
 - ◆ Mechanical site preparation

- ◆ Loading decks or landings and log bunching points
- ◆ Main skid trails, except to approach a designated stream crossing
- ◆ Aerial application, mist blowing or operational application of pesticides or fertilizer, including any drift from nearby applications
- ◆ Cleaning spray equipment or discharging rinse water from pesticide or fertilizer applications
- ◆ Road construction except when crossing a water body
- ◆ Site preparation burning on slopes of 18 percent or greater
- Within any secondary SMZ, comply with the following management criteria as defined by *Best Management Practices for Silviculture* (FDACS, 2009). There are no timber harvesting limitations within the secondary SMZ (unrestricted selective harvesting and clearcut harvesting are both allowed.) However, the following operational restrictions apply:
 - No mechanical site preparation
 - No main skid trails (except for stream crossings), loading decks, or landings
 - No cleaning of spray equipment or discharging of rinse water from pesticide and fertilizer applications
 - No road construction except for stream crossings
 - No plowed firelines except during fire suppression
 - No site preparation burning on slopes of 18 percent or greater
- When possible, plant longleaf pine seedlings on harvested interstitial areas.
- Require all vehicles and personnel to cross identified darter streams only at established crossings or on bridges.
- Comply with the following avoidance and minimization measures to minimize potential impact to RCWs:
 - Proposed tree clearing areas must be surveyed prior to tree removal to ensure no undocumented cavity trees have been recently excavated.
 - No tree-clearing activities would be conducted within 200 feet of an active RCW tree during nesting season.
 - Proponent must ensure that all mission and land-clearing personnel are provided with restrictions regarding protected species, either in verbal or written form. This will include maps when necessary.
 - All land clearing personnel must be briefed on potential endangered species concerns before tree-clearing activities in endangered species habitat; contract clauses would require coordination with an Eglin NRS endangered species biologist.
 - All inactive RCW trees must be surveyed and screened prior to tree cutting to ensure no birds are living in the cavities.

- In areas where the use of prescribed fire may be limited, use herbicides or mechanical means to maintain RCW foraging habitat.
- Eglin NRS will continue monitoring of RCWs in the area.
- Prior to commencement of activities, ensure implementation of any modifications or conditions resulting from consultation with the USFWS (Appendix G).
- Provide personnel with a description of the indigo snake, its behaviors, and protection under federal law, and give them instructions not to injure, harm, or kill this species.
- Comply with the USFWS standard protection measures as described in the Programmatic Biological Assessment for the eastern Indigo Snake (U.S. Air Force, 2008b).
- Log and report sightings of endangered species (for example, indigo snake) to the 96 CEG/CEVSN.
- Personnel should stop activities if a black bear or gopher tortoise is sighted and allow the animal to move away from the site before resuming activities.
- Obtain approval from the Eglin Forest Management NRS for any herbicide treatments in outstanding natural areas, significant botanical sites, or high quality natural communities or near aquatic preserves, Gulf sturgeon critical habitat, or EFH, including specifics on application method, herbicide type, buffers, and timing.
- Map sensitive habitats digitally using GPS/GIS and provide to aerial herbicide applicators so that they can avoid the areas, unless specifically approved otherwise by the Eglin Forest Management NRS.
- Restrict aerial application of nonaquatic label pesticides near aquatic sensitive habitats.
- Time the application of herbicides to avoid upcoming rain events.
- Adhere to herbicide label instructions and USEPA-suggested mitigations during handling, mixing, and application of herbicides.
- Require herbicide applicators conducting treatment activities on Eglin AFB to be DoD- or state-certified pesticide applicators or qualified individuals under direct supervision of a certified applicator.
- During the planning process, consider the objectives of the proposed activity and potential impacts from actions that disturb the soil surface or impact water quality.
- Identify sensitive areas and applicable best management practices (BMPs) to be used during herbicide applications.
- Continue herbicide treatments as needed to control vegetation, but reduce the intensity of treatments after the initial application and use prescribed fire for long-term maintenance.
- Brief applicators (including contractors and their staff) regarding any potential endangered species concerns and applicable avoidance and minimization measures before herbicide application in endangered species habitat.
- Prohibit herbicide applications within 1,500 feet of ponds and sampling points located within FNAI Category 1 (habitat known to support flatwoods salamanders) or FNAI Category 2 (habitat with a strong potential to support flatwoods salamanders) areas. Provide maps showing these areas to applicators.

- Prohibit applications of herbicides within 300 feet of known dusky gopher frog habitat or known Florida bog frog habitat.
- Around designated Gulf sturgeon critical habitat and Okaloosa darter streams, require a 300-foot buffer for nonaquatic-labeled herbicides that are toxic to fish and herbicides that are highly mobile and have the potential to contaminate groundwater.
- Prohibit direct application of herbicides to water around designated Gulf sturgeon critical habitat and in Okaloosa darter streams.
- Prohibit herbicide applications within 1,500 feet of the bald eagle nest site during the breeding season (1 October through 15 May).
- Do not allow ground application of herbicides using mechanized equipment within an RCW cluster during the RCW nesting season.
- In the event of manual application of herbicides within an RCW cluster, follow procedures outlined in the consultation for “Hexazinone Application on Interstitial Areas” (25 September 2001) or further coordinate with the USFWS.
- Prohibit aerial applications of herbicides known to cause eye damage—permit only ground applications of these herbicides.

Air Quality

- To decrease potential for drift, do not allow aerial application of herbicides wind speeds are greater than 10 miles per hour.

Environmental Justice and Risks to Children

- Properly plan herbicide application missions to prevent the release of approved chemicals near populated areas.
- As per safety protocols, close areas on Eglin used for recreational purposes (hunting, fishing, camping, etc.) prior to application of herbicides and until applied herbicides have degraded to safe levels (dependant on labeled chemical persistence).

Safety

- Adhere to herbicide label instructions during handling, mixing, and application.
- Require all herbicide applicators conducting treatment activities on Eglin AFB to be DoD- or state-certified pesticide applicators or qualified individuals under direct supervision of a certified applicator.
- For areas used by recreationists or other persons, post signs at the entrances of areas to be treated; on the sign, include the reason and time and duration of closure.
- Schedule herbicide application so that herbicides minimize impacts to hunting.
- Dispose of or recycle pesticide containers and/or excess pesticides according to local, state, and federal regulations and label requirements.
- Clean up and/or contain any pesticide spill immediately.

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3. AFFECTED ENVIRONMENT

This chapter describes the receptors within TA C-72 that are potentially impacted by testing and training operations. Receptors are discussed by resource area (i.e., chemical materials, soils, water resources, biological resources, cultural resources, air quality, noise, safety, land use, and socioeconomic resources).

3.1 CHEMICAL MATERIALS/RANGE DEBRIS

Chemical materials encompass liquid, solid, or gaseous substances released to the environment as a result of mission activities. These materials would include munitions and pyrotechnic combustion byproducts from items such as bombs, missiles, small arms, and flares. Release of these materials may potentially affect air quality, water quality, soils, and sediments. The environmental analysis of chemical materials describes the potentially adverse environmental impacts from testing and training activities within TA C-72.

3.1.1 Hazardous Materials

According to the Resource Conservation and Recovery Act (RCRA), Section 6903(5), hazardous materials and waste are defined as substances that, because of “quantity, concentration, or physical, chemical, or infectious characteristics, may cause or significantly contribute to increases in mortality or serious illnesses, or pose a substantial threat to human health or the environment.”

Hazardous materials as referenced here pertain to mission-related hazardous chemicals or substances meeting the requirements found in 40 CFR 261.21.24, are regulated under RCRA, and are guided by AFI 32-7042. The hazardous materials to be transported, stored, and used on-site for the Proposed Action consist of fuels, munitions, and pyrotechnics.

Eglin AFB has implemented a hazardous waste management plan, per AAC Instruction 32-7003, that identifies hazardous waste generation areas and addresses the proper packaging, labeling, storage, and handling of hazardous wastes. The plan also addresses record keeping, spill contingency and response requirements, and education and training of appropriate personnel in the hazards, safe handling, and transportation of these materials (U.S. Air Force, 2006a). Specific procedures and responsibilities for responding to a hazardous waste spill or other incident are also described in the Eglin AFB *Spill Prevention, Control, and Countermeasures (SPCC) Plan* (U.S. Air Force, 2005a).

Releases to the environment from munitions utilized in proficiency and qualification training require reporting to the U.S. Environmental Protection Agency (USEPA) under the Emergency Planning and Community Right-to-Know Act (EPCRA) Toxic Release Inventory (TRI) program. Training is subject to a TRI reporting threshold of 10,000 pounds per year for most common chemicals, with lower reporting thresholds for chemicals classified as “persistent bioaccumulative toxic.” These chemicals include mercury, with a reporting threshold of 10 pounds, and lead, with a threshold of 100 pounds. In cases when a threshold is exceeded, the

installation must report on a “Form R” to the USEPA the quantity of munitions-related waste released to the environment or recovered and recycled.

Eglin AFB has procedures to comply with TRI reporting requirements and would track ordnance use associated with the proposed alternatives. This could require new procedures if proposed training activities would result in reporting thresholds being exceeded at the base for any new chemicals.

Regulations

Under federal law, the transportation of hazardous materials is regulated in accordance with the Hazardous Materials Transportation Act, 49 U.S. Code (USC) 1801 et seq. For the transportation of hazardous materials, Florida has adopted federal regulations that implement the Hazardous Materials Transportation Act, found at 49 CFR 178.

State laws pertaining to hazardous materials management include the Florida Right-to-Know Act, Florida Statutes Title 17, Chapter 252, and annotated Title 29, Section 403.721, which authorizes the Hazardous Waste Section of the FDEP and the Florida Department of Transportation Motor Carrier Compliance Department to implement 49 CFR 178.

AFI 32-7086 Supplement 1, *Hazardous Materials Management*, describes how Eglin complies with federal, state, Air Force, and DoD laws and instructions. All Eglin AFB organizations and tenants are required to follow this plan.

Eglin AFB Instruction (EAFBI) 3-212, *Range Planning and Operations*, places the following restrictions on munitions use at TA C-72. No munitions may be expended on the northwest end or extreme southwest corner of the range. The maximum munitions size that may be expended on this range is set by Range Safety on a case-by-case basis. In the proximity of the downrange instrumented targets, munitions size is also limited on a case-by-case basis (U.S. Air Force, 2010b).

3.1.2 Debris

Debris includes the physical materials deposited on the surface of terrestrial or aquatic environments during mission activities. The potential impacts are primarily related to physical disturbances to people, wildlife, or other users of the Range, and chemical alterations that could result from the residual materials. Examples of debris deposited from activities at TA C-72 potentially resulting in environmental impacts include the following:

- Shell casings, canisters from signal smokes, flares, chutes from flares
- UXO (primarily inert items)
- Litter and refuse from daily mission activities, including ground troop movement

Currently, TA C-72 is periodically cleared of range debris in accordance with AFI 13-212, which indicates that each Major Command (MAJCOM) or Range Operating Authority (ROA) is responsible for the clearance of operational ranges under its control (U.S. Air Force 2010c).

3.2 SOILS

This section provides descriptions of the soils found within TA C-72. The Lakeland Sand soil series is the primary soil type at the test area, although several additional types occur as well. Information on erosion potential is also presented. Appendix B, *Relevant Laws, Regulations, and Policies*, provides applicable regulations.

3.2.1 Soil Types

TA C-72 is approximately 4,592 acres of continuous land area. The test area is located within the Western Highland physiographic province, which generally consists of elevated sand hills that range in elevation from 100 to 200 feet. Western Highland hills are typically cut by deep, narrow stream valleys. The lowest elevations at Test Area C-72 are near the creek beds, where the hills are cut to approximately 125 feet above sea level. Slopes rise up from the creek areas to plateaus of 200 feet elevation.

Eleven soil types occur at TA C-72 (Figure 3-1). The Lakeland Sand soil series is the primary soil type at the site. Of the remaining soils, four types constitute the majority and are identified in Table 3-1. The additional six types represent only approximately 1 percent of soils present at the test area. Further soil descriptions are provided in Appendix C, *Soils*.

Table 3-1. Test Area C-72 Predominant Soil Types and Characteristics

Soil Name	Erosion Risk	Attributes	Soil Type	Acreage within TA C-72
Lakeland Sand	Moderate to high	Yellowish brown to grayish brown	Sand	4,001
Dorovan-Pamlico Association	Very low	Highly organic	Muck	172
Bonifay Loamy Sand	Low	Very acidic; ironstone nodules	Loamy sand	142
Fuquay Loamy Sand	Low	Very acidic; ironstone nodules	Loamy sand	140
Troup Sand	Low to moderate	Acidic to strongly acidic	Sand	81

3.2.2 Erosion

Erosion caused by human activities may occur at rates greater than that caused by natural conditions and may have detrimental effects on soils and ecosystems. The susceptibility of soil to erosion depends on factors such as soil texture, moisture content, pH, and ionic strength of the eroding water. The erosion potential generally declines with increases in the amount of clay and organic matter content. In contrast, uniform silts and sands tend to have a higher erosion probability. Slope angle and length are the primary topographic variables influencing rainfall erosion. Vegetation plays a role in the interception and diffusion of water energy from rain splash and overland water flows.

Key properties of Lakeland soils, which are the predominant soils at TA C-72, include quartz sand texture, excessive drainage, high permeability rates, low organic matter and clay content, poor soil structure (low cohesion, adhesion, and aggregate stability), and absence of active soil-forming processes. These characteristics suggest a low-to-moderate potential for soil erosion at the test area. The potential for erosion on the test area exists in areas associated with roads, borrow pits, steep slopes, and run-in lines no longer used for missions.

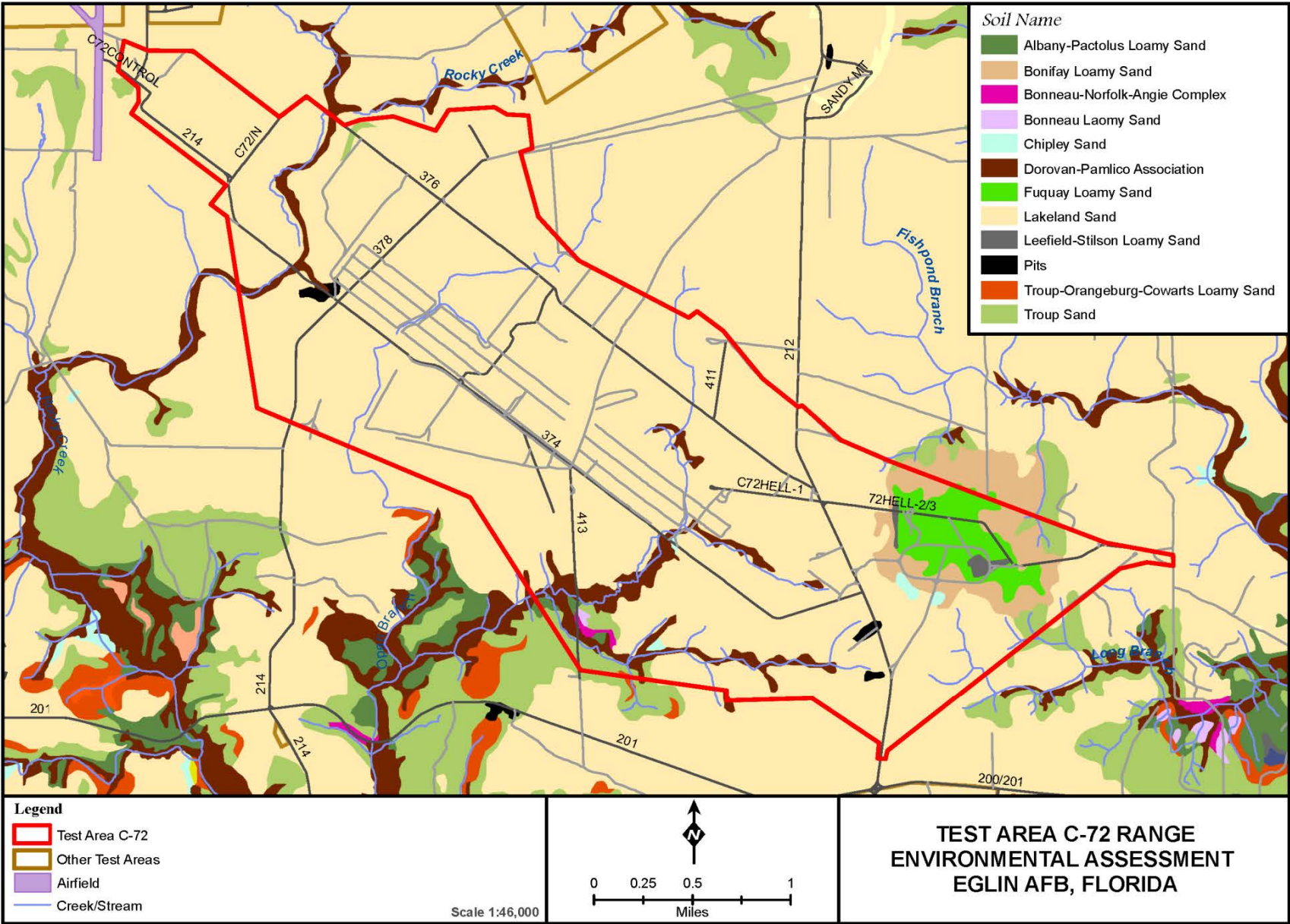


Figure 3-1. Soil Types Within Test Area C-72

3.3 WATER RESOURCES

This section describes the qualitative and quantitative characteristics of water resources at TA C-72. Water resources include groundwater, surface water, wetlands, floodplains, and the coastal zone. Site-specific information on the water resources associated with TA C-72 is contained in the following paragraphs. Appendix B, *Relevant Laws, Regulations, and Policies*, provides applicable regulations.

3.3.1 Groundwater

Two major aquifers underlie Eglin AFB: the Surficial aquifer, also known as the Sand and Gravel aquifer, and the Floridan aquifer. The Surficial aquifer is a generally unconfined (having a free water surface or water table conditions), near-surface unit separated from the underlying confined (under pressure) Floridan aquifer by the low-permeability Pensacola Clay confining bed. The Surficial aquifer is mainly composed of clean, fine-to-coarse sand and gravel, while the Floridan aquifer consists of a thick sequence of interbedded limestone and dolomite. Water quality of the Surficial aquifer is generally good, but it is vulnerable to contamination from surface pollutants due to its proximity to the ground surface (U.S. Air Force, 2003b).

Water from the Surficial aquifer is not a primary source of domestic or public water supply on Eglin because of the large quantities of higher quality water available from the underlying upper limestone of the Floridan aquifer (U.S. Air Force, 2003b). Water drawn from the upper limestone of the Floridan aquifer is of suitable quality for most uses and is the primary source of water used at Eglin AFB. The top of the aquifer is about 50 feet below mean sea level (MSL) in the northeast corner of the base and increases to about 700 feet below MSL in the southwestern area of the base (McKinnon and Pratt, 1998).

The Surficial aquifer system is in direct contact with surface waters on Eglin, and discharge of groundwater constitutes the base flow for most streams and rivers. The position of the Surficial aquifer near the surface and its relatively high percolation rates make the aquifer vulnerable to contamination by surface pollutants. Lateral migration of contaminants toward surface water discharge points potentially facilitates the transfer of groundwater pollutants to area streams, rivers, and wetlands.

3.3.2 Surface Water

Surface waters are any waters that lie above groundwater, such as streams, springs, ponds, lakes, rivers, bayous, and bays. Several streams and tributaries occur within the boundaries of TA C-72 (Figure 3-2). The test area is bisected by two major streams, including Rocky Creek and Open Branch. In addition, East Rocky Creek, which is a tributary of Open Branch, bisects the test area as well. Mattress Head Branch originates on the southeastern portion of the test area and feeds into East Rocky Creek. Tributaries of Long Branch and Little Alaqua Creek originate in the eastern portion of the site. Surface waters on the test area total 63,863 linear feet. All of these drainages are in the Choctawhatchee Bay Basin and flow south into Choctawhatchee Bay.

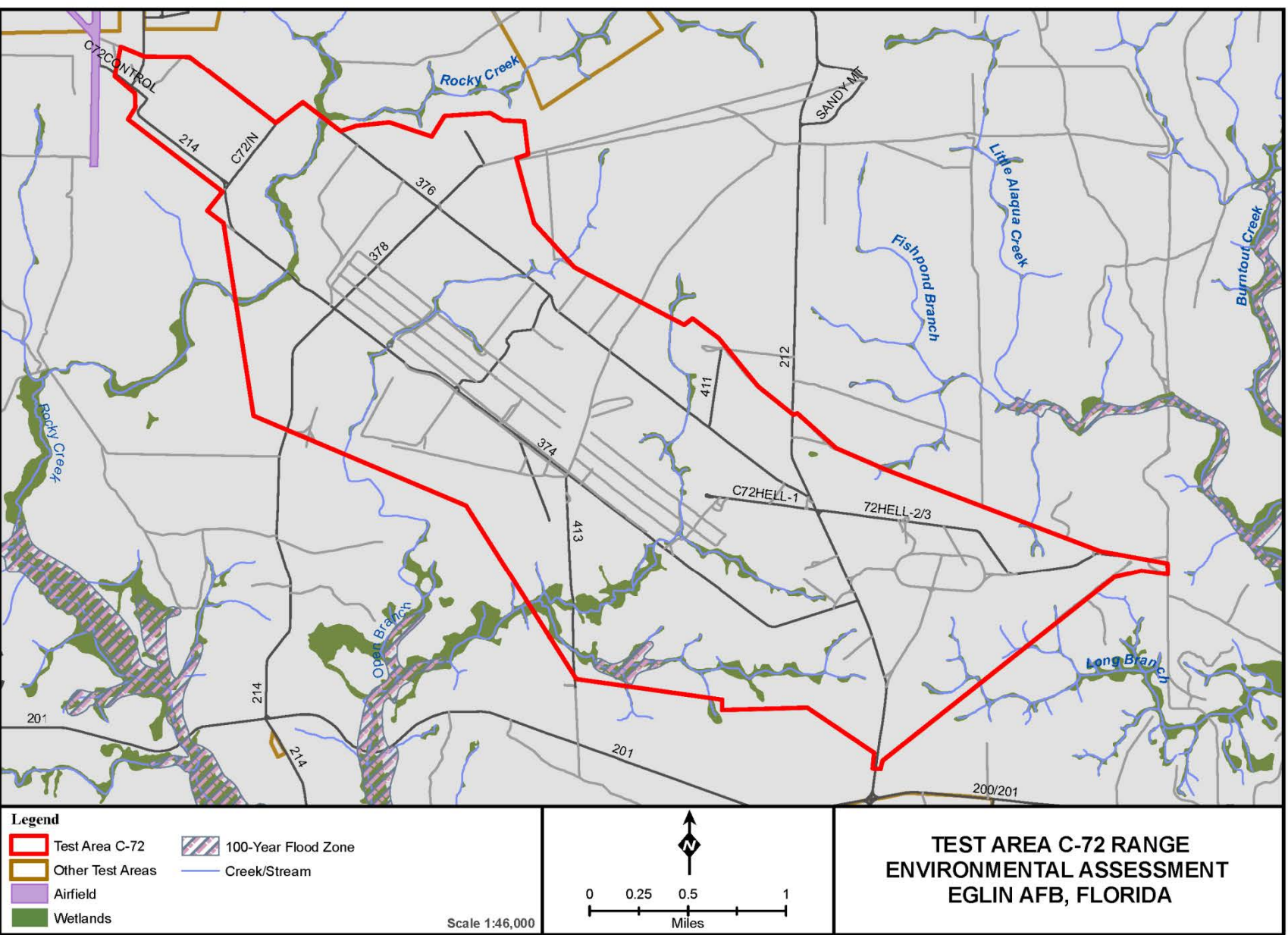


Figure 3-2. Water Resources Located at Test Area C-72

The state of Florida has developed and retains jurisdiction for surface water quality standards for all waters of the state in accordance with provisions of the Clean Water Act (CWA). Section 303 of the CWA requires the state to establish water quality standards for waterways, identify those that fail to meet the standards, and take action to clean up these waterways. Florida recently adopted the Impaired Waters Rule (IWR) (Florida Administrative Code [FAC], Chapter 62-303), with amendments, as the methodology for assessing the state's waters for 303(d) listing. The Florida Department of Environmental Protection (FDEP) submits names of surface waters determined to be impaired, using the methodology in the IWR and adopted by secretarial order, to the U.S. Environmental Protection Agency (USEPA) for approval as Florida's 303(d) list. The FDEP submits updates to Florida's 303(d) *List of Impaired Surface Waters* to the USEPA every two years. The *2006 Integrated Water Quality Assessment for Florida: 2006 305(b) Report* and *303(d) List Update* (FDEP, 2008) satisfy the listing and reporting requirements of Sections 303(d) and 305(b) of the CWA.

Surface waters on Eglin AFB are Class III waters, meaning that they are designated for "recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife" (FDEP, 2008). Impaired waters on or adjacent to Eglin AFB include Boggy Bayou, Poquito Bayou, Rocky Bayou State Park, Choctawhatchee Bay, East Bay, and Yellow River (FDEP, 2008; FDEP, 2007). The land areas of TA C-72 that drain into basins constitute a small fraction of the total land area that drains into the receiving waters. Industry, agriculture, and waste processing in these areas are major contributors of water runoff and effluent components to the receiving water bodies. There is no clear association between the status of the basins and activities occurring at TA C-72.

3.3.3 Wetlands

Wetlands are areas of transition between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water (USFWS, 1979). Abiotic and biotic environmental factors such as morphology, hydrology, water chemistry, soil characteristics, and vegetation contribute to the diversity of wetland community types. The term *wetlands* describe marshes, swamps, bogs, and similar areas. Local hydrology and soil saturation largely affects soil formation and development, as well as the plant and animal communities found in wetland areas (USEPA, 1995). Wetlands are often categorized by water patterns (the frequency or duration of flooding) and location in relation to upland areas and water bodies. Wetland hydrology is considered one of the most important factors in establishing and maintaining wetland processes (Mitsch and Gosselink, 2000).

Jurisdictional wetlands are those over which the U.S. Army Corps of Engineers (USACE) has regulatory control under Section 404 of the CWA. Wetlands are defined in the USACE *Wetlands Delineation Manual* as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE, 1987). The majority of jurisdictional wetlands in the United States are described using three principal wetland delineation criteria: hydrophytic vegetation, hydric soils, and hydrology (USACE, 1987). USFWS uses a simpler classification system that is satisfied by any one of the above three characteristics.

USACE is the lead agency in protecting wetland resources and invokes jurisdiction over federal wetlands (33 CFR 328.3) under Section 404 of the CWA (30 CFR 330) and Section 10 of the Rivers and Harbors Act (30 CFR 329). The USEPA assists USACE (in an administrative capacity) in the protection of wetlands (40 CFR 225.1 to 233.71). Florida regulates wetlands under the Wetlands/Environmental Resource Permit program under Part IV, Florida Statutes Section 373.

In addition, the USFWS and the National Marine Fisheries Service (NMFS) have important advisory roles. FAC Chapter 62-312, *Dredge and Fill Program*, affords regulatory protection to wetland resources (protection from excavating or filling a wetlands area with dirt, riprap, etc.) at the state level. FDEP issues a Section 401 certification under the authority of the CWA (40 CFR 230.10[b]). Section 401 of the CWA requires federal agencies to obtain certification from the state before issuing permits that would result in increased pollutant loads to a water body. The certification is issued only if such increased loads would not cause or contribute to exceedances of water quality standards (USEPA, 2009).

TA C-72 supports a total of approximately 186 acres of palustrine and riverine wetlands. Most of the wetlands are palustrine, as riverine wetlands total only 0.36 acres. These wetlands are associated with all the surface waters at the test area, including Rocky Creek, Open Branch, East Rocky Creek, Mattress Head Branch, and the tributaries of Long Branch and Little Alaqua Creek (Figure 3-2). Total wetland acreage corresponds to approximately 4 percent of the total land area (Table 3-2).

Table 3-2. Land and Wetlands Area Associated With Test Area C-72

Total Land Area (Acres)	Associated Wetlands (Acres)	Percent Area Covered by Wetlands
4,592	186	4

3.3.4 Floodplains

Floodplains are lowland areas adjacent to surface water bodies (i.e., lakes, wetlands, and rivers) that are periodically covered by water during flooding events. Floodplains and riparian habitat are biologically unique and highly diverse ecosystems, supporting a rich diversity of aquatic and terrestrial species (Mitsch and Gosselink, 2000). Floodplain vegetation promotes bank stability and provides shade to moderate water temperatures. Vegetation and soils act as water filters, intercepting surface water runoff before it reaches lakes, streams, or rivers, and storing floodwaters during flood events. This filtration process aids in the removal of excess nutrients, pollutants, and sediments from the water and helps reduce the need for costly cleanups and sediment removal. Floodplains also reduce downstream flooding by increasing upstream storage in wetlands, sloughs, back channels, side channels, and former channels.

Any actions being considered by federal agencies must be evaluated to determine whether they would occur within a floodplain. Floodplains that must be considered include those areas with a 1 percent chance of being inundated by floodwater in a given year (also known as a 100-year floodplain). EO 11988, *Floodplain Management* (1977, 42 *Federal Register* 26951), requires federal agencies to avoid adverse impacts associated with the occupancy and modification of floodplains and to avoid floodplain development whenever possible. Additionally, EO 11988 requires federal agencies to make every effort to reduce the risk of flood loss, minimize the impact of floods on human health, safety, and welfare, and preserve the natural beneficial value

of floodplains. The order stipulates that federal agencies proposing actions in floodplains consider alternative actions to avoid adverse effects, avoid incompatible development in the floodplains, and provide opportunity for early public review of any plans or proposals. If adverse effects are unavoidable, the proponent must include mitigation measures in the action to minimize impacts.

Parts of the floodplain that are also considered wetlands will, in addition to floodplain zonings, receive protection from federal, state, and local wetland laws. These laws, such as the USACE Section 404 Permit Program, regulate alterations to wetlands to preserve both the amount and integrity of the nation's remaining wetland resources. Specific wetland regulations are described in Section 3.3.3.

Approximately 20 acres of TA C-72 are located within the 100-year floodplain and are associated with Mattress Head Branch (Figure 3-2). Floodplains represent approximately 0.4 percent of the land area (Table 3-3). Other floodplains occur in association with the surrounding creeks adjacent to TA C-72.

Table 3-3. Land and Floodplain Area Associated With Test Area C-72

Total Land Area (Acres)	Associated Floodplains (Acres)	Percent Area Covered by Floodplains
4,592	20	0.4

3.3.5 Coastal Zone

The term *coastal zone* is defined as coastal waters and adjacent shore lands, which strongly influence one another, located in proximity to the several coastal states. The coastal zone includes islands, transitional and inner tidal areas, salt marshes, wetlands, and beaches. Coastal waters are defined as any waters adjacent to the shoreline that contain a measurable amount of sea water, including but not limited to sounds, bays, lagoons, bayous, ponds, and estuaries. The seaward boundary of the coastal zone is the limit of state waters, which for the Gulf coast of Florida is nine nautical miles from shore. The entire land mass of Florida is considered part of the coastal zone and is subject to the Coastal Zone Management Act (CZMA).

Federal agency activities potentially impacting the coastal zone are required to be consistent, to the maximum extent practicable, with approved state Coastal Zone Management Programs. Federal agencies make determinations as to whether their actions are consistent with approved state plans. Eglin AFB submits consistency determinations to the state of Florida for review and concurrence. All relevant state agencies must review proposed actions and issue a consistency determination. The Florida Coastal Management Program is composed of 23 Florida statutes that are administered by 11 state agencies and 4 of the 5 water management districts.

Components of the TA C-72 Proposed Action would take place within the jurisdictional concerns of FDEP and, therefore, would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA (APPENDIX F).

3.4 BIOLOGICAL RESOURCES

Biological resources include the native and introduced terrestrial and aquatic plants and animals found on and around TA C-72. The habitats of Eglin AFB are home to an unusually diverse biological community including several sensitive species and habitats, many of which are present at or in proximity to TA C-72.

3.4.1 Ecological Associations

Four broad matrix ecosystems exist on Eglin AFB: Sandhills, Flatwoods, Wetlands/Riparian, and Barrier Island. The ecosystems are defined by floral, faunal, and geophysical similarities. Artificially maintained open grasslands/shrublands and urban/landscaped areas also exist on Eglin, primarily at test areas or on the Main Base. Although grasslands/shrublands and urban/landscaped areas are not true ecological associations, they are included in this section as land uses, as they are present within the study area.

Test Area C-72 is predominately open grasslands/shrublands with interspersed sandhills, wetlands/riparian areas, and urban/landscaped areas (Figure 3-3). Areas immediately adjacent to TA C-72 are largely sandhills, with some wetland/riparian and flatwoods along the streams that surround the test area. A list of typical species found within each ecological association is provided in Table 3-4, while detailed descriptions of the ecological associations are found in Appendix D, *Biological Resources*.

3.4.2 Sensitive Habitats

Sensitive habitats include areas that the federal government, state government, or the DoD have designated as worthy of special protection due to certain characteristics, such as high species diversity, rare plant species, or other unique features. No sensitive habitats are located within the boundaries of TA C-72. Sensitive habitats located in close proximity to the test area include wetlands, floodplains, and some stands of old growth longleaf pine. Also, southeast of the test area are sensitive habitats designated as outstanding natural areas and significant botanical sites (Figure 3-4). However, the closest of these is more than half a mile from the test area boundary and, therefore, they are not likely to be impacted by the proposed action or alternatives. Wetlands and floodplains are detailed in the Section 3.3.

3.4.3 Sensitive Species

Sensitive species are those species protected under federal or state law, including migratory birds and threatened and endangered species. An *endangered* species is one that is in danger of extinction throughout all or a significant portion of its range. A *threatened* species is any species that is *likely* to become endangered within the foreseeable future throughout all or a significant portion of its range.

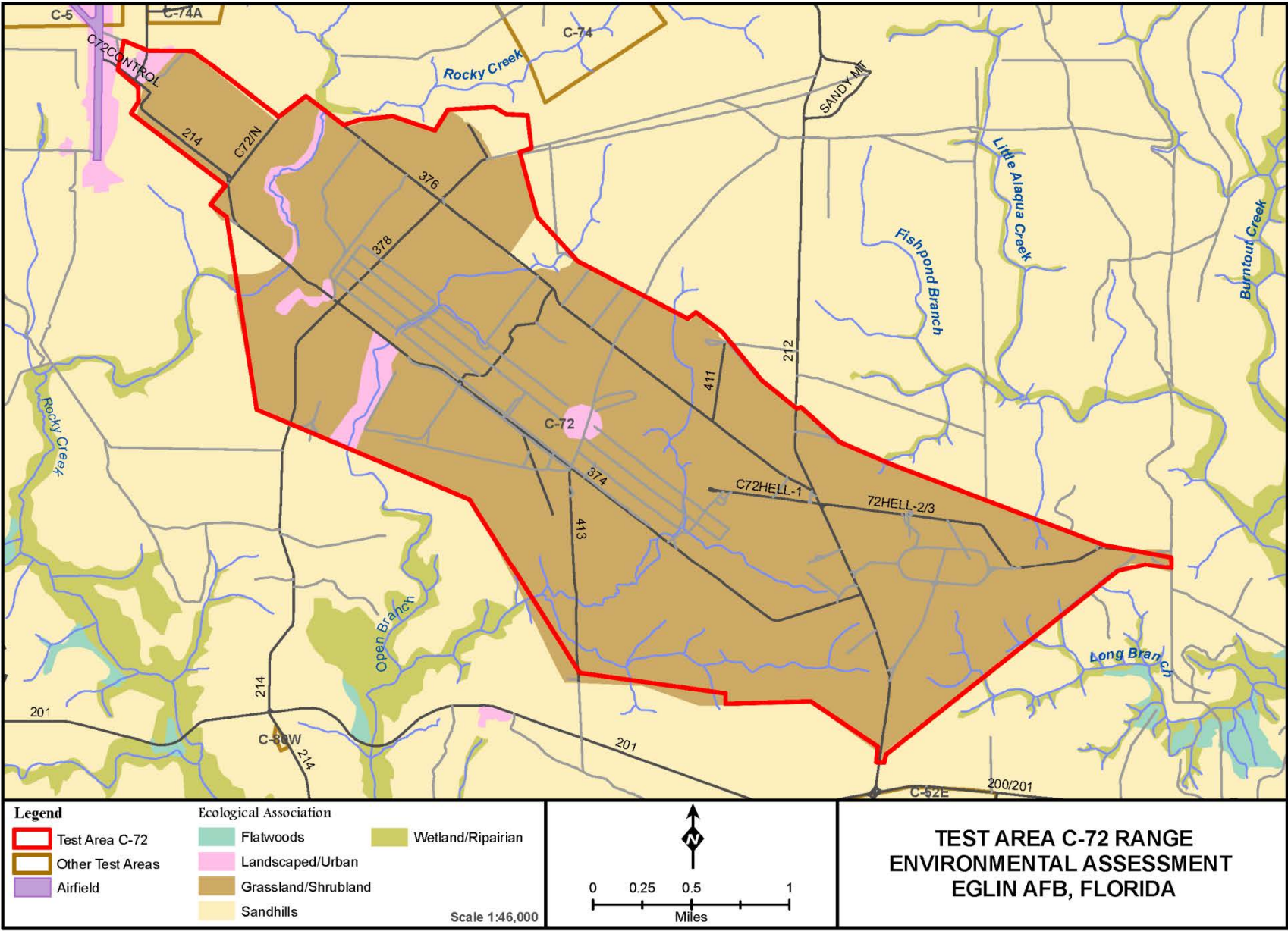


Figure 3-3. Ecological Associations Found On or Near Test Area C-72

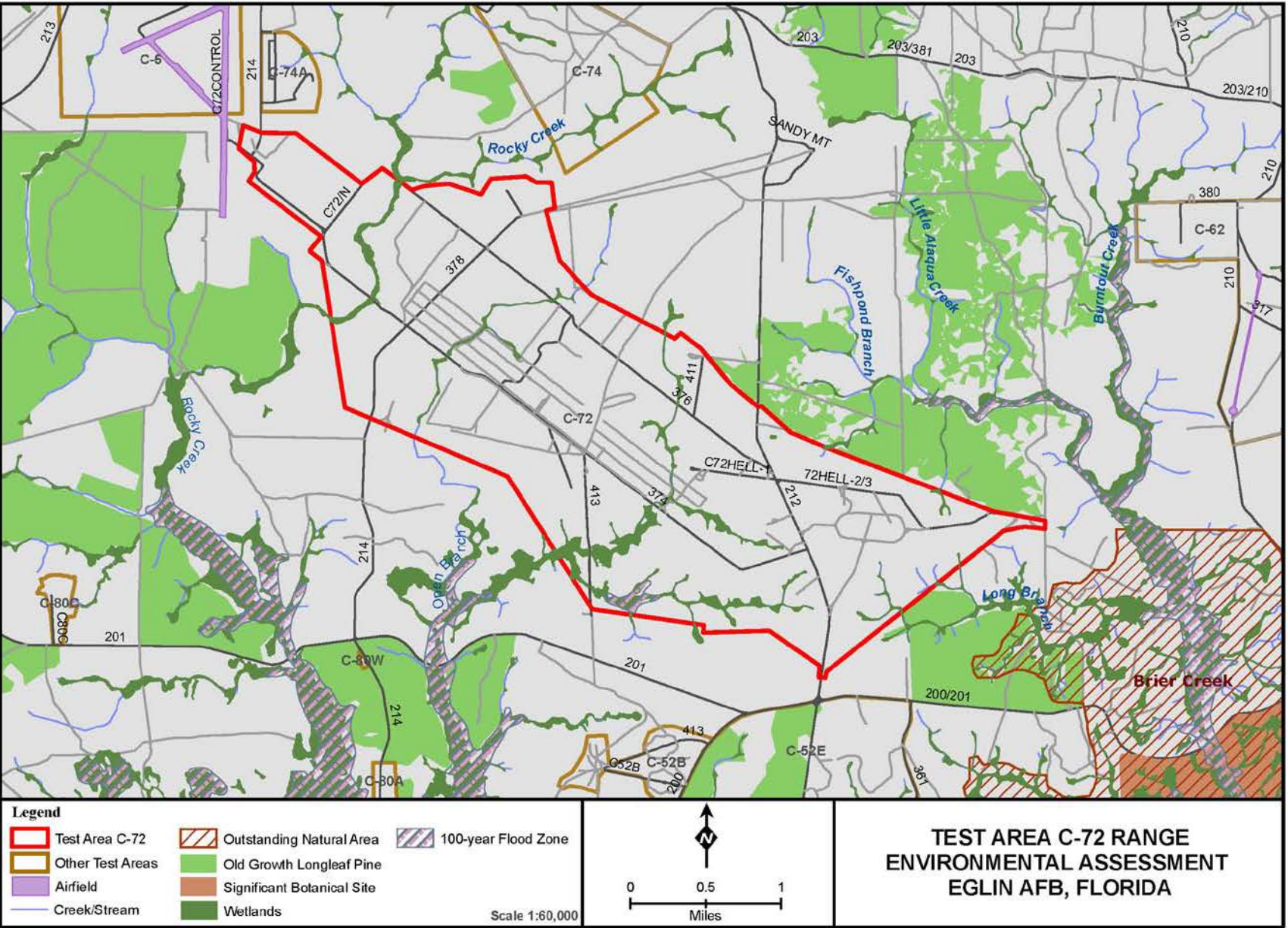


Figure 3-4. Sensitive Habitats Found On or Near Test Area C-72

Table 3-4. Typical Species Found Within the Sandhills, Wetland/Riparian, Flatwoods, and Open Grassland/Shrubland Ecological Associations

Plants		Animals	
Common Name	Scientific Name	Common Name	Scientific Name
Sandhills Ecological Association			
Longleaf pine	<i>Pinus palustris</i>	Red-cockaded woodpecker	<i>Picoides borealis</i>
Turkey oak	<i>Quercus laevis</i>	Bobwhite quail	<i>Colinus virginianus</i>
Blackjack oak	<i>Q. marilandica</i>	Great horned owl	<i>Bubo virginianus</i>
Bluejack oak	<i>Q. incana</i>	Gopher tortoise	<i>Gopherus polyphemus</i>
Wiregrass	<i>Aristida stricta</i>	Indigo snake	<i>Drymarchon corais</i>
Saw palmetto	<i>Serona repens</i>	Diamondback rattlesnake	<i>Crotalus adamanteus</i>
Bracken fern	<i>Pteridium aquilinum</i>	Six-lined racerunner	<i>Cnemidophorus sexlineatus</i>
Blueberry	<i>Vaccinium spp.</i>	Florida black bear	<i>Ursus americanus floridanus</i>
Yaupon	<i>Ilex vomitoria</i>	Fox squirrel	<i>Sciurus niger</i>
Gallberry	<i>Ilex glabra</i>	Least shrew	<i>Cryptodius parva</i>
Gopher apple	<i>Licania michauxii</i>	Cottontail rabbit	<i>Sylvilagus floridanus</i>
Blackberry	<i>Rubus cuneifolius</i>	Pocket gopher	<i>Geomys pinetus</i>
Sand pine	<i>Pinus Clausa</i>	White-tailed deer	<i>Castor canadensis</i>
Pine-woods bluestem	<i>Andropogon arctatus</i>	Feral pig	<i>Sus scrofa</i>
Wiregrass	<i>Aristida stricta</i>	Raccoon	<i>Procyon lotor</i>
Wetland and Riparian Ecological Association (Freshwater)			
Yellow water lily	<i>spp.</i>	Raccoon	<i>Procyon lotor</i>
Saw grass	<i>Cladium jamaicensis</i>	Florida black bear	<i>Ursus americanus floridanus</i>
Cattail	<i>Typha domingensis</i>	Sherman's fox squirrel	<i>Sciurus niger shermani</i>
Phragmites	<i>Phragmites australis</i>	American alligator	<i>Alligator mississippiensis</i>
White cedar	<i>Chamaecyparis thyoides</i>	Pine barrens tree frog	<i>Hyla andersonii</i>
Water tupelo	<i>Nyssa biflora</i>	Five-lined skink	<i>Eumeces fasciatus</i>
Pitcher plant	<i>Sarracenia purpurea</i>	Green anole	<i>Anolis carolinensis</i>
Red titi	<i>Cyrtilla racemiflora</i>	Garter snake	<i>Thamnophis sirtalis</i>
Tulip poplar	<i>Liriodendrom tulipifera</i>	Indigo snake	<i>Drymarchon corais</i>
Sweet bay magnolia	<i>Magnolia virginiana</i>	American beaver	<i>Castor canadensis</i>
Red bay	<i>Persea borbonia</i>	Parula warbler	<i>Parula americana</i>
Flatwoods Ecological Association			
Longleaf pine	<i>Pinus palustris</i>	Wood duck	<i>Aix sponsa</i>
Runner oak	<i>Quercus pumila</i>	Red-winged blackbird	<i>Agelaius phoenicius</i>
Saw palmetto	<i>Serona repens</i>	Cotton mouth	<i>Agkistridon piscivorus</i>
St. John's wort	<i>Hypericum brachyphyllum</i>	Flatwoods salamander	<i>Ambystoma cingulatum</i>
Slash pine	<i>Pinus elliotii</i>	River otter	<i>Lutra canadensis</i>
Black titi	<i>Cliftonia monophylla</i>	Beaver	<i>Castor canadensis</i>
Milkweed	<i>Asclepias humistrata</i>	Florida black bear	<i>Ursus americanus floridanus</i>
Pitcherplant	<i>Sarracenia spp.</i>	Gray fox	<i>Urocyon cinereoargenteus</i>
Open Grassland/Shrubland Ecological Association			
Switchgrass	<i>Panicum virgatum</i>	Red-shouldered hawk	<i>Buteo lineatus</i>
Broomsedge	<i>Andropogon virginicus</i>	Southeastern American kestrel	<i>Falco sparverius paulus</i>
Big bluestem	<i>Schizachyrium spp.</i>	Florida burrowing owl	<i>Athene cunicularia</i>
Yellow Indian grass	<i>Sorghastrum spp.</i>	Flycatchers	<i>Tyrannidae spp.</i>
Purple lovegrass	<i>Eragrostis spectabilis</i>	Cotton mouse	<i>Peromyscus gossypinus</i>
Woolly panicum	<i>spp.</i>	Slender glass lizard	<i>Ophisaurus attenuatus</i>
Forbs	<i>Panicum virgatum</i>	Gopher tortoise	<i>Gopherus polyphemus</i>

The Endangered Species Act (ESA) of 1973 (16 USC 1531 to 1544; 1997–Supp) was enacted to provide for the conservation of endangered and threatened species and the ecosystems on which they depend. Air Force Policy Directive 32-70 directs the implementation of the ESA. Certain federal activities may require an ESA Section 7 consultation with the USFWS and/or the NMFS if impacts to federally listed species are possible.

AFI 32-7064 details how to manage natural resources to comply with federal, state, and local laws and regulations. This AFI calls for the protection and conservation of state-listed species when not in direct conflict with the military mission. Eglin AFB applies for appropriate permits for actions that may affect state-listed species (such as monitoring and handling) and also cooperates with the FWC to further the goals of the Florida State Wildlife Conservation Strategy.

Migratory birds are protected under the Migratory Bird Treaty Act (16 USC 703-712; 1997-Supp) and EO 13186. A migratory bird is defined by the USFWS as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during their annual life cycle. Federal agencies are to integrate bird conservation principles, measures, and practices into agency activities, and are to avoid or minimize adverse impacts on migratory bird resources. Also, federal agencies must provide notice to the USFWS in advance of conducting an action that is intended to take migratory birds.

Sensitive species found on or near TA C-72 are listed in Table 3-5 and are depicted in Figure 3-5 and Figure 3-6. Detailed descriptions of these species are located in Appendix D, *Biological Resources*.

Table 3-5. Sensitive Species Found On or Near Test Area C-72

Scientific Name	Common Name	Status
Reptiles		
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	SSC
<i>Drymarchon corias couperi</i>	Eastern indigo snake	FT, ST
<i>Gopherus polyphemus</i>	Gopher tortoise	ST
Fish		
<i>Etheostoma okaloosae</i>	Okaloosa darter	FE, SE
Birds		
<i>Falco sparverius paulus</i>	Southeastern American kestrel	ST; MBTA
<i>Picoides borealis</i>	Red-cockaded woodpecker	FE, ST; MBTA
Mammals		
<i>Ursus americanus floridanus</i>	Florida black bear	ST
Plants		
<i>Sarracenia rubra</i>	Sweet pitcherplant	ST
<i>Baptisia calycosa</i> var. <i>villosa</i>	Hairy wild indigo	ST

FE = federally endangered; FT = federally threatened; MBTA = protected under the Migratory Bird Treaty Act; SE = state endangered; ST = state threatened; SSC = state species of special concern

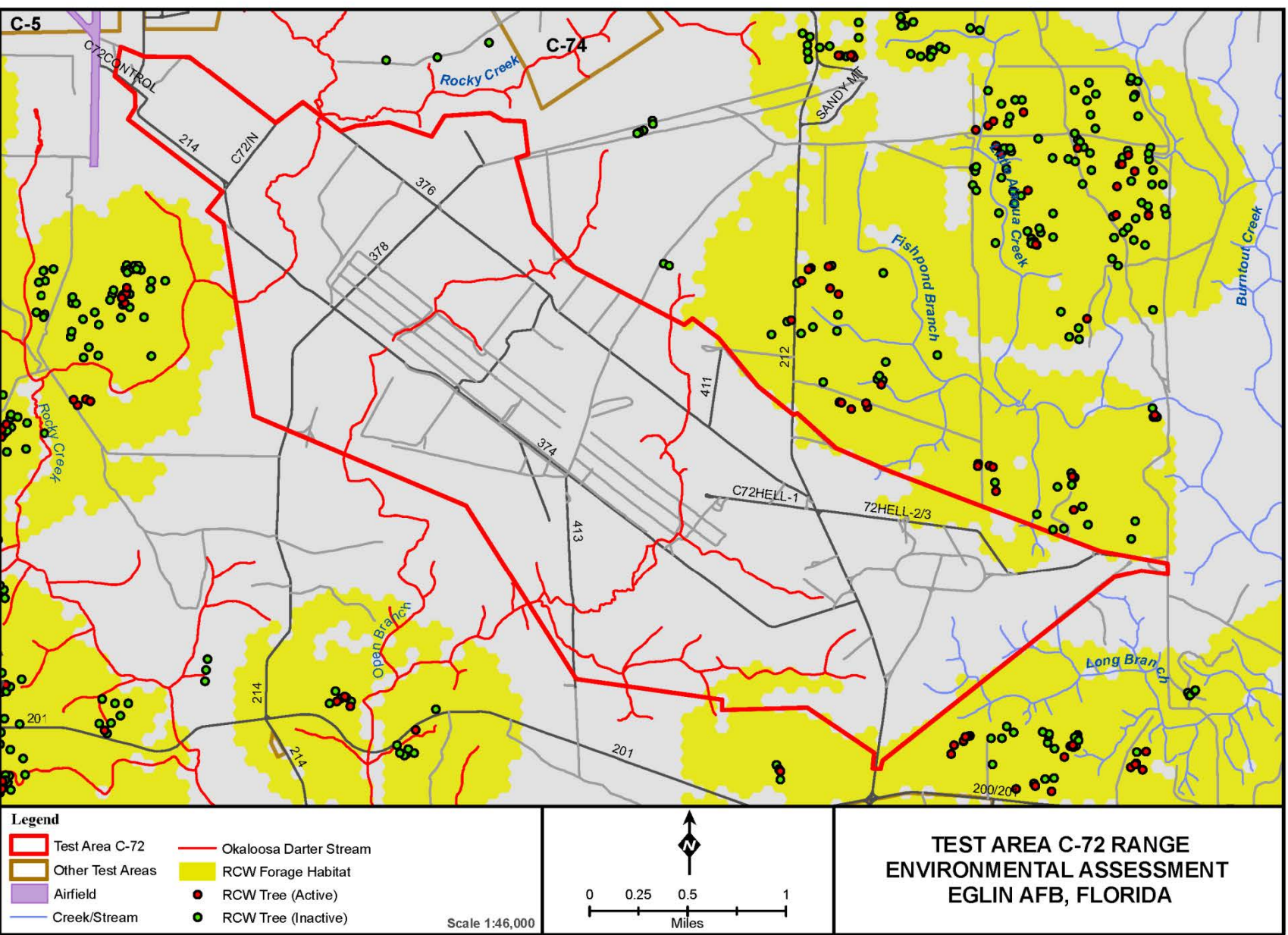


Figure 3-5. Sensitive Species Found On or Near Test Area C-72

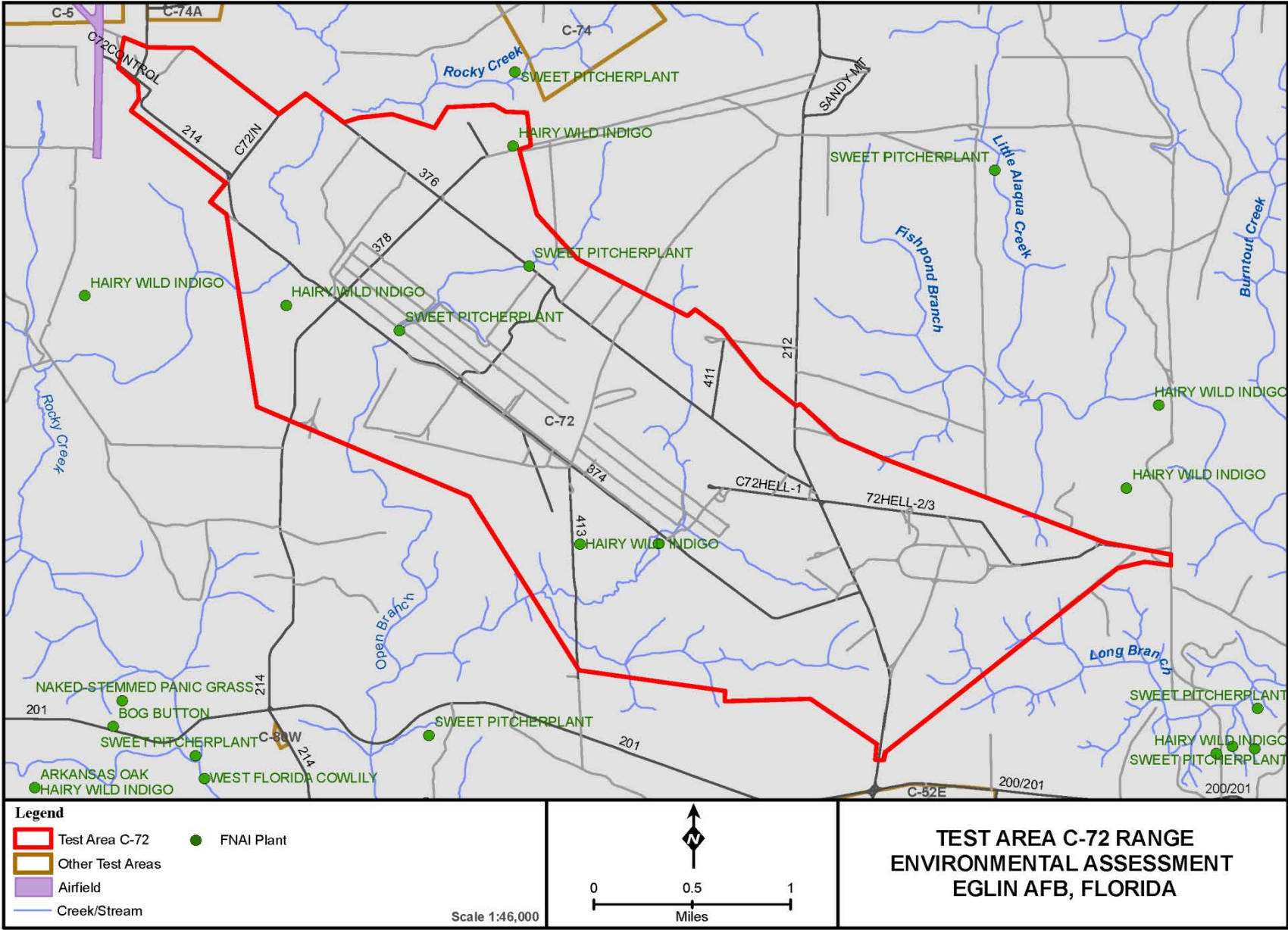


Figure 3-6. Sensitive Plants Found On or Near Test Area C-72

3.4.4 Invasive Non-native Species Management

Invasive non-native species (INS) include plants, animals, insects, diseases, and other organisms that are becoming established and spreading at an alarming rate throughout the world. An invasive species can be defined as a species that is non-native to an ecosystem and whose intentional or accidental introduction causes or is likely to cause environmental or economic damage or harm to human health.

The Eglin AFB INS Management Program focuses on invasive non-native plant and animal species that cause or may cause negative environmental impacts to Eglin ecosystems. Some of the main invasive non-native species of concern are Chinese tallow, cogon grass, Japanese climbing fern, Chinese privet, torpedo grass, feral pigs, and feral cats (U.S. Air Force, 2006c). The program's purpose is to protect the integrity of Eglin's natural ecosystems by reducing and controlling the spread of INS. The plan includes a recommendation to limit foot traffic and vehicle traffic in areas where INS are present to prevent the spread of the invasive and exotic species. Equipment moving through these areas needs to be washed so that all seedlings are removed before the equipment is transferred to a noncontaminated area. Standard operating procedures dictate that all vehicles are cleaned prior to use, which would lessen or eliminate the potential for the spread of INS.

3.5 CULTURAL RESOURCES

Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered relevant to a culture or community for scientific, traditional, religious, or other reasons. They include archaeological resources (both prehistoric and historic), historic architectural resources, and American Indian sacred sites and traditional cultural properties. Historic properties (as defined in 36 CFR 60.4) are significant archaeological, architectural, or traditional resources that are defined as either eligible or ineligible for listing on the NRHP.

3.5.1 Relevant Laws

As a federal agency, Eglin AFB is legally required to consider the effects its actions may have on historic properties existing on the Eglin range complex, including all properties being utilized by other federal agencies. These requirements are considered under AFI 32-7065 (U.S. Air Force, 2004). Mandating federal regulations are the Antiquities Act of 1906, Historic Sites Act of 1935, NEPA of 1969, NHPA of 1966 as amended, 36 CFR Part 800, Archaeological and Historic Preservation Act of 1974, Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and American Indian Religious Freedom Act. The act that has the most influence on cultural resources management at Eglin AFB is the NHPA (U.S. Air Force, 2004).

The NHPA was enacted to set federal policy for managing and protecting significant historic properties. Federal agencies must identify historic properties and consult with the Advisory Council on Historic Preservation and State Historic Preservation Office (SHPO) (U.S. Air Force, 2004). Section 106 of the NHPA requires that federal agencies analyze the impacts of federal activities on historic properties or cultural resources included in, or eligible for inclusion in, the NRHP.

3.5.2 Affected Environment

The affected environment or area of potential effects for this REA consists of any area described in this REA where proposed activities would involve ground disturbance. Any ground disturbance can cause potential impacts to cultural resources. Should planned activities or areas affected change in the future, Cultural Resources Branch (96 CEG/CEVH) is required to obtain the latest information for any ground-disturbing activities that might impact these areas.

All areas considered high probability for prehistoric resources have been surveyed to date with 1,028 acres of historic homestead survey areas remaining unsurveyed (CRIMS, 2011). Previous archaeological surveys did not identify any archaeological sites considered eligible for listing on the NRHP present within TA C-72.

