

**ENVIRONMENTAL ASSESSMENT OF
THE
USE OF PRESCRIBED FIRE
ON
SIX BURN UNITS**



**WESTOVER AIR RESERVE BASE,
MASSACHUSETTS**

MARCH 2005

**439th Mission Support Group Environmental Engineering
Natural /Cultural Resources Management**

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE MAR 2005		2. REPORT TYPE		3. DATES COVERED 00-00-2005 to 00-00-2005	
4. TITLE AND SUBTITLE Environmental Assessment of the Use of Prescribed Fire on Six Burn Units Westover Air Reserve Base, Massachusetts				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) 439th Mission Support Group Environmental Engineering,Natural /Cultural Resources Management,250 Patriot Avenue, Suite 100 Westover Air Reserve Base,Chicopee,MA,01022				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 34	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

**FINDING OF NO SIGNIFICANT IMPACT (FONSI)
FOR THE USE OF PRESCRIBED FIRE ON SIX BURN UNITS AT
WESTOVER ARB, MASSACHUSETTS**

AGENCY: Department of the Air Force.

INTRODUCTION: The attached Environmental Assessment (EA), incorporated here by reference, analyzes the potential environmental impacts associated with the use of prescribed fire on six burn units at Westover ARB, Massachusetts.

PROPOSED ACTION: The Proposed Action is to burn approximately 300 acres of airfield grassland and brushy areas that have regenerated after land clearing. Three grassland units to be burned are located to the southeast of the Runway 05/23. Chicopee Memorial State Park is the closest neighboring landowner and is located to the south and east. Two of the three brushy units to be burned are east of the approach to Runway 33. Both are on Base property, although one is outside of the perimeter fence. Chicopee Memorial State Park and Massachusetts Municipal Wholesale Electric Company (in Ludlow) are the closest neighboring landowners, located to the east. The third brushy area is on the north side of the Base along abandoned taxiway Delta. Westover Golf Course in Ludlow is the closest neighbor to this unit. Please see Section 8 at the end of the EA for a map of Westover ARB and the prescribed fire units to be burned.

ALTERNATIVE 1: Alternative 1 is to use herbicides and growth retardants. Air Force Pamphlet 91-212 says, "Keep broad-leafed weeds to a minimum on the airfield. Apply herbicides as practical to control weeds and comply with AFI 32-1053, Pest Management Program. Broad-leafed weeds attract a variety of birds, may produce seeds or berries, and may limit grass growth. Growth retardants should be tested on small test plots before use on areas in general." The Air Force has reduced the use of chemicals in the environment and seeks to keep their use to a minimum.

ALTERNATIVE 2: Alternative 2 is to plow vegetation underground. Vegetation could be controlled by plowing it underground on a recurring basis.

NO ACTION ALTERNATIVE: The No Action alternative would continue the present airfield mowing practices. Airfield mowing is conducted per Air Force Pamphlet 91-212 policy on managing the risks of Bird/Wildlife Aircraft Strike Hazard (BASH). Vegetation is mowed to maintain a height between 7 and 14 inches next to and to 300-500 feet from aircraft movement areas. Vegetation beyond the 300-500 foot line is not mowed until after July 31st each year to provide breeding habitat for rare grassland birds.

BACKGROUND: Use of prescribed fire is necessary to minimize the risk of wildland fires by reducing vegetative fuels. Prescribed fire helps to preserve open grasslands, native vegetation, and state-listed as endangered or threatened bird and moth species. This burning also provides valuable training to firefighters from the base, USDA/FS and other federal agencies, and the state.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS: The values potentially affected by the Proposed Action and Alternatives are air quality; geological, water, biological and cultural resources; socioeconomics and environmental justice; and hazardous material and waste. No significant adverse effects would be expected.

Air Quality: The proposed action will temporarily generate smoke and ash. Westover ARB has received a permit from the Massachusetts DEP to conduct prescribed burns between April 1st and April 30th, 2005. The use of fire by qualified US Forest Service experts according to the permit stipulations will

not significantly increase pollutant emissions; exceed National Ambient Air Quality Standards (NAAQS) and other Federal, state, and local limits; or impact existing air permit limits.