As part of the effort for clearing timber to improve LOS, archaeological surveys were conducted in 2007 within the area of potential effects both inside and outside the boundaries of TA C-72. Eight distinct survey areas, totaling 988 acres, were subjected to surface and subsurface testing to determine the presence/absence of cultural resources (Mack et al., 2007a, b, c, d; Mallory et al., 2007a, b, c; Mallory, 2008). As a result of these surveys, 10 sites and archaeological occurrences were identified; however, none of these archaeological sites were considered eligible for the NRHP.

Protected historic cultural resources are present inside the boundaries of TA C-72. Test Area C-72 was originally known as Range E when it was opened in the 1950s as a free flight rocket ballistics test area (Weitze, 2005). Due to its association with significant Cold War military programs, the entire Range E complex is potentially eligible for listing on the NRHP as an historic district with existing structures, such as the rocket sled used in missile tests during this period (CRIMS, 2011).

In addition, individual structures on the range itself are considered eligible for listing on the NRHP. These include targets TT-63 (8WL2316), a mock SubPen target, and TT-64 (8WL2317), a concrete wall target. A complex of underground facilities, known as the “Vietnamese tunnel complex” (8WL2237 and 8WL1523) consist of 340 feet of underground tunnels built in 1966 and utilized through 2000. Among the structures that make up this complex are a buried concrete command post, various tunnels and trenches, howitzer emplacements, and a circular mortar emplacement (Weitze, 2005). The Vietnamese tunnel complex is considered eligible for listing on the NRHP.

3.6 AIR QUALITY

3.6.1 Definition

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The levels of pollutants are generally expressed as concentrations in units of parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) and state air quality standards (Table 3-6). These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare. Further discussion of the NAAQS and state air quality standards are included in Appendix E, *Air Quality*. Based on measured ambient air pollutant concentrations, the USEPA designates whether areas of the United States meet the NAAQS. Those areas demonstrating compliance with the NAAQS are considered “attainment” areas, while those that do not demonstrate compliance are known as “nonattainment” areas. Those areas that cannot be classified on the basis of available information for a particular pollutant are “unclassifiable” and are treated as attainment areas until proven otherwise.

Table 3-6. National Ambient Air Quality Standards (NAAQS)

Time Period	NAAQS Standards ($\mu\text{g}/\text{m}^3$)			
	CO	NO _x	PM	SO _x
<i>Annual (primary)</i>		100	50	80
<i>24-hour average (primary)</i>			150	365
<i>8- hour average (primary)</i>	10,000			
<i>3- hour average (secondary)</i>				1,300
<i>1- hour average (primary)</i>	40,000			

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter; CO = carbon monoxide; NO_x = nitrogen oxides;
PM = particulate matter; SO_x = sulfur oxides

3.6.2 Region of Influence and Existing Conditions

An air emissions inventory qualitatively and quantitatively describes the amount of emissions from a facility or within an area. Emissions inventories are designed to locate pollution sources, define the type and size of the sources, characterize emissions from each source, and estimate total mass emissions generated over a period of time, normally a year. These annual rates are typically represented in tons per year. Inventory data establish relative contributions to air pollution concerns by classifying sources and determining the adequacy, as well as the necessity, of air regulations. Accurate inventories are imperative for the development of appropriate air quality regulatory policy.

The most recent air emissions inventories for Eglin AFB quantify emissions from stationary and mobile sources, based on calendar year activities. Stationary sources include equipment/processes such as boilers, electric generators, surface coating, and fuel-handling operations. Mobile sources include motor vehicles, aerospace ground support equipment, and aircraft operations.

For comparison, Table 3-7 presents the USEPA’s 2002 National Emissions Inventory (NEI) data for Walton County (USEPA, 2002). The county data include emissions data from point sources,

area sources, and mobile sources. *Point sources* are stationary sources that can be identified by name and location. *Area sources* are point sources whose emissions are too small to track individually, such as a home or small office building or a diffuse stationary source, such as wildfires or agricultural tilling. *Mobile sources* are any kind of vehicle or equipment with gasoline or diesel engine, an airplane, or a ship. Two types of mobile sources are considered: on-road and non-road. On-road mobile sources consist of vehicles such as cars, light trucks, heavy trucks, buses, engines, and motorcycles. Non-road sources are aircraft, locomotives, diesel and gasoline boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles (USEPA, 2005).

Table 3-7. Baseline Emissions Inventory for Walton County

Source Type	Emissions Tons/yr				
	CO	NO _x	PM	SO _x	VOCs
Area sources	15,410	235	11,480	250	4,899
Non-road mobile	12,673	1,305	3,379	140	2,998
On-road mobile	24,033	3,855	190	153	1,809
Point sources	25	14	2	4	28
Total Walton County	52,140	5,409	15,052	547	9,734

Source: USEPA, 2002

CO = carbon monoxide; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOCs = volatile organic compound

In order to evaluate air emissions and their impact on the overall ROI, the emissions associated with the project activities were compared to the total emissions on a pollutant-by-pollutant basis for the ROI's 2002 NEI data.

Potential impacts to air quality are identified here as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10 percent criterion approach was used in the USEPA's General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas. The U.S. Environmental Protection Agency made revisions to the General Conformity Regulations on March 24, 2010. These final revisions remove the requirements for federal agencies to conduct conformity determinations for "regionally significant" actions. Such actions have emissions greater than 10 percent of the emissions inventory for a nonattainment area. However, this criterion will still be used here for purposes of discussion and comparison. Emissions from activities at Test Area C-72 will also be compared to the federal NAAQS.

3.7 NOISE

3.7.1 Definition

Noise is defined as any unwanted sound. Defining characteristics of noise include sound level (amplitude), frequency (pitch), and duration. Each of these characteristics plays a role in determining the intrusiveness and level of impact of the noise on a noise receptor. The term *noise receptor* is used in this document to mean any person, animal, or object that hears or is affected by noise.

Sound levels are measured on a logarithmic decibel (dB) scale, reflecting the relative way in which differences in sound energy levels are perceived. A sound level that is 10 dB higher than

another would normally be perceived as twice as loud, while a sound level that is 20 dB higher than another would be perceived as four times as loud. Under laboratory conditions, a person with normal hearing can detect a change in sound level as small as 1 dB. Under most nonlaboratory conditions, people notice changes in sound level of approximately 3 dB.

Sound measurement may be further refined through the use of frequency “weighting.” A typical healthy human can detect sounds that range in frequency from about 20 hertz (Hz) to 20,000 Hz (Federal Interagency Committee on Noise [FICON], 1992). However, all sounds throughout this range are not heard equally well. In “A-weighted” measurements, the frequencies in the 1,000- to 4,000-Hz range are emphasized, because these are the frequencies to which human hearing is most sensitive. Sound level measurements weighted in this way are termed *A-weighted decibels* (dBA). In the case of sonic booms, blast noise, and other impulsive “booming” noises, sound is felt as well as heard. With these types of noise, overpressure may be considered more annoying than the sound itself. For this reason, impulsive sounds are measured using “C-weighting,” which does not attenuate the lower frequencies to the extent that A-weighting does. Sound level measurements weighted in this way are termed *C-weighted decibels* (dBC). Unless otherwise noted, all sound levels referenced in this REA can be assumed to be A-weighted.

Typically, the sound level at any given location changes constantly. For example, the sound level changes continuously when an aircraft flies by, starting at the ambient (background) level, increasing to a maximum when the aircraft passes closest to the receptor, and then decreasing to ambient levels when the aircraft flies into the distance. The term *maximum sound level*, or “ L_{max} ,” represents the sound level at its greatest level during an aircraft overflight, when sound is at its maximum.

Because munitions noise levels are so strongly influenced by meteorological conditions (e.g., winds), the peak noise level at a particular location may vary significantly. The metric “peak noise exceeded by 15 percent of firing events,” or “ $PK_{15}(met)$,” accounts for weather-influenced statistical variation in received single-event peak noise levels. $PK_{15}(met)$ is the peak noise level, without frequency weighting, expected to be exceeded by 15 percent of all firing events. Because this value is based on probability and actual noise levels would vary higher and lower, it cannot be directly measured in the field. If multiple weapon types are fired from one location, or from multiple firing locations, the reported $PK_{15}(met)$ level would be based on the loudest weapon type at the closest location. The U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) recommends this metric as a supplement to time-averaged noise levels when discussing impulsive noise (USACHPPM, 2005).

Because both the duration and frequency of noise events also play a role in determining overall noise impact, several metrics are used to account for these factors. Each metric discussed below is used in the assessment of noise impacts in this REA.

Sound exposure level (SEL) accounts for both the maximum sound level and the length of time a sound lasts. SEL does not directly represent the sound level heard at any given time. Rather, it provides a measure of the total sound exposure for an entire event compressed into 1 second. This metric is useful for comparing fast-moving and slow-moving aircraft and is a good predictor of several noise impacts, including sleep disturbance and speech interference.

Day-night average sound level (DNL) represents aircraft noise level averaged over a 24-hour period, with a 10-dB penalty to flights occurring between 10:00 PM and 7:00 AM to account for

the added intrusiveness of noise during these hours. The DNL metric does not represent the noise heard at any single point in time, but rather a weighted average level of noise events that occur over the course of a day. The DNL metric has been endorsed by several federal agencies as being the best descriptor of general noise conditions in the vicinity of airfields (USEPA, 1974; Federal Interagency Committee on Urban Noise [FICUN], 1980).

C-weighted day-night sound level (CDNL) is the 24-hour day-night averaged C-weighted sound level computed for areas subjected to sonic booms and blasts from high explosives. The C-weighted scale accounts for the dominance of low-frequency components of these types of sounds.

Onset-rate adjusted monthly day-night average sound level (DNL_{mr}) is the measure used for subsonic aircraft noise in military airspace (ranges, military training routes [MTRs], military operating areas [MOAs], or warning areas). This metric accounts for the fact that when military aircraft fly low and fast, the sound can rise from the ambient level to its maximum very quickly. Known as an “onset rate,” this effect can make noise seem louder due to added “startle” effects. Penalties of up to 11 dB are added to account for the onset rate.

3.7.2 Effects of Noise

Annoyance, speech interference, sleep interference, human health impacts, structural damage, and wildlife impacts have all been associated with noise. In this document, the “Noise” section addresses general noise impacts on humans and structures, while noise impacts on land use, environmental justice, biological resources, and cultural resources are discussed in the respective resource section.

Annoyance is the most common effect of aircraft noise on humans. Aircraft noise often interferes with activities such as conversation, watching television, using a telephone, listening to the radio, and sleeping. This interference often contributes to individuals becoming annoyed. Whether or not an individual becomes annoyed by a particular noise is highly dependent on emotional and situational variables of the listener as well as the physical properties of the noise (Federal Aviation Administration [FAA], 1985). However, when assessed over long periods of time and with large groups of people, a strong correlation exists between the percentage of people highly annoyed by noise and the time-averaged noise exposure level in an area (Schultz, 1978; Finegold et al., 1994). This finding is based on surveys of groups of people exposed to various intensities of transportation noise. A generalized categorization of noise-induced annoyance can be found in Table 3-8. As discussed earlier in this section, DNL (A-weighted) is used to assess noise for which audible sound is the major concern (e.g., subsonic aircraft noise, small arms fire). CDNL (C-weighted) is used to assess noise in which vibration and low-frequency components are a major concern (e.g., sonic booms, high-explosive munitions noise).

Table 3-8. Relationship Between Noise Level and Percent of Population Highly Annoyed

Criteria	Noise Level		
A-weighted average noise levels (continuous noise)	< 65 dB	65–75 dB	> 75 dB
C-weighted average noise levels (impulsive noise)	< 62 dBC	62–70 dBC	>70 dBC
Unweighted peak noise levels (small arms noise)	< 87 dBP	87-104 dBP	>104 dBP
	Percent of Population Highly Annoyed		
	< 15%	15%–39%	>39%

Source: USACHPPM, 2005; U.S. Army, 1997

< = less than; > = greater than; dB = decibels; dBC = C-weighted decibels; dBP = P-weighted decibels

Note: The primary noise metric used by the U.S. Army to describe small arms noise is PK₁₅(met)

USEPA recommends that noise level in sleeping areas be less than 45 dB DNL (USEPA, 1974). As modern homes typically provide an exterior-interior noise level reduction of greater than 20 dB (U.S. Navy, 2005), residential areas in areas where noise is higher than 65 dB DNL are assumed to not meet the USEPA recommendation. Studies indicate a tendency for humans to habituate to regularly occurring nighttime noise over time, eventually reducing susceptibility to noise-induced sleep disturbance (Fidell et al., 1995; Pearsons et al., 1995; Kryter, 1984).

In addition, USEPA recommends that, to protect public health with an adequate margin of safety, exterior noise levels should not exceed 55 dB DNL and interior noise levels should not exceed 45 dB DNL in noise-sensitive locations (USEPA, 1974). FICUN took these recommendations into consideration when developing its recommendations on compatibility of land uses with noise (FICUN, 1980). These recommendations have been adopted, with minor modifications, by the DoD (DoD Instruction 4165.57).

Noise is generally viewed as being one of a number of general biological stressors. Some studies have indicated that excessive exposure to intense noise might contribute to the development and aggravation of stress-related conditions such as high blood pressure, coronary disease, ulcers, colitis, and migraine headaches. Other studies have found no correlation between noise and various health conditions. Nonauditory health effects of noise are not well established at this time, but they are likely only experienced at extremely high noise levels (USEPA, 1981).

A considerable amount of data on noise-related hearing loss has been collected and analyzed. For example, it has been established that 8 hours of continuous exposure to 85 dB increases the risk for potential permanent hearing loss over a 40-year period (USEPA, 1974). The National Academy of Sciences Committee on Hearing, Bioacoustics, and Biomechanics (CHABA) identified 75 dB DNL as the minimum level at which hearing loss may occur (CHABA, 1977). However, it is important to note that CHABA assumed long-term exposure (40 years) before hearing loss would occur. The U.S. Army has established a peak noise level of 140 dB as the threshold above which a temporary threshold shift (measured as increase in lowest level at which a sound is audible) may occur (USACHPPM, 2005).

3.7.3 Existing Noise Environment

Ambient noise is the combination of all sounds, near and far, at a particular location, excluding the sound source of interest, such as a mission activity. Natural wind, wildlife (for example, birds), aircraft, and vehicular traffic are primary contributors to the ambient noise environment at TA C-72. Vehicles associated with nearby highways and aircraft operating in the vicinity also contribute to the daily noise environment. Ambient noise is an important consideration when determining potential impact from an action. Generally, USEPA and Air Force studies predict

that noise from a given sound source that raises the average noise level 5 dB above ambient levels is intrusive and will likely generate widespread complaints. For noise levels over 20 dB above ambient levels, a more negative reaction may be expected (U.S. Army, 2007).

The most likely receptors of noise would be passing vehicles on Highway 285. The nearest residential area is approximately 5.6 miles to the north of the test area. The primary sensitive species of concern is the RCW which is discussed under Biological Resources, Sensitive Species.

3.8 SAFETY/RESTRICTED ACCESS

The existing safety environment encompasses risk to public health and, with respect to training activities, risk to the health of military personnel, and those measures designed to minimize that risk. For actions occurring on military property with inherent safety risks, procedures are in place that minimize or eliminate risks to the public. Such measures include the designation of areas as “restricted” or “closed” to the public, either permanently or temporarily. Such closures are driven either by the dimensions of the “safety footprint” of a particular action that may result in potentially harmful noise, blast, or other effects or by the existence of unexploded ordnance from historical missions.

This section presents information concerning the existing range safety conditions at Eglin AFB. It discusses the safety regulations and process, safety organizations and responsibilities, and other safety procedures.

3.8.1 Regulatory and Management Overview

This section discusses the regulations, policies, and management protocols in place at Eglin AFB for range safety relevant to TA C-72 use. The primary regulations that establish relevant safety policy and define requirements and procedures for conducting tests on Eglin AFB and areas under its jurisdiction are found in Eglin Air Force Base Instruction (EAFBI) 13-212. As described under section 1.2 of EAFBI 13-212, all test programs and operations are required to abide by the current 46 Test Wing planning process, including the test safety review process defined in AAC Instruction 91-201, *Test Safety Review Process*. This guidance is implemented by the AAC Range Safety Office (AAC/SE) and supporting organizations. The Test Safety Review Process described in AAC Instruction 91-201 implements the Operational Risk Management (ORM) process, as specified in AFI 90-901 for all AAC test programs, and reflects the practical application of ORM as outlined in Air Force Pamphlet (AFPAM) 90-902, *ORM Guidelines and Tools*. The steps in the ORM process, as they relate to the Test Safety Review Process are:

1. **Identify the hazards.** Personnel involved with the test or activity act as a team to identify all potential hazards.
2. **Assess the potential risk.** Assess the probability and severity of loss from exposure to the identified hazard.
3. **Analyze risk control measures.** Investigate specific strategies and tools that reduce, mitigate, or eliminate the risk.

4. **Make control decisions.** Approve the best risk control or combination of controls based on the analysis of overall costs and benefits.
5. **Implement risk controls.** Once procedures to minimize identified hazards have been determined and approved at the appropriate level, implement them during the test.
6. **Supervise and review.** Continue the ORM process throughout the accomplishment of every test program.

This instruction affects all test programs and operations conducted under a 46 TW test directive. It includes ground-training activities involving personnel, aircraft, equipment, or airspace. It applies to system program managers, program engineers, test engineers, range safety engineers, and aircrews that are responsible for incorporating safety planning and review into test and training programs. Safety procedures associated with routine training operations are implemented through the individual organization, based on its specific training protocols. Safety approvals must be obtained prior to mission conduct.

A number of standard safety procedures exist to ensure limited public access to affected training areas during test implementation. These procedures require every practical effort to keep the designated training areas clear of all nonparticipating persons and vehicles. Large portions of Eglin AFB are closed to public use, which facilitates range clearance operations. Depending on the type of training being conducted, contingency personnel may stand by in case of emergency (U.S. Air Force, 2003b).

3.8.2 Unexploded Ordnance

UXO is defined as any munitions device containing explosive material (i.e., live) that did not detonate upon impact with the surface but still has the potential to detonate. UXO is a potential problem across much of the Eglin Range Complex as a result of past mission activities. Eglin AFB has been testing munitions for approximately 70 years. During its long history, a vast number of different munitions items have been expended throughout the Range as part of routine training and special testing activities. While UXO is an unintended but unavoidable consequence of any operation involving energetic material, only recently has the Air Force published standards for munitions residue maintenance, remediation, and documentation.

Eglin has conducted an archive search to document the locations of formerly used ranges but has yet to conduct any basewide assessment of UXO contamination suitable to support an analysis of risk to training units. Previous informal analyses have centered on identifying areas with low enough risk to allow public recreation or to outgrant nonexcess real property. Currently, the AAC Directorate of Safety office handles requests on a case-by-case basis and controls the risk by limiting the type, location, or frequency of the requested action based on an informal risk assessment using local historical knowledge, the USACE Archive Search Report, and the Eglin Reservation Explosives Contamination study from July 1976.

Some areas of Eglin AFB have been classified as “clean” and access is not restricted. These areas either have never been used for munitions or the near surface has been checked for the presence of UXO. However, much of the range is considered potentially contaminated with UXO left from historical activities (U.S. Air Force, 1998c). TA C-72 is used for munitions testing and, therefore, is considered likely contaminated with UXO. Therefore, TA C-72 is permanently closed to public access (Figure 3-7).

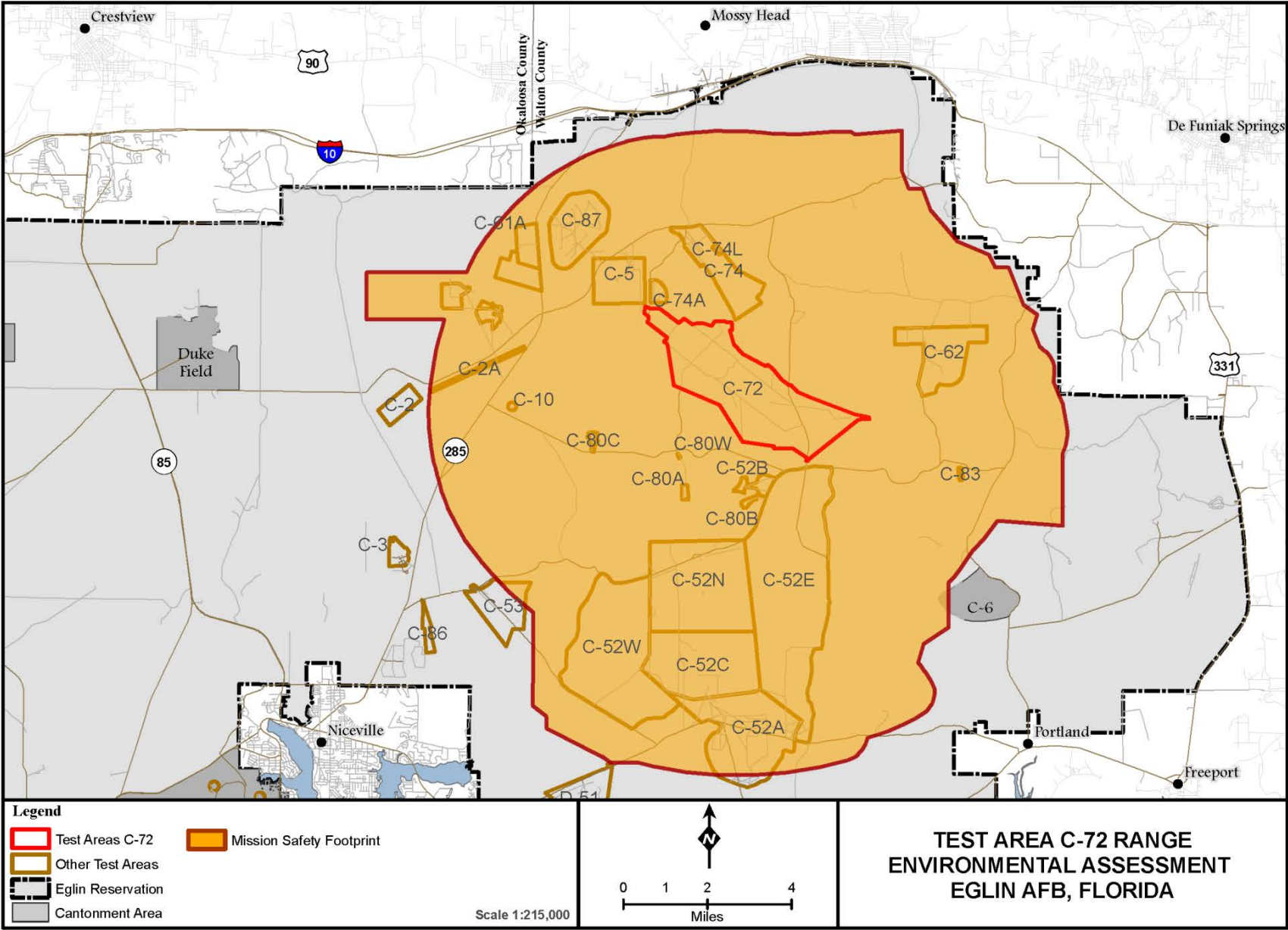


Figure 3-7. Restricted Access At and Around Test Area C-72

3.8.3 Restricted Access

Restricted access pertains to the temporary closure of areas on Eglin AFB because of mission activities. The purpose of restricting access to the public during these times is to ensure their safety while maintaining mission integrity. Receptors potentially impacted include the military and the public desiring to use recreational areas. Guidance for restricted access is utilized to coordinate public and military use of land within the Eglin AFB Range. Range areas in use are closed to all forms of public recreation. Areas permanently closed to the public are shown in Figure 3-7. Some military missions may require certain areas to be closed to the public for various periods of time. Recreational access information is available on a daily basis by calling the Base Information Line, (850) 882-1110.

3.9 SOCIOECONOMIC RESOURCES

This section discusses the socioeconomic resources with the potential to be impacted by activities occurring on and surrounding TA C-72 at Eglin AFB. The primary issue of concern includes the disproportionate impact of noise from testing and training activities occurring at TA C-72 to “environmental justice” concern areas, as well as to areas containing a high concentration of children.

3.9.1 Environmental Justice

In 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (Environmental Justice)*, was issued to focus the attention of federal agencies on human health and environmental conditions in minority populations and low-income populations. The EO was established to ensure that disproportionately high and adverse human health or environmental effects of federal actions on these populations are identified and addressed. The environmental justice analysis addresses the characteristics of race, ethnicity, and poverty status of populations residing in areas potentially affected by the proposed federal action. The purpose of this analysis is to identify disproportionate human health and safety and environmental impacts on minorities and low-income communities and to identify appropriate alternatives.

The DoD Strategy on Environmental Justice was adopted on March 24, 1995. It includes a summary report, strategy on environmental justice, and implementation plan and states that DoD will use NEPA as the primary mechanism to implement the provisions of EO 12898. AFI 32-7061, 1995, *The Environmental Impact Analysis Process*, addresses the need for consideration of environmental justice issues in the impact analysis process. Areas of concern for environmental justice in relation to TA C-72 are given in Figure 3-8.

For the purpose of this analysis, minority and low-income populations are defined as follows.

Minority Populations: All persons identified by the U.S. Census Bureau’s Census of Population and Housing to be of Hispanic or Latino origin, regardless of race, plus non-Hispanic persons who are Black or African American, American Indian and Alaskan Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other (i.e., non-white) Race or Two or More Races.

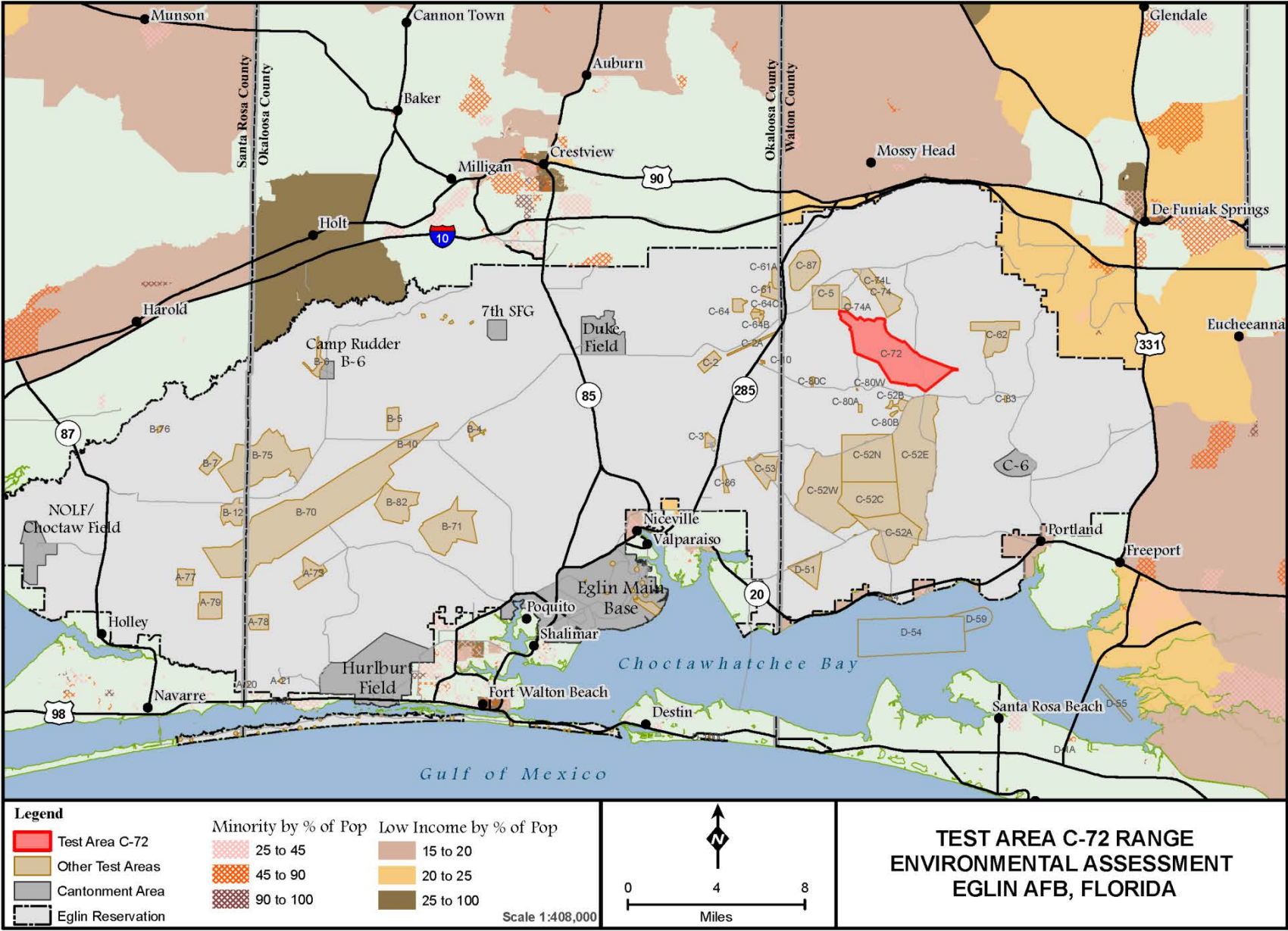


Figure 3-8. Communities with High Minority and Low Income Populations

For purposes of the analysis, the minority population is calculated by subtracting the number of persons who are White but not Hispanic, from the total population.

Low-Income Populations: All persons that fall within the statistical poverty thresholds published by the U.S. Census Bureau in the current population survey are considered to be low-income. For the purposes of this analysis, low-income populations are defined as persons living below the poverty level (\$16,895 for a family of four with two children, adjusted based on household size and number of children), as reported in the 2000 Census. The 2000 Census asked people about their income in the previous calendar year. Therefore, poverty estimates reported in the 2000 Census compare family income in 1999 with the corresponding 1999 poverty thresholds. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being below the poverty level.

The percentage of low-income persons is calculated as the percentage of all persons for whom the Census Bureau determines poverty status, which is generally a slightly lower number than the total population because it excludes institutionalized persons, persons in military group quarters and college dormitories, and unrelated individuals under 15 years old.

3.9.2 Risks to Children

In 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks (Protection of Children)*, was issued to identify and address issues that affect the protection of children. The EO states that “environmental health risks and safety risks mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to).” Higher concentrations of children occur in schools, community childcare facilities, and hospitals than in residential areas. The facilities with the potential to be impacted by activities in the test areas at Eglin are shown in Figure 3-9.

3.9.3 Noise Complaints

People and physical structures that are potentially susceptible to noise effects from the activities conducted at TA C-72 are in communities surrounding the Eglin Reservation. Table 3-9 shows the total number of complaints per city and the actual number of complainants. Table 3-10 provides examples of noise complaints received during 2010 from activities performed on the Eglin Complex.

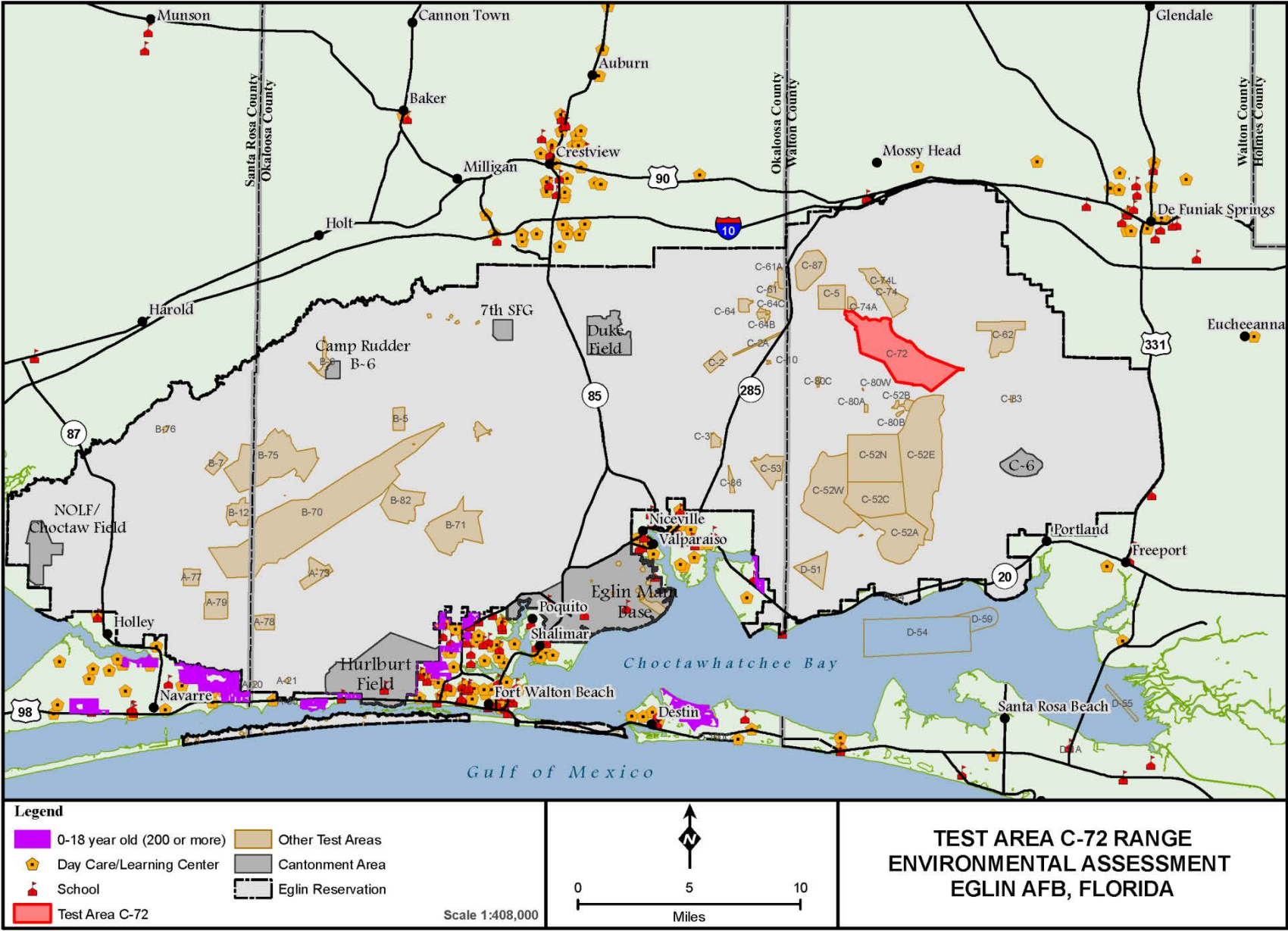


Figure 3-9. Communities with a High Percentage of Children Under 18

Table 3-9. 2010 Noise Complainant Data per City

City	Total Number of Complaints	Total Number of Complainants
Brewton, Alabama	1	1
Carrabelle, Florida	1	1
DeFuniak Springs, Florida	1	1
Destin, Florida	1	1
Freeport, Florida	1	1
Niceville, Florida	14	2
Pensacola, Florida	1	1
Ponce de Leon, Florida	1	1
Santa Rosa Beach, Florida	1	1

Source: Walsh, 2011

Table 3-10. Eglin AFB 2010 Noise Complaint Data by City and Type of Complaint

Location	Complaint	Number of Complaints
Brewton, Alabama	Low Flying/Noise	1
Carrabelle, Florida	Sonic Boom	1
DeFuniak Springs, Florida	Explosion	1
Destin, Florida	Explosion	1
Freeport, Florida	Explosion	1
Niceville, Florida	Explosion	13
Niceville, Florida	Low Flying/Noise	1
Pensacola, Florida	Low Flying/Noise	1
Ponce de Leon, Florida	Explosion	1
Santa Rosa Beach, Florida	Explosion	1

Source: Walsh, 2011

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4. ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential impacts associated with TA C-72 test and training activities (described in Chapter 2) on the affected environment (described in Chapter 3). The analysis examines the potential impacts of each of the proposed alternatives on the following resource areas:

- Chemical materials
- Soils
- Water resources
- Biological resources
- Cultural resources
- Air quality
- Noise
- Safety/restricted access
- Land use
- Socioeconomic resources

4.1 CHEMICAL MATERIALS/RANGE DEBRIS

The potential environmental impacts of hazardous materials and wastes were assessed as they pertain to debris from ground troop movement and chemical materials from ordnance for testing and training activities within TA C-72. Additionally, the transport, storage, use, and disposal of hazardous materials and wastes associated with activities at TA C-72 should be coordinated with Eglin's Environmental Compliance Branch, Pollution Prevention Section, and disposed of appropriately according to regulations and AAC Plan 32-5, *Hazardous Waste Management Plan*. AAC Plan 32-9, *Hazardous Materials Management*, describes how Eglin AFB complies with federal, state, Air Force, and DoD laws and instructions. These materials would be stored in the proper containers, employing secondary containment as necessary to prevent/limit accidental spills. All spills and accidental discharges of petroleum products, hazardous materials, or hazardous waste would be reported.

Eglin AFB has developed emergency response procedures and site-specific contingency plans for all hazardous materials locations. Procedures and responsibilities for responding to a hazardous material spill or other incidents are described in the Hazardous Waste Management Plan (U.S. Air Force, 2006a) and the Eglin AFB SPCC Plan (U.S. Air Force, 2005a).

4.1.1 No Action Alternative

Debris

Debris, such as cartridges, shrapnel deposited from bombs and missiles, intact inert bombs, canisters from smokes, chaff, and flares, as well as litter and refuse from ground troop movement, may be deposited from test and training activities. If these items are left in place and not properly disposed, packed out, or periodically cleared, the debris and refuse has the potential to cause adverse environmental impacts. AAC Plan 32-5 and AAC Plan 32-9 should be adhered to during training activities for recycling, hazardous materials management, and proper disposal of wastes.

Ordnance Use

Hazardous materials/solid wastes, as they pertain to the analysis in this section, are the explosives and metals associated with the expenditure of ordnance at TA C-72. These materials may degrade the quality of soil or water, or may be toxic to plants, wildlife, or people. For the mission activities occurring at TA C-72, metals and explosives from bombs, missiles, guns, mines, small arms, smokes, chaff, and flares are the primary chemical materials of concern. Munitions and pyrotechnics use at TA C-72 has increased since the previous baseline, and in some cases has exceeded the levels authorized in the *1999 Test Area C-72 Programmatic Environmental Assessment* (U.S. Air Force, 1999b). Under current practice, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. These practices are necessary for compliance with AFI 13-212, which requires the range to be cleared of munitions debris on a regular basis, and Eglin AFBI 3-212 which requires all efforts to be made to recover brass casings, use nonlead munitions, use frangible munitions, and avoid deposition of casings and other materials into streams and wetlands (U.S. Air Force, 2010b; U.S. Air Force, 2010c).

EAFBI 3-212 prohibits firing of the 155-mm howitzer on C-72 within 1,000 feet of the southeast boundary. All streams on C-72 are Okaloosa darter streams, so no pyrotechnics/munitions use is permitted within 200 feet of streams at TA C-72. No new cleared target areas should be established within 200 feet of any darter stream (U.S. Air Force, 2010c). These instructions would be adhered to under all alternatives.

Toxic Release Inventory–Data Delivery System

Quantification of chemical constituents in ordnance was determined using the TRI–Data Delivery System (TRI–DDS) (DoD, 2011). The TRI–DDS is a tool produced by the EPCRA Workgroup and is intended to provide a consistent method to assess chemical releases and waste management data across DoD. The EPCRA Workgroup supplies information for the DoD EPCRA TRI-reporting database for munitions and range activities.

The TRI–DDS draws on both constituent information and emission factor data to determine the quantities of chemicals released from demilitarization (e.g., open burn/open detonation), live fire, and training activities. Calculations in the TRI–DDS begin with identifying and selecting or entering the specific munitions item used. Munitions items are identified in the TRI–DDS by DoD Identification Code, Navy Ammunition Logistics Code, National Stock Number, or common name-pick lists. The resulting TRI–DDS report lists the chemical constituents of each munitions item. These quantities are used to determine quantities of chemicals emitted. Because it is assumed that all munitions debris, along with inert and duded munitions, will be removed from the Range annually, this analysis addresses only air emissions from inert munitions and blanks. It is assumed that emissions to the air from detonation will not only enter the air environment but will also have the potential to settle back onto the soil and possibly be transported by water.

Expenditures

TRI–DDS analysis included the chemical constituents in bombs, missiles, guns, mines, small arms, smokes, chaff, and flares used for testing and training within TA C-72. Numerous types of

munitions are used at TA C-72; however, for the purposes of analysis, the items listed in the following table were used as surrogates, in some cases as representatives, and where constituent data were not available. Ordnance expenditures listed were provided by user groups, and maximum annual expendables for TA C-72 under the No Action Alternative are detailed in Chapter 2 (Table 2-1). (Potential impacts from chemical releases to specific media [i.e., soil, water, air, biological resources] are discussed in the respective resource area sections.)

The DoD's TRI-DDS website was used to determine constituent chemical emissions from the discharge of these representative munitions at TA C-72. Expenditures were analyzed on an annual basis. Although 33 toxic chemical constituents are listed in the output of the various munitions, only those totaling greater than or equal to 1 pound annually (rounded to the nearest pound) are listed here (Table 4-1). This includes the six insoluble chemicals that would be the most persistent in the environment.

**Table 4-1. Munitions-Related Residue
Under No Action Alternative**

Chemical	Quantity Released at TA C-72 (pounds)
Acetaldehyde	1
Barium	1
Benzene	3
Ethylbenzene	1
Ethylene	7
Formaldehyde	1
Hydrazine	1
Hydrochloric acid	2
Lead	10
Nitric acid	1
Ozone	1
Propylene	1
n-Hexane	1

Source: DoD, 2011

No new TRI reporting thresholds would be exceeded by munitions expenditures associated with the No Action Alternative.

4.1.2 Alternative 1

Debris

Under Alternative 1, training activities occurring at TA C-72 would increase significantly over the currently approved levels under the No Action Alternative. However, there would be no new types of training or expenditures and no new user groups. Management practices are in place that ensure training areas will be scanned for debris and dud munitions and that they would be removed. Any dud munitions or UXO would be flagged and removed according to standard procedures. Therefore, no impacts are expected due to debris associated with the training activities under Alternative 1.

Ordnance Use

Ordnance use would increase under Alternative 1. Ordnance expenditures were provided by user groups, and maximum annual expendables for TA C-72 under Alternatives 1, 2, and 4 are detailed in Chapter 2 (Table 2-1). (Note: Potential impacts from chemical releases to specific media [i.e., soil, water, air, biological resources] are discussed in the respective resource area sections.)

The same methodology used for Table 4-2 was used to determine the chemical emissions associated with ordnance expenditure as a result of testing and training at TA C-72. It was calculated that the chemical load from all munitions would be distributed over 4,585 acres. Therefore, the overall concentration of any chemical at any given location would be minute. Additionally, because lead expenditures already require TRI reporting, no new TRI thresholds would be exceeded under Alternative 1.

**Table 4-2. Munitions-Related Residue
Under Alternative 1**

Chemical	Quantity Released at TA C-72 (pounds)
1,3-Butadiene	3
Acetaldehyde	3
Ammonia	3
Antimony	2
Barium	3
Benzene	18
Chromium (III) compounds	4
Cyanide	2
Ethylene	78
Formaldehyde	3
Hydrazine	6
Lead	251
Nitric acid	5
Ozone	5
Propylene	3
n-Hexane	9

Source: DoD, 2011

4.1.3 Alternative 2

Debris

Under Alternative 2, testing and training activities occurring at TA C-72 would increase over the levels analyzed under Alternative 1. However, management practices would remain in place to ensure training areas are scanned for debris and dudded munitions and that they would be removed. Any dudded munitions or UXO would be flagged and removed according to standard procedures.

Therefore, no impacts are expected due to debris associated with the training activities under Alternative 2.

Ordnance Use

Under Alternative 2, ordnance use would increase a great deal from the levels analyzed for Alternative 1. Ordnance expenditures were provided by user groups, and maximum annual expendables for TA C-72 under Alternatives 1 and 2 are detailed in Chapter 2 (Table 2-1). (Note: Potential impacts from chemical releases to specific media [i.e., soil, water, air, biological resources] are discussed in the respective resource area sections.)

The same methodology was used to determine the chemical emissions associated with ordnance expenditure as a result of training and testing at TA C-72. Chemical emissions under Alternative 2 are shown in Table 4-3. Increases are approximately threefold over Alternative 1. Again, since these emissions are shown on an annual basis and the affected area is so large, the concentration at any time at any given location would be insignificant. No new TRI thresholds would be exceeded under Alternative 2.

**Table 4-3. Munitions-Related Residue
Under Alternative 2**

Chemical	Quantity Released at TA C-72 (pounds)
1,3-Butadiene	10
Acetaldehyde	9
Ammonia	8
Antimony	25
Barium	75
Benzene	55
Chromium (III) compounds	13
Cyanide	6
Cyclohexane	1
Ethylbenzene	13
Ethylene	233
Formaldehyde	9
Hydrazine	17
Hydrochloric acid	63
Hydrogen cyanide	1
Lead	803
Nitric acid	16
Ozone	16
Propylene	9
n-Hexane	27

Source: DoD, 2011

4.1.4 Alternative 3

Debris

Implementation of Alternative 3 would not lead to any increase in range debris under any of the four proposed options. Munitions expenditures and range activities would be anticipated to remain the same regardless of the tree-clearing option chosen. Tree-clearing personnel, whether they are Air Force or independent contractor staff, would be expected to remove any equipment

or refuse that they brought into the area. This would include (but not be limited to) empty fuel and/or chemical containers as well as workers personal trash (e.g., beverage bottles and cans).

No impacts to range debris are expected as a result of implementation of Alternative 3 under any of the four options.

Herbicide Use

Under Options 1, 2, and 4 there would be no additional chemical discharge except for the possibility of an accidental petroleum, oil, and lubricant (POL) spill associated with tree-clearing machinery. However, the likelihood of this occurrence is small and Air Force personnel or contractors would be required to follow the procedures outlined in the Eglin SPCC (U.S. Air Force, 2005a), which would minimize any impacts.

Under Option 3, however, the Air Force proposes to use currently authorized herbicides to accomplish tree clearing under Alternative 3. This method may be preferable due to the decreased cost and decreased likelihood of impacts to soil and water resources from erosion.

The *Long-Term Vegetation Control Environmental Assessment for Eglin Air Force Base* (U.S. Air Force, 2007a) lists herbicides that are approved for use on Eglin AFB; these are also shown in Table 2-2. All of the herbicides proposed for use in the Proposed Action and Alternative 1 are classified as USEPA Category III, except for Vista/Fluroxypyr (Category II) and Chopper (Category II.) Further, all approved herbicides have shown an LD₅₀ of greater than 5,000 mg/kg, except Vista (3,162 mg/kg). This represents the lethal dose (LD) that causes death in 50 percent of treated laboratory animals. LD₅₀ indicates the dose of a chemical per unit body weight of an animal and is expressed in milligrams per kilogram (mg/kg).

In addition, in contrast to insecticides, herbicides are short-lived in the environment. Although the retention of residues varies depending on the specific chemical used, environmental condition, vegetation density, and soil properties, herbicides degrade within days or weeks, rather than the months or years common to many other classes of pesticides. The rate of degradation is defined as the half-life, which is the time it takes for the herbicide to degrade so that only 50 percent of the applied quantity is still present in the environment. More specifically, once applied, herbicide residues are subject to degradation through volatilization, adsorption, leaching, plant uptake, and numerous chemical and biological processes. Eglin approved herbicides all have listed half-lives of less than 140 days and, in most cases, less than 42 days (U.S. Air Force, 2007a).

Herbicide applicators conducting herbicide treatment activities on Eglin AFB would be DoD- or state-certified pesticide applicators or qualified individuals under direct supervision of a certified applicator. The applicators would be trained in the proper identification of both invasion non-native plant species (INPS) and native species. An Eglin AFB endangered species biologist would manage and oversee all herbicide contracts. Applicators (including contractors and their staff) would be briefed on any potential endangered species concerns before conducting herbicide application activities in endangered species habitat; alternatively, contracts for this type of work would include clauses requiring endangered species coordination. Herbicide labels and instructions would be adhered to during handling, mixing, and application of herbicides.

Through following these procedures, as well as the detailed policies, procedures, methods, and management actions laid out in the *Long-Term Vegetation Control Environmental Assessment* (U.S. Air Force, 2007a), no adverse impacts due to chemical materials would be expected as a result of implementing Alternative 3, Option 3 for the removal of trees and line of sight clearing at TA C-72. A summary of the required management actions associated with herbicide application is provided in Section 2.5, Management Requirements.

4.1.5 Alternative 4

Chemical materials and debris impacts under Alternative 4 would be the same as those discussed under Alternative 2 for range debris and chemical materials as a result of ordnance expenditures and range training. Impacts resulting from tree clearing are discussed above under Alternative 3.

4.2 SOILS

Testing and training activities at TA C-72 may affect soils by deposition of munitions residue and erosion. Potential munitions impacts to soils pertain to substances that can be released into the ground as a result of mission activities. Examples of such substances include lead and copper. Chemical substances absorbed into the soil may eventually be released into groundwater and surface waters. Munitions use, including bomb and small arms expenditures and associated ordnance retrieval, may initiate or accelerate erosion in sloped areas with reduced vegetative cover. The management requirements listed later in this chapter can substantially decrease erosion and chemical impacts to soils at TA C-72. In addition, under current practice, munitions debris is recovered and/or removed from the ranges for the purpose of storage, reclamation, treatment, and disposal as solid waste. These practices are necessary for compliance with AFI 13-212, which requires the range to be cleared of munitions debris regularly.

4.2.1 No Action Alternative

Munitions Residue

Potential impacts associated with munitions residue pertain to chemical materials that can be released into the ground as a result of mission activities. Degradation of ordnance materials may produce chemical byproducts that, under certain concentrations, may become an environmental concern. Once chemical substances are absorbed into the soils, they may be subsequently transported to groundwater and surface waters and, therefore, have the potential to affect water quality. The purpose of this analysis is to identify chemical materials generated by mission expenditures and assess the relationship between potential chemical material concentrations and environmental thresholds. Soil-deposited projectiles are the focus of this analysis.

Many of the metal and organic chemical material byproducts deposited on the surface following the execution of mission activities at TA C-72 naturally occur in the environment at relatively low concentrations and are important to overall ecosystem function. However, there is the potential for mission byproducts to accumulate in the soil at concentrations that may adversely impact biological receptors. For example, lead is a component of some types of explosive material and is of particular concern because, unlike organic materials, it is not easily destroyed and can be toxic to plants and animals.

When metals are introduced to the soil surface, downward transport does not occur to a great extent unless the metal retention capacity of the soil is overloaded or metal interaction with the associated organic waste matrix enhances mobility. Ultimately, the extent of vertical migration is primarily related to the soil solution and surface chemistry of the soil matrix. Metal byproducts deposited on or within the soil during TA C-72 mission events could exist in one or all of the following conditions:

- Dissolved in the soil solution
- Occupy exchange sites on inorganic soil constituents
- Specifically adsorbed on inorganic soil constituents
- Associated with insoluble soil organic matter
- Precipitated as pure or mixed solids
- Present in the structure of secondary minerals
- Present in the structure of primary minerals

Metal immobilization prevents leaching into groundwater systems by mechanisms of adsorption and precipitation. Metal adsorption by soil is related to properties of both the metal and the soil, such as clay content, organic content, texture, permeability, pH, particle size, surface area, ion exchange capacity, water content, and temperature. The soil components that are most associated with immobilization of metals are clay, iron oxides, and organic matter. The soil particle surface characteristics thought to be most important to adsorption are surface area and cation exchange capacity. Immobilized metals in surface soils that are prevented from entering groundwater can be readily transported to receiving waterways by soil erosion.

The U.S. Environmental Protection Agency (USEPA) Region III has developed risk-based criteria (RBC) for over 500 chemical compounds. The primary purpose of the RBC is for screening chemicals during risk assessments. *Risk* is defined as the expected frequency or probability of undesirable effects resulting from exposure to chemical stressors that could induce an adverse response in biological receptors. Pollutants in the soil may accumulate over time and persist for extended periods. RBC concentrations developed for residential soil are used in this analysis. RBCs are typically provided in a table located on the USEPA's website. In 2008, the USEPA began using the regional screening table developed by Oak Ridge National Laboratory to update the RBC table (USEPA, 2008).

The 1999 TA C-72 PEA identified four mission categories with the potential to deposit chemical materials onto the test area, including missile testing and training, bomb testing and training, gun testing and training, and air operations testing and training. The level of activity authorized under the 1999 PEA constitutes the level associated with the No Action Alternative. The following subsections provide analyses of potential soil impacts due to each mission category.

Missile Testing and Training

The primary source of explosive material associated with missile testing and training activities under the No Action Alternative is detonation byproducts from live Hellfire (AGM-114) and Maverick (AGM-65) missiles. The Hellfire missile has a net explosive weight (NEW) of 15 pounds, while the Maverick contains 86 pounds of NEW. All of the detonations were

identified as occurring on Test Targets (TT)-83, TT-84 and TT-85. A smaller number of Stinger missiles (0.87 pounds NEW) and BGM-71E Tow missiles (7 pounds NEW) are also associated with this alternative but contribute only a small proportion of chemical materials to the test area.

Expenditures of Hellfire and Maverick missiles under the No Action Alternative resulted in a total of 10,870 kilograms (kg) of explosive material deposited onto TA C-72 during the three-year period of Fiscal Years 1995 to 1997. The predominant explosive component of these missiles is Composition B, which is a mixture of approximately 40 percent 2,4,6-trinitrotoluene (TNT) and 60 percent RDX. The 1999 PEA identified a series of field and laboratory tests conducted by the U.S. Army at Dugway Proving Ground to determine the amount of byproducts generated by detonations of various explosives. Based on the results of the investigations, the Army developed emission factors (EFs) that can be used to calculate the amount of byproducts generated by an explosion. The primary combustion products of Composition B were determined to be carbon dioxide, carbon monoxide, water, and nitrous oxides. These compounds are not analyzed for impacts to soil resources. Lesser amounts of explosives and their derivatives are also generated, and their emission factors were reported in the 1999 PEA to range from 10^{-5} to 10^{-9} . In order to analyze a worst-case scenario, a 10^{-5} EF is used for all of the explosives to determine soil concentrations.

Estimated soil concentration is calculated by dividing the weight of explosive byproducts by the weight of the affected volume of soil. Assumptions were provided in the 1999 PEA for determining soil volume and weight. All explosive residues are assumed to be deposited around one target, within 3 meters of the target and to a soil depth of 15 centimeters. Soil density is assumed to be 1,550 kilograms per cubic meter (kg/m^3). An example calculation for determining the soil concentration of TNT is provided below. Similar calculations are used for the remainder of this and subsequent alternatives.

Total weight of soil: (3 meters radius) $\times$ (15 cm depth) = 4.2412 cubic meters (m^3) volume.
(4.2412 m^3) $\times$ (1,550 kg/m^3) = 6,574 kg.

Total weight of TNT: (10,870 kg explosive) $\times$ (40 percent) = 4,348 kg TNT, or 0.04348 kg when incorporating the EF.

Resulting soil concentration of TNT: (0.04348 kg TNT) / 6,574 kg soil = 6.61×10^{-6} kg/kg TNT, or 6.61 mg/kg TNT.

Table 4-4 shows the soil concentration of explosives resulting from missile use under the No Action Alternative, as well as USEPA criteria. It should be noted that this and the following calculations likely overestimate the actual soil concentration at any given target because it is assumed that all missiles are fired at the same target. In reality, missile expenditures will probably be spread among multiple targets.

Table 4-4. Soil Chemical Concentrations Resulting from Missile Use

Chemical Material	Risk-Based Criteria (RBC)	Estimated Soil Concentration	Percent of RBC
TNT	190 mg/kg^1	6.61 mg/kg	3.4
RDX	52 mg/kg^2	9.94 mg/kg	19.2

1. USEPA, 2008

2. Provided in U.S. Air Force (1999b), based on 1995 USEPA RBC levels
mg/kg = milligrams per kilogram

Bomb Testing and Training

The 1999 PEA identified live GBU-24 bombs as the munitions resulting in the greatest deposition of chemical materials onto the soil of TA C-72. BDU-33 bombs were also expended, but only a small amount of chemical materials are associated with these bombs, as only a small spotting charge is used. The GBU-24 contains 535 kg of explosive material, of which 80 percent is TNT. Twenty live bombs are associated with the No Action Alternative. Assuming all bombs are used on the same target, the resulting soil concentration is well under the USEPA RBC level (Table 4-5). This level is probably an overestimate because multiple targets would likely be used.

Table 4-5. Soil Chemical Concentrations Resulting from Bomb Use

Chemical Material	Risk-Based Criterion (RBC)	Estimated Soil Concentration	Percent of RBC
TNT	190 mg/kg	13.0 mg/kg	6.8

mg/kg = milligrams per kilogram

In addition to bomb use, up to two large-scale static detonations are associated with the No Action Alternative. These detonations would consist of 20,000 pounds of C-4 explosive. Analysis provided in the 1999 PEA determined that the soil concentration of TNT and RDX resulting from each detonation would be several orders of magnitude below USEPA thresholds and that impacts would not be significant. In addition, these detonations have been categorically excluded from further environmental impact analysis (U.S. Air Force, 1999b).

Gun Testing and Training

The use of small arms munitions in testing and training operations at TA C-72 was analyzed in the 1999 PEA. Expendables primarily included .50-cal, 7.62-millimeter (mm), and 20-mm, and 30-mm rounds. With the exception of 30-mm rounds, a maximum of a few thousand rounds per expendable type was authorized. Firing was concentrated around targets TT-66 and TT-67. Although lead, copper, and zinc may be deposited onto the soil, the analysis concluded that impacts were minimal, due to the relatively small amount of ammunition used during the baseline period. In addition, debris from small arms use, including the jacket, cartridge case, and core materials, is removed during post-mission cleanup and disposal, thereby minimizing potential impacts to soil resources from chemical leaching.

For the 30-mm munitions, up to 28,750 rounds were authorized per year for strafing missions in the 1999 PEA. Most of the approved rounds were target practice (TP), although 4,600 rounds were high-explosive incendiary (HEI). The TP rounds are fired from an A-10 aircraft at the strafing target (TT-67) at TA C-72, while the HEI rounds are used at the General Purpose Area. The 30-mm ammunition projectile consists of a steel body with a solid aluminum nose and hollow steel-nose cap. The projectile does not contain depleted uranium. The aluminum and steel materials are not in a chemical form readily available for environmental transport and exposure (U.S. Air Force, 1999b).

Air Operations Testing and Training

Chaff and flares are deployed by aircraft during testing and training activities over various targets within TA C-72. A total of 2,996 chaff bundles and 562 flares are associated with the No

Action Alternative. Aluminum is the principal constituent for chaff, while magnesium oxide is the principal combustion product of flares. Analysis in the 1999 PEA concluded that aluminum present in test area soils resulting from the deployment of chaff is not in a chemical form that makes it readily available for environmental transport or exposure. Aluminum from chaff is leachable only under strongly acidic conditions (pH of <4.0) and the rate of dissolution of aluminum from chaff during decomposition is not rapid enough to increase aluminum concentrations above normal background levels. Aluminum is ubiquitous in nature, and the 1999 PEA reported an average concentration in Eglin soil of 1,352 mg/kg. Natural soil constituents are not likely to be harmful unless high concentrations exist. The 1999 PEA conservatively assumed that at least a doubling of the background concentration is required before potential toxicity occurs.

Analysis of potential soil impacts due to aluminum deposition are based on assumptions provided in the 1999 PEA, including 1) each chaff bundle contains 0.23 kg of aluminum, and 2) all aluminum is contained within the top 5 centimeters of soil. Table 4-6 shows the number of chaff bundles required to double the concentration of aluminum across the test area. The number of bundles is substantially below that required to double the concentration, even if all the chaff was concentrated in a small area. However, in reality, chaff is expended over multiple locations, widely dispersed by winds, and deposited on soils within a large area.

Table 4-6. Threshold Analysis for Aluminum Resulting from Chaff

Number of Bundles, No Action Alternative	Number of Bundles Needed to Double Soil Aluminum Concentration at Test Area C-72
2,996	17,200,000

The 1999 PEA reported that magnesium from flare ash residue has been shown to undergo minimal leaching at neutral pH (7.0), with an approximate fivefold increase in leachability at pH 4.0. The soils at Eglin range in pH from 4.5 to 6.0; therefore, magnesium is likely soluble in the soil. However, it is considered unlikely that magnesium will be elevated above normal background soil concentrations, which are as high as 660 mg/kg on the base, due to the dispersion of flare residue over a wide area. Similar to the discussion for aluminum, magnesium is a natural soil constituent, and it is conservatively assumed that at least a doubling of this background concentration is required before potential toxicity occurs.

Analysis of potential soil impacts are based on assumptions provided in the 1999 PEA, including 1) atmospheric circulation and winds disperse flare material evenly across the test area, 2) all magnesium is contained within the top 5 centimeters of soil, and 3) each flare contains an average of 120 grams of magnesium. Table 4-7 shows the number of flares required to double the concentration of magnesium across the test area. The number of flares associated with the No Action Alternative would be expected to increase the soil magnesium concentration by less than 0.1 percent over background concentrations.

Table 4-7. Threshold Analysis for Magnesium Resulting from Flares

Number of Flares, No Action Alternative	Number of Flares Needed to Double Soil Magnesium Concentration at Test Area C-72
562	1,510,000

Soil Erosion

Soil erosion is the process of detachment, suspension, translocation, and deposition of surface materials by water, wind, ice, or gravity. The rate of erosion in a given area can be accelerated by human activities. Erosion can introduce sediments and pollutants into terrestrial and aquatic environments, damage or destroy cultural resources, reduce recreational use and value of affected watersheds, and increase land management and operating costs. Eroded soil particles moved and deposited by a watercourse (i.e., sediment), can adversely alter water quality, habitats, and the hydrologic form and function of waterways and wetlands. Suspended sediment in waterways inhibits light penetration and photosynthesis and diminishes the aesthetic value of water bodies. Sediment deposition in waterways leads to premature filling of water bodies, exertion of large oxygen demands on the water, burial of benthic organism aquatic habitats, and alteration of stream hydrology. Sediment deposition on other terrestrial systems can bury and kill vegetation and other organisms. Erosion and sedimentation can also introduce organic matter and nutrients, pesticides, metals, and other compounds into receiving ecosystems.

Erosion at TA C-72 that facilitates the transport of soil materials and other compounds beyond the boundaries of the test area is considered nonpoint source pollution. The CWA as amended in 1987, Section 319, places particular importance on the need to control nonpoint source pollution. The CWA states that nothing can be introduced into a stream or other water body that could potentially pollute the water, and programs for the control of nonpoint sources of pollution should be developed and implemented so as to enable the achievement of the nonpoint source goals of the CWA. Appendix B of AFI 32-7041, *Water Quality Compliance*, stipulates that the Air Force maintain compliance with the CWA and other federal, local, and state environmental and water quality directives. In adherence to the DoD proactive approach to minimizing and mitigating adverse environmental effects, it is prudent to address the potential impacts associated with accelerated erosion on the test area.

Soil erosion at TA C-72 could result from munitions expenditures or from vehicle and foot traffic. Under the No Action Alternative, up to 664 bombs and 1,211 missiles (total of live and inert) could be expended on the test area. This level of activity would result in soil disturbance and could contribute to erosion at the site, particularly in higher slope areas devoid of vegetation. However, the great majority of the test area consists of gently sloping terrain with a slope rating of less than 5 percent (U.S. Air Force, 2006b). Such areas are not particularly prone to erosion from mission activities, and erosion impacts are not considered likely. Munitions expenditures on or near stream banks probably have the greatest potential for erosion impacts. The three principal streams located on the test area function as habitat for the federally endangered Okaloosa darter, and siltation caused by erosion could adversely affect this species. However, targets would not be located in the vicinity of streams (see the following subsection, “Management Requirements”).

Erosion due to causes other than munitions use was previously an issue of concern at TA C-72. Activities that contributed to the initiation or acceleration of soil erosion included range maintenance, tactical vehicle operations, improper road maintenance, improper vegetation control techniques (e.g., roller drum chopping), and borrow pit use. The effects of these activities were particularly pronounced on sloped areas, including stream banks. However, these issues have generally been addressed in recent years, as described in U.S. Air Force (2005b).

Vegetation is currently maintained with bush hogging on the upland portions once every 12 to 18 months. This method has been effective for controlling vegetation within the central section of the test area, although tree growth around the margin is obstructing lines of sight for instrumentation and contributing to long-term inward migration of the test area boundary. The road network has been reconstructed and reconfigured to reduce sediment from entering streams. Several roads have been closed, and some stream crossings have been eliminated. In some cases, road-stream crossings and approaches were reconstructed with new and additional culverts, rock foundations, geocellular webbing, crushed rock surfaces, and inlet risers with outflow basins. Tactical vehicle operations could continue to cause erosion, as could foot traffic associated with ordnance retrieval on sloped areas. However, vehicle use is restricted in wetland areas (see the following subsection, “Management Requirements”).

Management Requirements

The preceding analyses describe potential impacts to soil resources at TA C-72 resulting from deposition of munitions residues and erosion. Although munitions use may affect soil quality by introducing metal residues, the resulting concentrations are not likely to approach USEPA thresholds. Munitions expenditures, vehicle operations, and foot traffic could contribute to soil erosion. These impacts would be diminished by implementing management requirements. A comprehensive list of management requirements is provided in Section 2.5. Those specifically applicable to soil resources are listed below.

Ordnance and Noise

- All inert weapons, including practice bombs with spotting charge, on or near the surface must be recovered, removed, and destroyed.

Tactical Vehicle Operation

- All vehicles used as immobile targets must be rendered environmentally safe by removal of all fuels, oils, and other chemical materials.
- Tactical vehicles must be moved only on established range roads.

Soil Resources

- Design vegetation control practices that minimize surface disturbance and create implementation strategies for increasing vegetative cover.
- Control the location and design of mission activities to avoid creating adverse slope shapes or gradients and/or to reduce vegetative cover.
- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Establish low-growing grassland communities on severely disturbed erosion response units.
- Design concave slope segments on newly constructed targets.
- Reduce the gradients of severely eroding slopes to the degree possible and revegetate.

Additional Measures

- No new cleared target areas should be established within 200 feet of any natural water body.
- Detonations of explosives should not occur within 200 feet of water bodies.
- If any ordnance lands in stream bank areas, it should be removed immediately in accordance with Air Force regulations.
- Monitoring of the test area, if conducted, should include chemical analysis of soils.

4.2.2 Alternative 1

Munitions Residue

Alternative 1 would authorize the current level of activity, defined as the maximum annual expenditure from FY 1998 through FY 2009, plus foreseeable future actions. Under this alternative, missile expenditures would decrease. The number of Hellfire and Maverick missiles, which are the primary live missiles used, would be reduced from more than 1,000 under the No Action Alternative to a total of 167. Similarly, the number of live bombs would decrease as well. Use of GBU-24 bombs would decrease from 20 to 5. Results of analyses under the No Action Alternative show that significant impacts to soil resources are not likely. Therefore, the reduced quantities associated with Alternative 1 would not likely result in significant impacts to soil.

Use of small arms ammunition would increase under Alternative 1. The increase would be due primarily to elevated use of 7.62-mm and .50-cal munitions, which would total 150,000 and 156,000, respectively. Use of 30-mm ammunition would remain essentially unchanged. Previous analysis at another test area on Eglin (U.S. Air Force, 2000) provides a framework for estimating soil impacts due to small arms use. The brass (70 percent copper and 30 percent zinc) cartridge case of a 7.62-mm round encapsulates the propellant charge and supports the bullet projectile. Projectile cartridge types include ball bullets, tracers, and incendiary bullets. The bullet projectile consists of two parts: a copper alloy clad steel metal jacket and a lead alloy core. The core of the ball is composed of a short steel forward section and a larger lead/antimony rear section. The metal jacket around the core is normally composed of brass (copper and zinc) or a ductile grade of malleable steel covered with a thin coating of copper. There is considered to be no impact to soils from the copper and zinc in the bullet casings, because the cases are typically removed from the site after small arms firing missions. The amount of copper in a .50-cal projectile is roughly 1.6 times the amount of that in a 7.62-mm projectile, and the amount of lead is approximately 0.14 times that in a 7.62-mm projectile. Based on these factors and the analysis provided in U.S. Air Force (2000), the maximum amount of residue deposited in the soil annually under Alternative 1 would be 2,984 pounds of copper and 2,223 pounds of lead.

Annual deposition of up to approximately 800 pounds of copper and 1,408 pounds of lead from 7.62-mm ammunition use at another test area (TA B-75) was evaluated in U.S. Air Force (2000). It was determined that this level of expenditure would not significantly impact soil resources. To determine if lead, copper, and other contaminants were present in soils at TA B-75, soils from representative target berms were tested for metals and other soil parameters. Results showed that

the concentrations of copper, iron, zinc, aluminum, chromium, and lead were generally well below the Eglin background and USEPA risk-based concentrations, with no exceedances identified. The USEPA threshold for copper concentration (non-cancer hazard index and residential soil screening level) was found to range from 969 to 44,000 times the concentrations measured in soils in frequently used target areas at TA B-75. The USEPA threshold for lead ranged from 40 to 3,600 times the concentrations measured in the soil samples. The high usage of the berm target sites, coupled with the relatively low concentrations of lead and copper in the soil samples, suggests that either the metals may become soluble in soil and migrate downward, or they are locked up in target berms as intact slugs. Lead and copper are generally stable in the environment, but under certain soil and climate conditions they can break down and become soluble in the soil. Once soluble, they become mobile and can be transported to groundwater. The availability of lead and copper is partly dependent on their rate of degradation in the soil. The rate of degradation, which is primarily regulated by soil chemistry and climate, ranges from a few years to hundreds of years. Although soil characteristics at the test area would seem to be conducive to metal leaching and potential water contamination, the Eglin Installation Restoration Program has determined that lead generally exhibits limited vertical migration in the soil. It is theorized that lead degrades slowly in the Eglin soil environment and generally does not manifest itself in the soil or groundwater with increased distance from the point of origin.

It is expected that the fate of copper and lead at TA C-72 resulting from small arms use could be similar, given that the test areas are composed of the same predominant soil type (Lakeland sand). The estimated total amount of copper and lead potentially deposited at TA C-72 is 3.7 and 1.6 times, respectively, the amount analyzed for TA B-75. These multiples are substantially less than the minimum factors of 40 (lead) and 969 (copper) that USEPA thresholds were found to range above measured soil concentrations at TA B-75. The level to which increased munitions deposition would elevate soil metal concentrations at TA C-72 is not known. However, given the soil sample results for TA B-75, increased small arms use is not expected to increase levels of lead, copper, and other substances in the soil to concentrations that would reach USEPA threshold levels.

Under Alternative 1, chaff and flare use would decrease. The number of chaff bundles would be lowered from 2,996 to 660, while the number of flares would decrease from 562 to 355. The higher numbers associated with the No Action Alternative were found to be substantially below that required to double the soil concentrations of aluminum and magnesium. Therefore, impacts to soils under Alternative 1 would not be significant.

Adherence to the management practices identified under the No Action Alternative would reduce potential impacts from munitions residue.

Soil Erosion

The overall number of live and inert bombs and missiles used under Alternative 1 would decrease compared to the No Action Alternative, although rocket use would increase. Bomb, missile, and rocket use would result in soil disturbance and could contribute to erosion at the site, particularly in higher slope areas devoid of vegetation. However, most of the test area consists of terrain with a slope rating of less than 5 percent. Such areas are not readily prone to erosion from mission activities, and erosion impacts are not considered likely. Munitions expenditures

on or near stream banks are more likely to cause erosion. However, targets will not be located in the vicinity of streams. Erosion due to causes other than munitions use could result from vehicle operations and foot traffic. However, vehicle use is restricted in wetland areas. Adherence to the management practices identified under the No Action Alternative would reduce the potential for erosion.

4.2.3 Alternative 2

Under Alternative 2, an increase in munitions expenditures could occur, as compared to Alternative 1. Under this alternative, up to 456 Hellfire and 45 Maverick missiles could be deployed. Similarly, the number of live bombs would potentially increase as well. The number of GBU-24 bombs would increase to 15. Table 4-8 shows the concentration of explosives in soil from missile use under Alternative 2, as well as USEPA criteria, and (Table 4-9) shows similar information for bomb use. The calculations likely overestimate actual soil concentration at any given target, because it is assumed that all bombs and missiles are used at the same target. In reality, expenditures would probably be spread among multiple targets.

Table 4-8. Soil Chemical Concentrations Resulting from Missile Use

Chemical Material	Risk-Based Criteria (RBC)	Estimated Soil Concentration	Percent of RBC
TNT	190 mg/kg ¹	2.94 mg/kg	1.5
RDX	52 mg/kg ²	4.45 mg/kg	8.6

mg/kg = milligrams per kilogram

Table 4-9. Soil Chemical Concentrations Resulting from Bomb Use

Chemical Material	Risk-Based Criterion (RBC)	Estimated Soil Concentration	Percent of RBC
TNT	190 mg/kg	9.77 mg/kg	5.1

mg/kg = milligrams per kilogram

The use of small arms ammunition would increase under Alternative 2 as well. The majority of expenditures would be 30-mm, 7.62-mm, and .50-cal rounds. The aluminum and steel materials associated with 30-mm munitions are not in a chemical form readily available for environmental transport and exposure (U.S. Air Force, 1999b) and are not considered further in this analysis.

Previous analysis at another test area on Eglin, TA B-75 (U.S. Air Force, 2000), provides a framework for estimating soil impacts from small arms use. The amount of copper in a .50-cal projectile is roughly 1.6 times the amount of that in a 7.62-mm projectile, and the amount of lead is approximately 0.14 times that in a 7.62-mm projectile. Based on these factors and the analysis provided in U.S. Air Force (2000), the maximum amount of residue deposited in the soil annually under Alternative 2 would be 8,951 pounds of copper and 6,664 pounds of lead.

Similar to Alternative 1, potential impacts associated with lead and copper deposition are analyzed within the framework provided in U.S. Air Force (2000). That document considered the effects of the deposition of 800 pounds of copper and 1,408 pounds of lead from 7.62-mm ammunition use at TA B-75. Soil samples from the test area were analyzed for contaminants, and the results indicated that concentrations of copper, iron, zinc, aluminum, chromium, and lead were generally well below the Eglin background and USEPA risk-based concentrations, with no exceedances identified. The USEPA threshold for copper concentration (noncancer hazard index and residential soil screening level) was found to range from 969 to 44,000 times the

concentrations measured in soils in frequently used target areas at TA B-75. The USEPA threshold for lead ranged from 40 to 3,600 times the concentrations measured in the soil samples on the test area. The high usage of the berm target sites, coupled with the relatively low concentrations of lead and copper in the soil samples, suggests that either the metals may become soluble in soil and migrate downward, or they are locked up in target berms as intact slugs. Lead and copper are generally stable in the environment, but under certain soil and climate conditions they can break down and become soluble in the soil. Once soluble, they become mobile and can be transported to groundwater. The availability of lead and copper is partly dependent on their rate of degradation in the soil. The rate of degradation, which is primarily regulated by soil chemistry and climate, ranges from a few years to hundreds of years. Although soil characteristics at the test area would seem to be conducive to metal leaching and potential water contamination, the Eglin Installation Restoration Program has determined that lead generally exhibits limited vertical migration in the soil. It is theorized that lead degrades slowly in the Eglin soil environment and generally does not manifest itself in the soil or groundwater with increased distance from the point of origin.

It is expected that the fate of copper and lead at TA C-72 resulting from small arms use could be similar, given that the test areas are composed of the same predominant soil type (Lakeland sand). The estimated total amount of copper and lead potentially deposited at TA C-72 is approximately 11.2 and 4.7 times, respectively, the amount analyzed for TA B-75. This multiple is less than the minimum factors of 40 (lead) and 969 (copper) that USEPA thresholds were found to range above measured soil concentrations at TA B-75. The actual level to which increased munitions deposition would elevate soil metal concentrations at TA C-72 is not known, but it is unlikely that, for example, an 11.2-fold increase in copper deposition would result in a corresponding 11.2-fold increase in soil concentration. Given the apparent slow degradation rate of metals in Eglin soils and limited vertical migration, as evidenced by low concentrations in heavily used areas of TA B-75, increased small arms use under Alternative 2 would not likely increase levels of lead, copper, or other substances in the soil to concentrations that would reach USEPA thresholds.

Under Alternative 2, chaff and flare use would increase to 1,980 chaff bundles and 1,065 flares. As discussed under the No Action Alternative, at least a doubling of the concentration of naturally occurring soil constituents is likely required before potential toxicity occurs. Table 4-10 shows the number of expenditures required to double the concentration of aluminum and magnesium across the test area. The number of expenditures associated with Alternative 2 is substantially below that required to double the concentrations.

Table 4-10. Threshold Analysis for Chaff and Flare Expenditures

Chemical Constituent	Number of Expenditures, Alternative 2	Number of Expenditures Needed to Double Soil Concentration at Test Area C-72
Aluminum	1,980 chaff bundles	17,200,000 chaff bundles
Magnesium	1,065 flares	1,510,000 flares

Adherence to the management practices identified for the No Action Alternative would reduce potential impacts due to munitions residue.

Soil Erosion

The number of live and inert bombs, missiles, and rockets used under Alternative 2 would increase compared with Alternative 1. Use of these munitions would result in soil disturbance and could contribute to erosion at the test area, particularly in higher slope areas devoid of vegetation. In addition, the number of small arms munitions expended could approach 1 million annually. These munitions would be used at a number of different target locations and, although individually impacting soil conditions to a negligible degree, in total could contribute to potential erosion of sparsely vegetated slopes. However, most of the test area consists of terrain with a slope rating of less than 5 percent. Such areas are not readily prone to erosion from mission activities, and erosion impacts are not considered likely. Munitions expenditures on or near stream banks are more likely to cause erosion. However, targets would not be located in the vicinity of streams. Erosion due to causes other than munitions use could result from vehicle operations and foot traffic. However, vehicle use is restricted in wetland areas. Adherence to the management practices identified for the No Action Alternative would reduce the potential for erosion.

4.2.4 Alternative 3

Alternative 3 includes line of sight tree clearing and maintenance at TA C-72. As such, there would be no impacts to soil resources from munitions residues. Potential impacts would be limited to soil disturbance. Most areas proposed for tree clearing are near streams, which in many cases are Okaloosa darter habitat. Therefore, the primary issue related to line of sight tree clearing and maintenance is erosion of sediments into the streams.

Tree clearing would be conducted by one of four methods: tree harvest, Gyro-Trac use, herbicide use, or cut and leave in place. Any activity that disturbs soil integrity or vegetative cover has the potential to create erosion issues at the test area, particularly in areas with steep slopes or on stream banks. Under the tree harvest and cut-and-leave methods, trees would be cut by hand and heavy equipment would not be used on sloped areas. The Gyro-Trac removes vegetation in such a way that at least a few inches of living vegetation remains in place. Further, the vehicle moves on a path of mulch (generated while the machine is in operation) so that the tracks seldom contact the soil. The Gyro-Trac typically causes minimal soil and root disturbance. Herbicides would be applied in accordance with all existing, approved management practices.

None of the potential methods are expected to cause soil disturbance that would lead to erosion. In addition, the management practices listed for the No Action Alternative would be implemented to minimize potential impacts to soil. Therefore, with implementation of management requirements, there would be no significant impacts to soil resources resulting from line of sight clearing and maintenance.

4.2.5 Alternative 4

Alternative 4 is a combination of Alternatives 2 and 3, which include an increase in TA C-72 operations as well as line of sight tree clearing and maintenance. Potential impacts to soil resources include deposition of munitions residues and erosion. Each of these impact categories are discussed under the preceding alternatives. With implementation of management requirements identified in Sections 2.5 and 4.2.1, there would be no impacts to soil resources

from missile testing and training, bomb testing and training, gun testing and training, air operations testing and training, or line of sight tree clearing and maintenance.

4.3 WATER RESOURCES

Water quality analysis focuses on the potential for chemical material byproducts and sediments to enter groundwater and surface waters, including wetlands. Potential contaminant transport mechanisms include groundwater recharge, surface runoff, and soil erosion.

4.3.1 No Action Alternative

Previous analysis of TA C-72 missions (U.S. Air Force, 2006b) identified the release of chemical materials as the primary water resource issue. Such materials include liquid, solid, or gaseous substances that may be derived from missiles, bombs, and other munitions, pyrotechnic, combustion, residual fuel leaks or spills, and untreated bilge release. Release of these materials may potentially affect water quality. In addition, water resources could potentially be affected by sediment runoff due to soil erosion.

Groundwater

Munitions residue could migrate into the groundwater of TA C-72 and ultimately enter surface waters through groundwater recharge. Residues of concern include TNT, RDX, copper, and lead. The occurrence or extent of groundwater contamination on the test area is currently unknown. However, groundwater quality at TA C-72 is not anticipated to be negatively affected by the proposed activities. Soil concentrations of these substances would be well below established risk-based thresholds at the activity level associated with the No Action Alternative, as described in Section 4.2.1. In addition, implementation of water quality management requirements, identified at the end of this section and in Section 2.5, would greatly decrease the potential for contamination.

Surface Water

In addition to recharge by the aquifer system, contaminants could enter surface waters by airborne transport, runoff, or sedimentation caused by soil erosion. The presence and concentration of metals or other contaminants in surface waters on and near TA C-72 is unknown, as sampling has not been conducted. However, mission activities under the No Action Alternative are not anticipated to impact water quality at TA C-72. The primary explosive byproducts that could become airborne and settle in water bodies include carbon dioxide, carbon monoxide, and nitrous oxides. These chemicals would be dissipated in the atmosphere before reaching the streams.

Chaff and flares could fall into surface waters and introduce aluminum and magnesium, respectively. The 1999 PEA cites a study indicating that no harmful effects to aquatic species were found when aluminum-coated chaff fibers reached a concentration of 1,000 milligrams per liter (mg/L). As a conservative point of comparison, 54,659 bundles of chaff would need to be deposited onto a hypothetical 1-acre pond with an average depth of 10 feet, and 100 percent of the aluminum metal would need to dissolve in the water, to reach an aluminum concentration of

1,000 mg/L (Table 4-11). In addition, the pond would need to be very acidic for all of the aluminum to dissolve. In reality, chaff bundles may be released over essentially any portion of the test area and are dispersed by winds throughout the vicinity, including areas beyond the test area boundary.

Magnesium concentration in groundwater is up to 5 mg/L on Eglin AFB (U.S. Air Force, 1999b). Similar to the analysis for aluminum, 9,816 flares would need to be deposited onto a hypothetical 1-acre pond averaging 10 feet deep in order to elevate the magnesium concentration to 1,000 mg/L (Table 4-11). Further, the principal byproduct of flare use, magnesium oxide, is insoluble in water.

Table 4-11. Threshold Analysis for Chaff and Flare Expenditures

Chemical Constituent	Number of Expenditures, No Action Alternative	Number of Expenditures Needed to Reach 1,000 mg/L in a 1-Acre Pond
Aluminum	2,996 chaff bundles	54,659 chaff bundles
Magnesium	562 flares	9,816 flares

mg/L = milligrams per liter

Gentle slopes typically characterize the soils at TA C-72, and soil concentrations of mission-related contaminants are likely well below established risk-based thresholds, as described in Section 4.2.1. Therefore, consistent with analysis in the 1999 PEA, munitions residues are unlikely to enter streams because of erosion or runoff. In addition, implementation of management requirements identified at the end of this section and in Section 2.5 would further reduce the potential for sedimentation. The management requirements include erosion control measures and restrictions on activities near water bodies. The 1999 PEA concluded that transport of chemicals into the stream systems is very unlikely to impact water quality due to the low concentrations, dilution, and temporal variation in deposit.

Wetlands

Approximately 186 acres of wetlands occur within the boundaries of TA C-72. In accordance with AFI 32-7064, all activities proposed at the test area under the No Action Alternative would, to the maximum extent practicable, avoid actions that would either destroy or adversely modify wetlands. Furthermore, implementation of specific wetland management requirements and water quality management requirements would greatly reduce the potential for impacts. For example, target location, off-road driving, and digging are prohibited in wetlands. Limited potential for erosion and the implementation of management requirements would minimize the potential impacts to wetlands.

Floodplains

Approximately 20 acres of floodplain resources occur within the boundaries of TA C-72. Most floodplains in the vicinity occur outside of the test area boundary. Impacts to floodplains would not be significant under the No Action Alternative. None of the actions at TA C-72 involve changes to the floodplain. Further, there are no habitable structures at risk from any changes to the floodplain. None of the activities would alter flow regimes of 100-year floods.

Coastal Zone

Components of the Proposed Action would take place within the jurisdictional concerns of FDEP and, therefore, would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA. Eglin AFB has prepared a CZMA determination to address the potential impacts to the coastal zone (APPENDIX F).

Management Requirements

The preceding analyses describe potential impacts to water resources at TA C-72 resulting from mission activities. These impacts would be diminished by implementing management requirements. A list of management requirements is provided in Section 2.5. Those specifically applicable to water resources, whether directly or indirectly, are listed below.

Pyrotechnics

- Do not release chemicals or metals into streams indirectly by releasing toxic aerosols in the vicinity of streams.
- Do not use munitions, smokes, simulators, flares, and any other pyrotechnics within 100 feet of water bodies.

Tactical Vehicle Operation

- All vehicles used as immobile targets must be rendered environmentally safe by removal of all fuels, oils, and other chemical materials.
- Tactical vehicles must be moved only on established range roads.

Soil Resources

- Design vegetation control practices that minimize surface disturbance and create implementation strategies for increasing vegetative cover.
- Control the location and design of mission activities to avoid creating adverse slope shapes or gradients and/or to reduce vegetative cover.
- Locate mission activities that result in surface disturbance away from slopes sensitive to erosion.
- Establish low-growing grassland communities on severely disturbed erosion response units.
- Design concave slope segments on newly constructed targets.
- Reduce the gradients of severely eroding slopes to the degree possible and revegetate.

Water Resources

- Conduct target and ordnance debris removal and disposal of solid debris from banks, chaff, smokes, and flares in accordance with Air Force regulations. During removal, minimize additional damage to the streambed and banks.

- Do not conduct off-road driving within 100 feet of any water body or wetland or on steep slopes.
- Do not dig holes or establish new cleared areas within 100 feet of any water body or wetland or on steep slopes.
- Direct release of chemicals or metals into water bodies or wetlands is prohibited.
- Do not release toxic aerosols within 300 feet of a water body.

Additional Measures

- Do not establish new cleared target areas within 200 feet of any natural water body.
- Maintain a vegetated buffer between surface waters and bare soil testing areas
- Do not detonate explosives within 200 feet of water bodies.
- If any ordnance lands in stream bank areas, removed it immediately in accordance with Air Force regulations.
- If monitoring the test area, include chemical analysis of soils, groundwater monitoring, and surface water monitoring.

4.3.2 Alternative 1

Groundwater

Munitions residue could migrate into the groundwater of TA C-72 and ultimately enter surface waters. Residues of concern include TNT, RDX, copper, and lead. The occurrence or extent of groundwater contamination at the test area is currently unknown. However, groundwater quality at TA C-72 is not anticipated to be negatively affected by the proposed activities. Soil concentrations of these substances would be well below established risk-based thresholds at the activity level associated with Alternative 1, as described in Section 4.2.2. In addition, implementation of water quality management requirements would greatly decrease the potential for contamination.

Surface Water

In addition to recharge by the aquifer system, contaminants could enter surface waters by airborne transport, runoff, or sedimentation caused by soil erosion. The presence and concentration of metals or other contaminants in surface waters at and near TA C-72 is unknown. However, mission activities under the Alternative 1 are not anticipated to impact water quality at TA C-72.

The primary explosive byproducts that could become airborne and settle in water bodies include carbon dioxide, carbon monoxide, and nitrous oxides. These chemicals would be dissipated in the atmosphere before reaching the streams. In addition, chaff and flares could fall into surface waters and introduce aluminum and magnesium, respectively. Similar the No Action Alternative, 54,659 bundles of chaff would need to be deposited onto a hypothetical 1-acre pond with an average depth of 10 feet, and 100 percent of the aluminum metal would need to dissolve in the water, to reach an aluminum concentration of 1,000 mg/L (Table 4-12). In addition, the

pond would need to be very acidic for all of the aluminum to dissolve. In reality, chaff bundles may be released over essentially any portion of the test area and are dispersed by winds throughout the vicinity, including areas beyond the test area boundary. In addition, 9,816 flares would need to be deposited onto the hypothetical pond to elevate the magnesium concentration to 1,000 mg/L (Table 4-12). Further, the principal byproduct of flare use, magnesium oxide, is insoluble in water.

Table 4-12. Threshold Analysis for Chaff and Flare Expenditures

Chemical Constituent	Number of Expenditures, Alternative 1	Number of Expenditures Needed to Reach 1,000 mg/L in a 1-Acre Pond
Aluminum	660 chaff bundles	54,659 chaff bundles
Magnesium	355 flares	9,816 flares

mg/L = milligrams per liter

The topography of TA C-72 generally consists of gentle slopes, and soil concentrations of mission-related contaminants are likely well below established risk-based thresholds, as described in Section 4.2.1. Therefore, munitions residues are unlikely to enter streams because of erosion or runoff. In addition, implementation of management requirements would further reduce the potential for sedimentation. The management requirements include erosion control measures and restrictions on activities near water bodies. The 1999 PEA concluded that transport of chemicals into the stream systems is very unlikely to impact water quality, due to the low concentrations, dilution, and temporal variation in deposit.

Wetlands

In accordance with AFI 32-7064, all activities proposed at the test area under the Alternative 1 would, to the maximum extent practicable, avoid actions that would either destroy or adversely modify wetlands. Furthermore, implementation of specific wetland management requirements and water quality management requirements would greatly reduce the potential for impacts. For example, target location, off-road driving, and digging are prohibited in wetlands. Limited potential for erosion and the implementation of management requirements would minimize the potential impacts to wetlands.

Floodplains

Most floodplains at and near TA C-72 occur outside of the test area boundary. Impacts to floodplains would not be significant under Alternative 1. None of the actions at the test area involve changes to the floodplain. Further, there are no habitable structures at risk from any changes to the floodplain. None of the activities would alter flow regimes of 100-year floods.

Coastal Zone

Components of the Proposed Action would take place within the jurisdictional concerns of FDEP and, therefore, would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA. Eglin AFB has prepared a CZMA determination to address the potential impacts to the coastal zone (APPENDIX F).

4.3.3 Alternative 2

Groundwater

Munitions residue could migrate into the groundwater of TA C-72 and ultimately enter surface waters. Residues of concern include TNT, RDX, copper, and lead. The occurrence or extent of groundwater contamination at the test area is currently unknown. However, soil concentrations of TNT and RDX would be well below USEPA thresholds at the activity level associated with Alternative 2, as described in Section 4.2.3. Soil concentrations of lead and copper would potentially be elevated but would still likely be under USEPA thresholds. In addition, implementation of water quality management requirements would greatly decrease the potential for contamination. Therefore, groundwater quality at TA C-72 is not anticipated to be negatively affected by the proposed activities.

Surface Water

In addition to recharge by the aquifer system, contaminants could enter surface waters by airborne transport, runoff, or sedimentation caused by soil erosion. The presence and concentration of metals or other contaminants in surface waters at and near TA C-72 is unknown. However, mission activities under the Alternative 1 are not anticipated to impact water quality at TA C-72.

The primary explosive byproducts that could become airborne and settle in water bodies include carbon dioxide, carbon monoxide, and nitrous oxides. These chemicals would be dissipated in the atmosphere before reaching the streams. In addition, chaff and flares could fall into surface waters and introduce aluminum and magnesium, respectively. Similar to the No Action Alternative, 54,659 bundles of chaff would need to be deposited onto a hypothetical 1-acre pond with an average depth of 10 feet, and 100 percent of the aluminum metal would need to dissolve in the water, to reach an aluminum concentration of 1,000 mg/L (Table 4-13). In addition, the pond would need to be very acidic for all of the aluminum to dissolve. In reality, chaff bundles may be released over essentially any portion of the test area and are dispersed by winds throughout the vicinity, including areas beyond the test area boundary. In addition, 9,816 flares would need to be deposited onto the hypothetical pond to elevate the magnesium concentration to 1,000 mg/L (Table 4-13). Further, the principal byproduct of flare use, magnesium oxide, is insoluble in water.

Table 4-13. Threshold Analysis for Chaff and Flare Expenditures

Chemical Constituent	Number of Expenditures, Alternative 1	Number of Expenditures Needed to Reach 1,000 mg/L in a 1-Acre Pond
Aluminum	1,980 chaff bundles	54,659 chaff bundles
Magnesium	1,065 flares	9,816 flares

mg/L = milligrams per liter

The topography of TA C-72 is generally characterized by gentle slopes, and soil concentrations of mission-related contaminants are expected to be lower than established risk-based thresholds, as described in Section 4.2.3. In addition, implementation of management requirements would further reduce the potential for sedimentation. The management requirements include erosion control measures and restrictions on activities near water bodies. Although the amount of metal

residues such as lead and copper would be elevated under this alternative, it is expected that transport of chemicals into the stream systems is unlikely to impact water quality due to dilution and temporal variation in deposit.

Wetlands

In accordance with AFI 32-7064, all activities proposed at the test area under Alternative 2 would, to the maximum extent practicable, avoid actions that would either destroy or adversely modify wetlands. Furthermore, implementation of specific wetland management requirements and water quality management requirements would greatly reduce the potential for impacts. For example, target location, off-road driving, and digging are prohibited in wetlands. Limited potential for erosion and the implementation of management requirements would minimize the potential impacts to wetlands.

Floodplains

Most floodplains at and near TA C-72 occur outside of the test area boundary. Impacts to floodplains would not be significant under the Alternative 2. None of the actions on the test area involve changes to the floodplain. Further, there are no habitable structures at risk from any changes to the floodplain. None of the activities would alter flow regimes of 100-year floods.

Coastal Zone

Components of the Proposed Action would take place within the jurisdictional concerns of FDEP and therefore would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA. Eglin AFB has prepared a CZMA determination to address the potential impacts to the coastal zone (APPENDIX F).

4.3.4 Alternative 3

Groundwater

Alternative 3 pertains only to line of sight tree clearing and maintenance. Therefore, no impacts due to munitions use are associated with this alternative. Potential impacts to groundwater associated with this alternative are limited to the possibility of herbicides migrating through the soil. However, herbicides would only be used in accordance with approved management practices. These practices include avoidance and minimization measures for sensitive habitats; spill prevention, cleanup, and containment measures; and strict adherence to herbicide instructions during handling, mixing, and application (see Section 4.1, Chemical Materials, for a complete discussion of herbicide use). There would therefore be no impacts to groundwater.

Surface Water

Tree removal and maintenance activities could potentially result in erosion at TA C-72. Most of the test area consists of gently sloping terrain with a slope rating of less than 5 percent. Such areas do not have a high potential for erosion. However, soil-disturbing activities occurring on slopes, including areas associated with stream banks, have a greater potential to initiate or accelerate erosion processes. Many of the areas proposed for tree-clearing activity occur in the vicinity of streams, most of which function as Okaloosa darter habitat. Erosion in such areas

could lead to sedimentation, which could degrade water quality and the corresponding habitat value.

Tree clearing would be conducted by one of four methods: tree harvest, Gyro-Trac use, herbicide use, or cut and leave in place. Under the tree harvest and cut-and-leave methods, trees would be cut by hand. The Gyro-Trac removes vegetation in such a way that at least a few inches of living vegetation remains in place. Further, the vehicle moves on a path of mulch (generated while the machine is in operation) so that the tracks seldom contact the soil. The Gyro-Trac typically causes minimal soil and root disturbance. Herbicides would be applied in accordance with all existing, approved management practices. Therefore, vehicle and foot traffic associated with these activities are expected to have minimal potential to cause soil disturbance leading to erosion.

A stormwater permit under the National Pollutant Discharge Elimination System (NPDES) is generally required for ground-disturbing activities affecting more than 1 acre of land. Although activities associated with Alternative 3 may affect an area of more than 1 acre, they are not expected to disturb soil or remove all vegetation (including tree roots). Activities that result in vegetation being left in place after completion generally do not require a NPDES permit (Brown, 2011). In the case of C-72 line of sight tree clearing, a permit would not be required if trees are hand cut or the Gyro-Track is used (leaving some live vegetation).

Management requirements pertaining to tree clearing and maintenance are listed in Sections 2.5 and 4.3.1. With implementation of management requirements, there would be no significant impacts to surface water resources resulting from line of sight clearing and maintenance.

Wetlands

Potential impacts to wetlands would be associated with soil erosion and the resulting sedimentation, as described above under “Surface Water.” However, implementation of specific wetland management requirements would greatly reduce the potential for impacts. Tree-clearing activities conducted in wetlands (including stream banks) would be limited to hand cutting of specific trees, where cut trees are left in place; otherwise, additional environmental analysis would be required. In addition, if tree removal is conducted in the vicinity of a wetland, including stream banks, Eglin AFB Environmental Management would need to be consulted before the action proceeds. These and all other wetland-related management requirements pertaining to tree clearing and maintenance are listed below. Additional requirements associated with potential impacts to the Okaloosa darter are detailed in Section 4.4, Biological Resources. With implementation of management requirements, there would be no significant impacts to wetlands resulting from line of sight tree clearing and maintenance.

Management Requirements for Wetlands

- Consult Eglin AFB Environmental Management if tree clearing and/or line of sight maintenance activities are conducted in the vicinity of a wetland, including stream banks.
- Employ hand cutting of trees, where cut trees are left in place, in the vicinity of a wetland, including stream banks.
- Do not conduct activities in wetlands that would significantly change the hydrologic condition of wetlands or the overall drainage pattern of the site.

- Do not significantly alter the natural drainage or flow patterns on forest lands immediately adjacent to wetlands.
- Do not conduct intensive site preparation, such as bedding, raking, and windrowing, in wetlands.
- Any other activities in wetlands, such as tree harvesting, skidding, or mat logging, would be conducted according to requirements in the *Best Management Practices for Silviculture* (FDACS, 2009).

Floodplains

Impacts to floodplains would not be significant under Alternative 3. None of the actions involve changes to the floodplain. Further, there are no habitable structures at risk from any changes to the floodplain. None of the activities would alter flow regimes of 100-year floods.

Coastal Zone

Components of the Proposed Action would take place within the jurisdictional concerns of FDEP and therefore would require a consistency determination with respect to Florida's Coastal Zone Management Plan and the CZMA. Eglin AFB has prepared a CZMA determination to address the potential impacts to the coastal zone (APPENDIX F).

4.3.5 Alternative 4

Alternative 4 is a combination of Alternatives 2 and 3, which include an increase in TA C-72 operations as well as line of sight tree clearing and maintenance. Potential impacts to water resources include introduction of munitions residues and herbicides and sedimentation caused by erosion. Each of these impact categories is discussed under subsections on the preceding alternatives. With implementation of management requirements identified in Sections 2.5, 4.3.1, and 4.3.4, there would be no impacts to water resources.

4.4 BIOLOGICAL RESOURCES

This section describes the potential impacts to the ecological associations, sensitive habitats, and sensitive species identified in Chapter 3. The analysis covers the No Action Alternative as well as Alternatives 1, 2, and 3, and their respective potential impacts on each biological resource group.

4.4.1 No Action Alternative

This alternative would continue the level of activity analyzed in the *Test Area C-72 Final Programmatic Environmental Assessment* (PEA) (U.S. Air Force, 1999b). TA C-72 is predominantly open grassland or urban/landscaped areas and is subject to frequent military activity. With the exception of the Okaloosa darter streams, the test area does not contain areas designated as sensitive habitats and would not be considered preferred habitat for most sensitive species.

Some habitat alteration is possible due to wildfires ignited by live munitions/pyrotechnics. The use of munitions and pyrotechnics increases the risk of wildfires. Fires are usually beneficial to

longleaf and open grassland communities, but it is unknown whether the wildfires potentially associated with the No Action Alternative would have a net positive or negative effect on sensitive habitats and species. Wildfires can cause damage to sensitive habitats if they burn too hot, smolder, or if fire suppression activities are necessary. Use of munitions and pyrotechnics use would follow Eglin's Wildfire Specific Action Guide restrictions, which rate fire dangers from low to extreme (U.S. Air Force, 2008a). During days with low fire danger, there are no restrictions on missions, but on days with extreme fire danger, no pyrotechnics are allowed without prior approval from the Wildland Fire Program Manager at Eglin's Natural Resources Section.

Sensitive Species

Okaloosa Darter

The primary threat to the Okaloosa darter is excess sedimentation into its stream habitat. Minimization of erosion in darter watersheds is extremely important to its well-being. To protect darter habitat streams, users of TA C-72 would use established roads, trails and bridges when troops and vehicles are crossing streams. Additionally, ground-disturbing activities such as off-road vehicle use, bivouac, and fighting positions, would be restricted near darter streams and on stream slopes. Pyrotechnics use would be restricted near darter streams, and munitions impact areas would be located away from darter streams. If any munitions land in darter streams, users would contact Eglin Natural Resources Section (NRS) (96 CEG/CEVSN) for consultation prior to attempted retrieval. With proper avoidance and minimization measures in place, the No Action Alternative is not expected to adversely affect the Okaloosa darter or its habitat streams.

Red-cockaded Woodpecker

Based on the growth trend of the RCW tracked by the Eglin NRS, the current levels of military activity in established test areas such as TA C-72 have not adversely affected RCW populations (U.S. Air Force, 2010d). The potential impacts to RCWs from test and training activities include the direct physical impact from munitions and disturbance from noise. During normal procedures, the areas of RCW foraging habitat in and around TA C-72 would not be affected. Therefore, the potential risk of physical impact to the RCW would be negligible.

While there are no documented RCW cavity trees within the boundaries of TA C-72, there are numerous active and inactive trees present in close proximity to the test area. The associated foraging habitat from these RCW clusters extends inside the test area boundary. Within TA C-72, there are approximately 196 acres of foraging habitat (Figure 4-1). This foraging habitat is subject to special protection, and before any tree clearing, units must coordinate with Eglin NRS. For activities performed near RCW trees, Eglin applies the *Management Guidelines for the Red-Cockaded Woodpecker on Army Installations* (U.S. Army, 2006); these guidelines detail the allowed and restricted activities near active RCW trees (Table 4-14). Activities that occur within 200 feet of a marked cavity tree are limited to those of a transient nature (less than 2 hours duration). Therefore, any test or training action that is expected to occur in a single location for more than 2 hours within a 200-foot buffer of an active RCW tree must be coordinated through Eglin NRS (96 CEG/CEVSN). Such activities would be evaluated on a case-by-case basis for their potential impact to the RCW.

**Table 4-14. Selected Army Training Activities Allowed/Not Allowed
Within 200 Feet of Marked RCW Cavity Tree**

Mission Activity	Allowed
Maneuver and Bivouac	
Hasty defense, light infantry, hands and hand tool digging only, no deeper than 2 feet, 2 hours maximum	Yes
Hasty defense, mechanized infantry/armor	No
Deliberate defense, light infantry	No
Deliberate defense, mechanized infantry/armor	No
Establish command post, light infantry	No
Establish command post, mechanized infantry/armor	No
Assembly area operations, light infantry/mechanized infantry/armor	No
Establish Combat Support/Combat Service Support (CS/CSS) sites	No
Establish signal sites	No
Foot transit through the cluster	Yes
Wheeled vehicle transit through the cluster ¹	Yes
Armored vehicle transit through the cluster ¹	Yes
Cutting natural camouflage, hardwood only	Yes
Establish camouflage netting	No
Vehicle maintenance for no more than 2 hours	Yes
Weapons Firing	
7.62 millimeter and below blank firing	Yes
.50 caliber blank firing	Yes
All others	No
Noise	
Generators	No
Artillery/hand grenade simulators	Yes
Hoffman-type devices	Yes
Pyrotechnics/Smoke	
CS/riot agents	No
Smoke, haze operations only, generators or pots, fog oil, and/or graphic flakes ²	Yes
Smoke grenades	Yes
Incendiary devices to include trip flares	Yes
Star clusters/parachute flares	Yes
Hexachloroethane (HC) smoke of any type	No
Digging	
Tank ditches	No
Deliberate individual fighting positions	No
Crew-served weapons fighting positions	No
Vehicle fighting positions	No
Other survivability/force protection positions	No
Vehicle survivability positions	No

Source: U.S. Army, 2006

RCW = red-cockaded woodpecker

1. Vehicles would not get any closer than 50 feet of a marked cavity tree unless on existing roads, trails, or firebreaks.

2. Smoke generators and smoke pots would not be set up within 200 feet of a marked cavity tree, but the smoke may drift through the 200-foot circle around a cavity tree.

RCWs exposed to noise from range activities, vehicular traffic, and other mission-related activities have shown some tolerance to disturbance (Delaney et al., 2002). Noise meaning (implication of the noise to recipient) is a crucial determinant in whether wild animals react to a noise source. For example, waterfowl and other game bird species are typically more responsive to noise than nongame species, due to the associated danger for hunted species (i.e., loud guns). Hunted species may become sensitized such that they will increase energy expenditures to avoid perceived danger from loud noises. Alternately, if a noise is deemed harmless by an animal, then the animal may habituate or adapt behaviorally and physiologically over time (Bowles, 1995).

Animals may initially react with a startle effect from noises but adapt over time, so that even this behavior is eradicated. Because RCWs in the vicinity of TA C-72 are regularly exposed to loud impulse noise (e.g., detonations, gunfire) without any associated physical danger, these individuals have likely become habituated to the noises, such that they do not expend energy on harmless stimuli.

Based on a review of literature pertaining to noise exposure in wildlife, Bowles (1995) suggests that outcome measures, such as reproductive success, are better indicators of distress in wildlife than short-term responses (e.g., startle reaction). Negative reproductive effects have not been seen in the RCW clusters in the TA C-72 area, and the population in the TA C-72 vicinity is growing. Since the entire Eglin RCW population continues to grow, it appears that RCWs on Eglin have adapted to the noises associated with the military mission. Although other suitable habitat is available on Eglin, RCWs have continued to nest and forage at and near TA C-72. Quality habitat appears to outweigh any negative influences associated with mission activities. Training may temporarily disturb individuals or populations, and foraging RCWs may avoid areas where disturbance is occurring. Pioneering RCWs may be affected by noise from daily operations and not colonize or immigrate to new areas within the test site or access roads. This could affect the growth of the RCW population adjacent to the proposed activity area. However, based on the continued usage of the areas around TA C-72 by RCWs despite historical mission impact, future mission activities at TA C-72 are not likely to have an adverse impact on RCW.

Some habitat alteration is possible due to wildfires ignited by live munitions/pyrotechnics. RCW require frequent fire to keep scrubby vegetation to a minimum. Wildfires may achieve this purpose. However, with every wildfire, there is the potential for damage or mortality of active RCW cavity trees if the trees ignite. Prescribed fire is the preferred option for maintaining these habitats.

Munitions and pyrotechnics use would follow Eglin's Wildfire Specific Action Guide restrictions, which rate fire danger from low to extreme (U.S. Air Force, 2008a). During days with low fire danger, there are no restrictions on missions, but on days with extreme fire danger, no pyrotechnics are allowed without prior approval from the Wildland Fire Program Manager at Eglin's Natural Resources Section. Within three working days of notification, the Eglin Natural Resources Section would reprovise a cavity tree if one was destroyed due to training activity (i.e., due to wildfire).

Eastern Indigo Snake

TA C-72 is also considered suitable, although not preferred, habitat for the eastern indigo snake and gopher tortoise. Because it uses a variety of habitat types, the eastern indigo snake could occur anywhere on the Eglin mainland reservation, including test areas. The species is uncommon; therefore, the likelihood of impact from test and training activities is considered extremely remote. In 2008, Eglin NRS submitted a programmatic biological assessment (BA) to the USFWS to address impacts to the eastern indigo snake from testing and training activities, general range road usage and maintenance, and construction activities. Within that BA, the NRS has adapted and modified the USFWS Standard Protection Measures for the eastern indigo snake for use on the Eglin reservation (U.S. Air Force, 2008b). The BA also outlines procedures to be used for implementing those protection measures. Given the low likelihood that an indigo snake would be encountered, missions at C-72 are not likely to adversely affect the indigo snake.

Gopher Tortoise

Test Area C-72 has not been comprehensively surveyed for gopher tortoise burrows, however, project-specific surveys of limited areas have been completed as recently as 2010. Individuals and burrows were documented during the most recent survey (U.S. Air Force, 2010d). Potential for significant habitat alteration exists from munitions and training missions resulting in the collapse of gopher tortoise burrows; however, this potential is infrequent. Training and heavy missions should be avoided near known gopher tortoise burrows. If a gopher tortoise or gopher tortoise burrow is identified within the proposed site of one of these activities, personnel must contact the Eglin NRS to inspect, evaluate, and possibly relocate the gopher tortoise. Also, prior to any clearing or establishment of new targets, mission personnel must contact Eglin NRS to conduct a survey of the area. Transportation and release of tortoises would follow guidelines established by the FWC in gopher tortoise permitting guidelines (FWC, 2008). The gopher tortoise is unlikely to be adversely impacted by missions at TA C-72.

Florida Black Bear

The Florida black bear may be found in the Sandhills and also in stream riparian areas, which they use as habitat and travel corridors. The presence of several creeks enhances the possibility of black bear potential. Because the majority of the test area is cleared, it is unlikely that black bear would traverse the open area. Vehicle strikes are the primary concern for bears on Eglin; thus, drivers should be alert to the presence of bears to avoid impacts. The Florida black bear is unlikely to be adversely impacted by test and training activities.

4.4.2 Alternative 1

Alternative 1 provides for several new types of munitions as well as additional user groups (7SFG and JSF). Therefore, there may be an increased likelihood of impact. However, provided that the new user groups adhere to the management requirements for use of the test area, the increase in frequency of missions and training is not anticipated to significantly impact biological resources.

Alternative 1 would result in increased munitions expenditures associated with training activities. Although some risk of wildfire would result from increased munitions use, no direct impacts to

sensitive species or habitats are anticipated from munitions. As with the No Action Alternative, adherence to the Eglin Wildfire Specific Action Guide), which includes restrictions during extreme fire danger, would reduce the likelihood of a mission-induced wildfire and its potential negative impacts.

Okaloosa Darter

Increased mission activity under Alternative 1 must continue to comply with management requirements that are designed to protect the species. New user groups must adhere to the accepted guidelines for use of the test area as described for the No Action Alternative. Therefore, the increase in frequency of missions and training is not anticipated to significantly impact the Okaloosa darter or its habitat streams.

Red-cockaded Woodpecker

Increased frequency of missions at TA C-72 would increase potential encounters with RCW. Eglin would continue to apply the *Management Guidelines for the Red-Cockaded Woodpecker on Army Installations* (U.S. Army, 2006) to activities near RCW trees. However, if additional tests and training operations are conducted within the RCW foraging habitat, they would be more disruptive to the species than the current level of activity. The RCW population continues to grow at Eglin, including areas in close proximity to test areas; therefore it appears that they have adapted to the noise associated with military missions, and the increase in missions described for Alternative 1 would not significantly impact RCW or their habitat.

If additional targets or training areas are proposed for TA C-72, it may require the removal of longleaf pine. Since longleaf pine of significant age and size are the sole nesting choice for RCW, the removal of such trees must be evaluated on a case-by-case basis for its significance to the affected RCW population. This action is not addressed within the analysis and must be coordinated through the Eglin NRS (96 CEG/CEVSN). The Eglin NRS believes the mission activities described under Alternative 1 are not likely to adversely impact the RCW.

Eastern Indigo Snake

Increased frequency of missions may increase the likelihood of encountering an eastern indigo snake. However, given the reclusive nature of the species and their assumed rarity, the potential impact from Alternative 1 is not significant. The Eglin NRS believes the mission activities described under Alternative 1 are not likely to adversely impact the indigo snake.

Gopher Tortoise

Increased mission activity under Alternative 1 must continue to comply with management requirements that are designed to protect the species. The greatest risk to the gopher tortoise from Alternative 1 is the potential for significant habitat alteration from munitions and training missions. If possible, training and heavy missions should be planned to avoid known gopher tortoise burrows. If gopher tortoise burrows cannot be avoided due to mission requirements, mission personnel must contact Eglin NRS to conduct a survey of the area. If necessary, Eglin NRS can relocate tortoises according to guidelines established by the FWC in *Gopher Tortoise*

Permitting Guidelines (FWC, 2008). The gopher tortoise is unlikely to be adversely impacted by missions at TA C-72.

Florida Black Bear

Increased mission activity under Alternative 1 must continue to comply with management requirements that are designed to protect the species. Increased frequency is not expected to change the potential impacts to the Florida black bear, as under the No Action Alternative.

4.4.3 Alternative 2

For Alternative 2, the potential impact to biological resources is expected to be similar to Alternative 1. However, since Alternative 2 provides for a significant increase in frequency of testing and training above the No Action Alternative and Alternative 1 levels, there may be additional likelihood of impact from mission activity.

Alternative 2 would result in increased munitions expenditures associated with training activities. Although some risk of wildfire would result from increased munitions use, no direct impacts to sensitive species or habitats are anticipated from munitions. As under the No Action Alternative, adherence to the Eglin Wildfire Specific Action Guide, which includes restrictions during extreme fire danger, would reduce the likelihood of a mission-induced wildfire and its potential negative impacts.

Okaloosa Darter

As under Alternative 1, increased mission activity under Alternative 2 must continue to comply with management requirements that are designed to protect the species. All user groups must adhere to the accepted guidelines for use of the test area as described for the No Action Alternative. Therefore, the increase in frequency of missions and training is not anticipated to significantly impact the Okaloosa darter or its habitat streams. The Eglin NRS believes the mission activities described under Alternative 2 are not likely to adversely impact the Okaloosa darter.

Red-cockaded Woodpecker

As under Alternative 1, increased frequency of missions at TA C-72 would further increase potential encounters with RCW. Eglin would continue to apply the *Management Guidelines for the Red-Cockaded Woodpecker on Army Installations* (U.S. Army, 2006) to activities near RCW trees. Additional tests and training operations conducted within the RCW foraging habitat would be more disruptive to the species than the current level of activity. However, the RCW population continues to grow at Eglin, including areas in close proximity to test areas; therefore, it appears that they have adapted to the noise associated with military missions, and the increase in missions described for Alternative 2 would not significantly impact RCWs or their habitat.

If additional targets or training areas are proposed for TA C-72, it may require the removal of longleaf pine. The removal of such trees for mission activities must be evaluated on a case-by-case

basis for its significance to the affected RCW population. This action is not addressed within the analysis and must be coordinated through the Eglin NRS (96 CEG/CEVSN). The Eglin NRS believes mission activities under Alternative 2 are not likely to adversely impact the RCW.

Eastern Indigo Snake

As with Alternative 1, increased frequency of missions may further increase the likelihood of encountering an eastern indigo snake. However, given the reclusive nature of the species and their assumed rarity, the potential impact from Alternative 2 is not significant. The Eglin NRS believes the mission activities described under Alternative 2 are not likely to adversely impact the indigo snake.

Gopher Tortoise

Increased mission activity under Alternative 2 must continue to comply with management requirements that are designed to protect the species. The greatest risk to the gopher tortoise under Alternative 2 is the potential for significant habitat alteration from munitions and training missions. If possible, training and heavy missions should be planned to avoid known gopher tortoise burrows. If gopher tortoise burrows cannot be avoided due to mission requirements, mission personnel must contact Eglin NRS to conduct a survey of the area. If necessary, Eglin NRS can relocate tortoises according to guidelines established by the FWC in *Gopher Tortoise Permitting Guidelines* (FWC, 2008).). The gopher tortoise is unlikely to be adversely impacted by missions at TA C-72.

Florida Black Bear

Increased mission activity under Alternative 2 must continue to comply with management requirements that are designed to protect the species. Increased frequency is not expected to change the potential impacts to the Florida black bear, as under the No Action Alternative and Alternative 1.

4.4.4 Alternative 3

Alternative 3 describes the proposed tree-clearing activities both on and around Test Area C-72 for the line of sight requirements of test mission video tracking sites (Figure 4-1). Many of the areas identified for tree clearing overlap with biological resources such as sensitive species habitats. The following analyses focus on the potential impacts to the Okaloosa darter, red-cockaded woodpecker, eastern indigo snake, gopher tortoise, and Florida black bear; however, the avoidance and minimization measures recommended to protect these species would serve to benefit the corresponding ecological associations as well.

In areas that require maintenance of vegetation utilizing herbicides, all avoidance and minimization measures in the *Long-Term Vegetation Control Environmental Assessment* and Long-Term Vegetation Control Section 7 consultation must be followed (U.S. Air Force, 2007a; U.S. Air Force, 2007b). All herbicide applicators conducting herbicide treatment activities on Eglin AFB would be DoD- or state-certified pesticide applicators or qualified individuals under direct supervision of a certified applicator. Sensitive areas would not receive herbicide (unless an aquatic label can be used). Sensitive areas include water bodies, areas adjacent to water bodies, sites without vegetation, and certain sensitive habitats as determined by the Eglin NRS. Areas to be avoided due to concerns for threatened and endangered species would be identified through coordination with endangered species biologists.

The 46th TW does not anticipate the need for large-scale maintenance of the tree-clearing area in the near future (i.e., 10 years) (O'Connell, 2011); thus, potential impacts from such maintenance are not analyzed in this document. If the need were to arise, a separate consultation would be conducted.

Okaloosa Darter

Tree-clearing activities at TA C-72 have the potential to impact Okaloosa darters and their habitat due to sedimentation, logging debris, chemicals, and water temperature fluctuations. Proper implementation of BMPs and management requirements are key to minimizing these impacts to darter streams.

Okaloosa darter habitat is sensitive to a variety of disturbances. Habitat loss or degradation has occurred from several factors, including siltation, small impoundments, and possibly domestic pollution. The Eglin Threatened and Endangered Species Component Plan identifies erosion and resulting sedimentation as a major contributor to the degradation of darter habitat. To protect the Okaloosa darter, the quantity and quality of water in the streams must be protected. Principal factors in the initial listing of the darter were the amount of its habitat degraded by road and dam construction, as well as siltation from land clearing (USFWS, 1998).

Six stream crossing projects conducted at TA C-72 have greatly reduced the erosion potentials in the area. Three of the crossings were upgraded with pipe replacements, stormwater controls, and geoweb road approaches, and the three others were decommissioned. Additionally, there have been approximately 24 erosion control projects and a borrow pit erosion control project at C-72 to limit erosion into darter streams. Hundreds of trees and other plants have been planted over the past 10 years at these sites. A stormwater repair at the Range Road (RR) 214/374 crossing on Rocky Creek was also accomplished. Approximately 50 acres of erosion control projects at TA C-72 (excluding TA C-7A-Hellfire and TA C-5) have been completed, with estimated construction costs of approximately \$900,000 (Pizzalato, 2011). Projects have involved earth moving, berms, native vegetation, and other erosion control methods (Figure 4-2).