Geological Resources: Plants will regenerate quickly and prevent soil erosion and sedimentation.

Water Resources: No sediment is expected to enter streams or wetlands from fire areas.

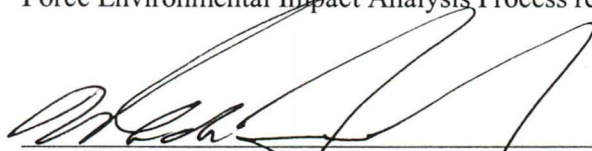
Biological Resources: Natural grasslands evolved with and are maintained by fire. Fire eliminates brush and tree species not adapted to fire that might otherwise encroach upon grasslands. Prescribed fire mimics this natural disturbance. None of the prescribed fire units proposed to be burned are in wetlands. The fires would be conducted before the nesting season for rare bird species.

Cultural Resources: No cultural resources exist in the fire units proposed for burning.

Socioeconomics and Environmental Justice: No socioeconomic effects would be expected. No disadvantaged or minority population would be disproportionately impacted by the Proposed Action.

Hazardous Material and Waste: The underground fuel pipeline would not be exposed to or at risk from the transitory fire on the surface. Fire will not be used in the vicinity of any pipeline vents. Fuel used in the drip torches and Terra Torch is consumed by the fire it carries to the vegetative fuel.

CONCLUSION: None of the alternatives accomplished reduction of vegetative thatch and BASH risk while also replicating the natural fire disturbance. As a result of the analysis performed in the EA, I have determined that the use of prescribed fire on six burn units as outlined in the EA would not result in significant environmental impacts. Based on this finding, an Environmental Impact Statement is not required. This FONSI and the supporting EA fulfill the requirements of the Council on Environmental Quality regulations implementing the National Environmental Policy Act (40 CFR 1500-1508), and Air Force Environmental Impact Analysis Process regulations at 32 CFR 989.


WALLACE W. FARRIS, JR., Col., USAFR
Commander 439 AW, Westover ARB, MA
DATE

Attachment:

EA OF THE USE OF PRESCRIBED FIRE ON SIX BURN UNITS AT
WESTOVER ARB, MASSACHUSETTS

**ENVIRONMENTAL ASSESSMENT OF
THE
USE OF PRESCRIBED FIRE
ON
SIX BURN UNITS**

Westover Air Reserve Base, Massachusetts

MARCH 2005

439th Mission Support Group Environmental Engineering
Natural /Cultural Resources Management
250 Patriot Avenue, Suite 100
Westover Air Reserve Base
Chicopee, MA 01022

ACRONYMS

AFI	Air Force Instruction	HQ	Headquarters
AFPD	Air Force Policy Directive	INRMP	Integrated Natural Resources Management Plan
AFRC	Air Force Reserve Command	IRP	Installation Restoration Program
AICUZ	Air Installation Compatible Use Zone	L _{dn}	day-night average sound level
AQCR	Air Quality Control Region	MA ARNG	Massachusetts Army National Guard
ARB	Air Reserve Base	MADEP	Massachusetts Department of Environmental Protection
AST	Aboveground Storage Tank	MCP	Massachusetts Contingency Plan
AW	Airlift Wing	MDFW	Massachusetts Division of Fish and Wildlife
BGP	Base General Plan	M.G.L.	General Laws of the Commonwealth of Massachusetts
BMP	Best Management Practice	MNHESP	Massachusetts Natural Heritage and Endangered Species Program
CAA	Clean Air Act	NAAQS	National Ambient Air Quality Standards
CEV	Civil Engineer Environmental Office	NEPA	National Environmental Policy Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	NPL	National Priorities List
CEQ	Council on Environmental Quality	NRHP	National Registry of Historic Places
CFR	Code of Federal Regulations	POL	Petroleum, Oil, and Lubricant
CMR	Code of Massachusetts Regulations	RCRA	Resource Conservation and Recovery Act
CWA	Clean Water Act	SAIA	Sikes Act Improvement Amendments
dB	decibel	SEL	sound exposure level
dba	A-weighted decibel	USACE	United States Army Corps of Engineers
DNL	day-night average sound level	USAF	United States Air Force
DoD	Department of Defense	USAF/ILEV	United States Air Force Environmental Office
DoDI	Department of Defense Instruction	U.S.C.	United States Code
DRMO	Defense Reutilization and Marketing Office	USDA/FS	United States Department of Agriculture/Forest Service
EA	Environmental Assessment	USDA/WS	United States Department of Agriculture/Wildlife Services
EIAP	Environmental Impact Analysis Process	USEPA	United States Environmental Protection Agency
EIS	Environmental Impact Statement	USFWS	United States Fish and Wildlife Service
ESA	Endangered Species Act	UST	Underground Storage Tank
FAA	Federal Aviation Administration	WARB	Westover Air Reserve Base
FEMA	Federal Emergency Management Agency		
FFA	Federal Facility Agreement		
FONSI	Finding of No Significant Impact		
FY	Fiscal Year		
HAZMAT	Hazardous Material		