Each tree-clearing area at TA C-72 has unique circumstances and requirements for mitigating erosion. Because the majority of streams at TA C-72 have steep slopes, most trees near the streams would not require removal, since the lower elevation trees would not impede line of sight. Eglin AFB is committed to the recovery of the Okaloosa darter; numerous mitigations and BMPs would be utilized to minimize or eliminate erosion issues associated with tree clearing.



Figure 4-2. Erosion Control Project on Okaloosa Darter Stream on Test Area C-72

For each forestry operation that is large enough to be categorized as a timber sale, Eglin NRS Forestry element would coordinate with contractors on BMPs (described below). The smaller areas that do not qualify as a timber sale through Eglin NRS would be coordinated through the 46th TW. All of the smaller TW-managed line of sight clearings that have the potential to impact darter streams would be coordinated with Eglin NRS Forest Management and Wildlife elements prior to any tree clearing, to ensure communication of proper BMPs (Sutsko, 2011a). Table 4-15 identifies the tree-clearing habitat, responsibility, and coordination requirements for each type of tree clearing at TA C-72.

Table 4-15. Tree Clearing Coordination Matrix

Location	Qualified Timber Sale?	Responsible Organization	Coordinating Organization	BMPs
More than 300 feet away from any darter stream	Yes	Eglin NRS Forestry	None required	Best Management Practices for Silviculture in Florida ¹
	No	46 th TW		
Within 300 feet of any darter stream	Yes	Eglin NRS Forestry	-Eglin NRS Forestry	
	No	46 th TW	-Eglin NRS erosion control manager	
Within 35 feet of any darter stream	All tree clearing	46 th TW, Eglin NRS Forestry	-Eglin NRS Forestry -Eglin NRS erosion control manager -Eglin NRS biologist	-Best Management Practices for Silviculture in Florida ¹ -Only hand cutting allowed -Cut trees left in place

1. See details in section on Special Management Zone Criteria

Eglin NRS Forest Management element follows *Best Management Practices for Silviculture* (FDACS, 2009). These practices are designed as the minimum standards necessary for protecting and maintaining the state's water quality as well as certain wildlife habitat values, during forestry activities. As such, they represent a balance between overall natural resource protection and forest resource use.

The soils at TA C-72 are primarily Lakeland sands with a low erodibility (K-factor of 0.17). The streams are all classified as perennial streams between 0 and 20 feet wide. Based on these conditions, all of the streams where tree clearing would occur would be protected by a primary SMZ buffer on each side of at least 35 feet, and a secondary SMZ of variable width depending on slope (Table 4-16). For areas that require clearing within 35 feet of a stream, only hand cutting would be allowed and the cut trees would be left in place (Tate, 2011). The 35-foot stream buffer covers 8.83 acres of the proposed tree clearing area.

Table 4-16. Primary and Secondary Special Management Zones for Perennial Streams (0 to 20 feet) with Low-Erodibility Soils

Slope	Primary SMZ		Secondary SMZ	
	feet	Management Criteria ¹	feet	Management Criteria ²
0-2	35	-No clearcut harvesting -Selective harvesting with restrictions -Protection of very large and/or old trees; snags and cavity trees, trees overhanging water -No mechanical site prep, loading decks, main skid trails, road construction; restrictions on pesticides and herbicide application	None	Clearcut harvesting and unrestricted selective harvesting allowed with the following operational restrictions: -No mechanical site prep -No main skid trails, loading decks or landings -Do not clean spray equipment or discharge rinse water from pesticide or herbicide applications -No road construction -No plowed firelines
3-7			10	
8-12			25	
13+			265	

1. See details in section on primary SMZ criteria

2. See details in section on secondary SMZ criteria

The *Best Management Practices for Silviculture* (FDACS, 2009) defines a Special Management Zone (SMZ) as a specified area associated with a stream that is maintained during silviculture operations to provide aquatic habitat benefits such as shade, streambank stability, erosion control, detritus, woody debris, and wildlife habitat. The SMZ is subject to specific management criteria that define operational restrictions and has three main components: the primary zone, the secondary zone, and the stringer (stringer is not applicable for the Proposed Action) (Figure 4-3).

The factors determining which components apply for a given forestry operation are soil type, slope, stream type, and stream width. The following sections provide a detailed description of the two pertinent SMZ components (primary and secondary SMZs) and the management requirements within each one. Practices that are allowed within all components of the SMZ include direct seeding, hand planting, or machine planting on the contour of the land, prescribed burning for site preparation on slopes less than 18 percent, and basal application of herbicides and insecticides.

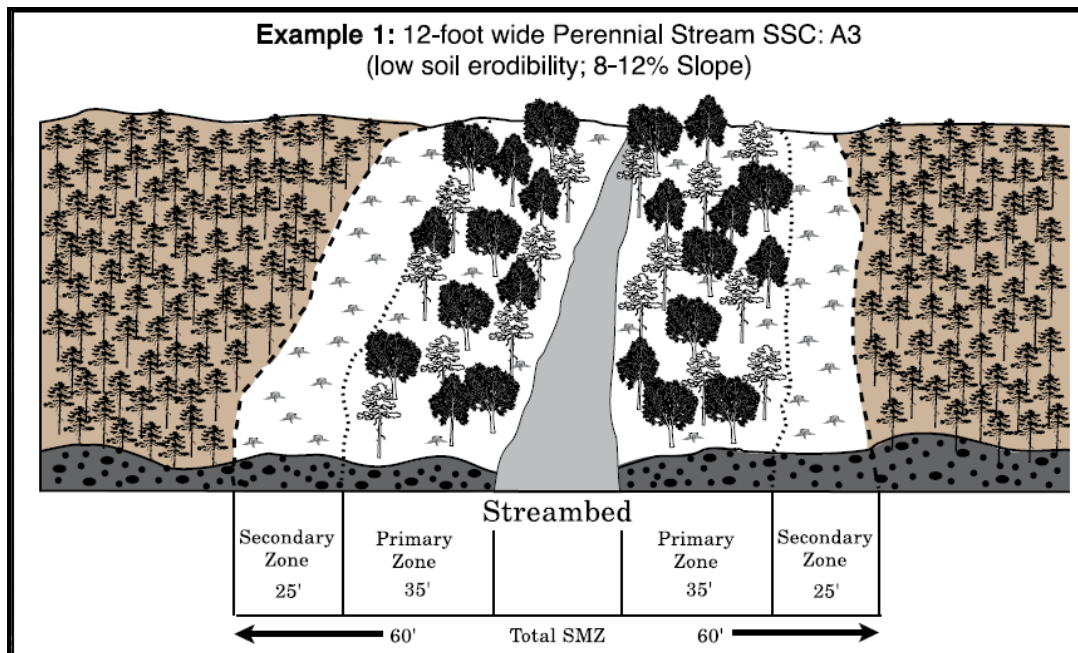


Figure 4-3. Example of Special Management Zone (SMZ), Primary SMZ, and Secondary SMZ

Within the primary SMZ, the following management criteria apply:

- Clearcut harvesting is **always** prohibited within 35 feet of all perennial waters.
- Selective harvesting may be conducted to the extent that 50 percent of a fully stocked stand is maintained. The residual stand must conform to the following:
 - Trees are left to maintain the approximate proportion of diameter classes and species present prior to harvesting, except that oaks (other than water oaks) and den trees may be favored. However, in mixed pine/hardwood forests the residual stand may be composed of up to 90 percent hardwood and 10 percent pine, and den trees may be favored.
 - Repeated entry into a harvested primary SMZ in short time intervals for additional harvesting is prohibited.
 - No trees will be harvested in stream channels or on the immediate stream bank.
- Special emphasis should be given to the protection of very large trees and/or old trees, snags and cavity trees, and trees where any part of the canopy overhangs the water.
- The following forestry activities are prohibited:
 - Mechanical site preparation
 - Loading decks or landings and log bunching points
 - Main skid trails, except to approach a designated stream crossing
 - Aerial application, mist blowing or operational application of pesticides or fertilizer, including any drift from nearby applications
 - Cleaning spray equipment or discharging rinse water from pesticide or fertilizer applications

- Road construction except when crossing a water body
- Site preparation burning on slopes of 18 percent or greater

Within the secondary SMZ, there are no timber harvesting limitations (unrestricted selective harvesting and clearcut harvesting are both allowed). However, the following operational restrictions apply:

- No mechanical site preparation
- No main skid trails (except for stream crossings), loading decks, or landings
- No cleaning of spray equipment or discharging rinse water from pesticide and fertilizer applications.
- No road construction except for stream crossings.
- No plowed firelines except during fire suppression.
- No site preparation burning on slopes of 18 percent or greater.

In addition to following the *Best Management Practices for Silviculture* (FDACS, 2009), Eglin would also follow the avoidance and minimization measures below to eliminate any potential for erosion into darter streams.

Avoidance and Minimization Measures

1. Follow *Best Management Practices for Silviculture* (FDACS, 2009).
2. Proponent must ensure that all mission and land clearing personnel are provided with restrictions regarding protected species, either in verbal or written form. Provide maps when necessary.
3. All land-clearing personnel would be briefed on potential endangered species concerns before tree-clearing activities in endangered species habitat; contract clauses would require coordination with an Eglin NRS endangered species biologist.
4. All forestry operations near Okaloosa darter streams must be coordinated with Eglin NRS Forest Management and Wildlife elements and the erosion control program manager. Eglin would follow any recommendations from the erosion control manager.
5. The areas where tree clearing has occurred would be visually monitored for three years, and corrective action would be taken to control any erosion.
6. Any trees within the primary SMZ that must be removed would be cut by hand and left in place (i.e., no heavy machinery or road development)
7. Prior to commencement of activities, Eglin would ensure implementation of any modifications or conditions resulting from consultation with the USFWS (Appendix G).

Summary of Darter Analysis

The Proposed Action has the potential to impact the Okaloosa darter from indirect habitat impacts (sedimentation into streams due to land clearing). Cumulatively, these stressors have the potential to negatively affect certain Okaloosa darter streams; however, by implementing the

avoidance and minimization measures described, the tree-clearing actions under Alternative 3 are not likely to significantly impact the Okaloosa darter or its habitat. Eglin NRS has conducted a Section 7 consultation with the USFWS (Appendix G) and the tree-clearing actions under Alternative 3 are not likely to adversely affect the Okaloosa darter or its habitat.

Red-cockaded Woodpecker

Proposed tree-clearing actions may impact red-cockaded woodpeckers (RCWs). Proposed areas to be cleared are shown on Figure 4-1. Potential impacts are divided into direct physical impacts, noise from daily operations, and habitat impacts. Analysis focuses on the habitat impacts associated with the Proposed Action and its potential impacts on the RCW.

Direct Physical Impacts

The proposed tree-clearing actions under Alternative 3 have some potential to cause direct physical impact to the RCW. Tree-clearing activity within foraging habitat could increase the probability of tree-clearing personnel and equipment encountering RCW individuals. However, given the shy nature of the species, this probability is extremely low. RCW individuals would likely temporarily flee the area. Therefore, proposed tree-clearing actions are not expected to cause any direct physical impact to the species.

Noise Impacts

Land clearing, large machinery operation, and noise may disturb individuals or populations. Foraging RCWs may avoid areas where tree clearing is occurring. Pioneering RCWs may be affected by noise from daily operations and not colonize or immigrate to new areas. Loud noises during nesting season (April through July) may affect RCW reproduction. No tree-clearing activities would be conducted within 200 feet of an active RCW tree during nesting season. Certain range roads in proximity to RCW foraging habitat would have an increased amount of traffic both during clearing and daily operations, potentially creating noise levels that would affect RCWs.

Suitable habitat appears to outweigh any negative influences associated with noise due to tree clearing. Based on a review of literature pertaining to noise exposure in wildlife, Bowles (1995) suggests outcome measures, such as reproductive success, are better indicators of distress in wildlife than short-term responses (i.e., startle reaction). Negative reproductive effects have not been seen in the RCW clusters near TA C-72. Based on the fact that the entire Eglin RCW population continues to grow, it appears that RCWs on Eglin have adapted to noises associated with the military mission. There is other suitable habitat available on Eglin, but the RCWs have continued to nest and forage near TA C-72. All tree-clearing activities must be coordinated with Eglin NRS. During the nesting season (April through July), there would be no tree clearing within 200 feet of an active RCW tree, and a thorough RCW survey must be conducted just prior to tree clearing within RCW foraging habitat. Therefore, noise from tree removal near active clusters is not likely to adversely affect the RCW.

Habitat Impacts

Habitat impacts include loss, alteration, and/or degradation of habitat. Activities under this alternative may cause RCW habitat destruction or degradation resulting from human activities (e.g., tree clearing).

One essential element of RCW management is the allocation of foraging habitat to individual groups. Long-term success requires a thorough knowledge of the species' foraging requirements. Partitions around clusters serve to help provide the suitable quantity and quality of foraging habitat. Some potentially harmful activities may occur within the partition with minimal impact as long as at least 121 acres of good-quality habitat remains (Convery and Walters, 2004). Home ranges vary dramatically among and within populations and can complicate analyses. The quality of habitat has been found to be more important than distance from the cluster (Convery and Walters, 2004). This phenomenon was exaggerated when higher-quality habitat existed at or beyond the periphery of the partition but not in proximity to the cavity tree cluster.

The percentage of the RCW protected home range increases as a function of partition radius. However, larger partitions may not be better since they may not necessarily include good habitat. A trade-off exists between partition size and function, because RCWs are a central-place foraging species (i.e., they regularly return to the cavity tree cluster), and preferentially select habitat near the cavity tree cluster (Rosenberg and McKelvey, 1999). This makes habitat near the cluster center more valuable than habitat farther away. Furthermore, the percentage of better quality habitat decreases as a function of partition radius. Using larger partitions may result in restriction on use of land that is, in reality, unsuitable or poorer quality habitat (Convery and Walters, 2004). Groups often extend their home range in the direction away from neighbors and unsuitable habitat. Furthermore, Convery and Walters (2004) suggest land managers should limit the size and scope of practices that decrease foraging habitat quality within the partition and especially within the vicinity of the cluster area.

High-quality RCW forage habitat consists of open pine stands with tree diameter at breast height (dbh) averaging 10 inches and larger. While 100 acres of mature pine is sufficient for some groups, birds commonly forage over several hundred acres where habitat conditions are not ideal (Jackson et al., 1979). Depending on site productivity, different amounts of foraging habitat are required. In systems with medium to high productivity, only 120 acres may be needed, whereas 200 to 300 acres of foraging habitat may be required at sites with low productivity (USFWS, 2003). The NRS has determined that Eglin RCW groups utilize large areas for foraging habitat; thus, Eglin generally manages for 300 acres per cluster with the allowance of 30 percent overlap with surrounding clusters.

General population recommendations for good-quality foraging habitat include 18 or more stems per acre that are greater than 60 years in age and greater than 14 inches dbh. Site conditions at Eglin are generally poor; the result is that longleaf pines tend to have smaller diameters at breast height and lower densities than much of the rest of the RCW's range. Good-quality foraging habitat on Eglin is defined as habitat that contains between 19 and 33 stems per acre of pines that

are greater than 10 inches dbh. Another requirement for good-quality habitat is that it contains forbs and bunchgrasses in the understory and has sparse or no hardwood midstory.

Foraging Habitat Assessment Tool

The greatest threat to the RCW population is loss and fragmentation of its habitat. If timber is to be removed within 0.5 miles of active cavity trees, then a forage habitat analysis must be completed to determine potential impacts. Consultation is required if resulting resources fall below USFWS guidelines (USFWS, 2003).

Eglin has developed an independent Oracle-based GIS tool (model) that creates foraging habitat assessments, allowing Eglin to consistently and accurately estimate the available foraging resources without sampling the entire Reservation (U.S. Air Force, 2006c). The USFWS completed Endangered Species Act Section 7 consultation on the model in June 2003 and concurred with the Eglin NRS finding of “not likely to adversely affect.” Research has demonstrated that foraging analyses such as Eglin’s model accurately portray the actual territories of RCW groups (Convery and Walters, 2004).

Eglin NRS has consulted with the USFWS on the guidelines for the habitat conditions and foraging requirements for RCWs on Eglin. Eglin NRS personnel use the guidelines identified in the *Threatened and Endangered Species Component Plan* (U.S. Air Force, 2006c) when determining whether consultation with the USFWS is required. Table 4-17 compares the current Recovery Plan foraging standards with Eglin specific standards.

Table 4-17. Foraging Habitat Variable Standards for Red-cockaded Woodpeckers

Measure	USFWS Recovery Standard	USFWS Managed Stability Standard	Eglin Recovery Standard	Eglin Managed Stability Standard
Acres	200 to 300	75	300	150
Density (stems per acre)	18 > 14 inches dbh	None	20 > 10 inches dbh	None
Density total (stems per foraging area)	None	None	6,000 > 10 inches dbh	3,000 > 10 inches dbh
Basal area (ft ² per acre)	20 > 14 inches dbh	40-70 > 10 inches dbh	20 > 10 inches dbh	None
Basal area total (ft ²)	None	3,000 > 10 inches dbh	6,000 > 10 inches dbh	4,000 > 10 inches dbh
Distance from cluster	0.5 mile	0.25 mile	0.5 mile	0.3 mile
Midstory height	7 feet	7 feet	7 feet	7 feet
Ground cover	>40% herb	None	> 40% herb	None

> = greater than; < = less than; dbh = diameter at breast height; ft² = square feet; USFWS = U.S. Fish and Wildlife Service

The first column contains the values defined in the Recovery Plan as the recovery standard for public lands. The second column contains the values defined in the Recovery Plan as the managed stability standard for private lands in order to protect existing groups (USFWS, 2003). The last two columns are recommendations for Eglin’s recovery standard and managed stability standard. A “no effect” determination would be made if a cluster’s foraging resources exceed Eglin’s recovery standard after the completion of a proposed action. A “not likely to adversely

affect” determination would be made if a cluster’s foraging resources fall between Eglin’s recovery standard and Eglin’s managed stability standard after the completion of a proposed action. A “likely to adversely affect” determination would be made if a cluster’s foraging resources fall below Eglin’s managed stability standard after the completion of a proposed action. Also, if the proposed action affects less than 1 percent of the foraging resources, and the foraging resources are above Eglin’s managed stability standard, then no consultation would be required.

Foraging Habitat Analyses

The memorandum, “Implementation Procedures for Use of Foraging Habitat Guidelines and Analysis of Project Impacts under the Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan: Second Revision,” provides implementation guidance for use of the foraging habitat standards presented in the RCW recovery plan (DOI, 2005). The foraging habitat analysis below follows these procedures, along with the specific guidelines for the habitat conditions and foraging requirements for RCWs on Eglin under the Proposed Action.

Foraging Partition Analysis: Partition analysis involves using the model results from the foraging habitat assessment tool described above to determine what quantity and quality of foraging habitat exists pre-project and what would remain post-project. The foraging habitat model ranks habitat from 0 to 3, with 3 being the highest quality. This analysis determines whether partitions affected by the project would meet the managed stability standard, recovery standard, or fall somewhere in between, post-project (see Table 4-17).

Model results show that eight clusters would be impacted (Table 4-18). Of the 134 acres affected, approximately 57 percent is considered optimal habitat, 26 percent is marginal habitat, and 13 percent is low-quality habitat (Figure 4-1). Table 4-18 calculates the remaining acres left after tree clearing and whether the habitat meets Eglin’s recovery standard or managed stability standard. Other clusters near the line of sight clearings with foraging resources would remain and would not be affected. All tree removal would be coordinated with Eglin NRS.

Table 4-18. Foraging Habitat Impacted

Cluster	Foraging Habitat Cleared (Acres)	Foraging Habitat (acres)		Basal Area Total (square feet)		Density Total (stems per foraging area)		Determination
		Before Tree Removal	After Tree Removal	Before Tree Removal	After Tree Removal	Before Tree Removal	After Tree Removal	
0608Q	0.55	301.92	301.37	6,691	6,679	5,509	5,499	NLAA
0608D	21.92	316.98	295.06	7,663	7,133	7,669	7,139	NLAA
0602B	10.34	191.18	180.84	4,752	4,495	3,910	3,699	NLAA
0608F	32.92	387.48	354.56	10,598	9,698	8,715	7,975	NE
0608M	2.13	201.29	199.16	6,135	6,070	5,041	4,988	NLAA
0608E	8.56	291.83	283.27	8,519	8,269	7,000	6,795	NLAA
0601L	38.38	528.33	489.95	15,623	14,488	12,840	11,907	NE
0608S	19.21	329.57	310.36	9,485	8,932	7,797	7,343	NE

NLAA = not likely to adversely affect; NE = no effect

Based on the foraging partition analysis, the proposed tree-clearing actions under Alternative 3 may affect, but are not likely to adversely affect, the RCW.

Group Level Analysis: Group level analysis involves examining a project's impact on the demographic health of a group. The term demographic as used in the group level analysis is relating to the dynamic balance of a population especially with regard to density and capacity for expansion or decline. Demographic health is related, in part, to quality and quantity of foraging habitat. Researchers continue to improve the understanding of relationships between RCW group fitness (e.g., reproductive success, group size, adult survival) and habitat quality (Engstrom and Sanders, 1997; Hardesty et al., 1997; James et al., 1997; James et al., 2001; Walters et al., 2002). The structure of foraging habitat is important to fitness and influences habitat selection. RCW fitness and habitat quality increase when foraging habitat is burned regularly, has an open character and herbaceous ground cover, and contains large old pines (DOI, 2005). Additionally, as habitat quality increases, the amount of foraging habitat used (i.e., home range size) decreases.

In addition to habitat quality and quantity, group demographic health is also related to configuration of suitable habitat, which influences the degree of group isolation. Isolation affects group fitness (i.e., size and reproductive potential). Published literature on group demographic health as it relates to population density and size is not extensive. However, several references (Conner and Rudolph, 1991; Hooper and Lennartz, 1995; and Beyer et al., 1996) are available to help determine what density of groups is considered necessary to maintain demographic health (i.e., avoid isolation) of individual groups. Without sufficient numbers of dispersing birds to fill breeding vacancies or become helpers, group size and reproductive potential can be reduced.

Similar to the foraging partition analysis, a relatively small loss of foraging habitat (134 acres spread over eight clusters with one cluster losing 38 acres at most) would not affect the group negatively. The sporadic tree-clearing locations and the configuration of suitable habitat intermingled with unsuitable habitat would not affect demographic health of any group. The clusters surrounding the proposed tree clearing would not be affected due to any group isolation or significant habitat fragmentation.

The proposed tree-clearing actions under Alternative 3 may affect the RCW, but are not likely to adversely affect, the species at the group level. A neighborhood level analysis is not required but is discussed briefly to obtain a full picture of the potential for impacting neighborhood groups.

Neighborhood Level Analysis: Neighborhood groups are those groups not directly impacted by the project but that occur adjacent to, or within the dispersal distance of groups that are directly affected by the project. By adversely affecting quantity and quality of foraging habitat, and, thereby, the survival or stability of individual groups (e.g., by disruption of dispersal opportunities), projects may affect the health and distribution of RCW groups on a larger scale, i.e., the neighborhood.

Habitat quality associated with the neighboring clusters is good. Currently, the area is frequently burned with low-intensity prescribed fires, has a good grass and herbaceous plant cover, and a low hardwood midstory component. Even though the Proposed Action would result in a direct reduction of foraging habitat, neighboring clusters would not be affected. There is no potential for disruption of dispersal at their current location. The only possible effect would be that groups that are impacted by the tree clearing may adjust their territories into the territories of adjacent groups, leaving them with fewer resources.

At the neighborhood level, the proposed tree-clearing actions under Alternative 3 may affect, but are not likely to adversely affect the RCW; a population level analysis and Recovery Unit Level Analysis is not warranted. Table 4-19 summarizes the results of the foraging habitat analysis.

Table 4-19. Results of Foraging Habitat Analysis

Type of Analysis	ESA Section 7 Consultation Determination	Reasons
Foraging partition analysis	Not likely to adversely affect	Some clusters' foraging resources fall between Eglin's recovery standard and Eglin's managed stability standard after the completion of the tree removal.
Group level analysis	Not likely to adversely affect	The sporadic tree-clearing locations and the configuration of suitable habitat intermingled with unsuitable habitat would not negatively affect demographic health of any group.
Neighborhood level analysis	Not likely to adversely affect	No decrease in neighboring birds' long-term dispersal opportunities, but there may be territorial shifts.
Population level analysis and recovery unit level analysis	No effect	Does not appreciably reduce the likelihood of the recovery unit meeting its population goal.

RCW Inactive Tree Removal

The proposed land-clearing actions under Alternative 3 may require the cutting of up to two inactive cavity trees, in clusters 608F and 608D, northeast of TA C-72. The inactive trees within foraging habitat proposed to be cleared are described as "complete inactive" in Eglin GIS and are unlikely to become active again over the next year or two. If tree clearing is to occur during nesting season, Eglin NRS will screen each inactive cavity tree during the breeding season to verify no trees have been recolonized and to prevent use by other bird species protected by the Migratory Bird Treaty Act. Eglin NRS believes that removal of two inactive RCW trees for the proposed tree clearing is not likely to adversely affect the species.

Avoidance and Minimization Measures

Eglin would implement the following avoidance and minimization measures as part of the Proposed Action:

- Areas would be surveyed prior to tree removal to ensure no undocumented cavity trees have been recently excavated.
- No tree-clearing activities would be conducted within 200 feet of an active RCW tree during nesting season.

- Proponent must ensure that all mission and land-clearing personnel are provided with restrictions regarding protected species, either in verbal or written form. This will include maps when necessary.
- All land-clearing personnel would be briefed on potential endangered species concerns before tree-clearing activities in endangered species habitat; contract clauses would require coordination with an Eglin NRS endangered species biologist.
- All inactive RCW trees must be surveyed and screened prior to tree cutting to ensure no birds are living in the cavities.
- In areas where the use of prescribed fire may be limited, herbicides or mechanical means would be used to maintain RCW foraging habitat.
- Eglin NRS will continue monitoring of RCWs in the area.
- Prior to commencement of activities, Eglin would ensure implementation of any modifications or conditions resulting from consultation with the USFWS (Appendix G).

Summary of RCW Analysis

The Proposed Action has the potential to impact the RCW from direct physical impacts, noise and human presence, and habitat impacts (land clearing). Cumulatively, these stressors have the potential to negatively affect certain RCW clusters. However, by implementing avoidance and minimization measures as part of the proposed tree-clearing actions under Alternative 3, Eglin NRS believes the actions may affect, but are not likely to adversely affect, the RCW. Eglin has conducted a Section 7 consultation with the USFWS and the results are provided in Appendix G.

Eastern Indigo Snake

Increased levels of vehicular traffic due to tree-clearing activities have the potential to impact indigo snakes and their habitat. However, most of TA C-72 is open grassland, which is not the preferred habitat of the indigo snake. Additionally, the potential for encountering an indigo snake is very low; Eglin has not had any indigo snake sightings or reports since 1999. Incidental contact with personnel on foot or vehicles could result in trampling or crushing of individuals, but this occurrence is unlikely, as a snake would most likely move away from the area if it sensed a general disturbance in its vicinity. If an indigo snake is sighted, personnel would cease activities until the snake has moved away from the area and immediately notify the NRS. Personnel would follow the *Standard Protection Measures for the Eastern Indigo Snake* (U.S. Air Force, 2008b), and the management requirements listed in Section 2.5 to reduce or eliminate impacts associated with the Proposed Action. Due to the low probability of an encounter and the requirement to avoid any sighted indigo snake, the actions proposed under Alternative 3 are not likely to adversely impact the species.

Gopher Tortoise

Burrow collapse and direct physical impacts are possible from vehicles used for tree-clearing activities. Vehicle operators would be instructed to avoid any gopher tortoises and, if possible, tree-clearing actions would avoid gopher tortoise burrows. The vehicles used during forestry operations have low-pressure tires and may drive over a burrow without fully collapsing the burrow. Gopher tortoises would be expected to dig out from the minor fill at the mouth of the

burrow. Therefore, tree-clearing activities on and around TA C-72 are not expected to significantly impact the gopher tortoise.

Florida Black Bear

Proposed tree-clearing actions would increase the level of vehicle and personnel activity within the natural areas in and around TA C-72. This would slightly increase the probability of encountering bears. However, given the shy nature of the species, they would likely flee the area at the first sights and sounds of the tree-clearing activity. Therefore, the proposed actions under Alternative 3 are not likely to cause any direct physical impact to Florida black bears.

Tree-clearing activities proposed under Alternative 3 could alter the habitat for the Florida Black Bear in and around TA C-72. While Option 3 (Herbicide Application) and Option 4 (Cut and Leave in Place) would leave wooded areas largely undisturbed, Options 1 and 2 may reduce the amount of wooded habitat available for black bears. Reducing these areas that may be utilized by bears for cover may cause them to explore other areas for food and shelter. However, the percentage of wooded areas targeted for tree clearing is relatively minor compared to the undisturbed wooded areas available across the Eglin Reservation. Therefore, the potential impact to black bear habitat due to tree clearing is not considered to be significant enough to adversely affect the species.

4.4.5 Alternative 4

Alternative 4 is a combination of Alternative 2 mission activities and Alternative 3 tree-clearing actions. Mission activities under Alternative 4 must continue to comply with management requirements that are designed to protect biological resources. Tree-clearing actions discussed under Alternative 3 must adhere to the avoidance and minimization measures designed to protect sensitive species and their habitat.

Okaloosa Darter

As discussed under Alternative 2, increased frequency of mission activities is not expected to negatively affect the Okaloosa darter. Tree-clearing actions discussed under Alternative 3 are not expected to negatively affect the Okaloosa darter. Therefore, provided that the management requirements and avoidance and minimization measures discussed throughout this EA are followed, the cumulative impact from both Alternatives 2 and 3 is also not expected to negatively impact the species or its habitat. Eglin NRS has conducted a Section 7 consultation with the USFWS (Appendix G) and the actions under Alternative 4 are not likely to adversely affect the Okaloosa darter or its habitat.

Red-cockaded Woodpecker

As discussed under Alternative 2, increased frequency of mission activities is not expected to negatively affect the RCW. Tree-clearing actions discussed under Alternative 3 are not expected to negatively affect the RCW. Therefore, provided that the management requirements and avoidance and minimization measures discussed throughout this REA are followed, the cumulative impact from both Alternatives 2 and 3 is also not expected to negatively impact the species or its habitat. Eglin NRS has conducted a Section 7 consultation with the USFWS

(Appendix G) and the actions under Alternative 4 are not likely to adversely affect the RCW or its habitat.

Eastern Indigo Snake

As discussed under Alternative 2, increased frequency of mission activities is not expected to negatively affect the eastern indigo snake. Tree-clearing actions discussed under Alternative 3 are not expected to negatively affect the indigo snake. Therefore, provided that the management requirements and avoidance and minimization measures discussed throughout this REA are followed, the cumulative impact from both Alternatives 2 and 3 is also not expected to negatively impact the species or its habitat. Eglin NRS has conducted a Section 7 consultation with the USFWS (Appendix G) and the actions under Alternative 4 are not likely to adversely affect the eastern indigo snake or its habitat.

Gopher Tortoise

As discussed under Alternative 2, increased frequency of mission activities is not expected to negatively affect the gopher tortoise. Tree-clearing actions discussed under Alternative 3 are not expected to negatively affect the gopher tortoise. Therefore, provided that the Management Requirements and Avoidance and Minimization Measures discussed throughout this EA are followed, the cumulative impact from both Alternatives 2 and 3 is also not expected to negatively impact the species or its habitat. Eglin NRS has conducted a Section 7 consultation with the USFWS (Appendix G) and the actions under Alternative 4 are not likely to adversely affect the gopher tortoise or its habitat.

Florida Black Bear

As discussed under Alternative 2, increased frequency of mission activities is not expected to negatively affect the Florida black bear. Tree-clearing actions discussed under Alternative 3 are not expected to negatively affect the Florida black bear. Therefore, provided that the management requirements and avoidance and minimization measures discussed throughout this REA are followed, the cumulative impact from both Alternatives 2 and 3 is also not expected to negatively impact the species or its habitat. Eglin NRS has conducted a Section 7 consultation with the USFWS (Appendix G) and the actions under Alternative 4 are not likely to adversely affect the Florida black bear or its habitat.

4.5 CULTURAL RESOURCES

4.5.1 No Action Alternative

The previous TA C-72 EBD (U.S. Air Force, 2006b) did not identify any impacts to cultural resources from mission activities. The No Action Alternative represents the previously approved level of activity at TA C-72 and would not adversely affect cultural resources. No archaeological sites, historic cemeteries, or traditional cultural properties eligible for listing on the NRPH are present within TA C-72. However, known historic structures eligible for listing on the NRHP are present. Therefore, mission activities should be restricted at known cultural resource sites such as the Vietnamese tunnels complex and Range E historic properties, to avoid potential impacts.

All future proposed actions must adhere to standards and guidelines outlined in the Eglin AFB *Integrated Cultural Resources Management Plan* (U.S. Air Force, 2006d) and the previously developed Programmatic Agreement between the AAC, the Florida SHPO, and the Advisory Council on Historic Preservation (U.S. Air Force, 2003c).

In areas where surveys have not been completed, the potential exists to encounter surface or subsurface cultural resources. In the event that unknown cultural resources are discovered during a mission activity, all activity in the immediate vicinity must cease until the Base Historic Preservation Officer and 96 CEG/CEVSH have been notified and a determination of significance has been rendered.

4.5.2 Alternative 1

Impacts to cultural resources would be similar to those proposed under the No Action Alternative. As under the No Action Alternative, no adverse effects to cultural resources would be expected under Alternative 1.

4.5.3 Alternative 2

Impacts to cultural resources would be similar to those proposed under the No Action Alternative, Alternative 1, Alternative 3, and Alternative 4. As under the No Action Alternative, no adverse effects to cultural resources would be expected under Alternative 2.

4.5.4 Alternative 3

Impacts to cultural resources would be similar to those proposed under the No Action Alternative, Alternative 1, Alternative 2, and Alternative 4. As under the No Action Alternative, no adverse effects to cultural resources would be expected under Alternative 3.

4.5.5 Alternative 4

Impacts to cultural resources would be similar to those proposed under the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3. As under the No Action Alternative, no adverse effects to cultural resources would be expected under Alternative 4.

4.6 AIR QUALITY

The air quality analysis focuses on the emissions from the detonation of munitions and vehicle travel based on the miles of road and vehicle miles that would be traveled during testing and training activities at TA C-72. However, two of the alternatives also include tree clearing to improve the line of sight for instrumentation used to track weapons on the test area. The methodology for air quality (criteria pollutants and greenhouse gases) analysis is detailed in Appendix E, Air Quality.

4.6.1 No Action Alternative

This alternative includes the activity level approved in the *Test Area C-72 Programmatic Environmental Assessment (PEA)* (U.S. Air Force, 1999b), which authorized a 100 percent increase in test and training missions and associated expendables over the baseline level in the range utilization reports for FY1995 through 1997 and anticipated mission additions. Emissions expected for this level of activity are shown in Table 4-20. For discussion purposes, the calculated concentrations under this alternative are small for CO, NO_x, and SO₂. Particulate matter emissions would be well below the specified standards. Emissions as compared with the regional air quality are also negligible (Table 4-21), with only a 0.4 percent increase to regional PM emissions from TA C-72 activities. The majority of the PM emissions come from fugitive dust due to the unpaved roads; however, the analysis for PM does not include deposition and, therefore, is most likely a very conservative estimate of actual emissions. No adverse impacts to regional air quality are expected under the No Action Alternative.

Table 4-20. No Action Alternative Air Emissions Compared with the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1 hour	35	6.023E-06
	8 hours	9	4.216E-06
NO _x	Annual	0.053	4.819E-07
SO ₂	3 hours	0.5	5.421E-06
	24 hours	0.14	2.409E-06
	Annual	0.03	4.819E-07
PM ₁₀	24 hours	150 µg/m ³	2.759 µg/m ³
	Annual	50 µg/m ³	5.517E-01 µg/m ³

CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; ppm = parts per million; SO₂ = sulfur dioxide; µg/m³ = micrograms per cubic meter

Under the No Action Alternative, greenhouse gases are emitted from vehicle use. The *Eglin Air Force Base Greenhouse Gas Inventory for FY 2008* shows total CO₂e emissions from government-owned vehicles (including the use of vehicles on Eglin Main Base) is approximately 2,946.04 tons per year (2,672.50 metric tons per year) (U.S. Air Force, 2010). Table 4-22 shows the greenhouse gas emissions for vehicle use at TA C-72.

Table 4-21. Air Emissions Under the No Action Alternative Compared with the 2002 NEI Data for Walton County

Category	Emissions (tons/year)				
	CO	NO _x	PM	SO ₂	VOCs
Total Walton County emissions	52,140	5,409	15,052	547	9,734
Test area emissions	6.896	0.962	64.284	0.051	0.722
% Walton County emissions	0.013%	0.018%	0.427%	0.009%	0.007%

CO = carbon monoxide; NEI = National Emissions Inventory; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound

Table 4-22. Greenhouse Gas Emissions for TA C-72 Under the No Action Alternative

Source	Total Short Tons CO ₂ e	Total Metric Tons CO ₂ e
Classes 1 and 2	119.34	108.26
Classes 3 and 4	29.28	26.56
Total	148.62	134.82

4.6.2 Alternative 1

Alternative 1 authorizes the current level of activity plus foreseeable future activities. Emissions were calculated using the data included in Table 2-1 for the number of munitions expected to be used annually. Table 4-23 and Table 4-24 summarize the emissions expected from munitions and vehicle miles traveled under Alternative 1. Mitigations were not factored in when calculating emissions.

Table 4-23. Air Emissions Under Alternative 1 Compared with the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1 hour	35	5.866E-06
	8 hours	9	4.106E-06
NO _x	Annual	0.053	4.693E-07
SO ₂	3 hours	0.5	5.280E-06
	24 hours	0.14	2.346E-06
	Annual	0.03	4.693E-07
PM ₁₀	24 hours	150 µg/m ³	2.687 µg/m ³
	Annual	50 µg/m ³	5.373E-01 µg/m ³

CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; ppm = parts per million; SO₂ = sulfur dioxide;
µg/m³ = micrograms per cubic meter

Emissions for CO, NO_x, and SO₂ would be negligible as compared with the NAAQS. Fugitive dust (particulate matter) is expected to temporarily increase in the local area but would still be well below the federal standards. All criteria pollutant emissions are expected to be less than the 10 percent threshold. Once activity is completed, there would be a short-term, temporary increase in particulate matter emissions, and air quality would return to baseline. Thus, adverse impacts are not expected to regional air quality under Alternative 1.

Table 4-24. Air Emissions Under Alternative 1 Compared with the 2002 NEI Data for Walton County

Category	Emissions (tons/year)				
	CO	NO _x	PM	SO _x	VOCs
Total Walton County emissions	52,140	5,409	15,052	547	9,734
Test area emissions	6.716	0.897	56.761	0.046	0.722
% Walton County emissions	0.013%	0.017%	0.377%	0.008%	0.007%

CO = carbon monoxide; NEI = National Emissions Inventory; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound

Greenhouse gases under Alternative 1 for vehicle use are the same as under the No Action Alternative.

4.6.3 Alternative 2

This alternative explores the potential impacts of a level of activity as described in Alternative 1 plus an increase in mission activity (testing and training). Table 4-25 and Table 4-26 summarize the emissions expected from munitions and vehicle travel. Emissions were calculated conservatively assuming that no mitigations would be used.

Table 4-25. Alternative 2 Air Emissions Compared with the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1 hour	35	6.659E-06
	8 hours	9	4.661E-06
NO _x	Annual	0.053	5.327E-07
SO ₂	3 hours	0.5	5.993E-06
	24 hours	0.14	2.664E-06
	Annual	0.03	5.327E-07
PM ₁₀	24 hours	150 µg/m ³	3.05 µg/m ³
	Annual	50 µg/m ³	6.099E-01 µg/m ³

CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; ppm = parts per million; SO₂ = sulfur dioxide; µg/m³ = micrograms per cubic meter

Table 4-26. Alternative 2 Air Emissions Compared with the 2002 NEI Data for Walton County

Category	Emissions (tons/year)				
	CO	NO _x	PM	SO _x	VOCs
Total Walton County emissions	52,140	5,409	15,052	547	9,734
Test area emissions	7.624	1.226	94.730	0.074	0.722
% Walton County emissions	0.015%	0.023%	0.629%	0.013%	0.007%

CO = carbon monoxide; NEI = National Emissions Inventory; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound

Under Alternative 2, emissions would be negligible for all criteria pollutants except particulate matter as compared with the federal NAAQS. Particulate matter is expected at a concentration of 3.05 µg/m³ averaged over a 24-hour period and 0.061 µg/m³ averaged over a year. The analysis for particulate matter does not include deposition of the material and is likely over estimated. However, these emission concentrations are still within federal standards and would not cause adverse affects to the regional air quality. Also, emissions would make up less than 1 percent of Walton County's emissions. The increase in fugitive dust would be short-term and temporary. Thus, no adverse impacts to regional air quality are expected under Alternative 2.

Greenhouse gases under Alternative 2 for vehicle use are the same as under the No Action Alternative.

4.6.4 Alternative 3

Option 1—Harvest Trees by Hand

Emissions from hand cutting trees are negligible and not included in this analysis. However, emissions from removing the trees include those from tractor trailer trucks and a loader. The

emissions are summarized in Table 4-27. Air emissions from harvesting trees at TA C-72 are negligible, and represent a small percentage of the total Walton County emissions (Table 4-28).

Table 4-27. Alternative 3, Option 1: Air Emissions Compared With the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1 hour	35	6.390E-10
	8 hours	9	4.473E-10
NO _x	Annual	0.053	5.112E-11
SO ₂	3 hours	0.5	5.751E-10
	24 hours	0.14	2.556E-10
	Annual	0.03	5.112E-11
PM ₁₀	24 hours	150 µg/m ³	2.927E-04 µg/m ³
	Annual	50 µg/m ³	5.853E-05 µg/m ³

CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; ppm = parts per million; SO₂ = sulfur dioxide; µg/m³ = micrograms per cubic meter

Table 4-28. Alternative 3, Option 1: Air Emissions Compared with the 2002 NEI Data for Walton County

Category	Emissions (tons/year)				
	CO	NO _x	PM	SO _x	VOCs
Total Walton County emissions	52,140	5,409	15,052	547	9,734
Test area emissions	0.001	0.001	0.000	0.000	0.000
% Walton County emissions	0.000%	0.000%	0.000%	0.000%	0.000%

CO = carbon monoxide; NEI = National Emissions Inventory; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound

Greenhouse gases emitted from loading cut trees and transporting them would be negligible under Alternative 3, Option 1.

Option 2—Mulch Trees with Gyro Trac

Emissions from hand cutting the trees are negligible and not included in this analysis. However, emissions from mulching the trees using the Gyro-Trac are listed in Table 4-29. Air emissions from clearing trees at TA C-72 using the Gyro-Trac are negligible and represent a very small percentage of the total Walton County emissions (Table 4-30).

Under Alternative 3, Option 2, greenhouse gases would be emitted from the Gyro-Trac's diesel engine. The estimated greenhouse gas emissions for using the Gyro-Trac to clear trees at TA C-72 would be negligible.

Table 4-29. Alternative 3, Option 2: Air Emissions Compared to the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1 hour	35	2.130E-10
	8 hours	9	1.491E-10
NO _x	Annual	0.053	1.704E-11
SO ₂	3 hours	0.5	1.917E-10
	24 hours	0.14	8.520E-11
	Annual	0.03	1.704E-11
PM ₁₀	24 hours	150 µg/m ³	9.755E-05 µg/m ³
	Annual	50 µg/m ³	1.951E-05 µg/m ³

CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; ppm = parts per million; SO₂ = sulfur dioxide;
µg/m³ = micrograms per cubic meter

Table 4-30. Alternative 3, Option 2: Air Emissions Compared to the 2002 NEI Data for Walton County

Category	Emissions (tons/year)				
	CO	NO _x	PM	SO _x	VOCs
Total Walton County emissions	52,140	5,409	15,052	547	9,734
Test area emissions	0.000	0.000	0.000	0.000	0.000
% Walton County emissions	0.000%	0.000%	0.000%	0.000%	0.000%

CO = carbon monoxide; NEI = National Emissions Inventory; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound

Option 3—Herbicide Application

There are no air emissions associated with herbicide application.

Option 4—Cut Trees and Leave in Place

Emissions from hand cutting trees are negligible and not included in this analysis. There are no significant air emissions from leaving the trees in place to decompose naturally.

4.6.5 Alternative 4

This alternative explores the potential impacts of a level of activity as described in Alternative 2 plus the impact of tree clearing described in Alternative 3.

Option 1

Table 4-31 and Table 4-32 summarize the emissions expected from munitions and vehicle travel. Emissions were calculated conservatively assuming that no mitigations would be used.

Table 4-31. Alternative 4, Option 1: Air Emissions Compared with the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1 hour	35	6.659E-06
	8 hours	9	4.662E-06
NO _x	Annual	0.053	5.328E-07
SO ₂	3 hours	0.5	5.994E-06
	24 hours	0.14	2.664E-06
	Annual	0.03	5.328E-07
PM ₁₀	24 hours	150 µg/m ³	3.05 µg/m ³
	Annual	50 µg/m ³	6.100E-01 µg/m ³

CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; ppm = parts per million; SO₂ = sulfur dioxide;
µg/m³ = micrograms per cubic meter

Table 4-32. Alternative 4, Option 1: Air Emissions Compared with the 2002 NEI Data for Walton County

Category	Emissions (tons/year)				
	CO	NO _x	PM	SO _x	VOCs
Total Walton County emissions	52,140	5,409	15,052	547	9,734
Test area emissions	7.625	1.227	94.730	0.074	0.722
% Walton County emissions	0.015%	0.023%	0.629%	0.014%	0.007%

CO = carbon monoxide; NEI = National Emissions Inventory; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound

Option 2

Table 4-33 and Table 4-34 summarize the emissions expected from munitions and vehicle travel. Emissions were calculated conservatively assuming that no mitigations would be used.

Table 4-33. Alternative 4, Option 2: Air Emissions Compared with the Federal National Ambient Air Quality Standards (NAAQS)

Criteria Pollutant	Averaging Time	NAAQS (ppm)	Calculated Concentration (ppm)
CO	1 hour	35	6.659E-06
	8 hours	9	4.661E-06
NO _x	Annual	0.053	5.327E-07
SO ₂	3 hours	0.5	5.993E-06
	24 hours	0.14	2.664E-06
	Annual	0.03	5.327E-07
PM ₁₀	24 hours	150 µg/m ³	3.05 µg/m ³
	Annual	50 µg/m ³	6.099E-01 µg/m ³

CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a diameter less than or equal to 10 microns; ppm = parts per million; SO₂ = sulfur dioxide;
µg/m³ = micrograms per cubic meter

Option 3

The impacts under Alternative 4, Option 3, are the same under Alternative 2, as there are no air emissions from tree clearing using herbicides.

Table 4-34. Alternative 4, Option 2: Air Emissions Compared with the 2002 NEI Data for Walton County

Category	Emissions (tons/year)				
	CO	NO _x	PM	SO _x	VOCs
Total Walton County emissions	52,140	5,409	15,052	547	9,734
Test area emissions	7.624	1.226	94.730	0.074	0.722
% Walton County emissions	0.015%	0.023%	0.629%	0.014%	0.007%

CO = carbon monoxide; NEI = National Emissions Inventory; NO_x = nitrogen oxides; PM = particulate matter; SO_x = sulfur oxides; VOC = volatile organic compound

Option 4

The impacts for Alternative 4, Option 4, are the same as those under Alternative 2, as there are no air emissions expected from cutting the trees and leaving them in place.

4.7 NOISE

Generally individual noise events are expressed in decibels, weighted to consider specific noise aspects. In the case of impulsive noise, such as munitions, the common weighting used is sound pressure level (SPL). The actual noise level is indicated as dBP. This weighs the sound energy contained in all frequencies equally. C-weighting (dBC) is also often used for impulsive noise. This metric emphasizes the lower frequency aspect of the noise spectrum that addresses the additional annoyance from vibration of structures.

There are no guidelines or criteria for assessing annoyance related to single noise events. The amount of annoyance depends on several factors, such as the characteristics of the noise (i.e., intensity), duration, repetitions, abruptness of onset or cessation, and the ambient noise against which a particular noise event occurs. The factors influencing annoyance, based on surveys, are:

- The degree of interference of the noise with activity
- Previous experience of the community with the particular noise
- The time of day during which the noise occurs
- The extent people believe that the noise output could be controlled.

Noises with less than 115-dBP sound level generally do not cause complaints. Sound levels of 115 to 130 dBP have a moderate complaint response and high potential for annoyance and possible structural damage at levels 130 to 140 dBP. Noise levels greater than 140 dBP can cause physiological and structural damage. Also, the threshold of permanent physiological damage to unprotected human ears is set at 140 dBP.

SPLs were used in this analysis to assess potential noise impacts resulting from testing and training activities at TA C-72. The analysis compared the munitions with the highest NEW to the known value from the detonation of two Poseidon rocket motors having a combined NEW of 31,720 pounds measured at maximum peak noise level of 125 dBP (UTTR, 2002). For the following alternatives, munitions noise was compared against this known sound level. The nearest residence is located 30,000 feet away, at which the sound would have decreased to approximately 35 dBP, assuming that sound pressure decreases by 6 dB per doubling of distance

from the source (Tontechnik-Rechner, 2010). The largest munition that has been tested regularly (152 times from 1998 through 2009) is the Mk-82 general purpose bomb, with a nominal weight of 500 pounds. The 1,000-pound Mk-83 has not been tested at TA C-72 since 1999. Although the 2,000-pound Mk-84 general purpose bomb has been tested eight times since 1999, all of these bombs have been inert (U.S. Air Force, 2010a). At 500 pounds, the Mk-82 bomb represents 1.6 percent the explosive weight of the reference munition. The MOAB (40,000 pounds) was audible 15 miles away but was not at harmful levels or considered loud.

4.7.1 No Action Alternative

Under the No Action Alternative, the munition with the greatest NEW is the Mk-82 general purpose bomb with a nominal weight of 500 pounds. This is 1.6 percent the explosive weight of the reference munition. The resultant noise from the detonation of these munitions is not expected to exceed 115 dBP and would attenuate to approximately 25 dBP in the vicinity of the nearest residential area (Tontechnik-Rechner, 2010). Atmospheric conditions (temperature and humidity) affect the impacts of noise more than the quantity of explosive used during the bomb detonation event. At higher temperatures and low humidity, sound propagates further. Noise levels reduce in intensity with distance; thus, potential receptors would not be subject to harmful noise levels. No adverse impacts are expected from noise under the No Action Alternative.

4.7.2 Alternative 1

Under the No Action Alternative, the munition with the greatest NEW is the Mk-82 general purpose bomb with a nominal weight of 500 pounds. This is 1.6 percent the explosive weight of the reference munition. The resultant noise from the detonation of these munitions is not expected to exceed 115 dBP. This level of noise is not expected to attenuate beyond the Eglin Range borders or adversely affect the public. No adverse impacts are expected from noise under from Alternative 1.

4.7.3 Alternative 2

Alternative 2 would have the potential to cause greater noise impacts than Alternative 1 or the No Action Alternative. Under Alternative 2, the potential for noise impacts would be greater, in that the number of munitions tested would increase. Therefore, the frequency of noisy evolutions would be higher. Under Alternative 2, the munition with the greatest NEW is the Mk-82 general purpose bomb, with 500 pounds of nominal weight. This is 1.6 percent the explosive weight of the reference munition. The resultant noise from the detonation of these munitions is not expected to exceed 115 dBP. The level of noise would not increase from that under Alternative 1 unless multiple operations are occurring simultaneously. Thus, no adverse impacts from noise are expected under Alternative 2.

4.7.4 Alternative 3

Alternative 3 would have no munitions associated with it, and the loudest noise source would be from tree-clearing operations. The four methods of tree clearing described in Chapter 2 have varying noise levels associated with them, and expect for the herbicide application method, the noise would consist of vehicular and machinery noise. There is currently some vehicular traffic

noise already at TA C-72, and given the remote location where tree clearing and maintenance would occur and the fact that the tree clearing would be temporary, the noise is not expected to attenuate beyond the Eglin Range borders or adversely affect the public. Thus, no adverse impacts are expected from noise under Alternative 3.

4.7.5 Alternative 4

Alternative 4 would have the potential to cause the greatest noise impacts. Under this alternative, the potential for noise impacts would be greater, in that the number of munitions tested would increase over the No Action Alternative and Alternative 1; therefore, the frequency of noisy evolutions would be higher. Under Alternative 4, the munition with the greatest NEW is the Mk-82 general purpose bomb with 500 pounds of nominal weight. This is 1.6 percent the explosive weight of the reference munition. The resultant noise from the detonation of these munitions is not expected to exceed 115 dBP and would attenuate to approximately 25 dBP in the vicinity of the nearest residential area (Tontechnik-Rechner, 2010). Additionally, tree clearing and maintenance noise from vehicles and machinery would be present, although this noise source would be temporary and would cease when tree clearing has been completed. The level of noise would not increase over that under Alternative 1 unless multiple operations are occurring simultaneously. Thus, no adverse impacts from noise are expected under Alternative 4.

4.8 SAFETY/RESTRICTED ACCESS

Military lands are open to recreational use as long as public use and safety does not interfere with the military mission. The use of Reservation lands for mission activities is a higher priority. The Sikes Act authorizes and encourages Air Force bases to open areas for outdoor recreation and requires the Air Force to manage the natural resources of reservations to provide for sustained multipurpose use. The Air Base Wing Commander has inherent administrative authority to revoke outdoor recreation privileges (U.S. Air Force, 2003b). In general, testing missions on Eglin are using longer-range weapons and are requiring larger safety footprints, extending over more interstitial area with time. Other actions currently undergoing NEPA assessment, such as actions associated with the Eglin Base Realignment and Closure (BRAC) implementation and Alabama Army National Guard training expansion, may also affect access to recreational areas on the Range. Consequently, future conflicts between recreational use and mission use may arise.

TA C-72 is located in an area that is permanently closed to the public. Areas surrounding TA C-72 could potentially be restricted to the public during certain training and testing operations and in areas where tree-clearing procedures would take place. However, any adverse impacts associated with temporary closures to public access locations are anticipated to be minor and temporary, lasting only for the duration of the activities under all alternatives.

4.8.1 No Action Alternative

Ordnance Use

A number of standard safety procedures exist to ensure limited public access to affected test areas during testing or training activities. These procedures require every practical effort to keep the designated areas clear of all nonparticipating vehicles and personnel. A key part of these procedures includes development of weapon safety footprints, also referred to as surface danger zones (SDZs). SDZs are employed for land-based training where live ordnance is used. These SDZs act as overlays that restrict activities that could normally occur within and adjacent to test or training areas. In general, for aircraft-launched weapons, as the distance from the weapons release to the target increases, so does the footprint. The same is true for altitude and speed at launch or release; as the launch altitude and/or aircraft speed increases, so does the size of the footprint (U.S. Air Force, 2003b).

The methodology for footprint formulation combines munitions system science, computer modeling, and best management practices. These footprints include safety zones for initial impacts as well as ricochets. A buffer zone is typically built into the footprint to further minimize the risk to the public or other resources from the testing of hazardous items on the range. Safety footprints are also employed for land-based training where live ordnance is used. Weapons safety footprints act as overlays that restrict activities that could normally occur within and adjacent to test areas (U.S. Air Force, 2003b).

All ordnance would be handled by trained and qualified personnel in accordance with Air Force and Army explosive safety standards and detailed published technical data. If any unauthorized personnel or vehicles are detected within the area during training, all activity would be temporarily halted until the area is again cleared and secured (U.S. Air Force, 2003b).

Weapons safety footprints would be employed for land- and aircraft-based training where live or inert ordnance would be used. Standard safety procedures, such as closing range gates and blocking all passable trails, would be implemented in all cases to ensure limited public access to affected areas during training activities. As a result, there are no safety concerns based on the levels of activity authorized by the TA C-72 PEA (U.S. Air Force, 1999b) under the No Action Alternative.

Unexploded Ordnance

For the 70 years the Eglin Range has been in use, the location of impact areas and the SDZs have changed many times. Impact areas and SDZs are locations where ordnance might have been accidentally dropped long or short of their target or might have landed after ricocheting. In 2000, Congress dictated an inventory of land contaminated by UXO to gain an understanding of the UXO liability nationwide. The Eglin inventory classified 724 square miles as active range using two subcategories: current impact areas (50,000 acres) and historical impact areas (335,000 acres). Test areas, some cantonment areas on historical ranges (not UXO-contaminated but restricted due to the mission) and some interstitial areas are closed to the public due to high

UXO risk (U.S. Air Force, 2001). There are no known areas surrounding TA C-72 that are “off limits” to the public due to high concentrations of UXO (Sutsko, 2011b).

Eglin has strict safety policies and procedures in place to minimize the risk posed by UXO to personnel. For example, areas that may contain UXO have signs posted to warn of potential danger. Also, Eglin’s Outdoor Recreation Map shows areas of probable and possible UXO contamination. Members of the public are required to observe a UXO awareness video prior to being issued recreation permits to access the Range. No injuries to the public are known to have occurred at Eglin AFB as a result of UXO (Caldwell, 2008). However, UXO could potentially pose a danger to the people involved in training, as personnel must sometimes enter potentially hazardous test areas to set up targets or instrumentation in support of test or training activities. However, other controls are in place for personnel involved in range management and/or engaged in missions on the range.

The 96 Civil Engineering Squadron (96 CES/CED) manages the risks posed by UXOs on the Range. Equipment such as metal detectors, robots, and protective “bomb suits” are routinely employed to find and deal with UXOs. Once a potentially dangerous item is found, 96 CES/CED determines the best way to disarm it. The item may be removed to another location for disposal or it may be destroyed in place (a small amount of plastic explosive is placed next to the item and detonated from a safe distance). 96 CES/CED will then verify that no dangerous components from the item remain on the Range.

As the result of 70 years of use, most areas on the Eglin Range, including TA C-72, have the potential for UXO contamination. While a detailed records search of range use and potential UXO contamination on the Eglin Range has been accomplished by the USACE and a number of other studies have been completed, records of UXO contamination remain incomplete. Eglin has published a UXO Management Plan, which addresses historical use and contamination, current management practices, and future needs. A number of procedures are in place to minimize risks to Eglin personnel and members of the public who access the Eglin Range. To mitigate any potential adverse impacts from UXO, consultation and coordination with 96 CES/CED personnel would be required to address UXO at TA C-72. Therefore, there are no adverse effects to safety under the No Action Alternative.

4.8.2 Alternative 1

Ordnance Use

Under Alternative 1, the current level of activity plus foreseeable future activities would be authorized at TA C-72. There would be increased munitions expenditures associated with ground training activities from new user groups, including the 7SFG and the Joint Strike Fighters (JSF). However, current safety procedures and policies would remain in effect, and all ordnance would be handled by trained and qualified personnel. As a result, no impacts to safety would occur under Alternative 1.

Unexploded Ordnance

Similarly, current procedures and policies for UXO monitoring and clearing would remain in place under Alternative 1. These procedures minimize the risk to Eglin personnel operating at TA C-72. Users would continue to coordinate with 96 CES/CED with regard to UXO encounters at TA C-72. This would mitigate any potential adverse impacts to safety from UXO at TA C-72.

4.8.3 Alternative 2

Under Alternative 2, the frequency and total quantity of munitions used would increase. Despite this increase, the policies and procedures already in place would ensure that safety of Eglin AFB personnel is not jeopardized. Due to the increased use of munitions, the likelihood of UXO encounter is increased, but because of the policies in place and the continued coordination with 96 CES/CEG, no new impacts to safety are anticipated.

4.8.4 Alternative 3

Ordnance Use

There are no munitions expenditures associated with Alternative 3. Therefore, no impacts to safety or restricted access are anticipated under this alternative.

Unexploded Ordnance

UXO on the majority of Eglin AFB is not a concern for tree harvesting, because the equipment used for such activities has high flotation tires and does not cause a soil disturbance (Sutsko, 2011b). However, a number of procedures are in place to minimize risks to Eglin personnel and members of the public who access the Eglin Range. To mitigate any potential adverse impacts from UXO, consultation and coordination with 96 CES/CED personnel would be required to address UXO on areas surrounding TA C-72 prior to tree-clearing activities in the vicinity of TA C-72. In addition, all participants associated with tree-clearing activities will receive a safety briefing prior to any tree-clearing activities.

4.8.5 Alternative 4

Alternative 4 is a combination of Alternative 2 and Alternative 3; therefore, the anticipated impacts under Alternative 4 are similar to those described under Sections 4.8.3 and 4.8.4. Under Alternative 4, the frequency and total quantity of munitions used would increase. Despite this increase, the policies and procedures already in place would ensure that safety of Eglin AFB personnel is not jeopardized. Due to the increased use of munitions, the likelihood of UXO encounter is increased, but because of the policies in place and the continued coordination with 96 CES/CEG, no new impacts to safety are anticipated.

There are no anticipated impacts to safety from tree-clearing activities, because the equipment used for such activities have high flotation tires that do not cause a soil disturbance. In addition, all participants associated with tree-clearing activities will receive a safety briefing prior to any tree-clearing activities.

4.9 SOCIOECONOMIC RESOURCES

4.9.1 No Action Alternative

This alternative is defined as authorizing the level of activity approved in the TA C-72 PEA (U.S. Air Force, 1999b). Socioeconomic resources were not explicitly covered in the TA C-72 PEA; however, noise impacts to the public were considered. Under the No Action Alternative, the public would not be exposed to noise events greater than 115 dBP during missile testing and training. However, adverse weather conditions, including temperature inversions and high winds, could propagate noise peak levels to an undesirable level in many public areas outside of the reservation boundary. Thus, in order to minimize any potential noise impacts to local communities, weather conditions should be taken into consideration prior to detonation of explosive materials and monitored during any testing and training activities.

4.9.2 Alternative 1

Under Alternative 1, it is anticipated that there would be more frequent noise impacts to the public from additional munitions expenditures at TA C-72 over the current level of activity. Although more frequent, noise impacts are anticipated to be minor and temporary, lasting only for the duration of the activity. Although, there is potential for noise impacts from activities performed at TA C-72, none of the 22 complaints reported during 2010 (Table 3-9 and Table 3-10) were confirmed to have originated from activities performed at TA C-72.

No special risks to children or disproportionate noise impacts have been identified to areas of environmental justice concerns from activities performed at TA C-72. Detonations during adverse weather conditions have a greater potential to create an undesirable noise level in public areas outside of the reservation boundary. Therefore, to further minimize any potential noise impacts to local communities, environmental and weather conditions should be taken into consideration prior to detonation of explosive materials and monitored during any testing and training activities.

4.9.3 Alternative 2

Under Alternative 2, there would be an increase of activity above the authorized level of activity as described under Alternative 1. Under this alternative, noise impacts to local communities would be similar to those described under Alternative 1, since the types of munitions would remain the same. However, the frequency would be greater and, therefore, the potential for noise impacts are anticipated to be even more frequent than under Alternative 1 and also potentially result in a greater number of noise complaints.

No special risks to children or disproportionate noise impacts have been identified to areas of environmental justice concerns from activities performed at TA C-72. Detonations during adverse weather conditions have a greater potential to create an undesirable noise level in public areas outside of the Reservation boundary. Therefore, to further minimize any potential noise impacts to local communities, environmental and weather conditions should be taken into

consideration prior to detonation of explosive materials and monitored during any testing and training activities.

4.9.4 Alternative 3

Under Alternative 3, there would be no adverse noise impacts anticipated to the public from tree-clearing activities. Noises generated from any of the four tree-clearing methods are not expected to attenuate beyond the Eglin Range borders and adversely affect the local communities. In addition, TA C-72 is permanently closed to public access; thus, there would be no adverse impacts to the public from tree-clearing activities performed at the test area. Any tree-clearing activities performed on areas outside the TA C-72 boundary would take place within the safety footprint, and the public would have restricted access to the area during clearing procedures, so there are no anticipated adverse impacts to the public under this alternative.

4.9.5 Alternative 4

Under Alternative 4, there would be the most potential for noise impacts to the public from expenditures and tree-clearing activities described under Alternative 2 and Alternative 3. However, the noises associated with both Alternative 2 and Alternative 3 are not anticipated to attenuate beyond the Range boundaries above 115 dBP. To minimize potential undesirable noise levels to public areas outside the reservation boundary, environmental and weather conditions should be taken into consideration prior to detonation of explosive materials and monitored during any testing and training activities.

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APPENDIX A

MISSION ACTIVITIES AND FACILITY DESCRIPTIONS

MISSION DESCRIPTIONS

Test Missions

Test missions are missions designed to test, verify, validate, demonstrate, or prove that the new or improved hardware, system, software, or tactic will work safely and accomplish the desired effect.

Air-to-Surface Missiles, Bombs, and Guns Testing

These types of missions typically test a new weapon, new fuse, upgraded guidance or sensor system, or a new mix of weapons not currently authorized for carriage. These tests can be done either with live warheads or have the warheads removed (i.e., inert weapons) and replaced with a telemetry package that sends data back to the control facility for analysis. These missions involve releasing or firing the bombs, missiles, or guns from an aircraft (both fixed- and rotor-wing), while the weapon effects or accuracy is scored at the test area.

Surface-to-Surface Missile and Gun Testing or Ground Testing

Surface-to-Surface missile testing evaluates a missile's ability to launch, navigate to, and strike its target. Typical surface-to-surface missile activity involves testing of the Army's Hellfire missiles launched from the C-7A ground launcher facility and impacting on a variety of targets on TA C-72. Other surface-to-surface missile activity evaluates the performance of a cruise missile launched from a surface ship or submarine. The cruise missile flies its programmed course over both land and water, recovering/striking simulated targets on one of the land test areas. Surface-to-surface gun testing evaluates the ammunition, fuse, or gun accuracy. These tests range from 20-millimeter (mm) to 155-mm guns. Ground testing is any other testing done exclusively on the ground not covered.

Air Operations Testing

Air operations testing includes any use of the airspace not previously described. Most common of these are sensor testing and electronic combat (EC) testing. The testers routinely accomplish these tests over the entire land range airspace and involve evaluation of a sensor's ability to interpret what it senses, or other testing of EC systems. The testers usually fly these missions at a low speed and moderate altitude, usually 5,000 to 15,000 feet, and may be as low as 200 feet. Chaff and flares may be expended from the aircraft as part of this testing. The Seeker/Sensor Evaluation Facility (located south of C-7A on RR 214) is utilized for countermeasure testing of various EW sources and the dispensing of flares and chaff are part of this mission's profile. This testing had previously been accomplished on C-52 but had to be relocated due to Army 7th Special Forces Group (SFG) training on C-52.

Ground Operations Testing

Users routinely perform tactical vehicle operations on the ground at TA C-72. These missions typically utilize tracked and wheeled vehicles for sensor testing. Users move tracked and wheeled vehicles around TA C-72 for target placement and often mobilize them during exercises to mimic troop movement and advancements. Sometimes users move the vehicles along clay roadways and across bridges over the three stream systems located on TA C-72. However, off-road movement and hiding of targets is often required for mission use. In the past, target relocation has required off-road stream crossings outside of established

bridges; however, the use of these off-road stream crossings does not occur today. Future needs for the fording capability is likely for transit of vehicles and for fording capability testing. Sometimes tactical vehicle operations require the placement of tank targets on slopes leading down toward creek systems to fulfill testing and training requirements. Tactical vehicle operations on many of the ranges including TAs C-72, C-52, C-62, B-70, and C-72 uses the sloped terrain for tactical maneuvers and seeker/sensor testing with mobile targets. Users conduct a particular type of tactical vehicle mission on ranges with variable terrain. Proponents use this terrain to hide targets in a simulated attack scenario where troops attempt to advance and claim territory through reconnaissance operations. These tracked and wheeled vehicles are free to move to any location on TA C-72, with the exception of unexploded ordnance areas, and utilize sloped terrain for cover. Tests on seeker/sensor systems and precision guided munitions systems occur during the operations.

An example of a tactical vehicle mission that utilized TA C-72 was the Improved Target Acquisition System Limited User Test II conducted from January 1999 to March 1999. The purpose was to test seeker/sensor hardware and software against typical vehicles in representative environments of employment to collect data for validation of models, simulations, and algorithms. The test unit included an Airborne Cavalry Troop from the 82nd Airborne, Fort Bragg, North Carolina, equipped with 8 high-mobility multipurpose wheeled vehicles (HMMWVs) with ITAS (Improved Target Acquisition System), approximately 14 other tactical vehicles, and 80 personnel. The opposing force consisted of approximately nine former Soviet Union tactical vehicles and 20 personnel. The test team consisted of approximately 35 personnel with an additional 22 tactical vehicles. The test unit, team, and force, conducted the test over two months; they required approximately 20 test missions encompassing over 300 hours of testing over a large portion of several ranges (B-6, B-70, C-52, C-62, and C72). Eglin usually hosts one major test such as this per year. Typically, there are no expendables reported for this type of operation, and no expendables were associated with ground operations testing during the baseline year.

Training Missions

Users design training missions to teach, maintain, or increase the operator's proficiency to perform mission operations. Training categories are similar to the testing categories. Each category identifies the type of activity, major trainees, typical aircraft, numbers of missions, and the types and numbers of expendables associated with the mission.

Air-to-Surface Missiles, Bombs, and Guns Training

Air-to-surface missiles, bombs, and guns training involves training where users release or launch bombs or missiles or fire aircraft guns at specific targets over land. Personnel score weapons either electronically on the ground or aircrews conduct the scoring. Training altitudes may range from a few hundred feet to 20,000 plus feet and speeds range from 200k to near supersonic speeds. Aircraft guns training uses the internal or pod-mounted aircraft guns, which includes side-firing AC-130 gunships, fighters using internal or pod mounted guns, and helicopters using machine guns. The most typical air-to-surface training done on TA C-72 is Army Hellfire missile training.

Surface-to-Surface or Surface-to-Air Missile Training

Surface-to-surface or surface-to-air missile training involves firing a missile from the ground toward either a target on the ground or a drone in the air. The Army usually suspends ground targets between poles, which they call pole targets. To date the Army only fires Stinger missiles from TA C-72 for training. This type of training at Eglin did not start until 1996. The Army 7th SFG is expected to fire live Javelin missiles against tank targets for future training missions.

Air Operations Training

Air operations training is almost identical to the description used for air operations testing, except that it is for training purposes rather than for testing new systems. Users expend chaff and flares from aircraft in some aspects of this training. Usually users schedule the airspace R-2914 or R-2914A instead of specifically TA C-72. Therefore, an exact number of missions that utilize TA C-72 airspace is not known. Users routinely accomplish this training over the entire land range airspace and involve sensor operation/interpretation or training against EC systems. Users usually fly these missions at a low speed and moderate altitude, usually 2,000 to 15,000 feet, and may be as low as 200 feet. Users may expend chaff and flares from the aircraft as part of this training.

Anti-Armor Tracking Range

This range will be utilized for training Army 7th SFG members for designating armor targets. This training requirement is for targeting and designating only (with laser designators), with no live fire allowed.

FACILITIES AND TARGETS DESCRIPTION

Facilities

The Hellfire Production Test Facility

The Hellfire Missile Test Complex consists of Test Site (TS) C-7 (Hellfire Control Facility), TS C-7A (Hellfire Launch Facility), TA C-72 (Hellfire Target Area) and various other test sites within TA C-72 that support cinetheodolites and video tracking equipment. Users fire missiles from the Hellfire Launch Facility at C-7A towards three designated Hellfire targets on TA C-72: TT-83, TT-84, and TT-85. Users remotely control all testing and data collection from TS C-7, located outside of the safety footprint. This facility is unique in the operation of remotely controlled instrumentation, data acquisition, and self-contained fiber optic network systems used in support of missile and other electro-optically guided weapons testing. The fiber optic network consists of underground cables that relays data back to Test Site C-7. This facility also supports many other Army/Air Force guided weapons tests.

Test Site C-7

Located six miles west of TA C-72, this control facility contains the equipment required to remotely operate all downrange instrumentation from outside a predetermined safety footprint. This includes the tracking consoles for three High Performance Video Trackers (HPVT), all cameras (normal and high speed video, and silicon vidicon), environmental chambers, missile test sets, and firing circuitry which are located on the test area itself. The

site has its own state-of-the-art telemetry ground station, a helicopter pad, and a 12,000-foot hangar, along with support buildings.

Test Site C-7A

Test Site C-7A is located on the western side of TA C-72. It includes a launch pad and support building set up on a hill rising approximately 20 feet above ground level. There are three platform launchers, each equipped with two launch rails and clamshell covers that support firing up to six missiles at a time. Users may install and control additional temporary launch rails from this location. The launch pad sits atop an instrumentation bunker, called the Grotto, which houses missile test sets, measurement and control instrumentation, and environmental conditioning unit temperature recorders.

Time-Space-Position-Information (TSPI)

There are four Contraves cinetheodolites equipped for obtaining complete photographic ballistic data. The cinetheodolites are positioned at Test Sites C-132, C-133, C-134, and C-135. Three remotely controlled high performance video trackers are located at Test Sites C-139, C-140, and C-141. These are equipped with long focal length shuttered video tracking optics. An AN/FPS-16 radar is operated from Test Site C-10, located between C-7 and TA C-72, and is augmented with long focal length tracking television systems. A fiber optic video/data system provides instrumentation coverage of the entire Hellfire range. Television, data, timing, and voice communications are available to and from the hub at Test Site C-7.

Test Area C-72 Hellfire Targets

There are three targets designated as Hellfire targets on TA C-72: TT-83, TT-84, and TT-85. The targets are made of mounds of clay material, with a metallic target face mounted on front. TT-83 and TT-84 are approximately 20 feet in height, while TT-85 is approximately 30 feet in height.

Anti-Armor Tracking Range

A designation and targeting range for Army 7th SFG training is located at the northwest end of C-72. This range consists of a firing pad with numerous fixed targets out to 2000 meters. Two 350m mobile targets (target boards on a rail system) are also utilized and located east of Rocky Creek. These targets are for laser and seeker designation only; no live fire is allowed on these targets.

Targets

Table A-1 briefly describes the published targets found on TA C-72 (Figure A-1). Other targets used on TA C-72 support a specific program and are not published targets. These include concrete blocks, billboard, cloth (lying on the ground), and temporary structures.

Table A-1. Target Locations on Test Area C-72

Target Name	Latitude (North)	Longitude (West)	Remarks
C-5			Sand Bombing Circle located in General Purpose Area
TT-1	30-38-30.49	86-18-36.32	Reinforced Concrete Free Standing Walls Center of Targets TT-1 - TT-6
TT-2			Reinforced Concrete Retaining Wall with Wing Walls and Embankments
TT-3	30-38-31.73	86-18-37.47	Reinforced Concrete Retaining Wall with Wing Walls and Embankments

Table A-1. Target Locations on Test Area C-72, Cont'd

Target Name	Latitude (North)	Longitude (West)	Remarks
TT-4			Reinforced Concrete Walls
TT-5			Reinforced Concrete Abutment with Walls and Embankments
TT-6			Reinforced Concrete Bents
TT-7	30-38-34.77	86-18-50.64	Revetted Radar Site
TT-8	30-38-44.144	86-19-03.529	Aircraft Revetment
TT-9	30-38-54.6	86-19-06.1	Simulated Power Line
TT-10			Air-to-ground WSEP Target
TT-12	30-38-28.50	86-18-53.51	Ammo Igloo
TT-13	30-38-44.84	86-18-47.66	P.O.L. Area
TT-14-2	30-38-26.50	86-19-08.45	Tob Center (Source: BAE)
TT-15	30-38-32.84	86-18-48.16	Revetted Missile Site (Semi-circular Earth Revetment)
TT-31			One Zigzag Trace Trench
TT-32			Nine Open One-Man Foxholes
TT-33			Nine Two-man Foxholes with Offsets
TT-34			Nine Half Covered One-Man Foxholes
TT-35			One Buried Concrete Command Post
TT-36			Two Buried Wooden Personnel Bunkers with Heavy Overhead Cover
TT-37			One Buried Wooden Personnel Bunker (Cut and Covered)
TT-38			Two Buried Concrete Personnel Bunkers
TT-39			Two Buried Concrete Automatic Weapon Emplacements
TT-40			Three Buried Wooden Automatic Weapon Emplacements
TT-41			Two Howitzer Emplacements
TT-42			One Circular Type Mortar Emplacement
TT-43			Six Horseshoe Type Machine Gun Emplacements
TT-44			Three Dug-in Tank Emplacements
TT-45			One 328-foot Tunnel and Shaft
TT-46			Open Crawl Trench Between Various Targets
TT-47			A 650-foot Triple Standard Concertina Fence
TT-48			A 350-foot Double Apron Fence
TT-63	30-39-37.99	86-20-01.15	One Reinforced Concrete Submarine Pen (Coord of Center) (Needs Repair)
TT-64	30-39-39.08	86-19-56.90	One Reinforced Concrete Vertical Wall (Coord of SE Corner)
TT-65	30-39-42.929	86-20-38.182	One Reinforced Concrete Ricochet Wall for GAU-8 (Coord of Center)
TT-66	30-38-09.05	86-18-40.97	Concrete Runway Target (200 foot x 1,500 foot) (Needs Repair)
TT-67	30-38-01.9	86-18-15.8	A 800- by 1,000-foot A-10 strafing target
TT-68	30-37-38.731	86-17-29.814	Concrete Target/Casting Area
TT-74	30-37-32.335	86-16-40.385	Center of Racetrack
TT-75	30-37-33.939	86-16-54.018	Vehicle Racetrack, Coordinates of Cal Point on Racetrack
TT-77	30-37-29.708	86-17-16.258	Clay Pad (100 foot x 100 foot)
TT-82	30-37-59.980	86-18-41.607	Hellfire 2 km Target
TT-83	30-37-49.69	86-17-49.12	Hellfire EO Target No. 1
TT-84	30-37-42.71	86-16-49.56	Hellfire EO Target No. 2
TT-85	30-37-33.21	86-15-34.23	Hellfire EO Target No. 3
TT-87			Strafing Target
TT-93			Bombing Circle
TT-94			General Purpose Bombing Grid (500 x 5000 feet)
TT-95			WSEP CONEX Array
TT-96			WSEP Vehicle Array

Source: Bufkin, 2005

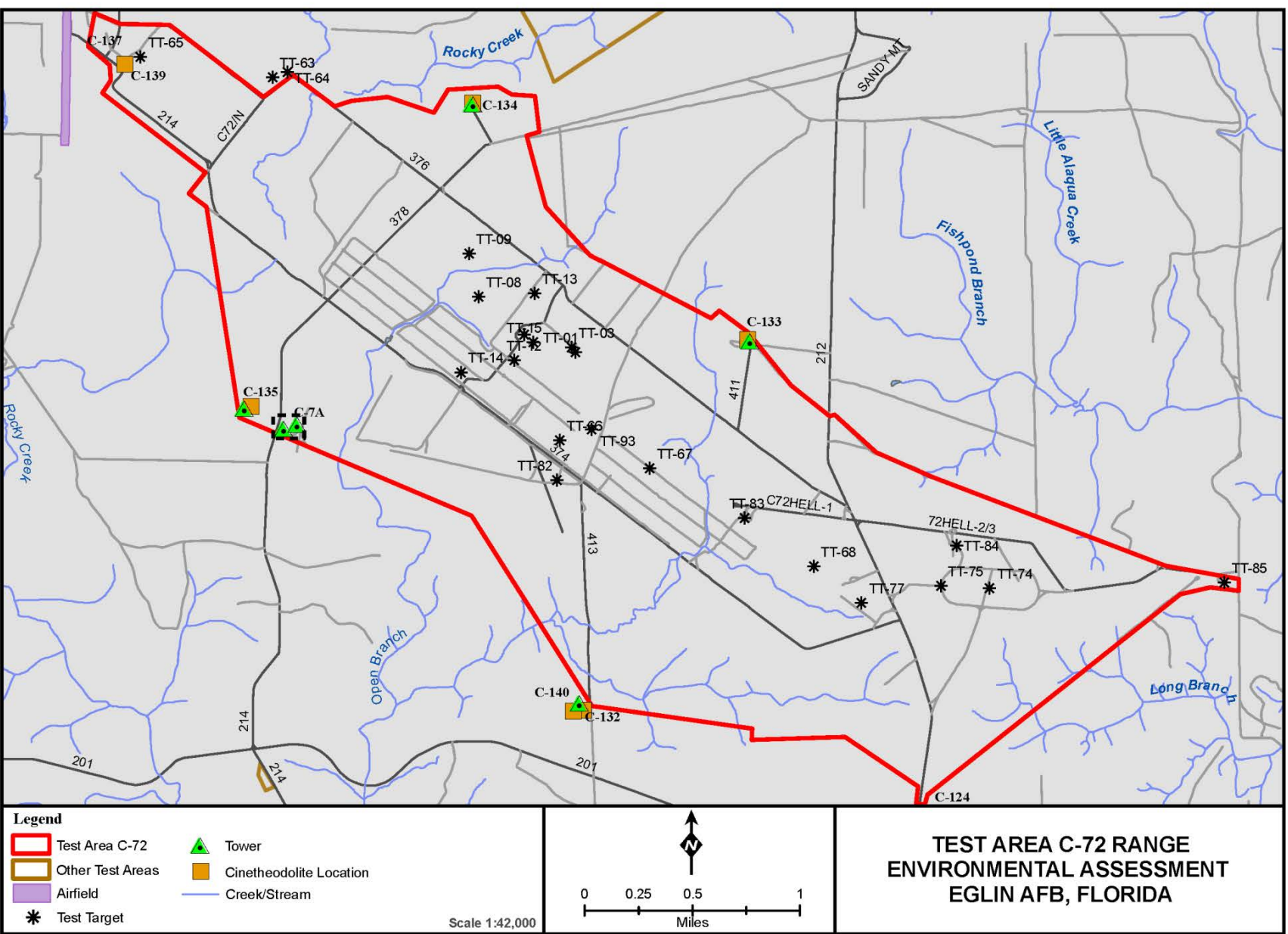


Figure A-1. Published Targets on TA C-72

General Purpose Area

Eglin designated a 1,800- by 5,000-foot area in the center of the test area as the general-purpose area. Eight flight line markers provide four parallel flight paths lengthwise with the long orientation of the test area (northwest to southeast). This area supports munitions and strafing tests of bombs, mines, guns, rockets, and guided munitions. Users also conduct fuse tests such as airburst, proximity, impact, and delay on this test area. An 800 by 1,000-foot A-10 strafing target is located in the area (U.S. Air Force, 2001).

Instrumentation

- Four Contraves cinetheodolites (TS C-132, C-133, C-134, and C-135) for obtaining complete photographic ballistic data.
- Three remotely controlled high-speed video trackers (TSs C-139, C-140, and C-141) with long focal length shuttered video tracking optics.
- An AN/FPS-16 computer-aided monopulse instrumentation radar (TS C-10) with long focal length shuttered video tracking optics and contrast TV tracking.
- Two mobile laser designator support trailers.
- One permanent five-point weather system.
- One forward scatter meter.
- One Global Positioning System/Multi-object Tracking and Control System (GPS/MTACS) site, C-133, equipped for 915 Megahertz (MHz) operation only. Eglin can convert this site to a 1,365 MHz operation with a minimum notification of 48 hours. Two MTACS sites, tower, and antenna can be equipped for 915 or 1635 MHz operation with a minimum 48 hours of notification.
- Three environmental conditioning systems (-45 to 145° F) at TS C-7A.

Buildings and Structures

Buildings used to support the Hellfire program include:

- One control and engineering building.
- One support building, an elevated launch mound with subterranean instrument room (bldg 9541).
- One missile preflight building (bldg 9540).
- Three instrumentation shelters.
- One 100-foot telemetry tower.
- One electro-optical support building.

Table A-2 describes structures located on TA C-72 and TS C-7. Other support facilities on TA C-72 include:

- One 500-foot inclined sled track (currently non-operational).
- One test area control building.
- Four small assembly/observational buildings.
- Four cinetheodolite buildings.
- One LRTC pad with calibration targets at TS C-12.
- One control/engineering building.
- One support (open bay) building.
- One elevated launch mound with subterranean instrument room.
- One missile preflight building.
- Three instrumentation shelters.
- One 100-foot telemetry tower.
- One EO support building.
- One 12,000 square-foot hangar.

Table A-2. Buildings/Structures on Test Area C-72 and Test Site C-7

Bldg. No.	Use	Bldg. No.	Use
8951	Pump House	9513	Pump House
8957	Misc. Storage Building	E-170	
8959	ES Supply Building	E-171	
9500	Range Control Building	E-222	Lumber Storage Shed
9502	Camera Station Centerline		Cable Adjustment Building
9503	Inclined Sled Track		Balloon Storage Shed
9504	Launch Block House		Compressor Shed
9505	Eastern Maintenance Shop	9471	Storage Building
9509	Pad for Fixed Launchers	9482	Support Building
9510	Pad for Firing Rockets from Aircraft	9483	Control Building
9511	Supply Building		Hangar Structure
9512	SOG Maintenance Shop and Open Storage		Five trailers

APPENDIX B

**RELEVANT LAWS, REGULATIONS,
AND POLICIES**

RELEVANT LAWS, REGULATIONS, AND POLICIES

The Range Environmental Assessment was prepared with consideration and compliance of relevant environmental laws, regulations, and policies; including federal and state laws and regulations, Department of Defense (DoD) directives, and Air Force instructions. A brief description of specific laws and regulations that legally define issues of compliance associated with the mission activities of this document are outlined below.

General

42 USC 4321 et seq; 1969; National Environmental Policy Act of 1969 (NEPA); Requires that federal agencies (1) consider the consequences of an action on the environment before taking the action and (2) involve the public in the decision making process for major Federal actions that significantly affect the quality of the human environment.

Executive Order 12372; 14-Jul-82; Intergovernmental Review of Federal Programs; Directs federal agencies to inform states of plans and actions, use state processes to obtain state views, accommodate state and local concerns, encourage state plans, and coordinate states' views.

Executive Order 12856; 3-Aug-93; Right to Know Laws and Pollution Prevention Requirements; Directs all Federal agencies to incorporate pollution planning into their operations and to comply with toxic release inventory requirements, emergency planning requirements, and release notifications requirements of Emergency Planning and Community Right-to-Know Act (EPCRA).

Executive Order 12898; 11-Feb-94; Environmental Justice; Directs federal agencies to identify disproportionately high and adverse human health or environmental impacts resulting from programs, activities or policies on minority populations.

Air Force Instruction 13-212; 16-Nov-07 (incorporating change 10-Jul-08; certified current 6-Jan-10); Range Planning and Operations; Establishes procedures for planning, construction, design, operation, and maintenance of weapons ranges as well as defines weapons safety footprints, buffer zones, and safest procedures for ordnance and aircraft malfunction.

Eglin AFB Instruction 3-212; 20-Dec-10; Range Planning and Operations; Implements AFD 13-2, *Air Traffic, Airfield, Airspace, and Range Management* and sets forth policies regarding the Eglin Test and Training Complex (ETTC) activities of all personnel (all Active Duty, Civilians, Guard, Reserves, Contractors, etc) executing official business on the range and meets the requirements identified in AFI 13-212, *Range Planning and Operations*.

Air Force Policy Directive (AFPD) 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention.

Air Force Instruction 90-803; 24-Mar-10; Environmental, Safety, and Occupational Health Compliance Assessment and Management; Implements AFPD 90-8 by providing guidance for establishing an assessment process designed to ensure compliance with Federal, State, and local environmental laws, Occupational Safety and Health Administration (OSHA) regulations, as well as Department of Defense (DoD), and Air Force policies and instructions.

32 CFR 989; 1-Jul-01; Environmental Impact Analysis Process (EIAP)--; This regulation provides a framework for how the Air Force is to comply with NEPA and the CEQ regulations.

Air Force Instruction 32-7062; 1-Oct-97 (certified current 13-Nov-09); Air Force Comprehensive Planning; Implements AFPD 32-70 by establishing Air Force Comprehensive Planning Program for development of Air Force Installations, ensuring that natural, cultural, environmental, and social science factors are considered in planning and decision making.

Physical Resources

Air Quality

42 USC 7401 et seq.; 40 CFR Parts 50 & 51; Clean Air Act, National Ambient Air Quality Standards (CAA, NAAQS); Emission sources must comply with air quality standards and regulations established by federal, state, and local regulatory agencies.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements Clean Air Act.

Air Force Instruction 32-7040; 27-Aug-07; Air Quality Compliance; This AFI sets forth actions for bases to implement to achieve and maintain compliance with applicable standards for air quality compliance, and responsibilities for who is to implement them. Includes requirements for NEPA and RCRA as well as CAA.

F.S. Ch. 403, Part I; Florida Air and Water Pollution Control Act; Regulates air pollution within the state.

FAC Chap. 62-204; Florida State Implementation Plan, with Ambient Air Quality Standards and Prevention of Significant Deterioration (PSD) Program; Establishes state air quality standards and requirements for maintaining compliance with NAAQS.

FAC Chap. 62-213; Operation Permits for Major Sources of Air Pollution; Adopted PSD permit program, designed to control the impact of economic growth on areas that are already in attainment.

Air Space Use

49 USC 106 & Subtitle VII; 1997; Federal Aviation Act of 1958 (FAA); Created the FAA and establishes administrator with responsibility of ensuring aircraft safety and efficient utilization of the National Airspace System.

14 CFR Part 71; 1997; Federal Aviation Regulation (FAR); Defines federal air routes, controlled airspace, and flight locations for reporting position.

14 CFR Part 73; 1997; Federal Aviation Regulation (SFAR No. 53); Defines and prescribes requirements for special use airspace.

14 CFR Part 91; 1997; FAR; Governs the operation of aircraft within the United States, including the waters within 3 nautical miles of the U.S. Coast. In addition, certain rules apply to persons operating in airspace between 3 and 12 nautical miles from the U.S. Coast.

Land Resources

16 USC 670a to 670o; 1997; Sikes Act, Conservation Programs on Military Reservations; DoD, in a cooperative plan with DOI and State, opens AF bases to outdoor recreation, provides the state with a share of profits from sale of resources (timber), and conserves and rehabilitates wildlife, fish, and game on each reservation. AF is to manage the natural resources of its reservations to provide for sustained multipurpose use and public use.

16 USC 1451 to 1465; 1997; Coastal Zone Management Act of 1972 (CZMA); Federal agency activities in coastal zones should be consistent with state management plans to preserve and protect coastal zones. Lands for which the Federal Government has sole discretion or holds in trust are excluded from the coastal zone.

USC 1701 et seq., Public Law 94-579; 1997; Federal Land Policy and Management Act of 1976 (FLPMA); Provides that the Sec. of Interior shall develop land use plans for public lands within BLM jurisdiction to protect scientific, scenic, historical, ecological, environmental and archeological values, and to accommodate needs for minerals, food and timber.

16 USC 3501 to 3510; 1997; Coastal Barrier Resources Act (CBRA); Limits Federal expenditure for activities on areas within the Coastal Barrier Resources System. An exception is for military activities essential to national security, after the Federal agency consults with the Secretary of the Interior.

Air Force Instruction 32-7062; 1-Oct-97 (certified current 13-Nov-09); Air Force Comprehensive Planning; Implements AFPD 32-70 by establishing Air Force Comprehensive Planning Program for development of Air Force Installations, ensuring that natural, cultural, environmental, and social science factors are considered in planning and decision making.

Air Force Instruction 32-7063; 13-Sep-05 (certified current 17-Nov-09); Air Installation Compatible Use Zone Program (AICUZ); Provides a framework to promote compatible development within area of AICUZ area of influence and protect Air Force operational capability from the effects of land use which are incompatible with aircraft operations.

Air Force Instruction 32-7064; 17-Sep-04; Integrated Natural Resources Management; Provides for development of an integrated natural resources management plan to manage the installation ecosystem and integrate natural resources management with the rest of the installation's mission. Includes physical and biological resources and uses.

Noise

42 USC 4901 to 4918, Public Law 92-574; 1972; Noise Control Act of 1972 (NCA); Provides that each Federal agency must comply with Federal, State, interstate and local requirements for control and abatement of environmental noise.

49 USC 44715; 1997; Controlling Aircraft Noise and Sonic Boom; Provides that the Federal Aviation Administration will issue regulations in consultation with the USEPA to control and abate aircraft noise and sonic boom.

Executive Order 12088; 1978; Federal Compliance with Pollution Control Standards; Requires the head of each executive agency to take responsibility for ensuring all actions have been taken to prevent, control, and abate environmental (noise) pollution with respect to federal activities.

Air Force Instruction 32-7063; 13-Sep-05 (certified current 17-Nov-09); AICUZ; The AICUZ study defines and maps noise contours. Update when noise exposure in air force operations results in a change of Day-Night Average Sound Level of 2 decibels (dBs) or more as compared to the noise contour map in the most recent AICUZ study.

Water Resources

33 USC 426, 577, 577a, 595a; 1970; River and Harbor Act of 1970 (RHA); Keeps navigable waterways open, authorizing the Army Corps of Engineers to investigate and control beach erosion and to undertake river and harbor improvements.

33 USC 1251 et seq.; 1997; Clean Water Act (CWA) (Federal Water Pollution Prevention and Control Act, FWPCA); In addition to regulating navigable water quality, the CWA establishes NPDES permit program for discharge into surface waters and storm water control; Army Corps of Engineers permit and state certification for wetlands disturbance; regulates ocean discharge; sewage wastes control; and oil pollution prevention.

33 USC 1344-Section 404; 1997; Federal Water Pollution Control Act/Clean Water Act (FWPCA/CWA), Dredged or Fill Permit Program; Regulates development in streams and wetlands by requiring a permit from the Army Corps of Engineers for discharge of dredged or fill material into navigable waters. A Section 401 (33 USC 1341) Certification is required from the State as well.

42 USC 300f et seq.; 1997; Safe Drinking Water Act (SDWA); USEPA-Requires the promulgation of drinking water standards, or MCLs, which are often used as cleanup values in remediation; establishes the underground injection well program; and establishes a wellhead protection program.

42 USC 6901 et seq.; 29-May-05; Resource Conservation and Recovery Act of 1976 (RCRA); Establishes standards for management of hazardous waste so that water resources are not contaminated: RCRA Corrective Action Program requires cleanup of ground water that has been contaminated with hazardous constituents.

42 USC 9601 et seq., Public Law 96-510; 11-Dec-80; Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA); Establishes the emergency response and remediation program for water and ground water resources contaminated with hazardous substances.

Executive Order 12114, 44 FR, No. 62; 01-04-79; Environmental Effects Abroad of Major Federal Actions. Activities outside the jurisdiction of the United States which significantly harm the natural or physical environment shall be evaluated. An EIS shall be prepared for major federal actions having significant environmental effects within the global commons (i.e., Antarctica, oceans).

Department of Defense Directive 6050.7; 31-Mar-79 (certified current 5-Mar-04); Environmental Effects Abroad of Major Department of Defense Actions. Implements Executive Order 12114.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements Clean Water Act, Safe Drinking Water Act, and Water Quality Act of 1987.

Air Force Instruction 32-7006; 29-Apr-94 (certified current 11-May-10); Environmental Program in Foreign Countries; Implements DoD Directive 6050.7.

Air Force Instruction 32-7041; 10-Dec-03 (certified current 28-Jan-10); Water Quality Compliance; Instructs the Air Force on maintaining compliance with the Clean Water Act; other federal, state, and local environmental regulations; and related DoD and AF water quality directives.

Air Force Instruction 32-7041, Eglin AFB Supplement; 16-Jun-10; Water Quality Compliance; This supplement applies to all units assigned or attached to Eglin Air Force Base, to include any associate/tenant organizations and off-base and remote site units. This supplement should be read in conjunction with AFI 32-7041, Water Quality Compliance.

Air Force Instruction 32-7064; 217-Sep-04; Integrated Natural Resources Management; Sets forth requirements for addressing wetlands, floodplains and coastal and marine resources in an integrated natural resources management plan (INRMP) for each installation.

F.S. Chaps. 253, 258; Florida Aquatic Preserves Act; Establishes state aquatic preserves.

F.S. Chap. 403, Part I; Florida Air and Water Pollution Control Act; establishes the regulatory system for water resources in the State of Florida.

FAC Chap. 62-302; Surface Water Quality Standards; Classify Florida surface waters by use. Identify Outstanding Florida Waters.

FAC Chap. 62-312; Florida Dredge and Fill Activities; Requires a State permit for dredging and filling conducted in, on, or over the surface waters of the State.

Biological Resources

Animal Resources

16 USC 668 to 668d; 1995; Bald and Golden Eagle Protection Act (BGEPA); Makes it illegal to take, possess, sell, barter, offer to sell, transport, export or import Bald and Golden eagles in the United States. Taking may be allowed for scientific, exhibition, or religious purposes, or for seasonal protection of flocks.

16 USC 703 - 712; 1997; Migratory Bird Treaty Act (MBTA); Makes it illegal to take, kill or possess migratory birds unless done so in accordance with regulations. An exemption may be obtained from the Dept. of the Interior for taking a listed migratory bird.

16 USC 1361 et seq.; 1997; Marine Mammal Protection Act of 1972, as amended (MMPA); Makes it illegal for any person to “take” a marine mammal, which term includes significantly disturbing a habitat, unless activities are conducted in accordance with regulations or a permit.

Air Force Instruction 32-7064; 17-Sep-04; Integrated Natural Resources Management; Explains how to manage natural resources on Air Force property, and to comply with Federal, State, and local standards for resource management.

Executive Order 13112; 1999; Instructs federal agencies to monitor for, control, and prevent the introduction of non-native, invasive species of plants and animals.

Executive Order 13186; 2001; Directs federal agencies whose actions may affect migratory birds to establish and implement a Memorandum of Understanding with the U.S. Fish and Wildlife Service (USFWS) to promote the conservation of migratory birds.

DoD and USFWS Memorandum of Understanding (MOU); 31-Jan-06; Requires the DoD to acquire permits for normal and routine operations, such as installation support functions, that may result in pursuit, hunting, taking, capturing, killing, possession, or transportation of any migratory bird.

50 CFR 21; 2007; Exempts the Armed Forces from the incidental taking of migratory birds during military readiness activities, except in cases where an activity would likely cause a significant adverse effect on the population of a migratory bird species. In this situation, the Armed Forces, in cooperation with the USFWS, must develop and implement conservation measures to mitigate or minimize the significant adverse impacts.

Threatened & Endangered Species

16 USC 1361 et seq., Public Law 92-574; 1997; Marine Mammal Protection Act of 1972, as amended (MMPA); Makes it illegal for a person to “take” a marine mammal, which term includes significantly disturbing the habitat, unless done in accordance with regulations or a permit.

16 USC 1531 to 1544-16 USC 1536(a); 1997; Endangered Species Act 1973 (ESA); Federal agencies must ensure their actions do not jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify the habitat of such species and must set up a conservation program.

50 CFR Part 402; Endangered Species Act Interagency Cooperation; These rules prescribe how a Federal agency is to interact with either the FWS or the NMFS in implementing conservation measures or agency activities.

50 CFR Part 450; Endangered Species Exemption Process; These rules set forth the application procedure for an exemption from complying with Section 7(a)(2) of the ESA, 16 USC 1536(a)(2), which requires that Federal agencies ensure their actions do not affect endangered or threatened species or habitats.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements Endangered Species Act.

Air Force Instruction 32-7064; 17-Sep-04; Integrated Natural Resources Management; This AFI directs an installation to include in its INRMP procedures for managing and protecting endangered species or critical habitat, including state-listed endangered, threatened or rare species; and discusses agency coordination.

Human Safety

29 CFR 1910.120; Occupational Safety and Health Act, Chemical Hazard Communication Program (OSHA); Requires that chemical hazard identification, information and training be available to employees using hazardous materials and institutes material safety data sheets (MSDS) which provide this information.

Department of Defense Instruction 6055.1; 19-Aug-98; Establishes occupational safety and health guidance for managing and controlling the reduction of radio frequency exposure.

Department of Defense Flight Information Publication; Identifies regions of potential hazard resulting from bird aggregations or obstructions, military airspace noise sensitive locations, and defines airspace avoidance measures.

Air Force Instruction 13-212; 16-Nov-07 (incorporating change 10-Jul-08; certified current 6-Jan-10); Weapons Ranges and Weapons Range Management; Establishes procedures for planning, construction, design, operation, and maintenance of weapons ranges as well as defines weapons safety footprints, buffer zones, and safest procedures for ordnance and aircraft malfunction.

Air Force Instruction 32-2001; 9-Sep-08; The Fire Protection Operations and Fire Prevention Program; Identifies requirements for Air Force fire protection programs (equipment, response time, and training).

Air Force Instruction 32-7063; 13-Sep-05 (certified current 17-Nov-09); AICUZ. The AICUZ Study defines and maps accident potential zones and runway clear zones around the installation, and contains specific land use compatibility recommendations based on aircraft operational effects and existing land use, zoning and planned land use.

Air Force Manual 91-201; 12-Jan-11; Explosives Safety Standards; Regulates and identifies procedures for explosives safety and handling as well as defining requirements for ordnance quantity distances, safety buffer zones, and storage facilities.

Air Force Instruction 91-301; 1-Jun-96; Air Force Occupational and Environmental Safety, Fire Protection and Health (AFOSH) Program; Identifies occupational safety, fire prevention, and health regulations governing Air Force activities and procedures associated with safety in the workplace.

Habitat Resources

Executive Order 11990; 24-May-77; Protection of Wetlands; Requires federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in their activities. Construction is limited in wetlands and requires public participation.

Executive Order 11988; 24-May-77; Floodplain Management; Directs Federal agencies to restore and preserve floodplains by performing the following in floodplains: not supporting development; evaluating effects of potential actions; allowing public review of plans; and considering in land and water resource use.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements Executive Order 11988 and 11990.

Anthropogenic Resources

Hazardous Materials

7 USC 136 et seq., Public Law 92-516; 1997; Federal Insecticide, Fungicide, and Rodenticide Act Insecticide and Environmental Pesticide Control (FIFRA); Establishes requirements for use of pesticides that may be relevant to activities at Eglin Air Force Base.

42 USC Sect. 2011 - Sect. 2259; Atomic Energy Act (AEA); Assure the proper management of source, special nuclear, and byproduct material.

42 USC 6901 et seq.; 1980; Resource Conservation and Recovery Act of 1976 and Solid Waste Disposal Act of 1980 (RCRA); Subchapter III sets forth hazardous waste management provisions; Subchapter IV sets forth solid waste management provisions; and Subchapter IX sets forth underground storage tank provisions; with which Federal agencies must comply.

42 USC 9601 et seq., Public Law 96-510; 1997; Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA); Establishes the liability and responsibilities of federal agencies for emergency response measures and remediation when hazardous substances are or have been released into the environment.

42 USC 11001 to 11050; Emergency Planning and Community Right-to-Know Act (EPCRA); Provides for notification procedures when a release of a hazardous substance occurs; sets up community response measures to a hazardous substance release; and establishes inventory and reporting requirements for toxic substances at all facilities.

42 USC 13101 to 13109; 1990; Pollution Prevention Act of 1990 (PPA); Establishes source reduction as the preferred method of pollution prevention, followed by recycling, treatment, then disposal into the environment. Establishes reporting requirements to submit with EPCRA reports. Federal agencies must comply.

Air Armament Center Plan 32-3; January 2004; Asbestos Management Plan; This plan establishes procedures for the Eglin Air Force Base (AFB) facility asbestos management program. It contains the policies and procedures used in controlling the health hazards created by asbestos containing materials (ACM), and the procedures used in ACM removal required to protect the health of personnel and to comply with applicable federal, state, and Air Force laws and inspections.

Air Armament Center Plan 32-4; January 2004. Lead-Based Paint Management Plan; This plan establishes procedures for the Eglin AFB lead-based paint management program. It contains policies and procedures used in controlling health hazards from exposure to lead-based paint.

Air Armament Center Plan 32-7; February 2003; Integrated Solid Waste Management Plan; The Eglin AFB Integrated Solid Waste Management Plan documents guidance and procedures with regard to regulatory compliance in the handling, reduction, recycling and disposal of solid waste. It contains requirements necessary to reach the mandated incremental waste diversion goal of 40 percent diversion of municipal solid waste from landfill disposal by fiscal year (FY) 2005. These policies and procedures are designed to preserve landfill space, increase recycling and reuse, address revenues and cost avoidance, provide pollution prevention alternatives and promote Affirmative Procurement. This plan draws from the aspects of two programs, the Integrated Solid Waste Management Program (ISWMP) and the Qualified Recycling Program (QRP).

Air Armament Center Plan 32-9; February 2003; Hazardous Materials Management Plan; The Eglin AFB Hazardous Material Management Plan documents existing policy and procedures for organizations requesting, procuring, issuing, handling, storing and disposing of hazardous material (HM) in accomplishment of the Air Armament Center (AAC) mission. These policies provide guidance for compliance with federal, state, and local occupational safety, health, and environmental regulations.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Provides for developing and implementing an Air Force Environmental Quality Program composed of four pillars: cleanup, compliance, conservation and pollution prevention. Implements Resource Recovery and Conservation Act, Comprehensive Environment Response Compensation and Liability Act of 1980, Emergency Planning and Community Right-to-Know Act, Pollution Prevention Act, Executive Order 12088, Executive Order 12777, and Executive Order 12586. Implements DoD Instruction 4120.14, DoD Directive 4210.15, and DoD Directive 5030.41.

Eglin AFB Instruction 32-7003; 1-Nov-2010; Hazardous Waste Management; This instruction is intended to provide a framework for complying with environmental standards applicable to Hazardous Waste (HW), Universal Waste (UW), Special Waste (SW) and used petroleum products on Eglin AFB.

Air Force Instruction 32-7020; 7-Feb-01; The Environmental Restoration Program; Introduces the basic structure and components of a cleanup program under the Defense Environmental Restoration Program. Sets forth cleanup program elements, key issues, key management topics, objectives, goals, and scope of the cleanup program.

Air Force Instruction 32-7042; 15-Apr-09 (incorporating change 31-Mar-10); Waste Management; Provides that each installation must develop a hazardous waste (HW) and a solid waste (SW) management plan; characterize all HW streams; and dispose of them in accordance with the AFI. Plans must address pollution prevention as well.

Air Force Instruction 32-7042, Eglin AFB Supplement; 28-Jan-10; Waste Management; Serve as the Solid Waste Management plan required by AFI 32-7042, *Solid and Hazardous Waste Compliance*, and applies to all agencies and organizations on Eglin AFB, all personnel living in military family housing (MFH) and contractors performing work under government contracts. Although the parent AFI also addresses hazardous waste, this supplement concerns only non-hazardous solid waste.

Air Force Instruction 32-7080; 12-May-94 (certified current 27-Oct-09); Pollution Prevention Program; Each installation is to develop a pollution prevention management plan that addresses ozone depleting chemicals; USEPA 17 industrial toxics; hazardous and solid wastes; obtaining environmentally friendly products; energy conservation, and air and water.

Air Force Policy Directive 40-2; 15-Mar-07; Radioactive Materials; Establishes policy for control of radioactive materials, including those regulated by the U.S. Nuclear Regulatory Commission (NRC), but excluding those used in nuclear weapons.

Cultural Resources

10 USC 2701 note, Public Law 103-139; 1997; Legacy Resource Management Program (LRMP); Provides funding to conduct inventories of all scientifically significant biological assets of Eglin AFB.

16 USC 431 et seq.; PL 59-209; 34 Stat. 225; 43 CFR 3; 1906; Antiquities Act of 1906; Provides protection for archeological resources by protecting all historic and prehistoric sites on Federal lands. Prohibits excavation or destruction of such antiquities without the permission (Antiquities Permit) of the Secretary of the department that has the jurisdiction over those lands.

16 USC 461 to 467; 1997; Historic Sites, Buildings and Antiquities Act (HAS); Establishes national policy to preserve for public use historic sites, buildings and objects of national significance: the Secretary of the Interior operates through the National Park Service to implement this national policy.

16 USC 469 to 469c-1; 1997; Archaeological and Historic Preservation Act of 1974 (AHPA); Directs Federal agencies to give notice to the Sec. of the Interior before starting construction of a dam or other project that will alter the terrain and destroy scientific, historical or archeological data, so that the Sec. may undertake preservation.

16 USC 470aa-470mm, Public Law 96-95; 1997; Archaeological Resources Protection Act of 1979 (ARPA); Establishes permit requirements for archaeological investigations and ensures protection and preservation of archaeological sites on federal property.

16 USC 470 to 470w-6-16 USC 470f, 470h-2; 1997; National Historic Preservation Act (NHPA); Requires Federal agencies to (1) allow the Advisory Council on Historic Preservation to comment before taking action on properties eligible for the NRHP and (2) preserve such properties in accordance with statutory and regulatory provisions.

25 USC 3001 - 3013), (Public Law 101-601; 1997; Native American Graves Protection and Repatriation Act of 1991 (NAGPRA); Federal agencies must obtain a permit under the Archeological Resources Protection Act before excavating Native American artifacts. Federal agencies must inventory and preserve such artifacts found on land within their stewardship.

42 USC 1996; American Indian Religious Freedom Act (AIRFA); Federal agencies should do what they can to ensure that American Indians have access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites in the practice of their traditional religions.

32 CFR Part 200; Protection of Archaeological Resources: Uniform Regulations; Provides that no person may excavate or remove any archaeological resource located on public lands or Indian lands unless such activity is conducted pursuant to a permit issued under this Part or is exempted under this Part.

36 CFR Part 60; Nominations to NRHP; Details how the Federal agency Preservation Officer is to nominate properties to the Advisory Council for consideration to be included on the NRHP.

36 CFR Part 800; Protection of Historic and Cultural Properties; Sets out the Section 106 process for complying with Sections 106 and 110 of the NHPA: the Agency official, in consultation with the State Historic Preservation Officer (SHPO), identifies and evaluates affected historic properties for the Advisory Council.

Executive Order 11593, 16 USC 470; 13-May-71; Protection and Enhancement of the Cultural Environment; Instructs federal agencies to identify and nominate historic properties to the NRHP, as well as avoid damage to Historic properties eligible for NRHP.

Executive Order 13007; 24-May-96; Directs federal agencies to provide access to and ceremonial use of sacred Indian sites by Indian religious practitioners as well as promote the physical integrity of sacred sites.

DoD Directive 4710.1; 21-Jun-84; Archaeological and Historic Resources Management (AHRM); Establishes policy requirements for archaeological and cultural resource protection and management for all military lands and reservations.

Air Force Policy Directive 32-70; 20-Jul-94; Environmental Quality; Develops and implements the Air Force Environmental Quality Program composed of cleanup, compliance, conservation, and pollution prevention. Implements National Historic Preservation Act, Executive Order 11593, and DoD Directive 470.1.

Air Force Instruction 32-7065; 1-Jun-04 (certified current 2-Nov-09); Cultural Resource Management; Directs AF bases to prepare cultural resources management plans (CRMP) to comply with historic preservation requirements, Native American considerations; and archeological resource protection requirements, as part of the Base Comprehensive Plan.

Air Force Policy Letter; 4-Jan-82; Establishes Air Force policy to comply with historic preservation and other federal environmental laws and directives.

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APPENDIX C

SOILS

SOILS

Soil formation is an on-going process that is determined by the nature of the parent material and influence of environmental factors such as climate, geology, topography, and vegetation. The soils on Test Area (TA) C-72 have developed from the Citronelle Formation and alluvial material (gravel, sand, silt, and clay deposited by water) in the floodplains of Rocky Creek and lowland areas.

Soils are often mapped as soil associations, which are groups of soil series (soils with similar profiles) with common characteristics, associated geographically, and delineated as a single map unit. The majority of soils within TA C-72 belong to the Lakeland association. Six other soil types comprise the great majority of the remaining soils on the test area, although other soil types may occur. The six types include Fuquay Loamy sand, Bonifay Loamy sand, Dorovan-Pamlico Association, Chipley and Hurricane, Albany-Pactolus Loamy Sand, and Bonneau-Norfolk-Angie Complex. Soil characteristics are provided in Table C-1 and in the text that follows.

Table C-1. Test Area C-72 Soil Types and Characteristics

Soil Name	Erosion Risk	Attributes	Soil Type
Lakeland Sand	Moderate to high	Yellowish brown to grayish brown	Sand
Fuquay Loamy Sand	Low	Very acidic; ironstone nodules	Loamy Sand
Bonifay Loamy Sand	Low	Very acidic; ironstone nodules	Loamy Sand
Dorovan-Pamlico Association	Very Low	Highly organic	Muck
Chipley and Hurricane	Moderate	Moderately acidic	Sand
Albany-Pactolus Loamy Sand	Low	Thick, deep soils; very acidic	Loamy Sand
Bonneau-Norfolk-Angie Complex	Low	Moderately acidic	Sand

Lakeland Soils

Lakeland soils are primarily deep, excessively drained, permeable soils that form in thick, sandy sediments. They lack cohesiveness and have limited water-holding capacity. Typically, they have sandy surface layers with sandy subsoils that are more than 80 inches deep. These soils are abundant on both level and steep uplands. Lakeland soils vary in acidity from medium to very strong; thus, soil colors vary and range from dark, grayish brown to brownish-yellow to yellowish-brown. Lakeland soils are typically low in organic matter content and cation exchange capacity. Soil pH values range from 4.5 to 6.0 and contain less than one percent organic matter in the top zero to 40 inches of soil. Reported cation exchange capacity values for the top six inches of Lakeland soils were variable (3.5 to 17 meq/100 g soil) and likely reflect variability in sampling sites (e.g., amount of surface organic matter, disturbed versus undisturbed surface).

Lakeland Sand soil series have a moderate susceptibility to erosion due to high sand content. However, in areas where the soils are mucky, erosion is less likely because mucks are comprised

of organic matter and clay. Erosion potential is less in soils that are less uniform. Variation of sediment size, with the addition of clay and organic matter, helps create soil stability. Slope also affects soil erodibility.

Fuquay Loamy Sand

Fuquay Loamy sand is nearly level to sloping with well-drained characteristics. Fuquay sand has variable, loamy subsoil, although it typically occurs at a depth of 20 to 40 inches.

Bonifay Loamy Sand

Bonifay Loamy sand is nearly level to strongly sloping soils. Generally loamy subsoil occurs at a depth of 40 inches or more.

Dorovan-Pamlico Association

Dorovan-Pamlico Association soils are very poorly drained, nearly level, deep mucky soils, underlain with sandy material.

Chipley and Hurricane Soil Series

The Chipley and Hurricane soil series frequently occur in tandem and have similar physical and chemical characteristics. Chipley and Hurricane soils are generally nearly level to gently sloping (typically less than 1 percent), with very poorly drained to moderately well drained soils. Some of these soil associations are sandy throughout while others have loamy subsoil below a depth of 40 inches.

Albany-Pactolus Loamy Sand

Albany-Pactolus Loamy Sand ranges from somewhat poorly drained to moderately well drained, and from nearly level to gently sloping. The surface layer is typically loamy sand that ends at a depth of approximately 20 inches. The subsoil is a sandy loam and ranges in depth from 45 inches to 80 inches.

Bonneau-Norfolk-Angie Complex

Bonneau-Norfolk-Angie Complex soils are nearly level to strongly sloping and well drained. These soils range from loamy to sandy and contain loamy or clayey subsoil at a depth below 40 inches.

APPENDIX D

BIOLOGICAL RESOURCES

ECOLOGICAL ASSOCIATIONS AND OTHER LAND USES

Sandhills Ecological Association

The Sandhills Ecological Association encompasses approximately 136 acres (3 percent) of TA C-72. Longleaf Pine Sandhills are characterized by an open, savanna-like structure with a moderate to tall canopy of longleaf pine, a sparse midstory of oaks and other hardwoods, and a diverse groundcover composed mainly of grasses, forbs, and low stature shrubs. The structure and composition was maintained by frequent fires, (every 3 to 5 years), which controlled hardwood, sand pine and titi encroachment.

Longleaf pine sandhills consist of a high diversity of species adapted to fire and the heterogeneous conditions that fires create. Variation within the sandhills is recognized by two associations differing in the dominance of grass species (wiregrass versus bluestem). Sandhills are often associated with and grade into scrub, upland pine forest, xeric hammock, or slope forests. Associated trees include longleaf pine turkey oak, longleaf pine-xerophytic oak, longleaf pine-deciduous oak or high pine (U.S. Air Force, 2007). The functional significance of the Sandhill ecological association is to provide maintenance of regional biodiversity. Additionally, the sandhills, due to their wide coverage on Eglin, are the ecological association across which fire carries into the other imbedded fire-dependent systems. Eglin AFB is the largest and least fragmented single longleaf pine ownership in the world, and has the best remaining old growth longleaf pine. Seepage slopes are a common embedded wetland feature found within Eglin's sandhill matrix.

Wetland/Riparian Ecological Association

Wetlands and Riparian ecological associations on Eglin AFB can be divided into the following categories: (1) wetlands, which are dominated by plants adapted to anaerobic substrate conditions imposed by saturation or inundation for more than 10 percent of the growing season; (2) lacustrine wetlands that occur in nonflowing wetlands of natural depressions; and (3) riverine communities, which are natural, flowing waters from their source to the downstream limits of tidal influence and are bounded by channel banks. The above categories are further broken down into the following natural community types.

Floodplain wetlands have alluvial sand or peat substrates associated with riverine natural communities and are subject to flooding but not permanent inundation.

- (1) Bottomland forest – Bottomland forest occurs on low-lying flatlands, usually bordering streams with distinct banks, where water rarely inundates the forest, such as areas along the Yellow River. On Eglin AFB, these communities are also found on low terraces along the larger streams, such as Alaqua Creek.
- (2) Floodplain forest – This term is used to designate river bottoms and low creek bottoms. In swamps with a recent fire history, the common tree is the black titi.

Basin wetlands are shallow, closed basin with an outlet usually only in time of high water. Bottom substrate is typically peat or sand and is usually inundated. Basin wetland vegetation is woody and/or herbaceous.

- (1) Depression marsh – These systems are shallow, usually rounded depressions in sand substrate with herbaceous vegetation often in concentric bands. Peaty soil accumulates in the deepest sections where water is most permanent.
- (2) River floodplain lake – Fresh water ponds support a variety of aquatic vegetation. Not all ponds on the Reservation support the same vegetation.
- (3) Sandhills upland lake – Shallow, rounded depressions, sandy bottom, low nutrient.

Riparian zones may be classified into the following ravine natural community types.

- (1) Alluvial stream – Clay and silt carrying, larger streams, perennial (Yellow River). Alluvial streams are characterized as perennial or intermittent seasonal watercourses originating in high uplands that are primarily composed of sandy clays and clayey-silty sands. Surface runoff generally predominates over subsurface drainage.
- (2) Blackwater stream – Blackwater streams are characterized as perennial or intermittent seasonal water courses originating deep in sandy lowlands where extensive wetlands with organic soils function as reservoirs, collecting rainfall, and discharging it slowly to the stream. The dark, tea-colored water typical of blackwater streams are laden with tannins, particulates, dissolved organic matter, and iron derived from drainage through swamps and marshes.
- (3) Seepage stream – Seepage streams are characterized as perennial or intermittent seasonal water courses, originating from shallow ground waters that have percolated through deep, sandy, upland soils. These streams are typically clear to lightly colored and are relatively short, shallow, and narrow.