**ENVIRONMENTAL ASSESSMENT OF THE
USE OF PRESCRIBED FIRE
ON
SIX BURN UNITS**

WESTOVER AIR RESERVE BASE, MASSACHUSETTS

CONTENTS

1.	INTRODUCTION.....	1-1
1.1	Location and Mission.....	1-1
1.2	National Environmental Policy Act of 1969.....	1-2
1.3	Public Review	1-2
2.	DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES.....	2-1
2.1	Purpose of and Need for the Proposed Action.....	2-1
2.2	Proposed Action (Use of Prescribed Fire on Six Burn Units)	2-1
2.3	Alternatives to the Proposed Action	2-2
2.3.1	Alternative 1: Use of Herbicides and Growth Retardants.....	2-2
2.3.2	Alternative 2: Plow Vegetation Underground	2-2
2.3.3	No Action.....	2-2
2.4	Scope of Analysis	2-2
3.	AFFECTED ENVIRONMENT.....	3-1
3.1	Air Quality	3-1
3.1.1	Definition of Resource	3-1
3.1.2	Existing Conditions.....	3-2
3.2	Geological Resources	3-2
3.2.1	Definition of Resource	3-2
3.2.2	Existing Conditions.....	3-3
3.3	Water Resources	3-3
3.3.1	Definition of Resource	3-3
3.3.2	Existing Conditions.....	3-4
3.4	Biological Resources	3-5
3.4.1	Definition of Resource	3-5
3.4.2	Existing Conditions.....	3-5
3.5	Cultural Resources	3-9
3.5.1	Definition of Resource	3-9
3.5.2	Existing Conditions.....	3-9
3.6	Socioeconomics and Environmental Justice	3-10
3.6.1	Definition of Resource	3-10
3.6.2	Existing Conditions.....	3-10
3.7	Hazardous Material and Waste	3-10
3.7.1	Definition of Resource	3-10
3.7.2	Existing Conditions.....	3-11
4.	ENVIRONMENTAL CONSEQUENCES.....	4-1
4.1	Proposed Action (Use of Prescribed Fire on Six Burn Units)	4-1
4.1.1	Air Quality	4-1
4.1.2	Geological Resources	4-2
4.1.3	Water Resources	4-2
4.1.4	Biological Resources	4-2
4.1.5	Cultural Resources.....	4-3
4.1.6	Socioeconomics and Environmental Justice.....	4-3

4.1.7	Hazardous Material and Waste	4-3
4.2	Use of Herbicides and Growth Retardants.....	4-3
4.3	Plow Vegetation Underground	4-4
4.4	No Action Alternative.....	4-4
4.5	Cumulative Impacts	4-5
5.	FINDINGS RELATED TO THE PROPOSED ACTION	5-1
6.	LIST OF PREPARERS	6-1
7.	REFERENCES 7-1	
8.	MAP OF 2005 PRESCRIBED FIRE AREAS	8-1

1. Introduction

This Environmental Assessment (EA) has been developed for use by Westover Air Reserve Base, MA in accordance with 32 Code of Federal Regulations (CFR) 989, as amended – the U.S. Air Force (USAF) *Environmental Impact Analysis Process (EIAP)*, and Air Force Policy Directive (AFPD) 32-70 – *Environmental Quality*.