Table D-1 shows the type of Wetlands/Riparian ecological associations found on or adjacent to Eglin AFB. The Wetland/Riparian Ecological Association accounts for less than 1 percent of TA C-72.

Table D-1. Wetland Types by Wetland/Riparian Ecological Association on or Adjacent to Eglin AFB

Type of Wetlands	Source of Hydrology	Substrate	Vegetation	Functional Significance
Depression Wetlands	Groundwater or rainwater	Peat or sand	Woody and/or herbaceous	Maintains regional biodiversity Floodwater storage Filters pollutants Maintains water quality
Seepage Slopes	Downslope seepage (sheetflow)	High in clay	Herbaceous	Rare habitats High biodiversity
Floodplain Wetlands	Rivers, streams, and creeks	Peat or sand	Woody and/or herbaceous	Maintains regional biodiversity Floodwater storage Wildlife corridors Maintains water quality

Source: U.S. Air Force, 2007

Flatwoods Ecological Association

TA C-72 does not contain areas of flatwoods ecological association within the test area boundary; however, flatwoods ecological association is located in proximity to the southeastern boundary of the test area. Pine flatwoods occur on flat, moderately well drained sandy soils with varying levels of organic matter, often underlain by a hard pan. While the canopy consists of slash pine and longleaf pine, the understory varies greatly from shrubby to an open diverse understory of grasses and herbs. The primary environmental factors controlling vegetation type are soil moisture (soil type and depth to groundwater) and fire history. The average fire frequency in flatwoods is one to eight years, with nearly all of the plants and animals inhabiting this community adapted to recurrent fires. Home to numerous rare and endangered plants and animals, the Flatwoods Matrix plays a significant role in maintaining regional biodiversity, Eglin's more than 300 acres of old growth flatwoods are among the last remaining of such high quality.

Other Land Uses

Open Grasslands/Shrublands

Open Grasslands/Shrublands are the largest land use on TA C-72 and encompass approximately 4,329 acres (94 percent). The Open Grasslands/Shrublands occur in areas of heavily disturbed Sandhills, Flatwoods, and Wetlands/Riparian ecological sites (U.S. Air Force, 2003) and predominantly occur within the test areas on Eglin AFB. The Open Grassland/Shrubland association is characterized by grasses and low shrubs and is maintained with machinery or fire that removes or prevents future growth. Riparian zones are found throughout these areas.

Urban/Landscaped Areas

Urban/landscaped areas encompass approximately 126 acres (3 percent) of TA C-72. Eglin AFB currently has approximately 46,000 acres of semi-improved areas and 14,000 acres of improved areas. Bahia grass (*Panicum notatum*) is the primary turf grass that is used in the semi-improved areas while St. Augustine grass (*Stenotaphrum secundatum*) and Centipede grass (*Eremochloa ophiuroides*) are the primary turf grasses used in the improved areas. Ground maintenance encourages low-maintenance landscaping and uses native plants whenever possible (U.S. Air Force, 2007).

SENSITIVE SPECIES

Okaloosa Darter (*Etheostoma okaloosae*)

The Okaloosa darter is a small federally and state-listed endangered fish. Spawning occurs from March to October, with the greatest amount of activity taking place during April (USFWS, 1998). The entire global population of this species is found in the tributaries and main channels of Toms, Turkey, Mill, Swift, East Turkey, and Rocky Creeks, which drain into two bayous of Choctawhatchee Bay. These seepage streams have persistent discharge of clear, sand-filtered water through sandy channels, woody debris, and vegetation beds. The Eglin Range contains

90 percent of the 457-square kilometer (176 square mile) drainage area. The remaining portions of the watershed are within the urban areas of Niceville and Valparaiso (U.S. Air Force, 2006).

The most immediate threat to the Okaloosa darter is loss of habitat through degradation of stream water quality from soil erosion into streams. The sources with high soil and sediment erosion probability are borrow pits, clay roads that cross streams, and a few test area sites where vegetation is maintained by using choppers on slopes. A 1992 study identified erosion from borrow pits and roads as major contributors to the degradation of darter habitat. Mission activities could avoid further degradation of stream quality by keeping vehicle activity and troop movement confined to trails, bridges, and roads and conducting ground-disturbing activities only outside of a 300-foot buffer around Okaloosa darter streams. These procedures are available to minimize sediment erosion into the darter watersheds and to avoid a consultation process under Endangered Species Act (ESA) regulations (U.S. Air Force, 2006).

Due to a recovery plan that Eglin AFB implemented for the Okaloosa darter in 1998, the darter is currently under federal status review for potential downlisting from endangered to threatened. The final rule is on schedule to be published in March 2011. To ensure down-listing of the Okaloosa darter, Eglin AFB is protecting instream flows and historical habitat through management plans, conservation agreements, easements, and/or acquisitions; is implementing an effective habitat restoration program to control erosion from roads, clay pits, and open ranges; is demonstrating that the Okaloosa darter population is stable or increasing and that the range of the Okaloosa darter has not decreased at all historical monitoring sites; and is seeing that no foreseeable threats exist that would impact the survival of the species.

The Eglin Natural Resources Section (NRS) is over 95 percent complete with erosion control projects in darter watersheds and will soon be entering the maintenance phase (U.S. Air Force, 2009).

Eastern Indigo Snake (*Drymarchon corais couperi*)

The federally threatened eastern indigo snake is the largest nonvenomous snake in North America and can grow up to 125 inches in length. The primary reason for its listing is the population decline resulting from habitat loss and fragmentation. Movement along travel corridors between seasonal habitats also exposes the snake to danger from increased contact with humans. The snake frequents flatwoods, hammocks, stream bottoms, canebrakes, riparian thickets, and high ground with deep, well drained to excessively drained, sandy soils. Habitat preferences vary seasonally. Xeric Sandhill winter dens are used from December to April; from May to July they shift from winter dens to summer territories; from August through November they are frequently located in shady creek bottoms.

The indigo snake is strongly associated with gopher tortoise burrows. They use abandoned burrows in winter and spring for egg laying, shedding, and protection from dehydration and temperature extremes. They also use stump holes, armadillo and gopher holes, and other wildlife ground cavities.

Red-Cockaded Woodpecker (*Picoides borealis*)

The RCW (*Picoides borealis*) is listed as a federally endangered bird species and a state species of special concern. The RCW excavates cavities in live longleaf pine trees that are at least 85 years old. The RCW historically had a habitat range as far north as New Jersey and as far west as Oklahoma. Today, the RCW has been restricted to the southeastern United States, from Florida to Virginia and to southeast Texas, due to a loss of habitat. In the southeast, 98 percent of the longleaf pine forests have been removed, making relatively undeveloped federal lands such as Eglin AFB primary habitat for the species. Due to the preservation of continuous longleaf pine forests on Eglin, the Eglin Range has one of the largest remaining populations of RCWs in the country. In 2003, USFWS identified Eglin AFB as 1 of 13 primary core populations for the RCW (U.S. Air Force, 2006).

As of 6 August 2009, the RCW population on Eglin reached the designated recovery goal of 350 potential breed groups (PBGs). The current population size (as of August 2010) is 429 active clusters and 392 PBGs (Figure D-1). This meets Eglin's recovery goal as established in the official species recovery plan. Eglin reinitiated consultation on 2 December 2009, with the USFWS on the management of the RCW; it was determined that Eglin's current management actions, including implementation of conservation measures, generally continue to have no effect or are not likely to adversely affect the RCW. The USFWS concurred with this determination and provided a letter of concurrence dated 24 March 2010.

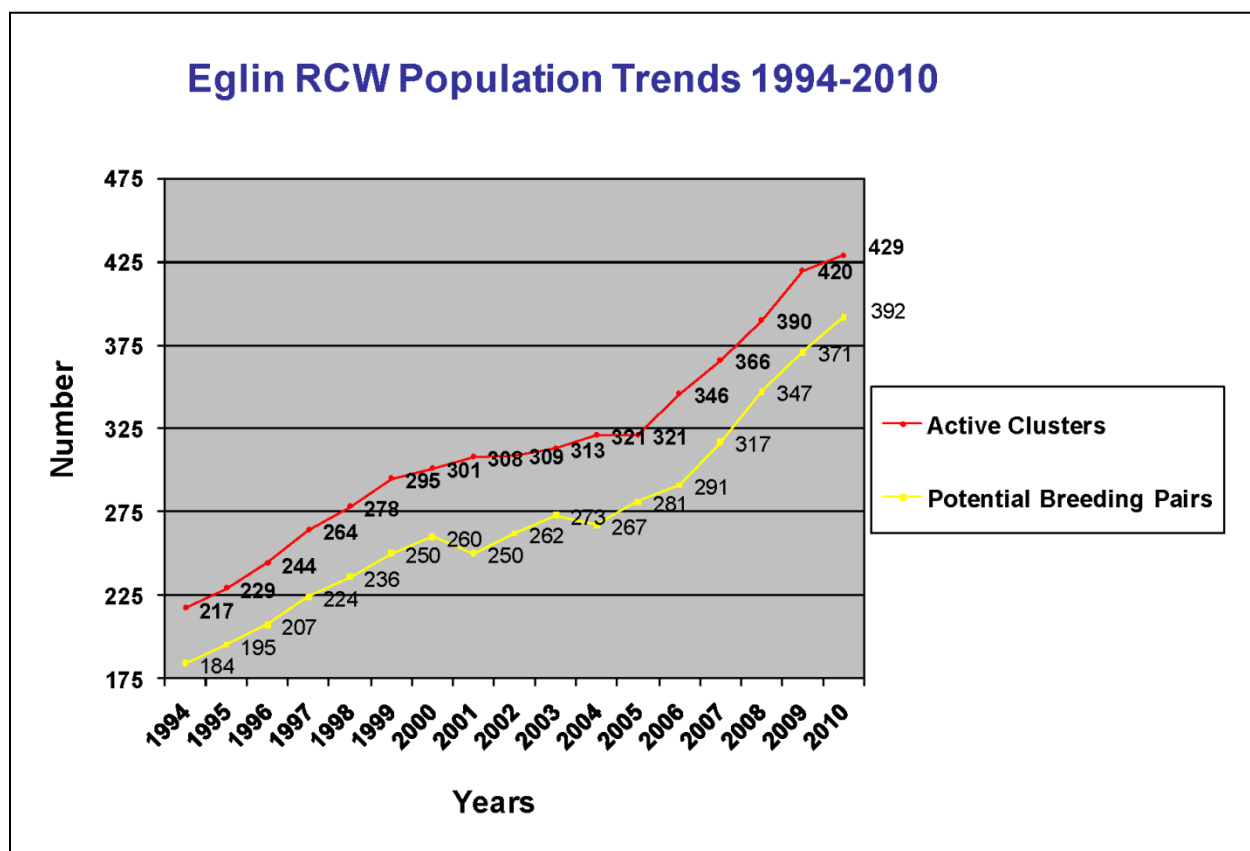


Figure D-1. Eglin RCW Population Trends 1994–2010

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is a state-threatened species. The tortoise is found primarily within the Sandhills and open grassland ecological associations on the Eglin Range, where it excavates a tunnel-like burrow for shelter from climatic extremes and refuge from predators. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (forbs and grasses). Prescribed fire is often employed to maintain these conditions. Nesting occurs during May and June and hatching occurs from August through September. Gopher tortoise burrows serve as important habitat for many species, including the federally listed eastern indigo snake (U.S. Air Force, 2006).

Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear was proposed for federal listing in 1990, however, in 1998 the USFWS removed it from listing consideration. The Florida black bear is currently listed as a state-threatened species except in Baker and Columbia counties and in the Apalachicola National Forest. Black bear populations are currently found in Florida, Georgia, and a small population in Alabama. Eglin AFB is considered to be the smallest population, with an estimated 60 to 100 individuals; however, Eglin's black bear population has shown signs of increase since the early 1990s (U.S. Air Force, 2002). Eglin's Natural Resources Section frequently receives reports of bear sightings and has responded to a growing number of bear/vehicle collisions and nuisance bear complaints. Most black bears on Eglin utilize the large swamps and floodplain forests in the southwest and northern portions of the Reservation. Black bear sightings have occurred in numerous locations throughout the Eglin Reservation, the majority of which have been within the interstitial areas.

Black bears eat a wide variety of food items. Their seasonal and annual diet consists primarily of fruits, acorns, beetles, and yellow jackets. Black bear in Florida breed in June–July. Implantation is delayed about four months and gestation lasts 7 to 7.5 months (average 220 days) (U.S. Air Force, 2002). Females give birth every two years, at most. Young are born in January–February, and stay with their mother until fall of the second year. Litter size is typically two to four cubs and females generally give birth at 3 to 4 years old (U.S. Air Force, 2002).

Southeastern American Kestrel (*Falco sparverius paulus*)

The Southeastern American kestrel is state-listed as threatened. The kestrel is a small falcon with pointed wings, a reddish back and tail, and two black stripes on each side of the white sides of its head. Kestrels are relatively common on Eglin AFB. The clutch size is three to seven (usually four to five). Incubation is conducted mainly by females, and usually lasts 29 to 31 days. Young are cared for by both parents and usually leave the nest in about 29 to 31 days. Kestrels will readily renest if the first clutch is lost.

Kestrels prefer open or partly open sandhills habitat. On Eglin, kestrels frequently utilize the cleared test areas as foraging areas and nest in cavities most often in longleaf pine trees. Cavity trees may be dead or alive. Kestrels frequently nest in old growth longleaf pines that contain cavities originally excavated by RCW. These cavities are usually enlarged by fox squirrels, pileated woodpeckers, or fire, making them large enough for kestrel use. Kestrels will readily use nest boxes; however, Eglin appears to contain an abundance of suitable nesting habitat.

Kestrels feed on insects (e.g., grasshoppers and crickets) and small vertebrates (e.g., snakes, lizards, birds, mice, and sometimes bats). They often utilize the tree line or utility poles adjacent to and within cleared test areas.

Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake has physically adapted to digging in the loose sand and also enters rodent burrows and occasionally gopher tortoise burrows. It is currently listed as a species of special concern by the state of Florida. Adults of this species are generally between 4 and 7 feet long, with an indistinct pattern of light brown blotches with a rusty background (USFWS et al., 2003). The Florida pine snake prefers sandhills, sand pine scrub, and pastures with dry, sandy soils and open canopies. They are found throughout most of the state, however, they are absent from the Keys. Pine snake habitat is best managed by maintaining gopher tortoise populations and by keeping soil and ground disturbance to a minimum.

MIGRATORY BIRDS

The Migratory Bird Treaty Act (16 USC 703-712; 1997-Supp) and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, protect migratory birds and their habitats and establish a permitting process for legal taking. A migratory bird is defined by the USFWS as any species or family of birds that lives, reproduces, or migrates within or across international borders at some point during their annual life cycle. For normal and routine operations such as installation support functions, actions of the DoD may not result in pursuit, hunting, taking, capturing, killing, possession, or transportation of any migratory bird, bird part, nest, or egg thereof, except as permitted. The DoD must address these routine operations through the Memorandum of Understanding developed in accordance with EO 13186 (DoD and USFWS, 2006). Under the 2003 National Defense Authorization Act, the Armed Forces are exempted from the incidental taking of migratory birds during military readiness activities, except in cases where an activity would likely cause a significant adverse effect to the population of a migratory bird species. As detailed in the final rule in the *Federal Register* (50 CFR 21), in this situation the Armed Forces, in cooperation with the USFWS, must develop and implement conservation measures to mitigate or minimize the significant adverse impacts (*Federal Register*, 2007).

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APPENDIX E

AIR QUALITY

AIR QUALITY SUPPLEMENTAL INFORMATION

This appendix provides a general overview of the federal and state regulatory air quality programs. Additionally, the appendix discusses emission factor development and calculations including assumptions employed in the air quality analyses presented in the Air Quality sections of this Range Environmental Assessment (REA).

AIR QUALITY PROGRAM OVERVIEW

In order to protect public health and welfare, the U.S. Environmental Protection Agency (USEPA) has developed numerical concentration-based standards or National Ambient Air Quality Standards (NAAQS) for six “criteria” pollutants (based on health-related criteria) under the provisions of the Clean Air Act (CAA) Amendments of 1970. There are two kinds of NAAQS: primary and secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (Government Printing Office, no date).

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the federal program. The Division of Air Resource Management within the Florida Department of Environmental Protection (FDEP) administers the state’s air pollution control program under authority of the Florida Air and Water Pollution Control Act and the Environmental Protection Act.

Florida has adopted the NAAQS as written in the federal regulations (40 Code of Federal Regulations [CFR] Part 51), except Florida has established a more conservative standard for sulfur dioxide (SO₂). USEPA has set the annual and 24-hour standards for SO₂ at 0.03 parts per million (ppm) (80 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) and 0.14 ppm (365 $\mu\text{g}/\text{m}^3$), respectively. Florida has adopted the more stringent annual and 24-hour standards of 0.02 ppm (60 $\mu\text{g}/\text{m}^3$) and 0.1 ppm (260 $\mu\text{g}/\text{m}^3$), respectively. In addition, Florida has adopted the national secondary standard of 0.50 ppm (1,300 $\mu\text{g}/\text{m}^3$). Federal and State of Florida ambient air quality standards are presented in Table E-1 (Florida Administrative Code [FAC]).

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States as having air quality better than the NAAQS (attainment), worse than the NAAQS (nonattainment), and unclassifiable. Those areas that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are “unclassifiable” and are treated as attainment until proven otherwise. Attainment areas can be further classified as “maintenance” areas. Maintenance areas are those areas previously classified as nonattainment that have successfully reduced air pollutant concentrations below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. All areas of the state of Florida are in compliance with the NAAQS.

Table E-1. National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Federal Primary NAAQS(8)	Federal Secondary NAAQS(8)	Florida Standards
Carbon Monoxide (CO)	8-hour(1)	9 ppm	No standard	9 ppm
		(10 mg/m ³)		(10 µg/m ³)
	1-hour(1)	35 ppm	No standard	35 ppm
		(40 mg/m ³)		(40 µg/m ³)
Lead (Pb)	Quarterly	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³
Nitrogen Dioxide (NO ₂)	Annual	0.053 ppm	0.053 ppm	0.053 ppm
		(100 µg/m ³)	(100 µg/m ³)	(100 µg/m ³)
Particulate Matter ≤10 Micrometers (PM ₁₀)	24-hour(2)	150 µg/m ³	150 µg/m ³	50 µg/m ³
Particulate Matter <2.5 Micrometers (PM _{2.5})	Annual(3)	15 µg/m ³	15 µg/m ³	150 µg/m ³
	24-hour(4)	35 µg/m ³	35 µg/m ³	15 µg/m ³
Ozone (O ₃)	1-hour(7)	0.12 ppm	0.12 ppm	65 µg/m ³
		(235 µg/m ³)	(235 µg/m ³)	0.12 ppm
	8-hour(5)	0.075 ppm (2008 std)		(235 µg/m ³)
	8-hour(6)	0.08 ppm (1997 std)	0.08 ppm	
Sulfur Dioxide (SO ₂)	Annual	0.03 ppm	No standard	0.02 ppm
		(80 µg/m ³)		(60 µg/m ³)
	24-hour(1)	0.14 ppm	No standard	0.10 ppm
		(365 µg/m ³)		(260 µg/m ³)
	1-hour(1)	75 ppb	0.50 ppm	0.50 ppm
			(1300 µg/m ³)	(1300 µg/m ³)

Source: USEPA, 2011 (Federal Standards); FAC 62-204.240, 2006 (Florida Standards)

ppm = parts per million; mg/m³ = milligrams per cubic meter; NAAQS = National Ambient Air Quality Standards; µg/m³ = micrograms per cubic meter

- (1) Not to be exceeded more than once per year
- (2) Not to be exceeded more than once per year on average over 3 years
- (3) To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.
- (4) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).
- (5) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
- (6) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
 (b) The 1997 standard, and the implementation rules for that standard, will remain in place for implementation purposes as the USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
- (7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
 (b) As of June 15, 2005 the USEPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

Each state is required to develop a state implementation plan (SIP) that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state, and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

Florida has a statewide air quality-monitoring network that is operated by the state *FDEP State Air Monitoring Reports* (FDEP, 1996). Ambient air quality data from these monitors are used to assess the regions' air quality in comparison to the NAAQS. The air quality is monitored for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide. The monitors tend to be concentrated in areas with the largest population densities. Not all pollutants are monitored in all areas. The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards; also included are areas where the ambient standards are being met, but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The end result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality exceedances of the NAAQS as well as pollutant trends.

The FDEP Northwest District operates monitors in several northwest counties, including Bay, Escambia, and Santa Rosa Counties. Over the years of record there have been exceedances (pollutant concentration greater than the numerical standard) of the NAAQS. However, there has not been a violation (occurrence of more exceedances of the standard than is allowed within a specified time period) of an ambient standard (*FDEP State Air Monitoring Reports*). Currently, all areas in the state of Florida are attainment for all criteria pollutants.

PROJECT CALCULATIONS: AIR EMISSIONS OF CRITERIA POLLUTANTS

Regulatory Compliance Methodologies

Mission-generated air emissions were analyzed to enable comparison to NAAQS and to the cumulative impact to the air shed within the affected Region of Influence (ROI). Activities occurring within the Test Area (TA) C-72 range that have the greatest potential to impact air quality are munitions and vehicle activities including particulate emissions that result from the dust of unpaved roads and trails. Aircraft emissions have been omitted from this REA, since all aircraft emissions are addressed in the Air Operations Environmental Baseline Document (EBD). In order to conservatively estimate the potential impact of these operations with short-term

ambient air quality, a Closed Box Assessment (CBA) was performed. Additionally, the annual emissions were compared to the USEPA 2002 National Emissions Inventory (NEI) for the ROI. Both techniques are described below, as well as the emissions calculations and project assumptions.

The Closed Box Assessment

The CBA provides a means to estimate maximum short-term impacts from emissions in a given element of space. Several assumptions are incorporated into this technique. First, it assumes that emissions are homogeneously mixed and contained within a defined volume of space throughout which the activities occur. For this assessment, this volume of air is defined by vertical and lateral boundaries. The vertical boundary of altitude established was 3,000 feet above sea level (ASL), and the dimensional area within the TA C-72 Range was utilized for lateral boundaries.

Second, the CBA assumes that the calculated concentrations within the defined box of criteria pollutants resulting from the operations are representative activities of the maximum resultant ground-level (i.e., sea-level) concentrations. Because of these assumptions, the results of these calculations are expected to indicate somewhat higher air quality impacts than those that would result from a more structured dispersion model. However, the results do provide a maximum impact scenario for comparison with established ambient air quality standards.

For this assessment, it was assumed that activities occurring within the TA C-72 range operated randomly. The ceiling altitude of 3,000 feet was chosen as a conservative estimate of the average height for stable temperature inversion common to the area. This type of inversion can significantly inhibit, if not effectively block, vertical mixing and widespread dispersion of some air pollutants. Therefore, pollutants can be considered confined between the base of the inversion and the ground, or that portion of the lower atmosphere commonly termed the mixing layer. The mixing-layer height determines the vertical extent of the dispersion process for pollutant releases below the mixing height.

A conservative one-hour scenario was developed encompassing the individual emissions associated with mobile sources as well as ordnance and munitions activities. The scenario assumes that all activities within the year occurred during the same time frame. These calculated one-hour emissions contributions were then compared to the appropriate NAAQS. For averaging times greater than one hour, the maximum concentration will generally be less than the calculated one-hour value. The comparison is limited to those criteria pollutants directly associated with range activities.

Vehicle Exhaust Calculations

Vehicle exhaust calculations were developed using emissions factors established by USEPA for various vehicle classes. The unit of measure for the vehicle emissions factors is represented in grams per vehicle mile traveled. These factors were correlated with the total vehicle mileage traveled in TA C-72.

Vehicles associated with mission activities were classified into two categories, gas and diesel powered. This method of combining the USEPA's four vehicle classes into two has been previously used in the 2009 Eglin Mobile Source Emissions Inventory. Previously, it has been determined that over 90 percent of the Eglin Range vehicular traffic is gasoline powered, while the remainder, over 9 percent, is composed of diesel.

Total road miles and average total vehicle road mileage traveled on Eglin's ranges were ascertained from the Greenhouse Gas Baseline Inventory published in 2010. The total road miles within TA C-72 was compared to the total Eglin Range road miles and converted to a percentage. It was assumed that the percentage of road miles that compose TA C-72 was a direct correlation with the vehicle miles traveled within TA C-72. This provides a conservative estimate of vehicle miles traveled.

Using the assumptions described, the vehicle miles traveled for the individual classes of vehicles were extrapolated. Emissions were ascertained utilizing the emission factors and mathematical expression provided below.

Table E-2 below contains the emission factors for each vehicle class.

$$\text{Emissions (tons/yr)} = (\text{RRM/TRRM}) \times \text{TAYVM} \times \text{EF} \times \text{CF}_1$$

$$\text{Emissions } (\mu\text{g}/\text{m}^3 \times \text{hr}) = (\text{RRM}/(\text{TRRM} \times \text{TV}) \times \text{TAYVM} \times \text{EF} \times \text{CF}_2$$

Where:

- RRM* = Range Road Miles (total miles for given range)
- TRRM* = Total Range Road Miles (Eglin's total range road miles)
- TAYVM* = Total Average Yearly Vehicle Miles traveled on Eglin's ranges
- TV* = Closed Box Volume
- EF* = Emission Factor
- CF₁* = Conversion Factor (1.1E-6)
- CF₂* = Conversion Factor (3.6E5)

CF₁ converts from grams to pounds, and then to tons. *CF₂* converts into micrograms and weights the value over an hour.

Table E-2. Vehicle Emission Factors

Emission Factors (g/mi)	CO	SO_x	NO_x	PM	VOC
Classes I, II	25	0.11	2.7	2.9	2.8
Classes III, IV	5	0.26	3.6	3.4	1.2

CO = carbon monoxide; g/mi = grams per vehicle mile traveled; NO_x = nitrogen oxides; PM = particulate matter;
SO_x = sulfur oxides; VOC = Volatile Organic Compounds

Vehicle Dust Emissions

When vehicles travel on unpaved roads, particulate matter (PM) is emitted into the air. In order to determine the amount of total suspended particulate matter (TSP) due to the activities on unpaved roads, several variables must be defined, such as percent surface silt content, mean vehicle weight (tons), mean vehicle speed (miles per hour [mph]), mean number of wheels per vehicle, and some constants.

Silt content was assumed to be a conservative value of 5 percent due to Florida's very low material surface silt content (USEPA, 2006). The mean weight of the vehicles traveling on the unpaved roads were determined to be 3 tons, since 91 percent of the vehicles traveling on the roads are considered classes I and II, which are mainly light trucks, cars, and suburban-type vehicles with weights ranging from 1.0 to 5.0 tons. Mean vehicle speed was deemed 35 mph; this value was based on previous studies, road conditions, and safety precautions considered when driving on unpaved roads. The variables and assumptions stated above along with the equation below were derived assuming dry road conditions (USEPA, 2006).

The following empirical expression was used to estimate the amount in pounds of particulate matter emitted from the unpaved road due to vehicle traffic.

$$E = [k(s/12)^a(S/30)^d] / [(M/0.5)^c] - C$$

Where:

- E* = emissions in (lbs)
- k* = particle size multiplier
- s* = silt content on road surface (%)
- S* = mean vehicle speed (mph)
- W* = mean number of wheels per vehicle
- M* = Moisture content
- a, c, & d* = constants (USEPA, 2006)

CUMULATIVE IMPACT COMPARISON

In order to evaluate the range emissions and their impact to the overall ROI, which is defined as Walton County for this document's purposes, the emissions associated with the range activities were compared to the total emissions on a pollutant-by-pollutant basis for the ROI's 2002 NEI data. Potential impacts to air quality are identified here as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10 percent criterion approach was used in the USEPA's General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas. The U.S. Environmental Protection Agency made revisions to the General Conformity Regulations on March 24, 2010. These final revisions remove the requirements for federal agencies to conduct conformity determinations for "regionally significant" actions. Such actions have emissions greater than 10 percent of the

emissions inventory for a nonattainment area. However, this criterion will still be used in this analysis for the purposes of discussion and comparison.

In accordance with Section 176(c) of the CAA, USEPA promulgated the General Conformity Rule that is codified at 40 CFR 51, Subpart W. The provisions of this rule apply to state review of all federal actions submitted pursuant to 40 CFR 51, Subpart W, and incorporated by reference at Rule 62-204.800, FAC. The Conformity Rule only affects federal actions occurring in nonattainment areas (areas that do not meet the NAAQS) and maintenance areas (areas that were classified as nonattainment but now are in attainment). Since the Proposed and Alternative Actions are located in attainment areas, Eglin Air Force Base (AFB) would not be required to prepare a conformity determination for the activities described. However, the general concept of the conformity rule was used as a criterion, although not necessary.

For impacts screening in this analysis, however, a more restrictive criteria than required in the General Conformity Rule was used. Rather than comparing emissions from test activities to regional inventories (as required in the General Conformity Rule), emissions were compared to the individual counties potentially impacted, which is a smaller area.

National Emissions Inventory

The NEI is operated under USEPA's Emission Factor and Inventory Group, which prepares the national database of air emissions information with input from numerous state and local air agencies, from tribes, as well as from industry. The database contains information on stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants (HAPs). The database includes estimates of annual emissions, by source, of air pollutants in each area of the country, on an annual basis. The NEI includes emissions estimates for all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. Emissions estimates for individual points or major sources (facilities), as well as county level estimates for area, mobile, and other sources, are available currently for years 1996, 1999, and 2002 for criteria pollutants and HAPs.

Criteria air pollutants are those for which USEPA has set health-based standards. Four of the six criteria pollutants are included in the NEI database.

- Carbon Monoxide (CO)
- Nitrogen Oxides (NO_x)
- SO₂
- Particulate Matter (PM₁₀ and PM_{2.5})

The NEI also includes emissions of Volatile Organic Compounds (VOCs), which are ozone precursors, emitted from motor vehicle fuel distribution and chemical manufacturing, as well as other solvent uses. VOCs react with NO_x in the atmosphere to form ozone. The NEI database defines three classes of criteria air pollutant sources.

- Point sources - Stationary sources of emissions, such as an electric power plant, that can be identified by name and location. A "major" source emits a threshold amount (or

more) of at least one criteria pollutant and must be inventoried and reported. Many states also inventory and report stationary sources that emit amounts below the thresholds for each pollutant.

- Area sources - Small point sources such as a home or office building, or a diffuse stationary source, such as wildfires or agricultural tilling. These sources do not individually produce sufficient emissions to qualify as point sources. Dry cleaners are one example (i.e., a single dry cleaner within an inventory area typically will not qualify as a point source), but collectively the emissions from all of the dry cleaning facilities in the inventory area may be significant and therefore must be included in the inventory.
- Mobile sources - Any kind of vehicle or equipment with a gasoline or diesel engine, airplane, or ship.

The main sources of criteria pollutant emissions data for the NEI are:

- For electric generating units – USEPA’s Emission Tracking System/Continuous Emissions Monitoring Data (ETS/CEM) and Department of Energy fuel use data.
- For other large stationary sources - State data and older inventories where state data was not submitted.
- For on-road mobile sources - The Federal Highway Administration’s (FHWA’s) estimate of vehicle miles traveled and emission factors from USEPA’s MOBILE Model.
- For non-road mobile sources – USEPA’s NONROAD Model.
- For stationary area sources - State data, USEPA-developed estimates for some sources, and older inventories where state or USEPA data was not submitted.

State and local environmental agencies supply most of the point source data. USEPA’s Clean Air Market program supplies emissions data for electric power plants.

Greenhouse Gases and Climate Change

This section describes the current and pending federal, state, and Air Force regulations that have driven the GHG inventory effort at Eglin AFB to date as well as the methodology used in doing the analysis.

Federal Regulations

EO 13423: EO 13423 (January 24, 2007) required federal agencies to meet specific goals to improve energy efficiency and reduce GHG emissions by reducing energy intensity by 3 percent annually through the end of FY 2015, or by 30 percent by the end of FY 2015, relative to the baseline of the agency’s energy use in FY 2003.

House of Representatives (H.R.) 2764 (Public Law 110-161): In the FY 2008 Consolidated Appropriations Act, Congress directed the USEPA to publish a mandatory GHG reporting rule, using the agency’s existing authority under the CAA. Congress requested that the USEPA include reporting of emissions to the extent that the agency deems appropriate.

40 CFR 86, 87, 89: The USEPA published 40 CFR 86, 87, 89, et al. on October 30, 2009 (USEPA, 2009a; USEPA, 2009b) with an effective date of December 29, 2009. Eglin AFB would be required to report GHG emissions if it meets the qualifications described in 40 CFR 98.2(3) (ii) and (iii). That ruling states that GHG emissions must be inventoried and reported by any facility that emits 25,000 metric tons of CO₂e or more per year from all stationary fuel combustion sources and has an aggregate maximum rated heat input capacity of its stationary fuel combustion units of 30 million British thermal units per hour (MMBtu/hr) (USEPA, 2009a).

EO 13514: On October 5, 2009, the President issued an Executive Order requiring that, within 90 days of the order, each agency shall report to the Chair of the Council on Environmental Quality a percentage reduction target for agency-wide reductions of scope 1 and scope 2 GHG emissions in absolute terms by FY 2020 and, within 240 days of the order, a target for agency-wide scope 3 GHG emissions, relative to FY 2008 baseline of the agency's scope 1, 2, and 3 GHG emissions.

State Regulations

Florida Governor Charlie Crist signed three executive orders regarding GHG emissions in 2007 (FDEP, 2009c):

- EO 07-126 requires state government to measure their GHG emissions and work to reduce emissions by 10 percent by 2012, 25 percent by 2017, and 40 percent by 2025.
- EO 07-127 directed the adoption of maximum emission levels of GHGs for electric utilities requiring a reduction of emissions to year 2000 levels by 2017, to year 1990 levels by 2025, and by 80 percent of year 1990 levels by 2050.
 - Florida would also adopt the California motor vehicle emission standards of 22 percent reduction in vehicle emissions by 2012 and a 30 percent reduction by 2016, pending approval of the USEPA waiver.
- EO 07-128 creates a Governor's Action Team on Climate Change that would be responsible for producing a Florida Climate Change Action Plan that will include strategies beyond the executive orders to reduce emissions, including recommendations for proposed legislation for consideration during the 2008 Legislative Session and beyond.

Currently Florida does not have a set standard or rule regarding GHG emission reporting. FDEP initiated three rulemaking projects aimed at reducing Florida's GHG emissions (FDEP, 2009d):

- Rules to reduce GHG emissions from electric utilities
- Adoption of the California motor vehicle emissions standards
- Developing a diesel idle reduction standard

Air Force Guidance

In accordance with the Air Force Energy Program Policy Memorandum disseminated on June 16, 2009, the Air Force is evaluating and developing protocols that will allow it to identify,

quantify, and manage GHG emissions as well as potential carbon offsets. These will include point and mobile sources as well as direct and indirect emissions resulting from Air Force operations (U.S. Air Force, 2009).

AFMC has created their interim GHG emissions inventory guidance, dated February 2009, to assist its bases in developing GHG emission inventories in preparation for upcoming federal and/or state regulations (AFMC 2009). Accordingly, Eglin AFB has completed their GHG emissions inventory, dated May 2010 (U.S. Air Force, 2010).

PROJECT CALCULATIONS: AIR EMISSIONS OF GREENHOUSE GASES

The six primary greenhouse gases that are internationally recognized and regulated under the Kyoto Protocol are:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF₆)

Emissions of CO₂, CH₄, and N₂O were analyzed in this document as the source of GHGs were primarily from vehicles used on the range and those from line of sight tree-clearing activities. The following data was required to calculate the emissions for on-road highway vehicles:

- vehicle class
- VMT
- fuel type
- average model year
- average fuel efficiency
- emission factor
- global warming potentials

Emission Calculation Algorithms

Emissions from on-road highway vehicles were calculated by multiplying the fuel consumption by the appropriate emission factor.

$$E_{pol} = [(EF \times FC \times GWP) / 2,000] \times 0.90718$$

Where:

- EPOL = Emissions of a particular pollutant (metric tons CO₂e)
 EF = Emission Factor (lb/gal)
 FC = Fuel Consumption (gallons)
 GWP = Global Warming Potential
 2,000 = Conversion from pounds to short tons
 0.90718 = Conversion from short tons to metric tons

Table E-3 shows the Global Warming Potentials used.

Table E-3. Global Warming Potentials

Pollutant	GWP
CH ₄	21
N ₂ O	310

Source: IPCC, 2007

Emission factors for CO₂ are provided in Table E-4 and emission factors for CH₄, and N₂O and are provided in Table E-5.

Table E-4. CO₂ Emission Factors for On-Road Highway Vehicles

GHG	Emission Factor (lb/gal)
Motor Gasoline	
CO ₂	19.4224
Diesel	
CO ₂	22.3765

Source AFMC, 2009

Table E-5. Emission Factors for CH₄ and N₂O for On-Road Highway Vehicles

Vehicle Class	GHG	Emission Factor (lb/gal)
Motor Gasoline		
Class 1	CH ₄	1.6152×10^{-3}
	N ₂ O	1.4664×10^{-3}
Class 2	CH ₄	1.4317×10^{-3}
	N ₂ O	1.0485×10^{-3}
Diesel		
Class 3	CH ₄	7.1429×10^{-5}
	N ₂ O	3.5714×10^{-5}
Class 4	CH ₄	6.4815×10^{-5}
	N ₂ O	4.3210×10^{-5}

Source AFMC, 2009

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APPENDIX F

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION

Introduction

This document provides the State of Florida with the U.S. Air Force's Consistency Determination under CZMA Section 307 and 15 C.F.R. Part 930 sub-part C. The information in this Consistency Determination is provided pursuant to 15 C.F.R. Section 930.39 and Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456, as amended, and its implementing regulations at 15 C.F.R. Part 930.

This federal consistency determination addresses the Proposed Action associated with testing and training activities as well as line of sight tree-clearing activities on Test Area (TA) C-72, Eglin Air Force Base (AFB), Florida (Figures 1 and 2).

Proposed Federal agency action:

The Proposed Action is for the 46 TW commander to establish a new authorized level of activity for TA C-72 that is based on an anticipated maximum usage in addition to line of sight tree-clearing activities. The region of influence (ROI) for this analysis is TA C-72, which is located on the eastern side of the Eglin Range Complex in Walton County, about 13 miles northeast of Eglin Main base as shown in Figure 2. TA C-72 is bisected by two major streams and is 5.33 miles long. The test area provides over 4,585 acres of continuous land test area.

TA C-72 is suitable for scored testing of air-to-ground and ground-to-ground munitions. The tests supported range from small submunitions to 2,000-pound bombs and missiles. This test area is also equipped to support testing of ground-launched weapons and ground testing of aircraft launchers, rockets, and dispensing systems. Through the support of various test sites, users may perform ground tests of rockets, launchers, and systems with real-time video, weather, laser, camera control, and time-space-position information. Various combinations of targets are also available including laser scoring and hardened high-value structures. TA C-72 also provides a 500-foot inclined rocket sled track for lobbing test items. This track has been inactive for many years and would need significant refurbishment before use.

Missions on TA C-72 are scheduled and monitored by the 46 TW. TA C-72 supports a variety of user groups and testing and training activities, which are detailed in Appendix A in the Draft Range Environmental Assessment.

The Proposed Action also includes line of sight tree clearing and maintenance. Tree clearance is required because video tracking sites are obstructed from viewing test missions. It was recognized that a failure to remove the trees could result in valuable data loss on Eglin test missions. The areas that would be cleared and maintained are shown in Figure 3.

Federal Review

Statutes addressed as part of the Florida Coastal Zone Management Program consistency review and considered in the analysis of the Proposed Action are discussed in the following table.

Pursuant to 15 C.F.R. § 930.41, the Florida State Clearinghouse has 60 days from receipt of this document in which to concur with, or object to, this Consistency Determination, or to request an extension, in writing, under 15 C.F.R. § 930.41(b). Florida's concurrence will be presumed if Eglin AFB does not receive its response on the 60th day from receipt of this determination.

Florida Coastal Management Program Consistency Review

Statute	Consistency	Scope
Chapter 161 <i>Beach and Shore Preservation</i>	The Proposed Action would not affect beach and shore management, specifically as it pertains to: • The Coastal Construction Permit Program. • The Coastal Construction Control Line (CCCL) Permit Program. • The Coastal Zone Protection Program. All activities would occur on federal property.	Authorizes the Bureau of Beaches and Coastal Systems within DEP to regulate construction on or seaward of the states' beaches.
Chapter 163, Part II <i>Growth Policy; County and Municipal Planning; Land Development Regulation</i>	The Proposed Action would not affect local government comprehensive plans.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 <i>State and Regional Planning</i>	The Proposed Action would not affect state plans for water use, land development, or transportation.	Details state-level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 <i>Emergency Management</i>	The Proposed Action would not affect the state's vulnerability to natural disasters. The Proposed Action would not affect emergency response and evacuation procedures.	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 <i>State Lands</i>	All activities would occur on federal property; therefore the Proposed Action would not affect state public lands.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 <i>State Parks and Preserves</i>	The Proposed Action would not affect state parks, recreational areas and aquatic preserves.	Addresses administration and management of state parks and preserves.
Chapter 259 <i>Land Acquisition for Conservation or Recreation</i>	The Proposed Action would not affect tourism and/or outdoor recreation.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands.
Chapter 260 <i>Recreational Trails System</i>	The Proposed Action would not include the acquisition of land and would not affect the Greenways and Trails Program.	Authorizes acquisition of land to create a recreational trails system and to facilitate management of the system.
Chapter 375 <i>Multipurpose Outdoor</i>	The Proposed Action would not affect	Develops comprehensive multipurpose outdoor recreation plan to document

<i>Recreation; Land Acquisition, Management, and Conservation</i>	opportunities for recreation on state lands.	recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet the identified needs.
Chapter 267 <i>Historical Resources</i>	Historic sites and structures are located within the TA C-72 test range. Due to these structures' association with a significant period and important events in U.S. history (i.e., the Cold War), they must be evaluated collectively for the National Register of Historic Places (NRHP). Any activities that may cause adverse effects to these structures must be vetted through the 96th Civil Engineer Group/Cultural Resources Branch (96 CEG/CEVSH). In the event that unknown cultural resources are discovered during a mission activity, all activity in the immediate vicinity must cease until the Base Historic Preservation Officer and 96 CEG/CEVSH have been notified and a determination of significance has been rendered. No adverse effects to cultural resources are expected from implementation of the Proposed Action. Therefore, the Proposed Action would be consistent with the State's policies concerning historical resource management.	Addresses management and preservation of the state's archaeological and historical resources.
Chapter 288 <i>Commercial Development and Capital Improvements</i>	The Proposed Action would not affect future business opportunities on state lands, or the promotion of tourism in the region.	Provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.
Chapter 334 <i>Transportation Administration</i>	The Proposed Action would not affect transportation.	Addresses the state's policy concerning transportation administration.
Chapter 339 <i>Transportation Finance and Planning</i>	The Proposed Action would not affect the finance and planning needs of the state's transportation system.	Addresses the finance and planning needs of the state's transportation system.
Chapter 370 <i>Saltwater Fisheries</i>	The Proposed Action would not affect saltwater fisheries.	Addresses management and protection of the state's saltwater fisheries.
Chapter 372 <i>Wildlife</i>	Biological resources may be affected by the Proposed Action. Issues to be examined include potential impacts on wildlife and sensitive species and habitats from direct physical impact, habitat alteration, and noise. Habitat alterations are described as	Addresses the management of the wildlife resources of the state.

	the physical damage or perturbations to terrestrial and aquatic habitats, line of sight clearing (and maintenance) as a potential cause for erosion and sedimentation issues, and erosion into Okaloosa darter streams from munitions and/or munitions retrieval. Habitat alteration can occur as a result of fire started by flares or munitions or from soil disturbance associated with munitions. The major issue at TA C-72 for this category is the potential loss of gopher tortoise burrows, gopher frog ponds, potential flatwoods salamander ponds, and red-cockaded woodpecker (RCW) trees/foraging habitats from bombs, missiles, or ground testing and training exercises. The management actions in Section 2.5 and 4.4 of the TA C-72 REA would serve to eliminate or minimize many of the potential impacts from proposed activities. Eglin Natural Resources has determined that the Proposed Action is "Not Likely to Adversely Affect" federally listed species and is conducting an Endangered Species Act Section 7 consultation on applicable species based on the implementation of the management requirements discussed in Section 4.4 of the TA C-72 REA. No adverse impacts are expected under any alternative; therefore, the Proposed Action would be consistent with the State's policies concerning the protection of wildlife and other natural resources.	
Chapter 373 <i>Water Resources</i>	The Proposed Action has the potential to impact water resources within and around the TA C-72; however, following the <i>Best Management Practices for Silviculture</i> (FDACS, 2009) would reduce the possibility of potential negative impacts. Eglin Water Resources (96 CFG/CFVCE) would ensure that any applicable permitting requirements would be satisfied in accordance with Florida Administrative Code. Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding the water resources of the state.	Addresses the state's policy concerning water resources.

Chapter 376 <i>Pollutant Discharge Prevention and Removal</i>	Munitions fragments and residues would be generated as a result of testing and training missions. Ordnance expenditures would increase three-fold, therefore the release of hazardous chemicals would increase. Despite this, no Toxic Release Inventory thresholds would be exceeded and adverse impacts to the environment are not anticipated. Management practices would remain in place that assure testing and training areas will be scanned for debris and dud munitions and that they would be removed. Any dud munitions or unexploded ordnance would be flagged and removed according to standard procedures. Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding the transfer, storage, or transportation of pollutants.	Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.
Chapter 377 <i>Energy Resources</i>	The Proposed Action would not affect energy resource production, including oil and gas, and/or the transportation of oil and gas.	Addresses regulation, planning, and development of oil and gas resources of the state.
Chapter 380 <i>Land and Water Management</i>	The Proposed Action would not affect development of state lands with regional (i.e. more than one county) impacts. The Proposed Action would not include changes to coastal infrastructure such as capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction.	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.
Chapter 381 <i>Public Health, General Provisions</i>	The Proposed Action would not affect the state's policy concerning the public health system.	Establishes public policy concerning the state's public health system.
Chapter 388 <i>Mosquito Control</i>	The Proposed Action would not affect mosquito control efforts.	Addresses mosquito control effort in the state.
Chapter 403 <i>Environmental Control</i>	The increase in munitions expenditures would cause an increase in air emissions to the region that would be minimal and temporary. The pollutant that has the potential to emit the most is particulate matter. Emissions would remain under the 10 percent threshold and would not exceed National Ambient Air Quality Standards (NAAQS). Air emissions would have no adverse impacts on air quality from the Proposed Action.	Establishes public policy concerning environmental control in the state.

	Therefore, the Proposed Action would be consistent with Florida's statutes and regulations regarding water quality, air quality, pollution control, solid waste management, or other environmental control efforts.	
Chapter 582 <i>Soil and Water Conservation</i>	The Proposed Action would not have any significant impacts to soils. Increased munitions expenditures would not result in metal concentrations in the soil exceeding USEPA risk-based concentrations. Increased munitions training and foot and vehicle traffic could cause soil erosion, particularly on sparsely vegetated slopes. However, adherence to management practices would decrease erosion potential. Therefore, the Proposed Action would be consistent with the Florida's statutes and regulations regarding soil and water conservation efforts.	Provides for the control and prevention of soil erosion.



Figure 1. Overview of Eglin AFB

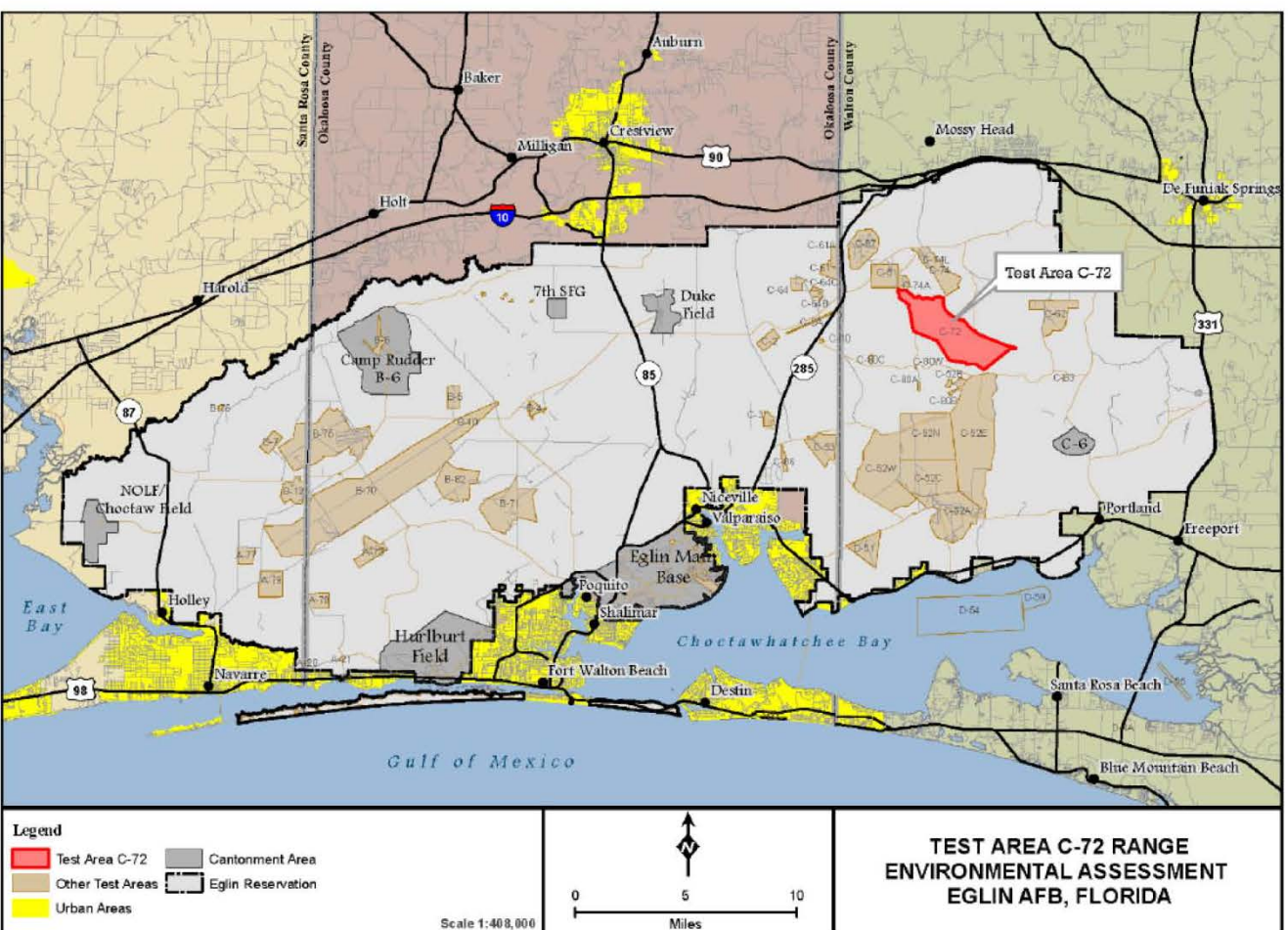


Figure 2. Overview of Test Area C-72

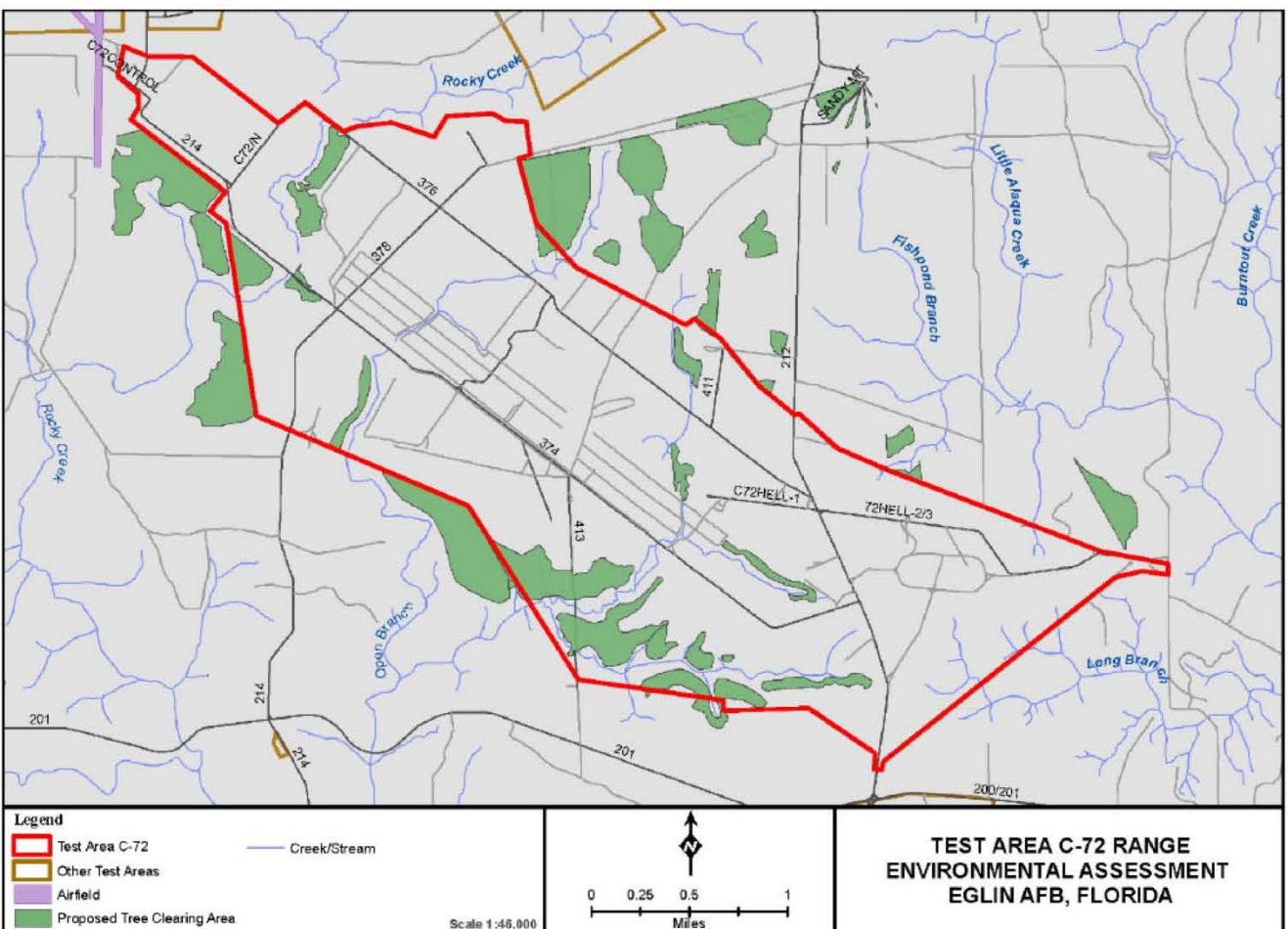


Figure 3. Proposed Line of Sight Tree Clearing and Maintenance Areas

APPENDIX G

SECTION 7 CONSULTATION



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 96TH AIR BASE WING (AFMC)
EGLIN AIR FORCE BASE FLORIDA

Mr. Stephen M. Seiber
Chief, Natural Resources Section
96 CEG/CEVSN
501 De Leon Street, Suite 101
Eglin AFB FL 32542-5133

MAY 26 2011

Dr. Donald Imm
U.S. Fish and Wildlife Service
1601 Balboa Avenue
Panama City FL 32405

Dear Dr. Imm:

The following document is being submitted to fulfill requirements under Section 7 of the Endangered Species Act (ESA). This biological assessment (BA) addresses potential impacts to all federally listed threatened and endangered (T&E) species associated with the proposed action in the Test Area (TA) C-72 and Line of Sight Range Environmental Assessment (REA). The analysis provides a determination of potential impacts to federally listed T&E species and identifies avoidance and minimization measures to lessen potential impacts. Because mission and tree clearing activities have the potential to adversely affect T&E species, this BA is meant to initiate Section 7 consultation with the USFWS.

Eglin AFB would notify the USFWS immediately if it modifies any of the actions considered in this Proposed Action or if additional information on listed species becomes available, as the USFWS may require a reinitiation of consultation. If impact to listed species occurs beyond what Eglin has considered in this assessment, all operations would cease and Eglin would notify the USFWS. Prior to commencement of activities, Eglin would implement any modifications or conditions resulting from consultation with the USFWS. Eglin NRS believes this fulfills all requirements of the ESA, and no further action is necessary.

If you have any questions regarding this letter or any of the proposed activities, please do not hesitate to contact either Mr. Bob Miller (850) 883-1153 or myself at (850) 882-8391.

Sincerely,

A handwritten signature in black ink, appearing to read "S. M. Seiber", is written over a horizontal line.

STEPHEN M. SEIBER, GS-13
Chief, Natural Resource Section

**EGLIN AIR FORCE BASE
Florida**

U.S. FISH AND WILDLIFE SERVICE

**FINAL
INFORMAL ESA SECTION SEVEN
CONSULTATION FOR
TEST AREA C-72
AND LINE OF SIGHT**

MAY 2011



PRINTED ON RECYCLED PAPER

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LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

46 TW	46th Test Wing
96 CEG/CEVSH	96th Civil Engineer Group/Cultural Resources Section
96 CEG/CEVSN	96th Civil Engineer Group/Natural Resources Section
96 CEG/CEVSP	96th Civil Engineer Group/Environmental Analysis Section
AAC	Air Armament Center
AFB	Air Force Base
BA	Biological Assessment
BMP	best management practice
CFR	Code of Federal Regulations
dbh	diameter at breast height
DoD	Department of Defense
EA	Environmental Assessment
ESA	Endangered Species Act
FWC	Florida Fish and Wildlife Conservation Commission
FY	fiscal year
GIS	geographic information system
GPS	global positioning system
INRMP	Integrated Natural Resources Management Plan
mm	millimeter
NRS	Eglin Natural Resources Section (a.k.a. 96 CEG/CEVSN)
RCW	red-cockaded woodpecker
REA	Range Environmental Assessment
ROI	region of influence
SFG	Special Forces Group
SMZ	Special Management Zone
SPCC	Spill Prevention, Control, and Countermeasures
TA	Test Area
TRI	Toxic Release Inventory
TT	Test Target
TW	Test Wing
U.S.	United States
USEPA	U.S. Environmental Protection Agency
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UTTR	Utah Test and Training Range
UXO	Unexploded Ordnance

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Introduction

1. INTRODUCTION

The proposed action of this Biological Assessment (BA) comes from the preferred alternative in the Test Area (TA) C-72 and Line of Sight Range Environmental Assessment (REA). The analysis in this BA provides a determination of potential impacts to federally listed Threatened and Endangered (T&E) species and identifies avoidance and minimization measures to lessen potential impacts. Because mission and tree clearing activities have the potential to adversely affect T&E species, this BA is meant to initiate Section 7 consultation with the USFWS.

1.1 REGION OF INFLUENCE

The region of influence (ROI) for this BA is TA C-72, which is located on the eastern side of the Eglin Range Complex in Walton County, about 13 miles northeast of Eglin Main Base as shown in Figure 1-1. TA C-72 is bisected by two major streams and is 5.33 miles long. The test area provides over 4,585 acres of continuous land test area.