1.1 Location and Mission

Westover ARB is composed of approximately 2,500 acres of land within the communities of Chicopee and Ludlow in the northern portion of Hampden County, Massachusetts. The Base is in close proximity to the Cities of Holyoke and Springfield, the Towns of West Springfield, Granby, and South Hadley, and is located 35 miles north of Hartford, Connecticut, and 90 miles west of Boston, Massachusetts. The Base is located in the Pioneer Valley Region, which encompasses 43 municipalities within Hampshire and Hampden Counties along the Connecticut River. The Base is situated approximately 2 miles east of the Connecticut River, and is traversed and/or bound by Cooley, Stony, and Willimansett Brooks.

State Route 33, the main thoroughfare providing access to Westover ARB, is located less than one mile west of the Base. Approximately two miles southwest of the Base, State Route 33 intersects with Interstate 90 (the Massachusetts Turnpike), an east-west route between Boston and New York State. Interstate 91 runs north-south approximately 5 miles west of the Base (WARB 1998a).

The USAF has chosen as part of its mission to be a leader in environmental and natural resources stewardship both now and in the future. The vitality of natural resources must be ensured in order to achieve its military mission. As a steward of natural resources, Westover Air Reserve Base (ARB) acknowledges its commitment to be a conservation leader for areas under its control.

Westover ARB's vision is to build on its status as the largest mobility and reserve-training base in the northeast, and thereby provide a Northeast Reserve Training Center that is also available as a fully operational Air Reserve Base. Westover ARB is home to the 439th Airlift Wing (AW), which operates and maintains sixteen C-5 aircraft, representing five percent of the United States' total airlift capability. The 439 AW oversees three flying squadrons and 40 supporting units that

are responsible for the movement of troops, equipment, and supplies; and the performance of medical evacuations (WARB 1998a).

1.2 National Environmental Policy Act of 1969

The National Environmental Policy Act, commonly known as NEPA, is a Federal statute requiring the identification and analysis of potential environmental impacts of proposed Federal actions before those actions are taken. NEPA established the Council on Environmental Quality (CEQ) that is charged with the development of implementing regulations and ensuring agency compliance with NEPA. CEQ regulations mandate that all Federal agencies use a systematic interdisciplinary approach to environmental planning and the evaluation of actions that may affect the environment. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. The intent of NEPA is to protect, restore, or enhance the environment through well-informed Federal decisions.

The process for implementing NEPA is codified in 40 CFR 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. To this end, the CEQ regulations specify that an EA be prepared to:

- Briefly provide evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI);
- Aid in an agency's compliance with NEPA when an EIS is unnecessary; and
- Facilitate preparation of an EIS when one is necessary.

AFPD 32-70 - *Environmental Quality* - states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is 32 CFR 989, as amended.

1.3 Public Review

The public was notified of the availability of the draft EA and FONSI for a review period of 7 days. The notice of availability was published in the Springfield Republican newspaper and the documents were made available for public review at the Chicopee and Ludlow libraries. No public comments were received.

2. Description of the Proposed Action and Alternatives

2.1 Purpose of and Need for the Proposed Action

Use of prescribed fire is necessary to minimize the risk of wildland fires by reducing vegetative fuels. Fire applied by experts (here, from the U.S. Forest Service) according to their detailed plan (the Prescription for specific units on Westover ARB) also helps to preserve open grasslands, native vegetation, and state-listed as endangered or threatened bird and moth species. This burning also provides valuable training to firefighters from the base, USDA/FS and other federal agencies, and the state. The environmental impacts of the proposed action and alternatives will be addressed in Section 4 of this EA.

2.2 Proposed Action (Use of Prescribed Fire on Six Burn Units)

The Proposed Action is to burn approximately 300 acres of airfield grassland and brushy areas in 6 units that have regenerated after land clearing. The burning will be done according to the conditions specifically set out for Westover ARB in the permit issued by the Massachusetts Department of Environmental Protection. Please see Section 8 at the end of this EA for a map of Westover ARB and the prescribed fire units to be burned. Three grassland units to be burned (shown together on the map as, “Model 1”) are contiguous to each other and are located to the southeast of the Runway 05/23, which is named for the directions it points to. Chicopee Memorial State Park is the closest neighboring landowner and is located to the south and east. Two of the three brushy units to be burned are contiguous to each other and are east of the approach to Runway 33. Shown on the map as, “Model 5” they are both are on Base property, although one is outside of the perimeter fence. Chicopee Memorial State Park and Massachusetts Municipal Wholesale Electric Company (in Ludlow) are the closest neighboring landowners, located to the east. The third brushy area, also shown as, “Model 5”, is on the north side of the Base along abandoned taxiway Delta. Westover Golf Course in Ludlow is the closest neighbor to this unit.

Use of prescribed fire is included in the latest revision of the Westover ARB Integrated Natural Resources Management Plan (INRMP) and will be included in the Base Vegetation Management Plan and Wildland Fire Management Plan (WFMP) per Air Force Instruction 32-7064 Chapter 12. It is part of an ecosystem-based conservation program. These Plans provide for conservation and rehabilitation of natural resources in a manner that is consistent with the military mission;

integrate and coordinate all natural resources management activities; and provide for sustainable multipurpose uses of natural resources. The Plans' management objectives will integrate threatened and endangered species management, watershed protection, fish and wildlife management, grounds maintenance, and outdoor recreation, as practicable and consistent with the military mission and established land uses.

2.3 Alternatives to the Proposed Action

2.3.1 Alternative 1: Use of Herbicides and Growth Retardants.

Air Force Pamphlet 91-212 says, "Keep broad-leafed weeds to a minimum on the airfield. Apply herbicides as practical to control weeds and comply with AFI 32-1053, Pest Management Program. Broad-leafed weeds attract a variety of birds, may produce seeds or berries, and may limit grass growth. Growth retardants should be tested on small test plots before use on areas in general." The Air Force has reduced the use of chemicals in the environment and seeks to keep their use to a minimum.

2.3.2 Alternative 2: Plow Vegetation Underground

Vegetative thatch could be controlled by plowing it underground on a recurring basis. It would decompose over time. This alternative would require additional work and equipment under the Base Operating System contract or hiring another contractor.

2.3.3 No Action.

The No Action alternative would continue the present airfield mowing practices. Airfield mowing is conducted per Air Force Pamphlet 91-212 policy on managing the risks of Bird/Wildlife Aircraft Strike Hazard (BASH). Vegetation is mowed to maintain a height between 7 and 14 inches next to and to 300-500 feet from aircraft movement areas. Vegetation beyond the 300-500 foot line is not mowed until after July 31st each year to provide breeding habitat for grassland birds.

2.4 Scope of Analysis

The Air Force is required by NEPA, CEQ regulations, and USAF instructions to assess the potential environmental effects associated with the Proposed Action and Alternatives. This EA

identifies and evaluates the effects of use of prescribed fire on the six land units. Section 3.0 of this EA describes the environmental and socioeconomic resources and conditions most likely to be affected by the burning. The potential effects associated with the Proposed Action and No Action Alternatives are discussed in Section 4.0.

3. Affected Environment

This section complies with NEPA, CEQ guidelines, and 32 CFR 989, as amended, by describing the current environmental and socioeconomic resources and conditions most likely to be affected by the use of prescribed fire. These resources and conditions include the following areas: air quality, noise, land use, geological resources, water resources, biological resources, cultural resources, socioeconomic and environmental justice, and hazardous materials and waste.

3.1 Air Quality

3.1.1 Definition of Resource

Air quality in a given location is generally described by the concentrations of various measurable substances known as “criteria pollutants.” Concentrations are normally expressed in units of parts per million, milligrams per cubic meter, or micrograms per cubic meter. Air quality is determined by the type and amount of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration is determined by comparison with Federal and/or state air quality standards. These standards represent the maximum allowable concentrations of various pollutants necessary to protect public health and welfare with a reasonable margin of safety.