1.2 TYPES OF MISSIONS

Missions on TA C-72 are scheduled and monitored by the 46 Test Wing (TW). TA C-72 is suitable for scored testing of air-to-ground and ground-to-ground munitions. The tests supported range from small submunitions to 2,000-pound bombs and missiles. This test area is also equipped to support testing of ground-launched weapons and ground testing of aircraft launchers, rockets, and dispensing systems. Through the support of various test sites, users may perform ground tests of rockets, launchers, and systems with real-time video, weather, laser, camera control, and time-space-position information. Various combinations of targets are also available including laser scoring and hardened high-value structures. TA C-72 supports a variety of user groups and testing and training activities, which are summarized in Table 1-1 and detailed in Section 2.

Table 1-1. Summary of Missions by Category

Mission Category	Testers/Trainees	Typical Aircraft
Air-to-surface testing	46 TW, 53 Wing (AWC), Army	F-15s, F-16s, any Army helicopter, A-10s
Surface-to-surface testing	46 TW, Navy	F-15s, F-16s, E-9s, UN-1s, CH-53s
Air operations testing	46 TW, 53 Wing (AWC), AFSOC	F-15s, F-16s, AC/MC-130s, A-10s
Ground operations testing	Various	N/A
Air-to-surface training	46 TW, 53 Wing (AWC), Army	F-15s, F-16s, A-10, any Army helicopter with exception of H-57
Surface-to-surface training	U.S. Army	Micro-drones
Air operations training	33rd Fighter Wing, Special Operations	Almost all
Anti-armor tracking training	7SFG(A)	N/A

7SFG(A) = U.S. Army 7th Special Forces Group (Airborne); AFSOC = Air Force Special Operations Command; AWC = Air Warfare Center; N/A = not applicable; TW = Test Wing

The proponent (46 TW) desires to authorize a new level of activity for TA C-72, replacing the current authorized level. Additionally, line-of-sight tree clearing and maintenance will occur. Alternative 4 from the REA was selected as the Preferred Alternative to adequately cover the environmental analysis needed to support potential increased testing and training requirements as they occur.

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Introduction

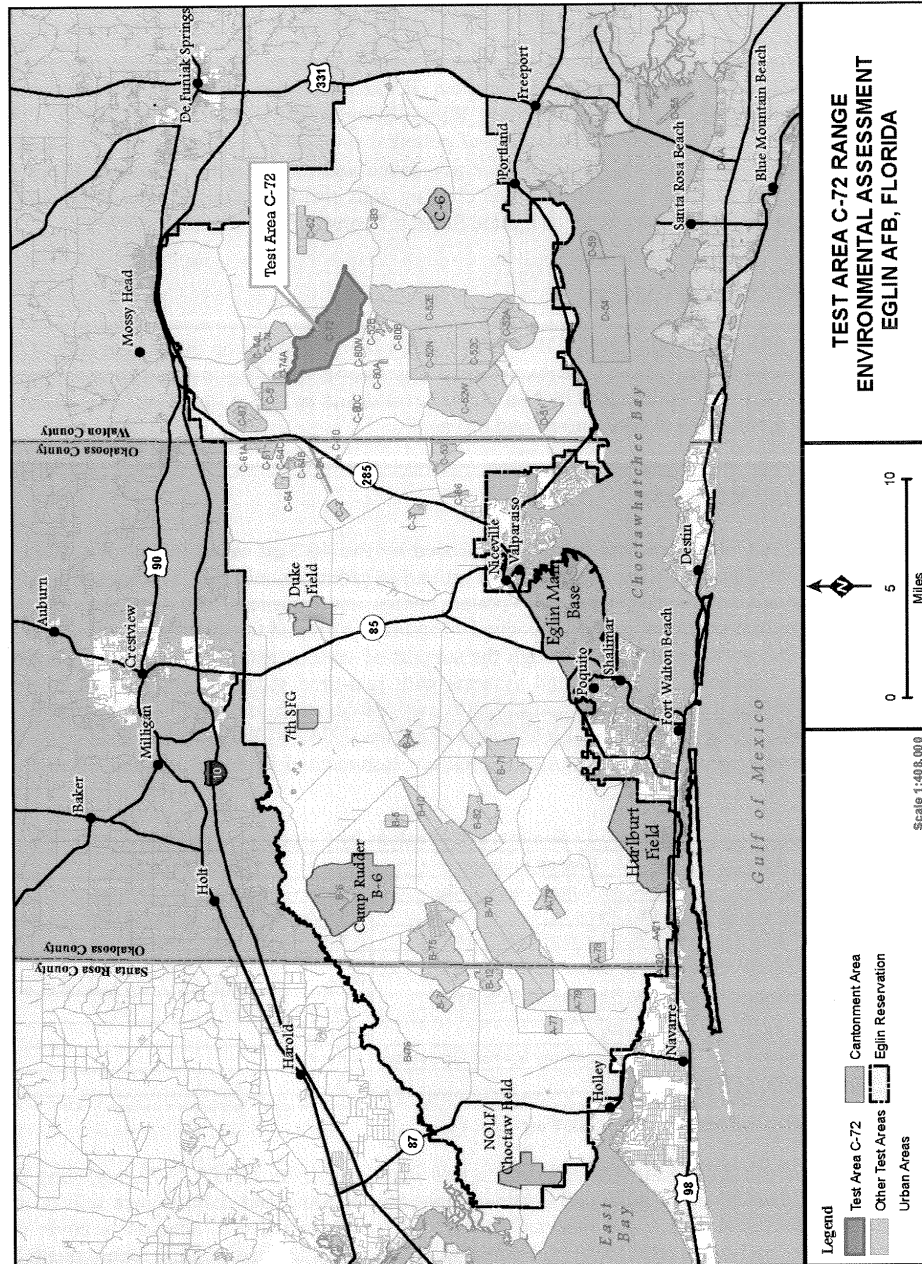


Figure 1-1. Land and Water Ranges of the Eglin Military Complex

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Biological Information

throughout the Eglin Range from 1956 to 1999, while no sightings have been reported since 1999 (Gault, 2009). Most of these snakes were seen crossing roads or after being killed by vehicles. It is difficult to determine a precise number or even estimate the number of these snakes due to the secretive nature of this species (U.S. Air Force, 2006).

3.1.3 Okaloosa Darter

The Okaloosa darter is a small federally threatened fish. Spawning occurs from March to October, with the greatest amount of activity taking place during April (USFWS, 1998). The entire global population of this species is found in the tributaries and main channels of Toms, Turkey, Mill, Swift, East Turkey, and Rocky Creeks, which drain into two bays of Choctawhatchee Bay. These seepage streams have persistent discharge of clear, sand-filtered water through sandy channels, woody debris, and vegetation beds. The Eglin Range contains 90 percent of the 457-square kilometer (176 square mile) drainage area. The remaining portions of the watershed are within the urban areas of Niceville and Valparaiso (U.S. Air Force, 2006).

The most immediate threat to the Okaloosa darter is loss of habitat through degradation of stream water quality from soil erosion into streams. The sources with high soil and sediment erosion probability are borrow pits, clay roads that cross streams, and a few test area sites where vegetation is maintained by using choppers on slopes. A 1992 study identified erosion from borrow pits and roads as major contributors to the degradation of darter habitat. Mission activities could avoid further degradation of stream quality by keeping vehicle activity and troop movement confined to trails, bridges, and roads and conducting ground-disturbing activities only outside of a 300-foot buffer around Okaloosa darter streams. These procedures are available to minimize sediment erosion into the darter watersheds and to avoid a consultation process under Endangered Species Act (ESA) regulations (U.S. Air Force, 2006).

Due to a recovery plan that Eglin AFB implemented for the Okaloosa darter in 1998, the darter was downlisted from endangered to threatened in March of 2011. Eglin AFB is protecting instream flows and historical habitat through management plans, conservation agreements, easements, and/or acquisitions; is implementing an effective habitat restoration program to control erosion from roads, clay pits, and open ranges; is demonstrating that the Okaloosa darter population is stable or increasing and that the range of the Okaloosa darter has not decreased at all historical monitoring sites; and is seeing that no foreseeable threats exist that would impact the survival of the species. Figure 3-1 shows the darter streams at TA C-72.

3.2 OTHER SPECIES CONSIDERED

3.2.1 Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*) is currently listed as a state threatened species and under consideration for federal status. The tortoise is found primarily within the sandhills and open grassland ecological associations on the Eglin Range, where it excavates a tunnel-like burrow for shelter from climatic extremes and refuge from predators. The primary features of good tortoise habitat are sandy soils, open canopy with plenty of sunlight, and abundant food plants (forbs and grasses). Prescribed fire is often employed to maintain these conditions. Nesting occurs during May and June and hatching occurs from August through September.

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Description of Proposed Action

2. DESCRIPTION OF PROPOSED ACTION

2.1 TESTING AND TRAINING ACTIVITIES

Table 2-1 shows the level of activity under the different alternatives in the REA. Alternative 4 (the proposed action in this BA) would involve authorizing the current level of activity, plus an increase in mission activity (testing and training) to achieve an optimum usage level, including management actions detailed in this letter. The optimum usage level was chosen as a likely maximum surge increase in military testing and training during a national defense contingency. Additional information on TA C-72 facilities and targets are provided in Appendix A.

Table 2-1. Maximum Annual Expendables for TA C-72 Under the Various Alternatives

Expendable Category	Expendable	No Action Alternative	Alternative 1	Alternative 2	Alternative 4
Bomb (live)		636	268	804	804
Bomb (inert)		28	316	948	948
Grenades (smoke)		0	111	333	333
Guns (inert)	30 mm	0	180	540	540
	40 mm	0	2,998	8,994	8,994
	84 mm recoilless	128	400	1,200	1,200
	105 mm	40	0	0	0
Guns (live)	20 mm	1,800	4,000	12,000	12,000
	25 mm	0	296	888	888
	30 mm	0	29,520	88,560	88,560
	40 mm	0	290	870	870
	84 mm recoilless	158	0	0	0
	105 mm HE	0	46	138	138
	105 mm smoke WP	0	2	6	6
Missile (inert)		3	23	69	69
Missile (HE)		1,122	250	750	750
Rocket (HE)		30	2,060	6,180	6,180
Rocket (inert)		56	231	693	693
Small Arms (Inert)	7.62 mm blank	0	7,498	22,494	22,494
	5.56 mm	0	2,402	7206	7206
	7.62 mm	2,360	150,000	450,000	450,000
Other (Live)	.50 cal	3,740	156,000	468,000	468,000
	Warhead	0	63	189	189
	Rocket motor	0	186	558	558
	Booster	0	1	3	3
	C-4, 1-lb HE	0	16,090	4,8270	48,270
	Blasting cap	0	90	270	270
	Cartridge, impulse	0	215	645	645
	Charge, demo (lb)	0	766	2,297	2,297
	High explosive 1 lb	0	1	3	3
	Igniter	0	42	126	126
	Cutter, HE	0	16	48	48
	Detonation cord (feet)	0	1,421	4,263	4,263
	Detonator	0	11	33	33
	Explosive bolts	0	12	36	36
	Flares	562	355	1,065	1,065
	Fuze	0	525	1,575	1,575

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Description of Proposed Action

Table 2-1. Maximum Annual Expendables for TA C-72 Under the Various Alternatives, Cont'd

Expendable Category	Expendable	No Action Alternative	Alternative 1	Alternative 2	Alternative 4
Other (Inert)	Chaff	2,996	660	1,980	1,980
	Fin assembly	0	28	84	84
	Unknown	0	14	42	42
	Retarder fin	0	66	198	198
	Laser ops, 1 hour ¹	0	90	270	270
Unknown	Unknown (inert)	0	29	87	87
Drones		0	2	6	6
GRAND TOTAL		13,659	377,574	1,132,721	1,132,721

Sources: U.S. Air Force, 2010a; Bufkin, 2010; U.S. Air Force, 2008c

lb = pounds; WP = white phosphorus; HE = high explosive

1. The use of lasers is analyzed in the Electromagnetic Radiation REA (U.S. Air Force, 2009a).

Test Missions

Test missions are missions designed to test, verify, validate, demonstrate, or prove that the new or improved hardware, system, software, or tactic will work safely and accomplish the desired effect.

Air-to-Surface Missiles, Bombs, and Guns Testing

These types of missions typically test a new weapon, new fuse, upgraded guidance or sensor system, or a new mix of weapons not currently authorized for carriage. These tests can be done either with live warheads or have the warheads removed (i.e., inert weapons) and replaced with a telemetry package that sends data back to the control facility for analysis. These missions involve releasing or firing the bombs, missiles, or guns from an aircraft (both fixed- and rotor-wing), while the weapon effects or accuracy is scored at the test area.

Surface-to-Surface Missile and Gun Testing or Ground Testing

Surface-to-Surface missile testing evaluates a missile's ability to launch, navigate to, and strike its target. Typical surface-to-surface missile activity involves testing of the Army's Hellfire missiles launched from the C-7A ground launcher facility and impacting on a variety of targets on TA C-72. Other surface-to-surface missile activity evaluates the performance of a cruise missile launched from a surface ship or submarine. The cruise missile flies its programmed course over both land and water, recovering/striking simulated targets on one of the land test areas. Surface-to-surface gun testing evaluates the ammunition, fuze, or gun accuracy. These tests range from 20-millimeter (mm) to 155-mm guns. Ground testing is any other testing done exclusively on the ground not covered.

Air Operations Testing

Air operations testing includes any use of the airspace not previously described. Most common of these are sensor testing and electronic combat (EC) testing. The testers routinely accomplish these tests over the entire land range airspace and involve evaluation of a sensor's ability to interpret what it senses, or other testing of EC systems. The testers usually fly these missions at a low speed and moderate altitude, usually 5,000 to 15,000 feet, and may be as low as 200 feet.

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Description of Proposed Action

Chaff and flares may be expended from the aircraft as part of this testing. The Seeker/Sensor Evaluation Facility (located south of C-7A on RR 214) is utilized for countermeasure testing of various EW sources and the dispensing of flares and chaff are part of this mission's profile. This testing had previously been accomplished on C-52 but had to be relocated due to Army 7th Special Forces Group (SFG) training on C-52.

Ground Operations Testing

Users routinely perform tactical vehicle operations on the ground at TA C-72. These missions typically utilize tracked and wheeled vehicles for sensor testing. Users move tracked and wheeled vehicles around TA C-72 for target placement and often mobilize them during exercises to mimic troop movement and advancements. Sometimes users move the vehicles along clay roadways and across bridges over the three stream systems located on TA C-72. However, off-road movement and hiding of targets is often required for mission use. In the past, target relocation has required off-road stream crossings outside of established bridges; however, the use of these off-road stream crossings does not occur today. Future needs for the fording capability is likely for transit of vehicles and for fording capability testing. Sometimes tactical vehicle operations require the placement of tank targets on slopes leading down toward creek systems to fulfill testing and training requirements. Tactical vehicle operations on many of the ranges including TAs C-72, C-52, C-62, B-70, and C-72 uses the sloped terrain for tactical maneuvers and seeker/sensor testing with mobile targets. Users conduct a particular type of tactical vehicle mission on ranges with variable terrain. Proponents use this terrain to hide targets in a simulated attack scenario where troops attempt to advance and claim territory through reconnaissance operations. These tracked and wheeled vehicles are free to move to any location on TA C-72, with the exception of unexploded ordnance areas, and utilize sloped terrain for cover. Tests on seeker/sensor systems and precision guided munitions systems occur during the operations.

An example of a tactical vehicle mission that utilized TA C-72 was the Improved Target Acquisition System Limited User Test II conducted from January 1999 to March 1999. The purpose was to test seeker/sensor hardware and software against typical vehicles in representative environments of employment to collect data for validation of models, simulations, and algorithms. The test unit included an Airborne Cavalry Troop from the 82nd Airborne, Fort Bragg, North Carolina, equipped with 8 high-mobility multipurpose wheeled vehicles (HMMWVs) with ITAS (Improved Target Acquisition System), approximately 14 other tactical vehicles, and 80 personnel. The opposing force consisted of approximately nine former Soviet Union tactical vehicles and 20 personnel. The test team consisted of approximately 35 personnel with an additional 22 tactical vehicles. The test unit, team, and force, conducted the test over two months; they required approximately 20 test missions encompassing over 300 hours of testing over a large portion of several ranges (B-6, B-70, C-52, C-62, and C-72). Eglin usually hosts one major test such as this per year. Typically, there are no expendables reported for this type of operation, and no expendables were associated with ground operations testing during the baseline year.

Description of Proposed Action**Training Missions**

Users design training missions to teach, maintain, or increase the operator's proficiency to perform mission operations. Training categories are similar to the testing categories. Each category identifies the type of activity, major trainees, typical aircraft, numbers of missions, and the types and numbers of expendables associated with the mission.

Air-to-Surface Missiles, Bombs, and Guns Training

Air-to-surface missiles, bombs, and guns training involves training where users release or launch bombs or missiles or fire aircraft guns at specific targets over land. Personnel score weapons either electronically on the ground or aircrews conduct the scoring. Training altitudes may range from a few hundred feet to 20,000 plus feet and speeds range from 200k to near supersonic speeds. Aircraft guns training uses the internal or pod-mounted aircraft guns, which includes side-firing AC-130 gunships, fighters using internal or pod mounted guns, and helicopters using machine guns. The most typical air-to-surface training done on TA C-72 is Army Hellfire missile training.

Surface-to-Surface or Surface-to-Air Missile Training

Surface-to-surface or surface-to-air missile training involves firing a missile from the ground toward either a target on the ground or a drone in the air. The Army usually suspends ground targets between poles, which they call pole targets. To date the Army only fires Stinger missiles from TA C-72 for training. This type of training at Eglin did not start until 1996. The Army 7th SFG(A) is expected to fire live Javelin missiles against tank targets for future training missions.

Air Operations Training

Air operations training is almost identical to the description used for air operations testing, except that it is for training purposes rather than for testing new systems. Users expend chaff and flares from aircraft in some aspects of this training. Usually users schedule the airspace R-2914 or R-2914A instead of specifically TA C-72. Therefore, an exact number of missions that utilize TA C-72 airspace is not known. Users routinely accomplish this training over the entire land range airspace and involve sensor operation/interpretation or training against EC systems. Users usually fly these missions at a low speed and moderate altitude, usually 2,000 to 15,000 feet, and may be as low as 200 feet. Users may expend chaff and flares from the aircraft as part of this training.

Anti-Armor Tracking Range

This range will be utilized for training Army 7SFG(A) members for designating armor targets. This training requirement is for targeting and designating only (with laser designators), with no live fire allowed.

Description of Proposed Action**2.2 LINE OF SIGHT TREE CLEARING ACTIVITIES**

Line of sight (LOS) tree clearing and maintenance is also included in the preferred alternative in the REA. In June 2005, Eglin AFB proposed line of sight tree clearing and maintenance for the south side of TA C-72. Tree clearance is required because video tracking sites are obstructed from viewing test missions. It was recognized that a failure to remove the trees could result in valuable data loss on Eglin test missions. The areas that would be cleared and maintained are shown in Figure 2-1. Forestry operations outside of the test area that fall within proposed line of sight tree-clearing areas would continue, provided that operations are conducted in accordance with the Eglin Integrated Natural Resources Management Plan (INRMP). Four different methods have been proposed. One or more of these methods may be utilized depending on the type of terrain and proximity to sensitive areas, such as streams and wetlands.

Option 1 – Harvest Trees

Eglin Natural Resources Section (NRS) provides direct support to the Range and is tasked when necessary with manipulating forest structure for specific areas adjacent to TAs for mission test or training needs (U.S. Air Force, 2009b). For this option, timber salvage operations involving small quantities of unwanted but merchantable trees would occur. Trees would be hand cut and gathered for removal and sale. An interdisciplinary team would identify and evaluate salvage areas presented in Figure 2-1, then provide recommendations on harvesting marketable trees. A contractor would then remove all timber, which would be sold on a price per ton basis through a forest products contract or cash sales contract.

Option 2 – Cut All Trees with Gyro-Trac Machines

Under this option, line of sight and tree clearing maintenance would be accomplished utilizing a Gyro-Trac mulching machine to clear suitable sight lanes. A Gyro-Trac is a tracked vehicle that has a ground pressure of 2.5 pounds per square inch with a front-mounted cutter head that can cut vegetation up to 4 inches in diameter. The vegetation is ground into mulch then deposited into a layer in front of the machine so that the tracks are seldom in contact with mineral soil. When a Gyro-Trac operates with the cutter heads close to the ground (a few inches) it typically operates with minimal soil and root mat disturbance. Eglin began using the Gyro-Trac in response to conservation recommendations set forth in a U.S. Fish and Wildlife Service (USFWS) Biological Opinion to construct fuel breaks between Eglin managed forests and populated areas (U.S. Air Force, 2003a).

Option 3 – Herbicide Application

Eglin currently is approved to use herbicides and prescribed fire to manage vegetation at test areas and interstitial areas (U.S. Air Force, 2007a). Standards are in place to implement standard avoidance and minimization measures for sensitive habitat protection: spill prevention, cleanup, and containment; strict adherence to herbicide labels and instructions during handling, mixing, and application of herbicides; and health and safety precautions.

Table 2-2 provides a list of approved herbicides that may be used at TA C-72 with approved management practices.

Description of Proposed Action

Table 2-2. Herbicides Approved for Use

Herbicide	Example Trade Names
2,4-D amine	Aqua-Kleen [®]
Aminopyralid	Milestone [™]
Fluroxypyr	Vista [®]
Fosamine	Krenite [®]
Glyphosate	Accord [®] XRT
	Rodeo [®] (aquatic)
Imazapic	Plateau [®]
Imazapyr	Arsenal
	Chopper
	Habitat [®] (aquatic)
Metsulfuron	Escort [®]
Sulfometuron methyl	Oust [®] XP
	Garlon [®] 3a
Triclopyr	Garlon 4 Ultra
	Renovate [®] 3 (aquatic)

Source: U.S. Air Force, 2007, Active Ingredient Fact Sheets

Option 4 – Cut and Leave in Place

For this option, trees would be hand cut and left where they fall to allow for natural decomposition of the trees. This would prevent ground disturbance that usually accompanies logging activity due to tree removal.

Description of Proposed Action

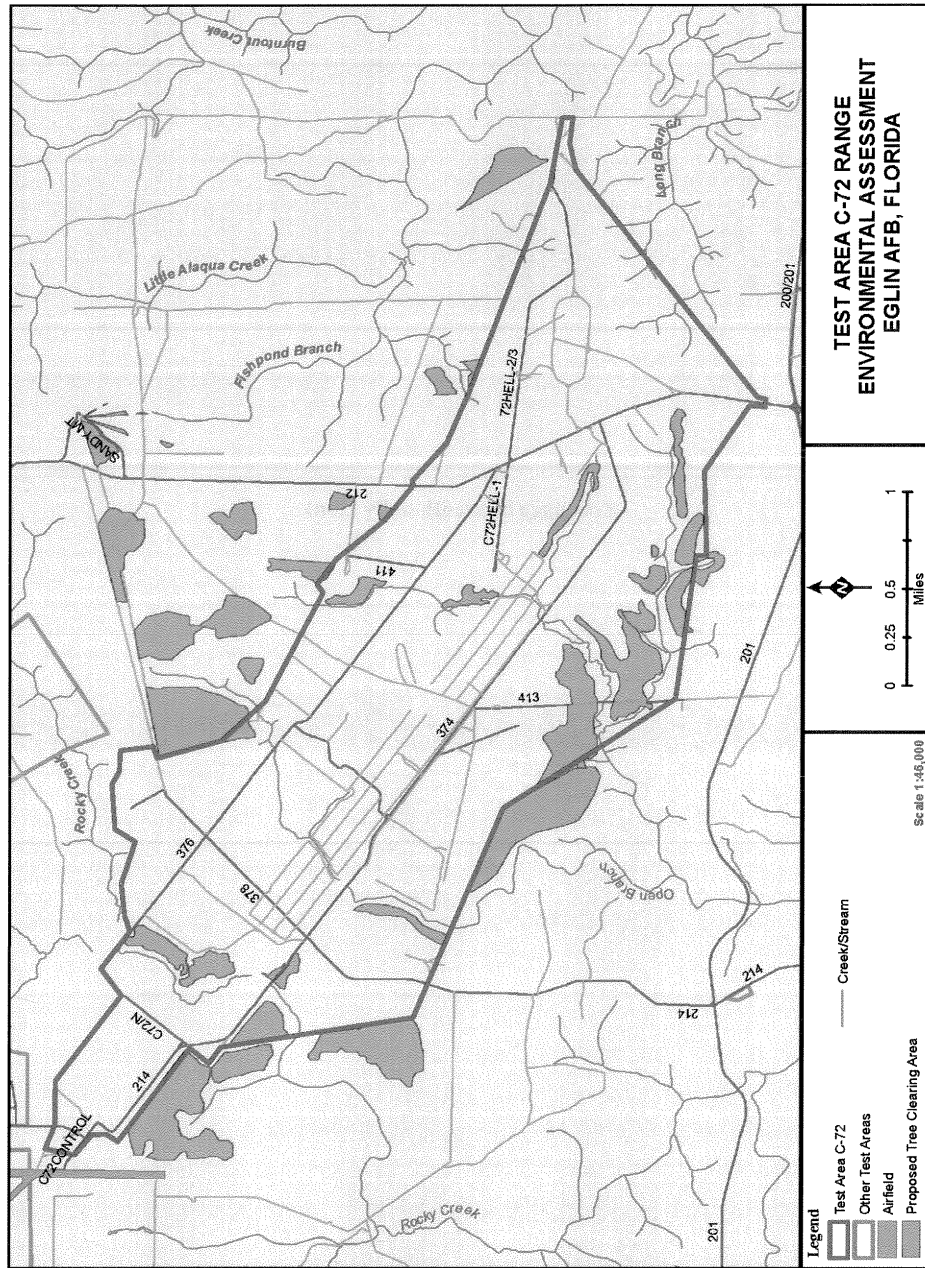


Figure 2-1. Proposed Line of Sight Tree Clearing and Maintenance Areas

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Description of Proposed Action

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Biological Information

3. BIOLOGICAL INFORMATION

Three federally listed endangered or threatened species (RCW, Okaloosa darter, and indigo snake) are known to occur within or near the project area and are considered in this BA. Also, two other sensitive species (gopher tortoise and black bear) and migratory birds are considered.

3.1 FEDERALLY LISTED SPECIES**3.1.1 Red-cockaded Woodpecker**

The RCW (*Picoides borealis*) is listed as a federally endangered bird species and a state species of special concern. The RCW excavates cavities in live longleaf pine trees that are at least 85 years old. The RCW historically had a habitat range as far north as New Jersey and as far west as Oklahoma. Today, the RCW has been restricted to the southeastern United States, from Florida to Virginia and to southeast Texas, due to a loss of habitat. In the southeast, 98 percent of the longleaf pine forests have been removed, making federal lands such as Eglin AFB primary habitat for the species.

Due to the preservation and continuity of longleaf pine forests on Eglin, the Eglin Range has one of the largest remaining populations of RCWs in the country. In 2003, the USFWS identified Eglin AFB as one of thirteen primary core populations for the RCW (U.S. Air Force, 2006). As of 6 August 2009, the RCW population on Eglin reached the designated recovery goal of 350 potential breed groups (PBGs). The current population size (as of August 2010) is 429 active clusters and 392 PBGs. This meets Eglin's recovery goal as established in the official species recovery plan. Eglin reinitiated consultation on 2 December 2009, with the USFWS on the management of the RCW; it was determined that Eglin's current management actions, including implementation of conservation measures, generally continue to have no effect or are not likely to adversely affect the RCW. The USFWS concurred with this determination and provided a letter of concurrence dated 24 March 2010.

The removal of longleaf pine trees, degradation of quality habitat, and noise generated from mission-related and other activities are potential threats to the RCW on the Eglin Range. Eglin is executing an approved USFWS management strategy to meet certain growth objectives of the RCW and to obtain increased mission flexibility with the federal requirements for RCW impacts (U.S. Air Force, 2006). No critical habitat has been designated for the RCW (USFWS, 2010a). Figure 3-1 shows active and inactive RCW trees and foraging habitat for the RCW in the ROI.

3.1.2 Eastern Indigo Snake

The eastern indigo snake (*Drymarchon corais couperi*) is listed as a federal and state threatened species and is the largest nonvenomous snake in North America. The primary reason for its listing is population decline resulting from habitat loss and fragmentation. Movement along travel corridors between seasonal habitats exposes the snake to danger from increased contact with humans. Indigo snakes frequently utilize gopher tortoise burrows and the burrows of others species for overwintering. The eastern indigo snake frequents flatwoods, hammocks, stream bottoms, riparian thickets, and high ground with well-drained, sandy soils. The species is extremely uncommon on the Eglin Range with sightings of only twenty-nine indigo snakes

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Determination of Impacts

Eglin NRS has consulted with the USFWS on the guidelines for the habitat conditions and foraging requirements for RCWs on Eglin. Eglin NRS personnel use the guidelines identified in the *Threatened and Endangered Species Component Plan* (U.S. Air Force, 2006c) when determining whether consultation with the USFWS is required. Table 4-2 compares the current Recovery Plan foraging standards with Eglin specific standards.

Table 4-2. Foraging Habitat Variable Standards for Red-cockaded Woodpeckers

Measure	USFWS Recovery Standard	USFWS Managed Stability Standard	Eglin Recovery Standard	Eglin Managed Stability Standard
Acres	200 to 300	75	300	150
Density (stems per acre)	18 > 14 inches dbh	None	20 > 10 inches dbh	None
Density total (stems per foraging area)	None	None	6,000 > 10 inches dbh	3,000 > 10 inches dbh
Basal area (ft ² per acre)	20 > 14 inches dbh	40-70 > 10 inches dbh	20 > 10 inches dbh	None
Basal area total (ft ²)	None	3,000 > 10 inches dbh	6,000 > 10 inches dbh	4,000 > 10 inches dbh
Distance from cluster	0.5 mile	0.25 mile	0.5 mile	0.3 mile
Midstory height	7 feet	7 feet	7 feet	7 feet
Ground cover	>40% herb	None	> 40% herb	None

> = greater than; < = less than; dbh = diameter at breast height; ft² = square feet; USFWS = U.S. Fish and Wildlife Service

The first column contains the values defined in the Recovery Plan as the recovery standard for public lands. The second column contains the values defined in the Recovery Plan as the managed stability standard for private lands in order to protect existing groups (USFWS, 2003). The last two columns are recommendations for Eglin's recovery standard and managed stability standard. A 'no effect' determination would be made if a cluster's foraging resources exceed Eglin's recovery standard after the completion of a proposed action. A "not likely to adversely affect" determination would be made if a cluster's foraging resources fall between Eglin's recovery standard and Eglin's managed stability standard after the completion of a proposed action. A "likely to adversely affect" determination would be made if a cluster's foraging resources fall below Eglin's managed stability standard after the completion of a proposed action. Also, if the proposed action affects less than 1 percent of the foraging resources, and the foraging resources are above Eglin's managed stability standard, then no consultation would be required.

Foraging Habitat Analyses

The memorandum, "Implementation Procedures for Use of Foraging Habitat Guidelines and Analysis of Project Impacts under the Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan: Second Revision," provides implementation guidance for use of the foraging habitat standards presented in the RCW recovery plan (DOI, 2005). The foraging habitat analysis below follows these procedures, along with the specific guidelines for the habitat conditions and foraging requirements for RCWs on Eglin under the Proposed Action.

Biological Information

Gopher tortoise burrows serve as important habitat for many species, including the federally listed eastern indigo snake (U.S. Air Force, 2006). C-72 provides excellent habitat for this species and intermittent gopher tortoise surveys on C-72 indicate there is a successful population on the TA; however, a thorough survey has not been completed (Gault, 2011).

3.2.2 Florida Black Bear

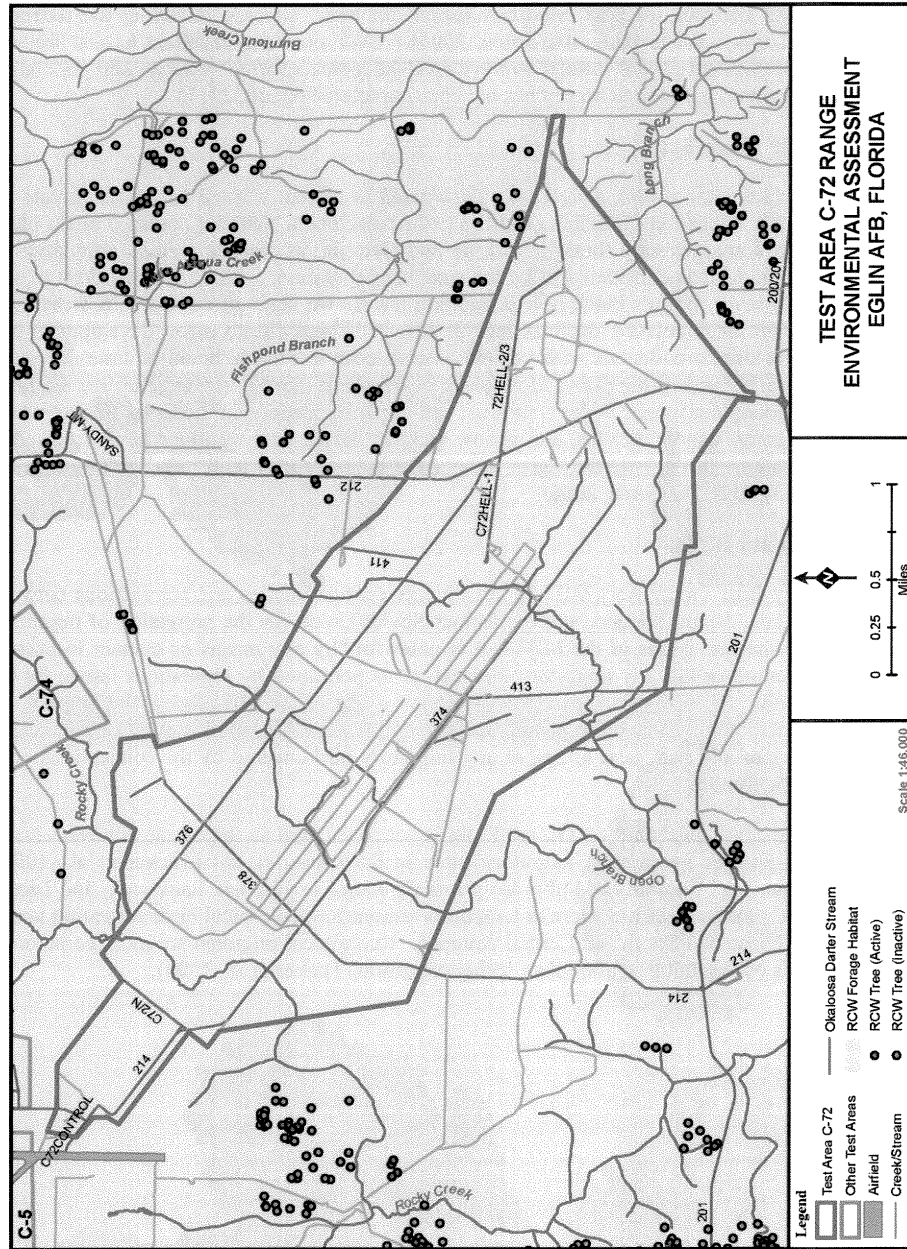
The Florida black bear (*Ursus americanus floridanus*) is currently listed as a state threatened species except in Baker and Columbia Counties and Apalachicola National Forest. Florida black bear populations are currently found in Florida and Georgia, as well as a small population in Alabama. Eglin AFB is considered to be the smallest population, with an estimated 60 to 100 individuals; however, Eglin's black bear population has shown signs of increase since the early 1990s. Reasons for population declines include loss of habitat due to urban development and direct mortality due to collisions with vehicles. Black bear in Florida breed in June–July, and young are born in January–February. Most black bears within the Eglin Range utilize the large swamps and floodplain forests in the southwest and northern portions of the Eglin Range, where they feed on fruits, acorns, beetles, and yellow jackets. Black bear sightings have occurred at numerous locations throughout the Eglin Range, the majority of which have been within the interstitial areas (U.S. Air Force, 2006).

3.2.3 Migratory Birds

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the provisions of the MBTA it is unlawful “by any means or manner to pursue, hunt, take, capture or kill any migratory bird except as permitted by regulations issued by the Fish and Wildlife Service. The term “take” is not defined in the MBTA, but the Service has defined it by regulation to mean to pursue, hunt, shoot, wound, kill, trap, capture or collect any migratory bird, or any part, nest or egg or any migratory bird covered by the conventions or to attempt those activities.

Migratory birds pass through the ROI, but Eglin is not considered an important stopover area or concentration site for neotropical migratory birds in the spring or fall (Tucker et al., 1996). Breeding neotropical migrants at Eglin are primarily found in riparian, hammock, and barrier island habitats. These areas can serve as temporary habitat for neotropical birds migrating to and from the Caribbean and South and Central America. Neotropical migrants are more common in the Eglin areas during fall migration than spring migration (Tucker et al., 1996).

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Determination of Impacts**4. DETERMINATION OF IMPACTS**

Based on the scope of the Proposed Action, as described above, potential impacts to sensitive species from TA C-72 activities (test and training missions, line of sight tree clearing) can be categorized as follows:

- **Direct Physical Impacts** – Physical harm (i.e., injury or mortality) to listed species as a result of human activities. The main cause of direct physical impacts associated with the proposed action would be physical contact, which could involve the crushing/trampling of, or collision with, a species due to vehicle traffic or human movements, or a munitions or shrapnel strike resulting in physical damage or mortality of a species. Chemical impacts from metals and explosives residue would also be considered direct physical impacts.
- **Harassment** – Actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Activities under the Proposed Action may result in harassment due to the following:
 - **Nest/burrow destruction** – Destruction of a nest or burrow due to excessive ground disturbance, causing a species to relocate.
 - **Foraging/nesting disturbance** – Disruption of normal breeding/nesting or foraging activity.
- **Habitat Impacts** – Habitat impacts include loss, alteration, and/or degradation of habitat. These impacts characterize the physical damage, stress, or disruptions that may adversely alter or degrade the habitats essential to the sustainment of a species. A habitat in this instance refers to the ecological and geomorphological components, such as vegetation, soil, topography, and water that support listed species. Activities under the Proposed Action may result in habitat impacts due to the following:
 - **Soil erosion** – Loss of soil due to vehicular traffic, human movements, munitions impacts, or other activities that involve the destruction or removal of vegetative ground cover occurring in or near sensitive species habitat resulting in habitat loss, alteration, or degradation.
 - **Sensitive habitat destruction** – Destruction or degradation of sensitive habitats such as wetland areas or foraging habitat resulting from human activities (i.e., driving, wildfires, munitions, pyrotechnics) having a negative impact.

4.1 FEDERALLY LISTED SPECIES**4.1.1 Red-cockaded Woodpecker*****Testing and Training Activities***

Based on the growth trend of the RCW tracked by the Eglin NRS, the current levels of military activity in established test areas such as TA C-72 have not adversely affected RCW populations (U.S. Air Force, 2010d). The potential impacts to RCWs from test and training activities include

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the disturbance from human presence and noise and habitat impacts from wildfires. While there are no documented RCW cavity trees within the boundaries of TA C-72, there are numerous active and inactive trees present in close proximity to the test area.

Noise Impacts

Increased frequency of missions at TA C-72 would increase potential encounters with RCWs. Eglin would continue to apply the *Management Guidelines for the Red-Cockaded Woodpecker on Army Installations* (U.S. Army, 2006) to activities near RCW trees. These guidelines detail the allowed and restricted activities near active RCW trees (Table 4-1.). Activities that occur within 200 feet of a marked cavity tree are limited to those of a transient nature (less than 2 hours duration). Therefore, any test or training action that is expected to occur in a single location for more than 2 hours within a 200-foot buffer of an active RCW tree must be coordinated through Eglin NRS (96 CEG/CEVSN). Such activities would be evaluated on a case-by-case basis for their potential impact to the RCW, and the possible need for additional consultation.

RCWs exposed to noise from range activities, vehicular traffic, and other mission-related activities have shown some tolerance to disturbance (Delaney et al., 2002). Noise meaning (implication of the noise to recipient) is a crucial determinant in whether wild animals react to a noise source. For example, waterfowl and other game bird species are typically more responsive to noise than nongame species, due to the associated danger for hunted species (i.e., loud guns). Hunted species may become sensitized such that they will increase energy expenditures to avoid perceived danger from loud noises. Alternately, if a noise is deemed harmless by an animal, then the animal may habituate or adapt behaviorally and physiologically over time (Bowles, 1995).

Animals may initially react with a startle effect from noises but adapt over time, so that even this behavior is eradicated. Because RCWs in the vicinity of TA C-72 are regularly exposed to loud impulse noise (e.g., detonations, gunfire) without any associated physical danger, these individuals have likely become habituated to the noises, such that they do not expend energy on harmless stimuli.

Based on a review of literature pertaining to noise exposure in wildlife, Bowles (1995) suggests that outcome measures, such as reproductive success, are better indicators of distress in wildlife than short-term responses (e.g., startle reaction). Negative reproductive effects have not been seen in the RCW clusters in the TA C-72 area, and the population in the TA C-72 vicinity is growing. Since the entire Eglin RCW population continues to grow, it appears that RCWs on Eglin have adapted to the noises associated with the military mission. Although other suitable habitat is available on Eglin, RCWs have continued to nest and forage at and near TA C-72. Quality habitat appears to outweigh any negative influences associated with mission activities.

Habitat Impacts

The use of munitions and pyrotechnics increases the risk of wildfires in the areas surrounding C-72. Fires are usually beneficial to longleaf communities, but it is unknown whether the wildfires potentially associated with the Proposed Action would have a net positive or negative effect on RCWs. The RCW requires frequent fire to keep scrubby vegetation to a minimum. Wildfires may achieve this purpose. However, with every wildfire, there is the potential for damage or mortality of RCW cavity trees if the trees ignite. Prescribed fire is the preferred option for maintaining these habitats.

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Table 4-1. Selected Army Training Activities Allowed/Not Allowed Within 200 Feet of Marked RCW Tree

Mission Activity	Allowed
Maneuver and Bivouac	
Hasty defense, light infantry, hands and hand tool digging only, no deeper than 2 feet, 2 hours maximum	Yes
Hasty defense, mechanized infantry/armor	No
Deliberate defense, light infantry	No
Deliberate defense, mechanized infantry/armor	No
Establish command post, light infantry	No
Establish command post, mechanized infantry/armor	No
Assembly area operations, light infantry/mechanized infantry/armor	No
Establish Combat Support/Combat Service Support (CS/CSS) sites	No
Establish signal sites	No
Foot transit through the cluster	Yes
Wheeled vehicle transit through the cluster ¹	Yes
Armored vehicle transit through the cluster ¹	Yes
Cutting natural camouflage, hardwood only	Yes
Establish camouflage netting	No
Vehicle maintenance for no more than 2 hours	Yes
Weapons Firing	
7.62 millimeter and below blank firing	Yes
.50 caliber blank firing	Yes
All others	No
Noise	
Generators	No
Artillery/hand grenade simulators	Yes
Hoffman-type devices	Yes
Pyrotechnics/Smoke	
CS/riot agents	No
Smoke, haze operations only, generators or pots, fog oil, and/or graphic flakes ²	Yes
Smoke grenades	Yes
Incendiary devices to include trip flares	Yes
Star clusters/parachute flares	Yes
Hexachloroethane (HC) smoke of any type	No
Digging	
Tank ditches	No
Deliberate individual fighting positions	No
Crew-served weapons fighting positions	No
Vehicle fighting positions	No
Other survivability/force protection positions	No
Vehicle survivability positions	No

Source: U.S. Army, 2006

RCW = red-cockaded woodpecker

1. Vehicles would not get any closer than 50 feet of a marked cavity tree unless on existing roads, trails, or firebreaks.

2. Smoke generators and smoke pots would not be set up within 200 feet of a marked cavity tree, but the smoke may drift through the 200-foot circle around a cavity tree.

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Munitions and pyrotechnics use will follow Eglin's Wildfire Specific Action Guide Restrictions, which rate fire danger from low to extreme. During days with low fire danger, there are no restrictions on missions, but on days with extreme fire danger, no pyrotechnics are allowed without prior approval from the Wildland Fire Program Manager at Eglin's Natural Resources Section. Within 3 working days of notification, the Eglin Natural Resources Section will re-provision a cavity tree if one is destroyed due to TA C-72 activities (i.e., due to wildfire).

Increased testing and training may temporarily disturb individuals or populations, and foraging RCWs may avoid areas where disturbance is occurring. Pioneering RCWs may be affected by noise from daily operations and not colonize or immigrate to new areas within the test site or access roads. This could affect the growth of the RCW population adjacent to the proposed activity area. However, based on the continued usage of the areas around TA C-72 by RCWs despite historical mission impact, Eglin NRS believes future test and training activities at TA C-72 are **not likely to adversely affect** the RCW.

Avoidance and Minimization Measures

- Comply with all requirements stated in Eglin AFB Instruction 13-212, *Range Planning and Operations*.
- Continue monitoring of RCWs around C-72.
- Ensure that all mission personnel are provided with restrictions regarding protected species, either in verbal or written form. Provide maps when necessary.
- Limit tree cutting to oaks and sand pine. No longleaf pines will be cut down for testing and training activities without further analysis of impacts..
- Coordinate with the 96 CEG/CEVSN for all military activities within or near stands of mature longleaf pine and for missions scheduled during RCW nesting season (late April–July).
- Adhere to Eglin AFB Wildfire Specific Action Guide restrictions regarding forest fire danger ratings for pyrotechnics. Check the Fire Danger ratings daily (available on CSE or from Eglin Fire Dispatch). Per the Specific Action Guide, if Fire Danger is:
 - Moderate - No restrictions on pyrotechnics. A fire watch is required to be posted for a minimum of 20 minutes after pyrotechnics use has been completed.
 - High - Use caution with pyrotechnics and post a fire watch for a minimum of 30 minutes after use of pyrotechnics has been completed.
 - Very High - Restrict pyrotechnics to hand-thrown simulators or smoke grenades. NO FLARES below 1000' AGL. Limit BDU 33s and other munitions that may start fires to "Safe" areas. Use simulators or grenades only on roads or in pits. Cleared areas for pyrotechnics should be a minimum of 1.5 times the blast radius.
 - Extreme - NO PYROTECHNICS allowed without prior approval from Wildland Fire Program Manager or designee at Eglin Natural Resources (Jackson Guard) (96 CEG/CEVSNP, 882-6233 or FAX 882-5321).
- Immediately notify Eglin AFB Fire Dispatch of any wildfire.

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- Within 3 working days of notification, Eglin must reprovision a cavity tree if one is destroyed due to TA C-72 activities (i.e., due to wildfire). Contact the Eglin Natural Resources Section to arrange the reprovisioning.
- Release flares at altitudes that will ensure complete burnout prior to reaching the surface. Allow no deployment of flares when fire index presents an unacceptable hazard.
- Do not drive nails or other objects into trees for any reason, unless there is special authorization to do so.
- Do not use explosives or munitions within or near stands of mature longleaf pines.
- Allow only transient (lasting less than 2 hours) foot traffic and vehicular traffic on established roads/trails within a 200-foot buffer around marked RCW trees.
- When conducting ground training activities, follow the Army guidelines for activities within RCW habitat (U.S. Army, 2006)

Line of Sight Tree Clearing Activities

Many of the areas identified for tree clearing overlap with RCW foraging habitat (Figure 4-1). Potential impacts are divided into noise impacts and habitat alteration.

Noise Impacts

Noise associated with land clearing and large machinery operation may disturb individuals or populations. Foraging RCWs may avoid areas where tree clearing is occurring, and pioneering RCWs may not colonize or immigrate to new areas. Loud noises during nesting season (April through July) could affect RCW reproduction, so no tree-clearing activities would be conducted within 200 feet of an active RCW tree during nesting season. All tree-clearing activities must be coordinated with Eglin NRS, and a thorough RCW survey must be conducted just prior to tree clearing within RCW foraging habitat. Therefore, noise from tree removal near active clusters is **not likely to adversely affect** the RCW.

Habitat Impacts

One essential element of RCW management is the allocation of foraging habitat to individual groups. Long-term success requires a thorough knowledge of the species' foraging requirements. Partitions around clusters serve to help provide the suitable quantity and quality of foraging habitat. Some potentially harmful activities may occur within the partition with minimal impact as long as at least 121 acres of good-quality habitat remains (Convery and Walters, 2004). Home ranges vary dramatically among and within populations and can complicate analyses. The quality of habitat has been found to be more important than distance from the cluster (Convery and Walters, 2004). This phenomenon was exaggerated when higher-quality habitat existed at or beyond the periphery of the partition but not in proximity to the cavity tree cluster.

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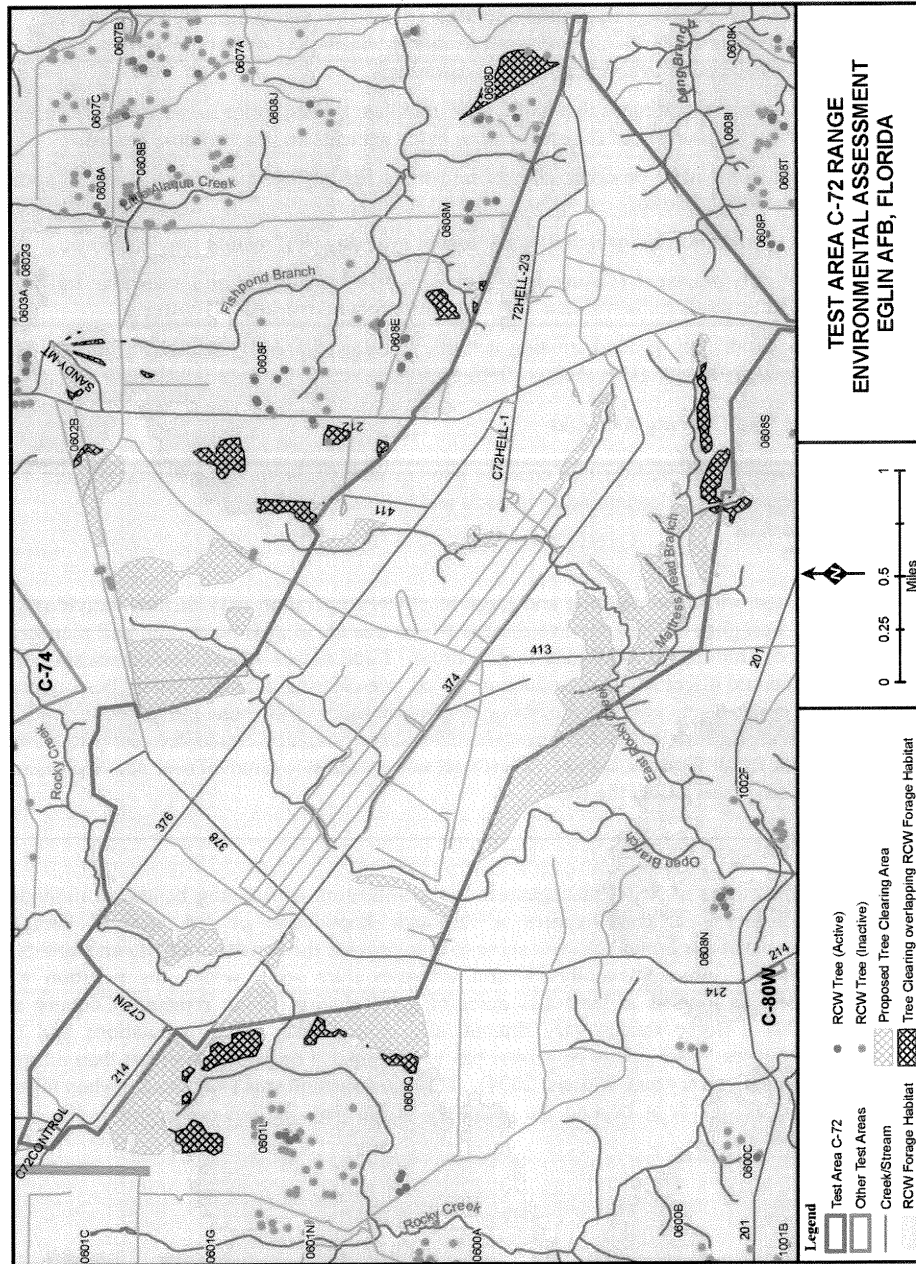


Figure 4-1. Proposed Tree Clearing and RCW Habitat

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The percentage of the RCW protected home range increases as a function of partition radius. However, larger partitions may not be better since they may not necessarily include good habitat. A trade-off exists between partition size and function, because RCWs are a central-place foraging species (i.e., they regularly return to the cavity tree cluster), and preferentially select habitat near the cavity tree cluster (Rosenberg and McKelvey, 1999). This makes habitat near the cluster center more valuable than habitat farther away. Furthermore, the percentage of better quality habitat decreases as a function of partition radius. Using larger partitions may result in restriction on use of land that is, in reality, unsuitable or poorer quality habitat (Convery and Walters, 2004). Groups often extend their home range in the direction away from neighbors and unsuitable habitat. Furthermore, Convery and Walters (2004) suggest land managers should limit the size and scope of practices that decrease foraging habitat quality within the partition and especially within the vicinity of the cluster area.

High-quality RCW forage habitat consists of open pine stands with tree diameter at breast height (dbh) averaging 10 inches and larger. While 100 acres of mature pine is sufficient for some groups, birds commonly forage over several hundred acres where habitat conditions are not ideal (Jackson et al., 1979). Depending on site productivity, different amounts of foraging habitat are required. In systems with medium to high productivity, only 120 acres may be needed, whereas 200 to 300 acres of foraging habitat may be required at sites with low productivity (USFWS, 2003). The NRS has determined that Eglin RCW groups utilize large areas for foraging habitat; thus, Eglin generally manages for 300 acres per cluster with the allowance of 30 percent overlap with surrounding clusters.

General population recommendations for good-quality foraging habitat include 18 or more stems per acre that are greater than 60 years in age and greater than 14 inches dbh. Site conditions at Eglin are generally poor; the result is that longleaf pines tend to have smaller diameters at breast height and lower densities than much of the rest of the RCW's range. Good-quality foraging habitat on Eglin is defined as habitat that contains between 19 and 33 stems per acre of pines that are greater than 10 inches dbh. Another requirement for good-quality habitat is that it contains forbs and bunchgrasses in the understory and has sparse or no hardwood midstory.

Foraging Habitat Assessment Tool

The greatest threat to the RCW population is loss and fragmentation of its habitat. If timber is to be removed within 0.5 miles of active cavity trees, then a forage habitat analysis must be completed to determine potential impacts. Consultation is required if resulting resources fall below USFWS guidelines (USFWS, 2003).

Eglin has developed an independent Oracle-based GIS tool (model) that creates foraging habitat assessments, allowing Eglin to consistently and accurately estimate the available foraging resources without sampling the entire Reservation (U.S. Air Force, 2006c). The USFWS completed Endangered Species Act Section 7 consultation on the model in June 2003 and concurred with the Eglin NRS finding of "not likely to adversely affect." Research has demonstrated that foraging analyses such as Eglin's model accurately portray the actual territories of RCW groups (Convery and Walters, 2004).

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The soils at TA C-72 are primarily Lakeland sands with a low erodibility (K-factor of 0.17). The streams are all classified as perennial streams between 0 and 20 feet wide. Based on these conditions, all of the streams where tree clearing would occur would be protected by a primary Special Management Zone (SMZ) buffer of at least 35 feet on each side, and a secondary SMZ of variable width depending on slope (Table 4-6). For areas that require clearing within 35 feet of a stream, only hand cutting would be allowed and the cut trees would be left in place (Tate, 2011). The 35-foot stream buffer covers 8.83 acres of the proposed tree clearing area.

Table 4-6. Primary and Secondary Special Management Zones for Perennial Streams (0 to 20 feet wide) with Low-Erodibility Soils

Slope	Primary SMZ		Secondary SMZ	
	Width (ft)	Management Criteria ¹	Width (ft)	Management Criteria ²
0-2	35	-No clearcut harvesting -Selective harvesting with restrictions -Protection of very large and/or old trees; snags and cavity trees, trees overhanging water -No mechanical site prep, loading decks, main skid trails, road construction; restrictions on pesticides and herbicide application	None	Clearcut harvesting and unrestricted selective harvesting allowed with the following operational restrictions: -No mechanical site prep -No main skid trails, loading decks or landings -Do not clean spray equipment or discharge rinse water from pesticide or herbicide applications -No road construction -No plowed firelines
3-7			10	
8-12			25	
13+			265	

¹ See details in section on primary SMZ criteria

² See details in section on secondary SMZ criteria

The Proposed Action has the potential to impact the Okaloosa darter from indirect habitat impacts (sedimentation into streams due to land clearing). Cumulatively, these stressors have the potential to negatively affect certain Okaloosa darter streams; however, by implementing the avoidance and minimization measures described below, the tree-clearing actions are not likely to significantly impact the Okaloosa darter or its habitat. Eglin NRS believes the tree-clearing actions are **not likely to adversely affect** the Okaloosa darter or its habitat.

- **Avoidance and Minimization Measures** Follow *Best Management Practices for Silviculture* (FDACS, 2009).
- Proponent must ensure that all land clearing personnel are provided with restrictions regarding protected species, either in verbal or written form. Provide maps when necessary.
- All land-clearing personnel would be briefed on potential endangered species concerns before tree-clearing activities in endangered species habitat; contract clauses would require coordination with an Eglin NRS endangered species biologist.
- All forestry operations near Okaloosa darter streams must be coordinated with Eglin NRS Forest Management and Wildlife elements and the erosion control program manager. Eglin would follow any recommendations from the erosion control manager.
- Any trees within the primary SMZ that must be removed would be cut by hand and left in place (i.e., no heavy machinery or road development).

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Foraging Partition Analysis: Partition analysis involves using the model results from the foraging habitat assessment tool described above to determine what quantity and quality of foraging habitat exists pre-project and what would remain post-project. The foraging habitat model ranks habitat from 0 to 3, with 3 being the highest quality. This analysis determines whether partitions affected by the project would meet the managed stability standard, recovery standard, or fall somewhere in between, post-project (see Table 4-2).

Model results show that eight clusters would be impacted (Table 4-3). Of the 134 acres affected, approximately 57 percent is considered optimal habitat, 26 percent is marginal habitat, and 13 percent is low-quality habitat. The remaining four percent is cleared areas or roads and is not considered usable habitat. Table 4-3 calculates the remaining acres left after tree clearing and whether the habitat meets Eglin's recovery standard or managed stability standard. Other clusters near the line of sight clearings with foraging resources would remain and would not be affected.

Eglin NRS performs comprehensive surveys prior to any land use change (e.g. habitat clearing) as required from the Section 7 consultation letter from the USFWS dated March 24, 2010. Eglin NRS will perform a comprehensive survey to confirm no birds have found suitable habitat within the tree clearing areas. All tree removal would be coordinated with Eglin NRS.

Table 4-3. Foraging Habitat Impacted

Cluster	Foraging Habitat Cleared (Acres)	Foraging Habitat (acres)		Basal Area Total (square feet)		Density Total (stems per foraging area)		Determination
		Before Tree Removal	After Tree Removal	Before Tree Removal	After Tree Removal	Before Tree Removal	After Tree Removal	
0608Q	0.55	301.92	301.37	6,691	6,679	5,509	5,499	NLAA
0608D	21.92	316.98	295.06	7,663	7,133	7,669	7,139	NLAA
0602B	10.34	191.18	180.84	4,752	4,495	3,910	3,699	NLAA
0608F	32.92	387.48	354.56	10,598	9,698	8,715	7,975	NE
0608M	2.13	201.29	199.16	6,135	6,070	5,041	4,988	NLAA
0608E	8.56	291.83	283.27	8,519	8,269	7,000	6,795	NLAA
0601L	38.38	528.33	489.95	15,623	14,488	12,840	11,907	NE
0608S	19.21	329.57	310.36	9,485	8,932	7,797	7,343	NE

NLAA = not likely to adversely affect; NE = no effect

Based on the foraging partition analysis, the proposed tree-clearing actions may affect, but are **not likely to adversely affect**, the RCW.