Federal standards, as determined by the U.S. Environmental Protection Agency (USEPA), are termed the National Ambient Air Quality Standards (NAAQS). These standards include maximum concentrations for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter less than 10 and less than 2.5 microns in diameter, and lead (40 CFR 50). The standards are defined in terms of concentrations determined over various periods of time (averaging periods). Short-term standards (1 hour, 8 hour, or 24 hour) were established for pollutants with acute health effects, while long-term standards (annual) were established for pollutants with chronic health effects.

The Clean Air Act (CAA) allows states to adopt ambient air quality standards and other regulations, provided they are at least as stringent as Federal standards.

3.1.2 Existing Conditions

Westover ARB is located in Hampden County, Massachusetts, and is within the USEPA interstate Air Quality Control Region (AQCR) No. 42. AQCR No. 42 is comprised of ten counties along the Interstate 91 corridor from Hartford, Connecticut, north to Springfield, Massachusetts, and is part of the Northeast Ozone Transport Region. AQCR No. 42 is in attainment (i.e., compliance) with all NAAQS pollutants, except for ozone. Westover ARB has two separate sources of air pollution, referred to as stationary and mobile sources.

The stationary sources are boilers, emergency generators, aircraft ground powered equipment, vehicle/aircraft refueling operations, and aircraft maintenance activities. These sources are stringently regulated by the Massachusetts Department of Environmental Protection (MADEP). Westover ARB maintains restricted emissions status to comply with its' Clean Air Act Title V Air Permit for all stationary sources on the Base. Mobile emissions from vehicle and aircraft operations are the second source. A major source of air pollution at Westover ARB is aircraft operations (taxiing, run-up, takeoff, and landing), which contribute approximately 70 percent of the total mobile air emissions at the Base (WARB 1999a). However, by comparison, the total amount of any primary air pollutant emitted from Westover ARB represents less than 1 percent of the Hampden County total emissions for each pollutant (WARB 1999a). Therefore, Westover ARB would not be considered a major contributor to air pollution in AQCR No. 42.

3.2 Geological Resources

3.2.1 Definition of Resource

An area's geological resources typically consist of surface and subsurface materials and their inherent properties. Principal factors influencing the ability of geological resources to support structural development are seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance), soil stability, and topography.

The term soil generally refers to unconsolidated materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil depth, structure, elasticity, strength, shrink-swell potential, and erodibility determine a soil's ability to support man-made structures and facilities. Soils typically are described in terms of their series or association, slope, physical characteristics, and relative compatibility or constraints in regard to particular construction activities and types of land use.

Topography is defined as the relative position and elevations of the natural and/or man-made features of an area that describe the configuration of its surface. An area's topography is influenced by many factors, including human activity, seismic activity of the underlying geological material, climatic conditions, and erosion. Information about an area's topography typically encompasses surface elevations, slope, physiographic features (i.e., mountains, ravines, or depressions), and their influence on human activities.

3.2.2 Existing Conditions

The topography of the area is characterized by gently sloping terraces that flank the Connecticut River. The topography of Westover ARB is relatively flat with occasional small rises and several low wetlands.

The area is characterized by gently sloping terrain of medium fertile, sandy loams. Silty deposits of firm glacial till underlie the majority of sandy loams. This vertical stratification and gentle slope result in good drainage for much of the Base. However, on the north end of the Base, the topography is flat and the subsoil is less porous, which results in the formation of wetland areas (USDA 1993).

3.3 Water Resources

3.3.1 Definition of Resource

Water resources include surface water, groundwater, and floodplains. They are valued for their quantity, quality, and the demand for potable, irrigation, and industrial purposes.

Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Stormwater flows, which may be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, are important to management of surface water. Stormwater also is important to surface water quality because of its potential to introduce sediments and other contaminants into lakes, rivers, and streams.

Groundwater consists of the subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically may be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Floodplains are areas of low-level ground present along a river or stream channel. Such lands may be subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. None of the 6 burn units are in a floodplain.