Group Level Analysis: Group level analysis involves examining a project's impact on the demographic health of a group. The term demographic as used in the group level analysis is relating to the dynamic balance of a population especially with regard to density and capacity for expansion or decline. Demographic health is related, in part, to quality and quantity of foraging habitat. Researchers continue to improve the understanding of relationships between RCW group fitness (e.g., reproductive success, group size, adult survival) and habitat quality (Engstrom and Sanders, 1997; Hardesty et al., 1997; James et al., 1997; James et al., 2001; Walters et al., 2002). The structure of foraging habitat is important to fitness and influences

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habitat selection. RCW fitness and habitat quality increase when foraging habitat is burned regularly, has an open character and herbaceous ground cover, and contains large old pines (DOI, 2005). Additionally, as habitat quality increases, the amount of foraging habitat used (i.e., home range size) decreases.

In addition to habitat quality and quantity, group demographic health is also related to configuration of suitable habitat, which influences the degree of group isolation. Isolation affects group fitness (i.e., size and reproductive potential). Published literature on group demographic health as it relates to population density and size is not extensive. However, several references (Conner and Rudolph, 1991; Hooper and Lennartz, 1995; and Beyer et al., 1996) are available to help determine what density of groups is considered necessary to maintain demographic health (i.e., avoid isolation) of individual groups. Without sufficient numbers of dispersing birds to fill breeding vacancies or become helpers, group size and reproductive potential can be reduced.

Similar to the foraging partition analysis, a relatively small loss of foraging habitat (134 acres spread over eight clusters with one cluster losing 38 acres at most) would not affect the group negatively. The disperse tree-clearing locations and the configuration of suitable habitat intermingled with unsuitable habitat would not affect demographic health of any group. The clusters surrounding the proposed tree clearing would not be affected due to any group isolation or significant habitat fragmentation.

The proposed tree-clearing actions may affect the RCW, but are **not likely to adversely affect**, the species at the group level. A neighborhood level analysis is not required but is discussed briefly to obtain a full picture of the potential for impacting neighborhood groups.

Neighborhood Level Analysis: Neighborhood groups are those groups not directly impacted by the project but that occur adjacent to, or within the dispersal distance of groups that are directly affected by the project. By adversely affecting quantity and quality of foraging habitat, and, thereby, the survival or stability of individual groups (e.g., by disruption of dispersal opportunities), projects may affect the health and distribution of RCW groups on a larger scale, i.e., the neighborhood.

Habitat quality associated with the neighboring clusters is good. Currently, the area is frequently burned with low-intensity prescribed fires, has a good grass and herbaceous plant cover, and a low hardwood midstory component. Even though the Proposed Action would result in a direct reduction of foraging habitat, neighboring clusters would not be affected. There is no potential for disruption of dispersal at their current location. The only possible effect would be that groups that are impacted by the tree clearing may adjust their territories into the territories of adjacent groups, leaving them with fewer resources.

At the neighborhood level, the proposed tree-clearing actions may affect, but are **not likely to adversely affect** the RCW; a population level analysis and Recovery Unit Level Analysis is not warranted. Table 4-4 summarizes the results of the foraging habitat analysis.

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Table 4-4. Results of Foraging Habitat Analysis

Type of Analysis	ESA Section 7 Consultation Determination	Reasons
Foraging partition analysis	Not likely to adversely affect	Some clusters' foraging resources fall between Eglin's recovery standard and Eglin's managed stability standard after the completion of the tree removal.
Group level analysis	Not likely to adversely affect	The sporadic tree-clearing locations and the configuration of suitable habitat intermingled with unsuitable habitat would not negatively affect demographic health of any group.
Neighborhood level analysis	Not likely to adversely affect	No decrease in neighboring birds' long-term dispersal opportunities, but there may be territorial shifts.
Population level analysis and recovery unit level analysis	No effect	Does not appreciably reduce the likelihood of the recovery unit meeting its population goal.

RCW Inactive Tree Removal

The proposed land-clearing actions may require cutting of up to two inactive cavity trees, in clusters 608F and 608D, northeast of TA C-72. The inactive trees within foraging habitat proposed to be cleared are described as "complete inactive" in Eglin GIS and are unlikely to become active again over the next year or two. If tree clearing is to occur during nesting season, Eglin NRS will screen each inactive cavity tree during the breeding season to verify no trees have been recolonized and to prevent use by other bird species protected by the Migratory Bird Treaty Act. With implementation of the below avoidance and minimization measures, Eglin NRS believes that removal of two inactive RCW trees for the proposed tree clearing is **not likely to adversely affect** the species.

Avoidance and Minimization Measures

Eglin would implement the following avoidance and minimization measures as part of the Proposed Action:

- Tree clearing areas would be surveyed prior to tree removal to ensure no undocumented cavity trees have been recently excavated.
- No tree-clearing activities would be conducted within 200 feet of an active RCW tree during nesting season.
- Proponent must ensure that all land-clearing personnel are provided with restrictions regarding protected species, either in verbal or written form, prior to tree clearing activities. This will include maps when necessary.
- Contract clauses for tree clearing activities would require coordination with an Eglin NRS endangered species biologist.
- All inactive RCW trees must be surveyed and screened prior to tree cutting to ensure no birds are living in the cavities.
- Eglin NRS will continue monitoring of RCWs in the area.

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- Prior to commencement of activities, Eglin would ensure implementation of any modifications or conditions resulting from consultation with the USFWS.
- Follow Best Management Practices for Silviculture (FDACS, 2009).
- When possible, plant longleaf pine seedlings on harvested interstitial areas.

Summary of RCW Analysis

The Proposed Action has the potential to impact the RCW from noise and human presence, and habitat impacts (land clearing). Cumulatively, these stressors have the potential to negatively affect certain RCW clusters. However, by implementing avoidance and minimization measures as part of the proposed tree-clearing actions, Eglin NRS believes the actions may affect, but are not likely to adversely affect, the RCW.

4.1.2 Eastern Indigo Snake*Testing and Training Activities*

TA C-72 is considered suitable, although not preferred, habitat for the eastern indigo snake. Because it uses a variety of habitat types, the eastern indigo snake could occur anywhere on the Eglin mainland reservation, including test areas. The species is uncommon; therefore, the likelihood of impact from test and training activities is considered extremely remote. Increased frequency of missions may increase the likelihood of encountering an eastern indigo snake. However, given the reclusive nature of the species and their assumed rarity, the potential impact from the Proposed Action is not significant.

In 2008, Eglin NRS submitted a programmatic biological assessment (BA) to the USFWS to address impacts to the eastern indigo snake from testing and training activities, general range road usage and maintenance, and construction activities. Within that BA, the NRS has adapted and modified the USFWS Standard Protection Measures for the eastern indigo snake for use on the Eglin reservation (U.S. Air Force, 2008b). The BA also outlines procedures to be used for implementing those protection measures, which are summarized below. Given the low likelihood that an indigo snake would be encountered, missions at C-72 are **not likely to adversely affect** the indigo snake.

- **Avoidance and Minimization Measures** The NRS will provide personnel with a description of the indigo snake, its behaviors, and protection under federal law, and give them instructions not to injure, harm, or kill this species.
- Stop activities if an eastern indigo snake is sighted and allow the snake to move away from the site before resuming activities.
- Avoid gopher tortoise burrows by a minimum of 25 feet.
- Prior to land clearing or establishment of a new target area, contact Eglin Natural Resources Section for a gopher tortoise/indigo snake survey.
- Comply with the USFWS standard protection measures as described in the Programmatic Biological Assessment for the eastern Indigo Snake (U.S. Air Force, 2008b) (Appendix B).

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Determination of Impacts

Line of Sight Tree Clearing Activities

Increased levels of off-road vehicular traffic due to tree-clearing activities have the potential to impact indigo snakes and their habitat. However, most of TA C-72 is open grassland, which is not the preferred habitat of the indigo snake. Additionally, the potential for encountering an indigo snake is very low; Eglin has not had any indigo snake sightings or reports since 1999. Incidental contact with personnel on foot or vehicles could result in trampling or crushing of individuals, but this occurrence is unlikely, as a snake would most likely move away from the area if it sensed a general disturbance in its vicinity. If an indigo snake is sighted, personnel would cease activities until the snake has moved away from the area and immediately notify the NRS. Personnel would follow the *Standard Protection Measures for the Eastern Indigo Snake* (U.S. Air Force, 2008b), and the avoidance and minimization measures listed below to reduce or eliminate impacts associated with the Proposed Action. Due to the low probability of an encounter and the requirement to avoid any sighted indigo snake, the Proposed Actions are **not likely to adversely affect** the species.

- **Avoidance and Minimization Measures** Eglin NRS will provide personnel with a description of the indigo snake, its behaviors, and protection under federal law, and give them instructions not to injure, harm, or kill this species.
- Stop activities if an eastern indigo snake is sighted and allow the snake to move away from the site before resuming activities.
- Avoid gopher tortoise burrows by a minimum of 25 feet.
- Prior to land clearing, contact Eglin Natural Resources Section for a gopher tortoise/indigo snake survey.
- Comply with the USFWS standard protection measures as described in the Programmatic Biological Assessment for the eastern Indigo Snake (U.S. Air Force, 2008b) (Appendix B).

4.1.3 Okaloosa Darter

The Eglin Threatened and Endangered Species Component Plan identifies erosion and resulting sedimentation as a major contributor to the degradation of Okaloosa darter habitat. To protect the Okaloosa darter, the quantity and quality of water in the streams must be protected. Principal factors in the initial listing of the darter were the amount of its habitat degraded by road and dam construction, as well as siltation from land clearing (USFWS, 1998).

Six stream crossing restoration projects conducted at TA C-72 have greatly reduced the erosion potentials in the area. Three of the crossings were upgraded with pipe replacements, stormwater controls, and geoweb road approaches, and the three others were decommissioned. Additionally, there have been approximately 24 erosion control projects and a borrow pit erosion control project at C-72 to limit erosion into darter streams. Hundreds of trees and other plants have been planted over the past 10 years at these sites. A stormwater repair at the Range Road (RR) 214/374 crossing on Rocky Creek was also accomplished. Approximately 50 acres of erosion control projects at TA C-72 (excluding TA C-7A-Hellfire and TA C-5) have been completed, with estimated construction costs of approximately \$900,000 (Pizzalato, 2011). Projects have involved earth moving, berms, native vegetation, and other erosion control methods (Figure 4-2).

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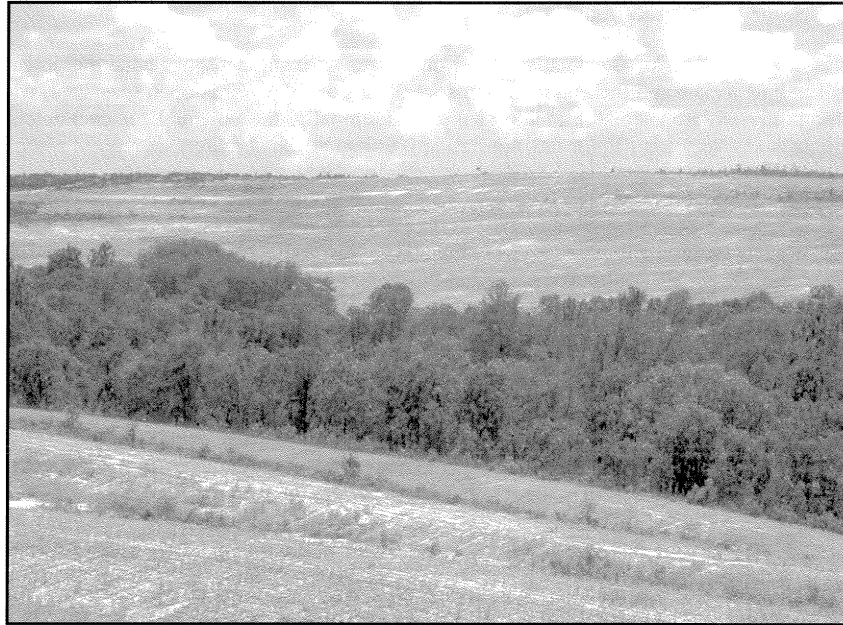
Determination of Impacts

Figure 4-2. Erosion Control Project on Okaloosa Darter Stream on Test Area C-72

Testing and Training Activities

The primary threat to the Okaloosa darter is excess sedimentation into its stream habitat. Minimization of erosion in darter watersheds is extremely important to its well-being. Increased mission activity would continue to comply with avoidance and minimization measures that are designed to protect the species. New user groups must adhere to the accepted guidelines for use of the test area. The increase in frequency of missions and training is not anticipated to significantly impact the Okaloosa darter or its stream habitat.

To protect darter stream habitat, users of TA C-72 would use established roads, trails and bridges when troops and vehicles are crossing streams. Additionally, ground-disturbing activities such as off-road vehicle use, bivouac, and fighting positions, would be restricted near darter streams and on stream slopes. Pyrotechnics use would be restricted near darter streams, and munitions impact areas would be located away from darter streams. If any munitions land in darter streams, users would contact Eglin Natural Resources Section (NRS) (96 CEG/CEVSN) prior to attempted retrieval. With proper avoidance and minimization measures in place, the increased level of testing and training activity is **not likely to adversely affect** the Okaloosa darter or its habitat.

- ***Avoidance and Minimization Measures*** Comply with all requirements stated in Eglin AFB Instruction 13-212, *Range Planning and Operations*.

Determination of Impacts

- Ensure that all mission personnel are provided with restrictions regarding protected species, either in verbal or written form. Provide maps when necessary.
- All vehicles and personnel must cross identified darter streams only at established crossings or on bridges.
- Ground-disturbing activities such as off-road vehicle use, bivouac, and fighting positions, would be restricted within 200 feet of darter streams and on stream slopes.
- Pyrotechnics use would be restricted within 100 feet of darter streams, and munitions impact areas would be located away from darter streams.
- Contact Eglin NRS (96 CEG/CEVSN) for any munitions that land in darter streams.

Line of Sight Tree Clearing Activities

Tree-clearing activities at TA C-72 have the potential to impact Okaloosa darters and their habitat due to sedimentation, logging debris, chemicals, and water temperature fluctuations. The majority of streams at TA C-72 have steep slopes, so most trees near the streams would not require removal because the lower elevation trees would not impede line of sight. Proper implementation of BMPs and avoidance and minimization measures are key to minimizing these impacts to darter streams.

At a minimum, all logging operations would follow the *Best Management Practices for Silviculture in Florida* (FDACS, 2009). These practices are designed as the minimum standards necessary for protecting and maintaining the state's water quality and certain wildlife habitat values during forestry activities. As such, they represent a balance between overall natural resource protection and forest resource use.

For each forestry operation that is large enough to be categorized as a timber sale, Eglin NRS Forestry element would coordinate with the logging contractors. The smaller areas that do not qualify as a timber sale through Eglin NRS would be coordinated through the 46th TW. All of the clearings (NRS and TW coordinated parcels) that have the potential to impact darter streams would be coordinated with Eglin NRS Forest Management and Wildlife elements prior to any tree clearing, to ensure communication of proper BMPs (Sutsko, 2011a). Table 4-5 identifies the tree-clearing habitat, responsibility, and coordination requirements for each type of tree clearing at TA C-72.

The *Best Management Practices for Silviculture in Florida* (FDACS, 2009) defines a Special Management Zone (SMZ) as a specified area associated with a stream that is maintained during silviculture operations to provide aquatic habitat benefits such as shade, streambank stability, erosion control, detritus, woody debris, and wildlife habitat. The SMZ is subject to specific management criteria that define operational restrictions and has three main components: the primary zone, the secondary zone, and the stringer (stringer is not applicable for the Proposed Action) (Figure 4-3).

Determination of Impacts

Table 4-5. Tree Clearing Coordination Matrix

Location	Qualified Timber Sale?	Responsible Organization	Coordinating Organization	BMPs
More than 300 feet away from any darter stream	Yes	Eglin NRS Forestry	None required	<i>Best Management Practices for Silviculture in Florida</i> ¹
	No	46 th TW		
Within 300 feet of any darter stream	Yes	Eglin NRS Forestry	-Eglin NRS Forestry -Eglin NRS erosion control manager	<i>Best Management Practices for Silviculture in Florida</i> ¹
	No	46 th TW		
Within 35 feet of any darter stream	All tree clearing	46 th TW, Eglin NRS Forestry	-Eglin NRS Forestry -Eglin NRS erosion control manager -Eglin NRS biologist	- <i>Best Management Practices for Silviculture in Florida</i> ¹ -Only hand cutting allowed -Cut trees left in place

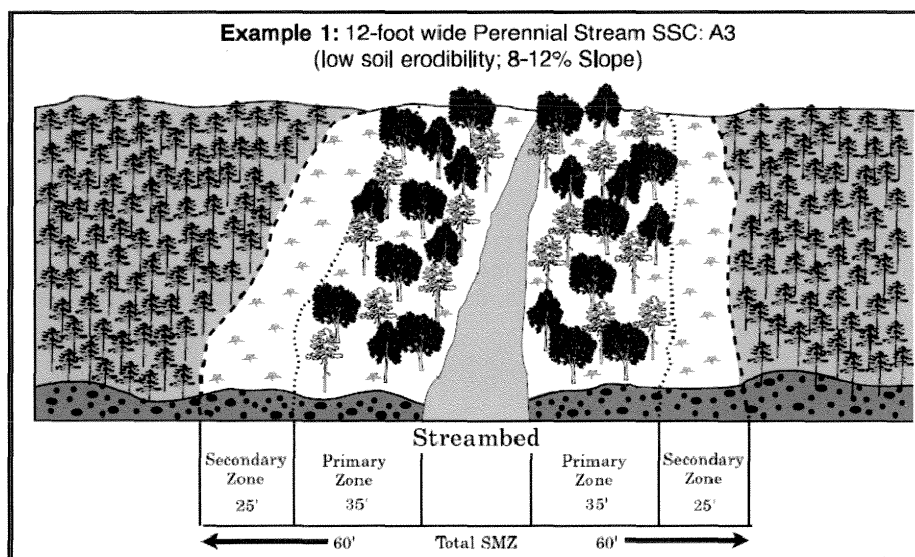
¹ See details in section on Special Management Zone Criteria

Figure 4-3. Example of Special Management Zone (SMZ), Primary SMZ, and Secondary SMZ

The factors determining which components apply for a given forestry operation are soil type, slope, stream type, and stream width. The following section provides a detailed description of the two pertinent SMZ components (primary and secondary SMZs) and the avoidance and minimization measures within each one. Practices that are allowed within all components of the SMZ include direct seeding, hand planting, or machine planting on the contour of the land, prescribed burning for site preparation on slopes less than 18 percent, and basal application of herbicides and insecticides.

Determination of Impacts

Within the primary SMZ, the following management criteria apply:

- Clearcut harvesting is **always** prohibited within 35 feet of all perennial waters.
- Selective harvesting may be conducted to the extent that 50 percent of a fully stocked stand is maintained. The residual stand must conform to the following:
 - Trees are left to maintain the approximate proportion of diameter classes and species present prior to harvesting, except that oaks (other than water oaks) and den trees may be favored for wildlife species such as bears. However, in mixed pine/hardwood forests the residual stand may be composed of up to 90 percent hardwood and 10 percent pine, and den trees may be favored.
 - Repeated entry into a harvested primary SMZ in short time intervals for additional harvesting is prohibited.
 - No trees will be harvested in stream channels or on the immediate stream bank.
- Special emphasis should be given to the protection of very large trees and/or old trees, snags and cavity trees, and trees where any part of the canopy overhangs the water.

The following forestry activities are prohibited within the primary SMZ:

- Mechanical site preparation
- Loading decks or landings and log bunching points
- Main skid trails, except to approach a designated stream crossing
- Aerial application, mist blowing or operational application of pesticides or fertilizer, including any drift from nearby applications
- Cleaning spray equipment or discharging rinse water from pesticide or fertilizer applications
- Road construction except when crossing a water body
- Site preparation burning on slopes of 18 percent or greater

Within the secondary SMZ, there are no timber harvesting limitations (unrestricted selective harvesting and clearcut harvesting are both allowed). However, the following operational restrictions apply:

- No mechanical site preparation
- No main skid trails (except for stream crossings), loading decks, or landings
- No cleaning of spray equipment or discharging rinse water from pesticide and fertilizer applications.
- No road construction except for stream crossings.
- No plowed firelines except during fire suppression.
- No site preparation burning on slopes of 18 percent or greater.

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Determination of Impacts

- Prior to commencement of activities, Eglin would ensure implementation of any modifications or conditions resulting from consultation with the USFWS.

4.2 OTHER SPECIES CONSIDERED**4.2.1 Gopher Tortoise*****Testing and Training Activities***

Test Area C-72 has not been comprehensively surveyed for gopher tortoise burrows; however, project-specific surveys of limited areas have been completed, and individuals and burrows were documented during a small survey in 2010 (U.S. Air Force, 2010d). There is a low potential for impacts from munitions and training missions such as burrow collapse or direct physical impact. Training and heavy missions should be avoided near known gopher tortoise burrows. If a gopher tortoise or gopher tortoise burrow is seen within the proposed site of one of these activities, personnel must contact the Eglin NRS to inspect, evaluate, and possibly relocate the gopher tortoise. Also, prior to any clearing or establishment of new targets, a gopher tortoise survey must be completed; mission personnel must contact Eglin NRS to arrange the survey. Transportation and release of tortoises would follow guidelines established by the FWC in gopher tortoise permitting guidelines (FWC, 2008). The gopher tortoise is unlikely to be adversely impacted by missions at TA C-72.

Avoidance and Minimization Measures

- Avoid gopher tortoise burrows by at least 25 feet.
- If a gopher tortoise is sighted, allow the animal to move away from the area before resuming activities.
- Notify the Natural Resources Section if a gopher tortoise or burrow is found.
- Prior to any clearing or establishment of new targets, a gopher tortoise survey must be completed; mission personnel must contact Eglin NRS to arrange the survey. Transportation and release of tortoises would follow guidelines established by the FWC in gopher tortoise permitting guidelines (FWC, 2008).

Line of Sight Tree Clearing Activities

Burrow collapse and direct physical impacts are possible from LOS tree clearing activities, but are unlikely given that tortoises prefer to establish burrows in open areas. Beauman, 2008 found that 97.6 percent of gopher tortoises self-excavated after their burrows were collapsed. Tree clearing would leave stumps in place, thus ground disturbance would be minimal. Gopher tortoise surveys are not required for tree clearing operations that do not involve ground disturbing activities. Personnel would avoid impacts to known tortoise burrows, and would not disturb any tortoises that were spotted. No significant impacts to the gopher tortoise would occur from LOS clearing.

- ***Avoidance and Minimization Measures*** Cut trees at the base and leave stumps in place. Do not conduct any ground disturbing activities.

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Determination of Impacts

- If a gopher tortoise is sighted, allow the animal to move away from the area before resuming activities.
- Avoid known gopher tortoise burrows.
- Notify the Natural Resources Section if a gopher tortoise or burrow is found.

4.2.2 Florida Black Bear

The Florida black bear may be found in the Sandhills and also in stream riparian areas, which they use as habitat and travel corridors. The presence of several creeks enhances the possibility of black bear potential. Because the majority of the test area is cleared, it is unlikely that black bear would traverse the open area. Vehicle strikes are the primary concern for bears on Eglin; thus, drivers should be alert to the presence of bears to avoid impacts. The Florida black bear is unlikely to be adversely impacted by increased test and training activities.

Vehicle strikes are the main concern for LOS tree clearing activities. Vehicle operators would be instructed to stop and allow bears to move away from the area before resuming activities, and to contact the NRS to report the sighting. The black bear is unlikely to be adversely impacted by LOS tree clearing activities.

- ***Avoidance and Minimization Measures*** If a black bear is sighted, allow the animal to move away from the area before resuming activities.
- Notify the NRS if a black bear is sighted.
- Properly dispose of trash to avoid attracting bears.

4.2.3 Migratory Birds

Migratory birds pass through the area, but Eglin is not considered an important stopover area or concentration site for neotropical migratory birds in the spring or fall (Tucker et al., 1996). Breeding migrants at Eglin are primarily found in riparian, hammock and barrier island habitats. The majority of TA C-72 is cleared, thus does not provide good habitat for migratory birds. The Proposed Action is unlikely to adversely affect migratory birds.

Conclusion**5. CONCLUSION**

The proposed action would have no significant adverse effects on any of the resources evaluated in this BA. Avoidance and minimization measures, which are part of the proposed action, would preclude direct effects to biological resources and their habitats. Based on analysis of the potential impacts to federally protected species from the proposed activities, TA C-72 mission activities and LOS tree clearing are NOT LIKELY TO ADVERSELY AFFECT any protected species.

The U.S. Fish and Wildlife Service would be notified immediately if any of the actions considered in this proposed action are modified, or if additional information on listed species becomes available, as re-initiation of consultation may be required. If impact to listed species occurs beyond what has been considered in this assessment, all operations would cease and the Service would be notified. Any modifications or conditions resulting from consultation with the Service would be implemented prior to commencement of activities. The Natural Resources Section believes this fulfills all requirements of the Endangered Species Act and no further action is necessary.

Conclusion

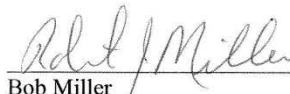
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Signatures

6. SIGNATURES**INFORMAL CONSULTATION REGARDING**

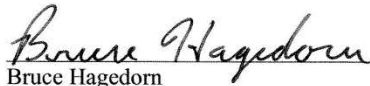
POTENTIAL IMPACTS TO FEDERALLY LISTED SPECIES
RESULTING FROM
TEST AREA C-72 AND LINE OF SIGHT AT
EGLIN AIR FORCE BASE, FLORIDA

Reviewed by:



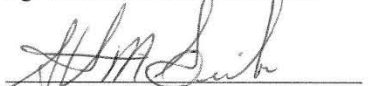
Bob Miller
Endangered Species Biologist
Eglin Natural Resources Section

5/23/11
Date



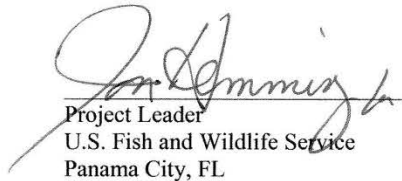
Bruce Hagedorn
Chief, Wildlife Element
Eglin Natural Resources Section

5-25-11
Date



Stephen M. Seiber
Chief, Eglin Natural Resources Section

5/25/2011
Date

USFWS CONCURRENCE:

Project Leader
U.S. Fish and Wildlife Service
Panama City, FL

6/9/11
Date

FWS Log No.

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Signatures

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Appendix B

*Conditions of BA/BO Information for Consultation:
Indigo Snake Programmatic*

should be thoroughly soaked in water and then frozen.
If proposed locations for training activities are known and localized, they would be surveyed for active and inactive gopher tortoise burrows. Eglin AFB NRS personnel would conduct a gopher tortoise survey prior to any ground disturbance or personnel activities.
Active burrows are marked and a 25-ft buffer is observed around the burrow for avoidance
If during the course of the training, an indigo snake is sighted all activity would cease and the snake would be given sufficient time to leave the area if the training activity is small and has minor impacts to the surrounding habitat. However, if the training activity is large and the habitat is to be degraded or destroyed, the snake will be moved to suitable habitat in a new location. Relocation of the indigo snake would be conducted under the above guidelines modified from the USFWS Standard Protection Measures for the Eastern Indigo Snake (Section 4.1).
Any new training activities in undeveloped areas that may have the potential to impact gopher tortoises would be subject to an effect determination by utilizing Eglin's Effects Determination Key (Section 4.2).
Active and inactive burrows are avoided when using heavy equipment, such as during logging operations. "Stumping operations" are allowed only in areas of proposed roads, facilities, and planned construction
During forest operations, unnecessary forest roads are closed to minimize vehicle encounters with the indigo snake
In pine plantations, single drum chopping is used whenever possible (instead of bedding and root-raking).
If construction activities, such as fiber optic cable or utilities installation, may potentially impact gopher tortoise, Eglin AFB NRS personnel would conduct a gopher tortoise survey prior to any ground disturbance. If during the course of construction, an indigo snake is sighted all work would cease and the above guidelines modified from the USFWS Standard Protection Measures for the Eastern Indigo Snake (Section 4.1) would be followed.
Any new construction activities in undeveloped areas that may have the potential to impact gopher tortoises would be subject to an effect determination by utilizing Eglin's Effects Determination Key (Section 4.2).
Eglin AFB NRS personnel would conduct a gopher tortoise survey prior to any ground disturbance for proposed construction projects.

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Test Area C-72 and Line of Sight
Biological Assessment

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APPENDIX A
FACILITY AND TARGETS DESCRIPTION

Appendix A

Facilities and Targets Descriptions

FACILITIES AND TARGETS DESCRIPTIONSFacilities***The Hellfire Production Test Facility***

The Hellfire Missile Test Complex consists of Test Site (TS) C-7 (Hellfire Control Facility), TS C-7A (Hellfire Launch Facility), TA C-72 (Hellfire Target Area) and various other test sites within TA C-72 that support cinetheodolites and video tracking equipment. Users fire missiles from the Hellfire Launch Facility at C-7A towards three designated Hellfire targets on TA C-72: TT-83, TT-84, and TT-85. Users remotely control all testing and data collection from TS C-7, located outside of the safety footprint. This facility is unique in the operation of remotely controlled instrumentation, data acquisition, and self-contained fiber optic network systems used in support of missile and other electro-optically guided weapons testing. The fiber optic network consists of underground cables that relays data back to Test Site C-7. This facility also supports many other Army/Air Force guided weapons tests.

Test Site C-7

Located six miles west of TA C-72, this control facility contains the equipment required to remotely operate all downrange instrumentation from outside a predetermined safety footprint. This includes the tracking consoles for three High Performance Video Trackers (HPVT), all cameras (normal and high speed video, and silicon vidicon), environmental chambers, missile test sets, and firing circuitry which are located on the test area itself. The site has its own state-of-the-art telemetry ground station, a helicopter pad, and a 12,000-foot hangar, along with support buildings.

Test Site C-7A

Test Site C-7A is located on the western side of TA C-72. It includes a launch pad and support building set up on a hill rising approximately 20 feet above ground level. There are three platform launchers, each equipped with two launch rails and clamshell covers that support firing up to six missiles at a time. Users may install and control additional temporary launch rails from this location. The launch pad sits atop an instrumentation bunker, called the Grotto, which houses missile test sets, measurement and control instrumentation, and environmental conditioning unit temperature recorders.

Time-Space-Position-Information (TSPI)

There are four Contraves cinetheodolites equipped for obtaining complete photographic ballistic data. The cinetheodolites are positioned at Test Sites C-132, C-133, C-134, and C-135. Three remotely controlled high performance video trackers are located at Test Sites C-139, C-140, and C-141. These are equipped with long focal length shuttered video tracking optics. An AN/FPS-16 radar is operated from Test Site C-10, located between C-7 and TA C-72, and is augmented with long focal length tracking television systems. A fiber optic video/data system provides instrumentation coverage of the entire Hellfire range. Television, data, timing, and voice communications are available to and from the hub at Test Site C-7.

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Test Area C-72 and Line of Sight
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Appendix A

Facilities and Targets Descriptions

Test Area C-72 Hellfire Targets

There are three targets designated as Hellfire targets on TA C-72: TT-83, TT-84, and TT-85. The targets are made of mounds of clay material, with a metallic target face mounted on front. TT-83 and TT-84 are approximately 20 feet in height, while TT-85 is approximately 30 feet in height.

Anti-Armor Tracking Range

A designation and targeting range for Army 7th SFG training is located at the northwest end of C-72. This range consists of a firing pad with numerous fixed targets out to 2000 meters. Two 350m mobile targets (target boards on a rail system) are also utilized and located east of Rocky Creek. These targets are for laser and seeker designation only; no live fire is allowed on these targets.

Targets

Table A-1 briefly describes the published targets found on TA C-72 (Figure A-1). Other targets used on TA C-72 support a specific program and are not published targets. These include concrete blocks, billboard, cloth (lying on the ground), and temporary structures.

Table A-1. Target Locations on Test Area C-72

Target Name	Latitude (North)	Longitude (West)	Remarks
C-5			Sand Bombing Circle located in General Purpose Area
TT-1	30-38-30.49	86-18-36.32	Reinforced Concrete Free Standing Walls Center of Targets TT-1 - TT-6
TT-2			Reinforced Concrete Retaining Wall with Wing Walls and Embankments
TT-3	30-38-31.73	86-18-37.47	Reinforced Concrete Retaining Wall with Wing Walls and Embankments
TT-4			Reinforced Concrete Walls
TT-5			Reinforced Concrete Abutment with Walls and Embankments
TT-6			Reinforced Concrete Bents
TT-7	30-38-34.77	86-18-50.64	Revetted Radar Site
TT-8	30-38-44.144	86-19-03.529	Aircraft Revetment
TT-9	30-38-54.6	86-19-06.1	Simulated Power Line
TT-10			Air-to-ground WSEP Target
TT-12	30-38-28.50	86-18-53.51	Ammo Igloo
TT-13	30-38-44.84	86-18-47.66	P.O.L. Area
TT-14-2	30-38-26.50	86-19-08.45	Tob Center (Source: BAE)
TT-15	30-38-32.84	86-18-48.16	Revetted Missile Site (Semi-circular Earth Revetment)
TT-31			One Zigzag Trace Trench
TT-32			Nine Open One-Man Foxholes
TT-33			Nine Two-man Foxholes with Offsets
TT-34			Nine Half Covered One-Man Foxholes
TT-35			One Buried Concrete Command Post
TT-36			Two Buried Wooden Personnel Bunkers with Heavy Overhead Cover
TT-37			One Buried Wooden Personnel Bunker (Cut and Covered)
TT-38			Two Buried Concrete Personnel Bunkers
TT-39			Two Buried Concrete Automatic Weapon Emplacements
TT-40			Three Buried Wooden Automatic Weapon Emplacements
TT-41			Two Howitzer Emplacements
TT-42			One Circular Type Mortar Emplacement
TT-43			Six Horseshoe Type Machine Gun Emplacements
TT-44			Three Dug-in Tank Emplacements

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Test Area C-72 and Line of Sight
Biological Assessment

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Appendix A

Mission Activities and Facility Descriptions

Table A-1. Target Locations on Test Area C-72, Cont'd

Target Name	Latitude (North)	Longitude (West)	Remarks
TT-45			One 328-foot Tunnel and Shaft
TT-46			Open Crawl Trench Between Various Targets
TT-47			A 650-foot Triple Standard Concertina Fence
TT-48			A 350-foot Double Apron Fence
TT-63	30-39-37.99	86-20-01.15	One Reinforced Concrete Submarine Pen (Coord of Center) (Needs Repair)
TT-64	30-39-39.08	86-19-56.90	One Reinforced Concrete Vertical Wall (Coord of SE Corner)
TT-65	30-39-42.929	86-20-38.182	One Reinforced Concrete Ricochet Wall for GAU-8 (Coord of Center)
TT-66	30-38-09.05	86-18-40.97	Concrete Runway Target (200 foot x 1,500 foot) (Needs Repair)
TT-67	30-38-01.9	86-18-15.8	A 800- by 1,000-foot A-10 strafing target
TT-68	30-37-38.731	86-17-29.814	Concrete Target/Casting Area
TT-74	30-37-32.335	86-16-40.385	Center of Racetrack
TT-75	30-37-33.939	86-16-54.018	Vehicle Racetrack, Coordinates of Cal Point on Racetrack
TT-77	30-37-29.708	86-17-16.258	Clay Pad (100 foot x 100 foot)
TT-82	30-37-59.980	86-18-41.607	Hellfire 2 km Target
TT-83	30-37-49.69	86-17-49.12	Hellfire EO Target No. 1
TT-84	30-37-42.71	86-16-49.56	Hellfire EO Target No. 2
TT-85	30-37-33.21	86-15-34.23	Hellfire EO Target No. 3
TT-87			Strafing Target
TT-93			Bombing Circle
TT-94			General Purpose Bombing Grid (500 x 5000 feet)
TT-95			WSEP CONEX Array
TT-96			WSEP Vehicle Array

Source: Bufkin, 2005

General Purpose Area

Eglin designated a 1,800- by 5,000-foot area in the center of the test area as the general-purpose area. Eight flight line markers provide four parallel flight paths lengthwise with the long orientation of the test area (northwest to southeast). This area supports munitions and strafing tests of bombs, mines, guns, rockets, and guided munitions. Users also conduct fuse tests such as airburst, proximity, impact, and delay on this test area. An 800 by 1,000-foot A-10 strafing target is located in the area (U.S. Air Force, 2001).

Appendix A

Mission Activities and Facility Descriptions

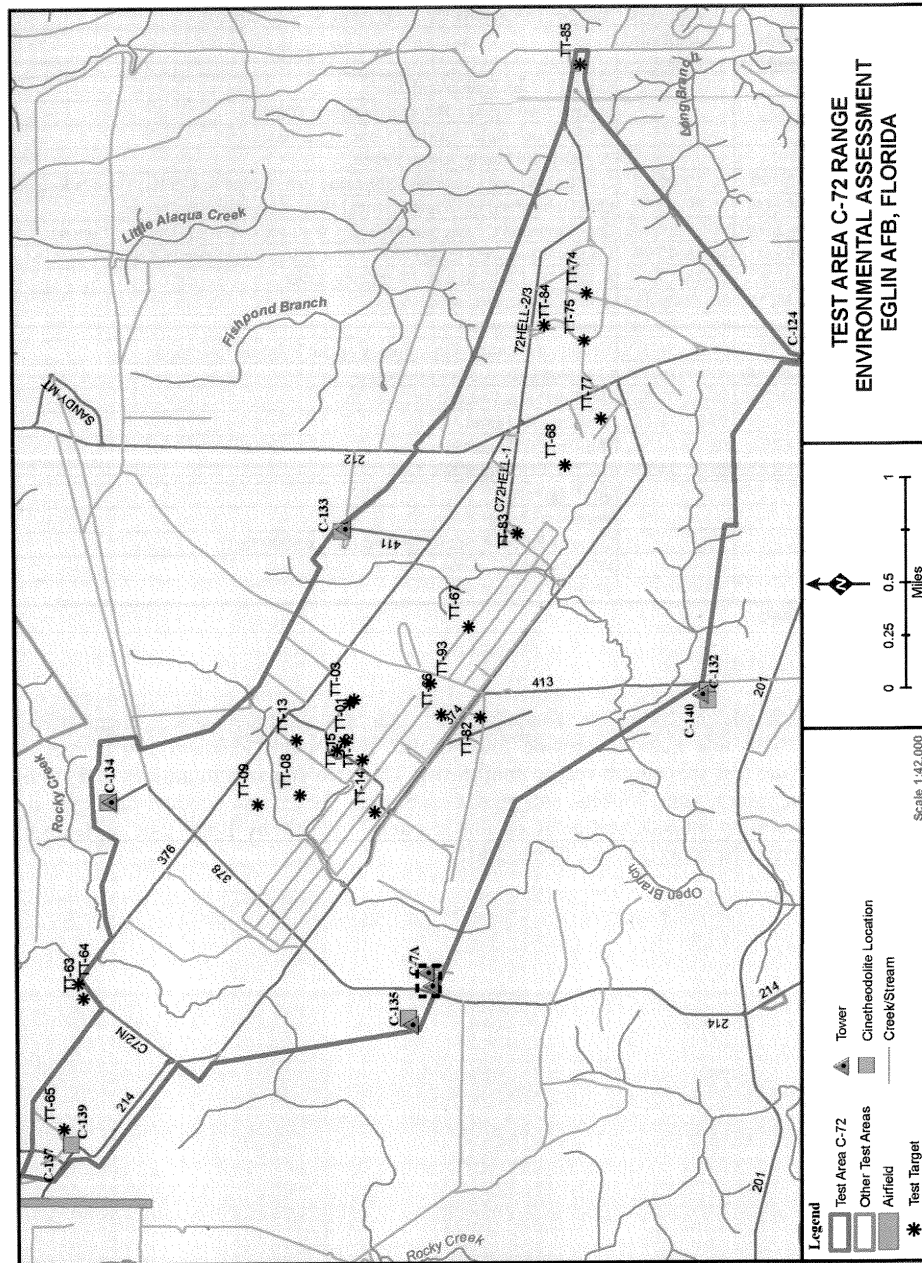


Figure A-1. Published Targets on TA C-72

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Test Area C-72 and Line of Sight
Biological Assessment

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Appendix A

Mission Activities and Facility Descriptions

Instrumentation

- Four Contraves cinetheodolites (TS C-132, C-133, C-134, and C-135) for obtaining complete photographic ballistic data.
- Three remotely controlled high-speed video trackers (TSs C-139, C-140, and C-141) with long focal length shuttered video tracking optics.
- An AN/FPS-16 computer-aided monopulse instrumentation radar (TS C-10) with long focal length shuttered video tracking optics and contrast TV tracking.
- Two mobile laser designator support trailers.
- One permanent five-point weather system.
- One forward scatter meter.
- One Global Positioning System/Multi-object Tracking and Control System (GPS/MTACS) site, C-133, equipped for 915 Megahertz (MHz) operation only. Eglin can convert this site to a 1,365 MHz operation with a minimum notification of 48 hours. Two MTACS sites, tower, and antenna can be equipped for 915 or 1635 MHz operation with a minimum 48 hours of notification.
- Three environmental conditioning systems (-45 to 145° F) at TS C-7A.

Buildings and Structures

Buildings used to support the Hellfire program include:

- One control and engineering building.
- One support building, an elevated launch mound with subterranean instrument room (bldg 9541).
- One missile preflight building (bldg 9540).
- Three instrumentation shelters.
- One 100-foot telemetry tower.
- One electro-optical support building.

Table A-2 describes structures located on TA C-72 and TS C-7. Other support facilities on TA C-72 include:

- One 500-foot inclined sled track (currently non-operational).
- One test area control building.
- Four small assembly/observational buildings.
- Four cinetheodolite buildings.
- One LRTC pad with calibration targets at TS C-12.
- One control/engineering building.
- One support (open bay) building.
- One elevated launch mound with subterranean instrument room.
- One missile preflight building.
- Three instrumentation shelters.
- One 100-foot telemetry tower.
- One EO support building.
- One 12,000 square-foot hangar.

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Test Area C-72 and Line of Sight
Biological Assessment

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Appendix A

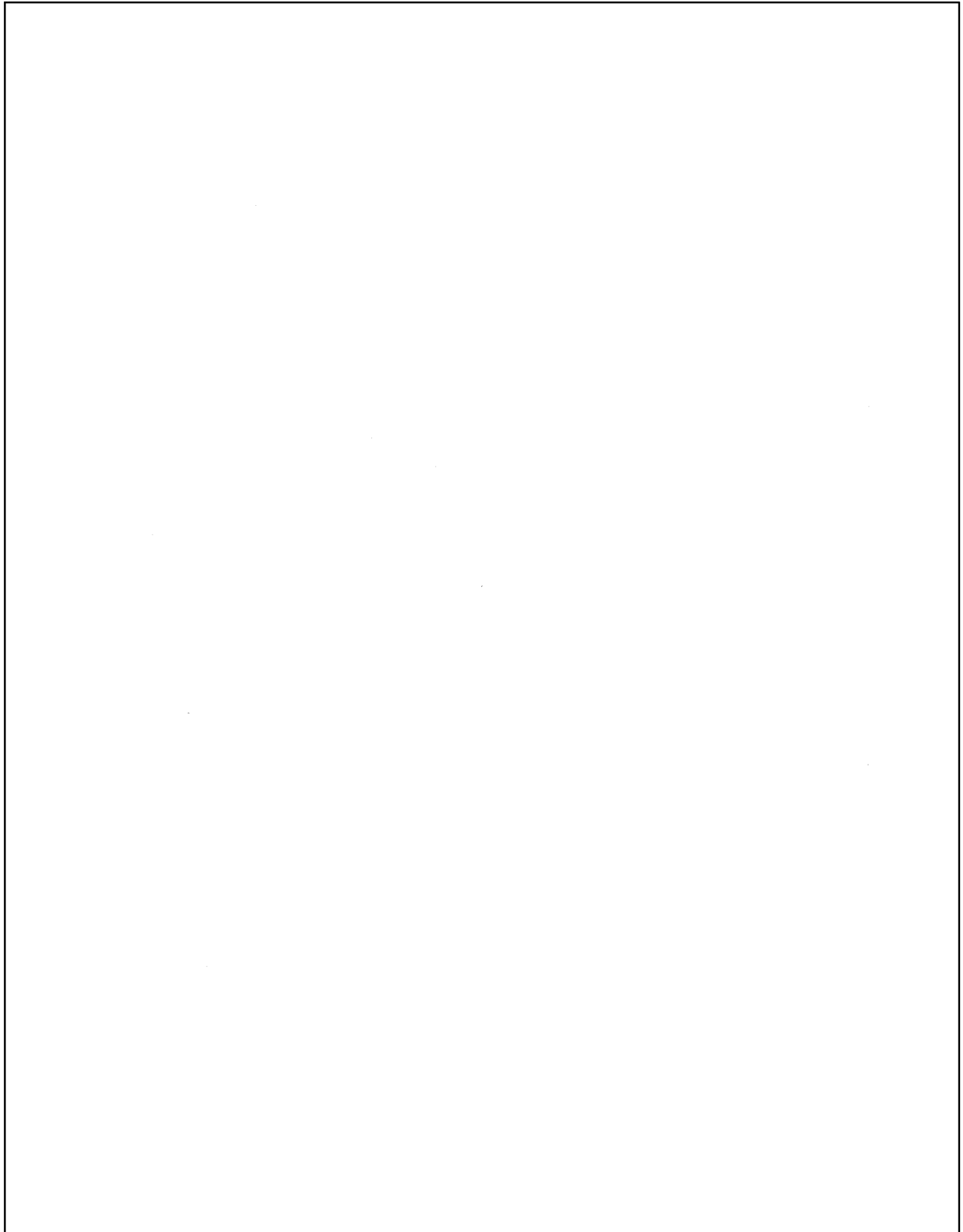
Mission Activities and Facility Descriptions

Table A-2. Buildings/Structures on Test Area C-72 and Test Site C-7

Bldg. No.	Use	Bldg. No.	Use
8951	Pump House	9513	Pump House
8957	Misc. Storage Building	E-170	
8959	ES Supply Building	E-171	
9500	Range Control Building	E-222	Lumber Storage Shed
9502	Camera Station Centerline		Cable Adjustment Building
9503	Inclined Sled Track		Balloon Storage Shed
9504	Launch Block House		Compressor Shed
9505	Eastern Maintenance Shop	9471	Storage Building
9509	Pad for Fixed Launchers	9482	Support Building
9510	Pad for Firing Rockets from Aircraft	9483	Control Building
9511	Supply Building		Hangar Structure
9512	SSG Maintenance Shop and Open Storage		Five trailers

APPENDIX B

**CONDITIONS OF BA/BO INFO FOR CONSULTATION:
INDIGO SNAKE PROGRAMMATIC**



Appendix B

Conditions of BA/BO Information for Consultation:
Indigo Snake Programmatic**CONDITIONS OF BA/BO INFORMATION FOR CONSULTATION:
INDIGO SNAKE PROGRAMMATIC****Terms & Conditions**

1. Eglin's Natural Resource Staff shall follow the Conservation Measures outlined in the Biological Assessment and amendment letter dated March 7, 2008 and July 17, 2008.

2. Eglin NRS shall submit annual reports to the U.S. Fish and Wildlife Service Panama City Field Office, 1601 Balboa Avenue, Panama City, FL 32405, describing actions taken to implement the Terms and Conditions of this Incidental Take Statement by January 15 of the following year of completing the proposed actions. This report shall also include efforts taken to survey, monitor, and potentially relocate gopher tortoises.

3. Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Fish and Wildlife Service Law Enforcement Office located in Clermont, Florida at (352) 429-1037 within 24 hours. Additional notification must be made to the Fish and Wildlife Service Ecological Services Field Office at Panama City, Florida at (850) 769-0552 and to the FWC at 1-888-404-3922. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

Management Requirements

1. Only an individual who has been authorized by a section 10(a)(1)(A) permit issued by the Service and authorized by the FWC for such activities, is permitted to come in contact with or relocate an eastern indigo snake.

2. If necessary, eastern indigo snakes shall be held in captivity only long enough to transport them to a release site; at no time shall two snakes be kept in the same container during transportation.

3. Should Eglin encounter an indigo snake that must be relocated due to military operations, NRS would use the Eastern Indigo Snake Habitat Suitability and Relocation Models (as provided on October 21, 2008) to determine the most appropriate location to release the snake.

4. If an indigo snake is observed during training activities, the exact location would be mapped in GIS and the surrounding 2,500 acres will be considered as habitat.

5. If a dead eastern indigo snake is found, the specimen should be thoroughly soaked in water and frozen, and the applicant should notify the Panama City Field Office immediately. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

An eastern indigo snake protection/education plan shall be developed by the applicant or requestor for all construction personnel or trainees to follow. The educational materials for the plan may consist of a combination of posters, videos, pamphlets, and lectures (e.g., an observer trained to identify indigo snakes could use the protection/education plan to instruct construction personnel before any clearing activities occur). This protection/education plan is described in Eglin's Threatened and Endangered Species Component Plan (U.S. Air Force 2006). Informational brochures containing the following information will be distributed to all contractors: a. A description of the eastern indigo snake, its habits, and protection under Federal Law; b. Instructions not to injure, harm, harass, or kill this species; c. Directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; d. Telephone numbers of pertinent agencies to be contacted if a live or dead eastern indigo snake is encountered. The dead specimen should be thoroughly soaked in water and then frozen.

An eastern indigo snake monitoring report shall be submitted to the Panama City, Florida Field Office within 60 days of the conclusion of clearing phases if an indigo snake is sighted or relocated. The report should contain the following information: a. Any sightings of eastern indigo snakes; and, b. Other obligations required by the FWC, as stipulated in the permit. a. A description of the eastern indigo snake, its habits, and protection under Federal Law; b. Instructions not to injure, harm, harass, or kill this species; c. Directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; d. Telephone numbers of pertinent agencies to be contacted if a live or dead eastern indigo snake is encountered. The dead specimen

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Test Area C-72 and Line of Sight
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APPENDIX H

PUBLIC INVOLVEMENT

Notice of Availability, Agency Comments, and Air Force Responses to Comments

Notice of Availability

The following Notice of Availability was published in the Northwest Florida Daily News on April 6, 2011. No public comments were received.

Public Notification

In compliance with the National Environmental Policy Act, Eglin Air Force Base (AFB), Florida, announces the availability of *the Test Area C-72 and Line of Sight Draft Range Environmental Assessment (REA), Revision 1, and the Draft Finding of No Significant Impact (FONSI)* for public review.

The Proposed Action is to establish a new authorized level of activity for Test Area (TA) C-72 on Eglin AFB that is based on an optimum usage level, with known or minimal environmental impacts, and to authorize line of sight tree clearing activities.

The Preferred Alternative, Alternative 4 (which is a combination of Alternatives 2 and 3), would authorize the current level of activity plus an increase in TA C-72 operations over the current level of activity to achieve an optimum usage level as well as line of sight tree clearing activities. The optimum usage level includes an increase in all mission activities including missile, bomb, small arms, and ground operations training and testing operations at TA C-72. Foreseeable future activities and expenditures also addressed include increased munitions expenditures associated with ground training activities from new user groups, including the 7th Special Forces Group (7SFG) and the Joint Strike Fighter (JSF).

Your comments on this Draft REA are requested. Letters and other written or oral comments may be published in the Final REA. As required by law, comments will be addressed in the Final REA and made available to the public. Any personal information provided, including private addresses, will be used to identify your desire to make a statement during the public comment period and/or to compile a mailing list to fulfill requests for copies of the Final REA or associated documents. However, only the names and respective comments of respondent individuals will be disclosed; personal home addresses and phone numbers will not be published in the Final EA.

The Draft REA is available on the web at www.eglin.af.mil/environmentalassessments.asp, from April 6 until April 20, 2011. Comments must be received by April 25, 2011. Each of the libraries in Crestview, Fort Walton Beach, Navarre, Milton, and Niceville have computers available to the general public and librarians who can provide assistance linking to the document. Hard copies of the document may be available for a limited time. To request a printed copy or more information, or to comment on the Proposed Action, contact Mike Spaits, Eglin AFB Public Affairs Office, 101 West D Avenue, Suite 110, Eglin AFB, FL 32542-5499; email: spaitsm@eglin.af.mil; telephone: (850) 882-2836; or fax: (850) 882-4894.

2071931

Agency Comments



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

May 25, 2011

Ms. Amy L. Sands, Project Manager
Science Applications International Corporation
1140 North Eglin Parkway
Shalimar, FL 32579

RE: Department of the Air Force – Draft Range Environmental Assessment,
Revision 1 for Test Area C-72 and Line of Sight, Eglin Air Force Base –
Walton County, Florida.
SAI # FL201104055718C

Dear Ms. Sands:

The Florida State Clearinghouse has coordinated a review of the referenced draft range environmental assessment (DREA) under the following authorities: Presidential Executive Order 12372; Section 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Florida Department of Environmental Protection's (DEP) Northwest District Office in Pensacola notes that the proposed project activities may impact jurisdictional waters of the state. The U.S. Air Force may be required to obtain an environmental resource permit under Chapter 62-346, *Florida Administrative Code*, for both wetland impacts and stormwater runoff/sedimentation management on the site. Depending on the scope and size of the actual impacts, the applicant would need to apply with either the DEP or the Northwest Florida Water Management District (NFWFMD). The applicant is advised to contact DEP or the NFWFMD prior to submitting an application to discuss the specific scope of the project.

Based on the information contained in the DREA and the enclosed state agency comments, the state has determined that, at this stage, the proposed activities are consistent with the Florida Coastal Management Program (FCMP). To ensure the project's continued consistency with the FCMP, the regulatory concerns identified by the DEP must be addressed prior to project implementation. The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of any issues identified during subsequent regulatory reviews. The state's final

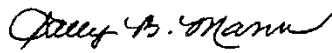
www.dep.state.fl.us

Ms. Amy L. Sands
May 25, 2011
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concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process in accordance with Section 373.428, *Florida Statutes*, if applicable.

Thank you for the opportunity to review the proposed project. Should you have any questions regarding this letter, please contact Ms. Jillian Schatzman at (850) 245-2187.

Yours sincerely,



Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/js
Enclosures

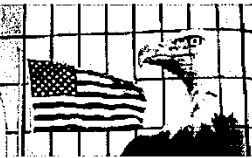
cc: Darryl Boudreau, DEP, Northwest District



Florida

Department of Environmental Protection

"More Protection, Less Process"



Categories

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Project Information

Project:	FL201104055718C
Comments Due:	05/13/2011
Letter Due:	06/03/2011
Description:	DEPARTMENT OF THE AIR FORCE - DRAFT RANGE ENVIRONMENTAL ASSESSMENT, REVISION 1 FOR TEST AREA C-72 AND LINE OF SIGHT, EGLIN AIR FORCE BASE - WALTON COUNTY, FLORIDA.
Keywords:	USAF - DREA, TEST AREA C-72 AND LINE OF SIGHT, EGLIN AFB - WALTON CO.
CFDA #:	12.200

Agency Comments:

WEST FLORIDA RPC - WEST FLORIDA REGIONAL PLANNING COUNCIL

No Comments Received

FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

NO COMMENT BY PAUL SCHARINE ON 4/29/11.

STATE - FLORIDA DEPARTMENT OF STATE

No Comment/Consistent

TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION

The FDOT's Aviation Office and District Three have no comments

ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

The DEP Northwest District Office in Pensacola notes that the proposed project activities may impact jurisdictional waters of the state. The U.S. Air Force may be required to obtain an environmental resource permit under Chapter 62-346, Florida Administrative Code, for both wetland impacts and stormwater runoff/sedimentation management on the site. Depending on the scope and size of the actual impacts, the applicant would need to apply with either the DEP or the Northwest Florida Water Management District (NWFWD). The applicant is advised to contact DEP or the NWFWD prior to submitting an application to discuss the specific scope of the project.

NORTHWEST FLORIDA WMD - NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

No comment/consistent

For more information or to submit comments, please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD, M.S. 47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

Visit the [Clearinghouse Home Page](#) to query other projects.

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COUNTY: WALTON
106-8CH-USA-P-EG
2011-1387

DATE: 4/5/2011
COMMENTS DUE DATE: 5/13/2011
CLEARANCE DUE DATE: 6/3/2011
SAI#: FL201104055718C

MESSAGE:

STATE AGENCIES
ENVIRONMENTAL PROTECTION
FISH and WILDLIFE COMMISSION
X STATE
TRANSPORTATION

WATER MNGMNT. DISTRICTS
NORTHWEST FLORIDA WMD

OPB POLICY UNIT

RPCS & LOC GOVS

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- X Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

DEPARTMENT OF THE AIR FORCE - DRAFT
RANGE ENVIRONMENTAL ASSESSMENT,
REVISION 1 FOR TEST AREA C-72 AND LINE
OF SIGHT, EGLIN AIR FORCE BASE - WALTON
COUNTY, FLORIDA.

To: Florida State Clearinghouse

AGENCY CONTACT AND COORDINATOR (SCH)
3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

EO. 12372/NEPA Federal Consistency

- | | |
|--|---|
| ☒ No Comment | ☒ No Comment/Consistent |
| ☐ Comment Attached | ☐ Consistent/Comments Attached |
| ☐ Not Applicable | ☐ Inconsistent/Comments Attached |
| | ☐ Not Applicable |

From:

Division of Historical Resources

Division/Bureau: Bureau of Historic Preservation

Reviewer:

S. Edwards

Laura R. Kammerer
Deputy SAPO

Date:

4-19-11

4.20.2011

RECEIVED

APR 22 2011

DEP Office of
Intergov't Programs

Air Force Responses to Comments on the Draft REA

Reviewer	Comment	Response
Florida Department of Environmental Protection's Northwest District Office, Pensacola	The Florida Department of Environmental Protection's (DEP) Northwest District Office in Pensacola notes that the proposed project activities may impact jurisdictional waters of the state. The U.S. Air Force may be required to apply for and obtain an Environmental Resource Permit under Chapter 62-346, <i>Florida Administrative Code</i> , for both wetland impacts and stormwater runoff/sedimentation management on the site. Depending on the scope and size of the actual impacts, the applicant would need to apply with either the DEP or the Northwest Florida Water Management District (NFWFMD). The applicant is advised to contact DEP or the NFWFMD prior to submitting an application to discuss the specific scope of the proposed project.	Thank you for your comment. Eglin AFB will coordinate with FDEP and/or NFWFMD regarding applicable permitting requirements.
Florida Department of Environmental Protection	Based on the information contained in the DREA and the enclosed state agency comments, the state has determined that, at this stage, the proposed activities are consistent with the Florida Coastal Management Program (FCMP). To ensure the project's continued consistency with the FCMP, the regulatory concerns identified by the DEP must be addressed prior to project implementation. The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of issues identified during this and subsequent regulatory reviews. The state's final concurrence of the projects' consistency with the FCMP will be determined during the environmental permitting process in accordance with Section 373.428, <i>florida statutes</i> , if applicable.	Thank you for your comment, comment noted.

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