3.3.2 Existing Conditions

Surface water. Westover ARB has extensive natural and man-made surface drainage. Stony, Cooley, and Willimansett Brooks are the primary drainages of Westover ARB. Most of the water that is discharged is collected from impervious surfaces throughout the installation and conveyed via ditches, culverts, and underground storm sewer lines with oil/water separators that empty into these brooks.

Cooley Brook receives discharges from most of the industrial areas of the Base. A constructed wetland bio-remediates stormwater that contains fluids used to remove ice from aircraft. The southern (off Base) portion of the brook has been dammed to form the Chicopee Reservoir. The reservoir comprises approximately 16 acres and is located 1,200 feet from the end of Instrument Runway 23 (WARB 1998a).

Stony Brook receives drainage from the Base through a network of storm sewers. Stony Brook is dammed just upstream of the Base to form Wade Lake, a 16-acre pond located 2,200 feet from the end of the main runway. The Brook leaves the Base and flows to the north on its meandering route to the Connecticut River (WARB 1998a and OPA 1995).

Willimansett Brook receives drainage from the urban portion of the Base through a storm drainage system that primarily serves office buildings. This drainage forms the headwaters of the Brook, which eventually flows through Mountain Lake.

Groundwater. Groundwater in the area is primarily contained in the shallow delta outwash plain aquifer that underlies Westover ARB. This unconfined aquifer lies above glacial-lacustrine fine-grained sediments (i.e., silts and clays). The water table within the unconfined shallow aquifer ranges from 0 to 20 feet in depth and is significantly influenced by topography (WARB 1995a). Groundwater elevation is generally incidental to (coincides with) the elevations of streams and wetlands at Westover ARB.

Drinking Water. The City of Chicopee supplies drinking water for Westover ARB. The drinking water, which comes from treated surface water, enters the Base distribution center and is metered at Building 7980.

Floodplains. Floodplains are defined as areas adjoining inland or coastal waters that are prone to flooding. FEMA Flood Insurance Rate Maps covering Westover ARB have never been prepared. The FEMA maps that illustrate Stony Brook show that there are floodplains associated with the brook as it enters and exits the Base (WARB 1998a).

3.4 Biological Resources

3.4.1 Definition of Resource

Biological resources include native or naturalized plants and animals, and the habitats (i.e., wetlands, forests, and grasslands) in which they exist. Sensitive and protected biological resources on the Base include plant and animal species listed as threatened or endangered by Massachusetts Natural Heritage and Endangered Species Program (MNHESP). The Base does not have any species listed or that are candidates for listing by the U.S. Fish and Wildlife Service (USFWS) under the federal Endangered Species Act (ESA).

Wetlands are an especially important natural system and habitat because of the diverse biologic, hydrologic, and human-valued functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, unique flora and fauna niche provision, stormwater attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the “waters of the United States” under Section 404 of the Clean Water Act (CWA). The U.S. Army Corps of Engineers (USACE) defines wetlands as “those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (33 CFR 328). Westover’s wetlands are also protected by the Massachusetts Wetlands Protection Act (MGL c131 s40) and by municipal laws.

3.4.2 Existing Conditions

Streams and Wetlands. The fisheries habitat on Westover ARB consists of Cooley, Stony, and Willimansett Brooks, and several unnamed tributaries. Common dace, brook trout and shiners
Westover Air Reserve Base - MA

have been identified in Stony and Cooley Brooks (WARB 1999c). Surveys conducted in these streams indicated that water quality was high due to the diversity of species and the age classes of the species identified (WARB 1999c).

A pending Base-wide wetlands survey was conducted in the fall of 2004. The prior study was done between June 1997 and May 1998 to identify and delineate the Jurisdictional wetlands present on Westover ARB. Thirty-three jurisdictional wetlands totaling approximately 144 acres were identified, primarily within the northern and eastern portions of the Base (WARB 1998b). The wetlands are located in a variety of landscapes, ranging from forested areas to open grasslands. The largest amount of wetland acreage on the Base is associated with the Stony Brook wetland complex (WARB 1998a).

Among the wetlands present on Westover ARB are vernal pools. Vernal pools are unique wetlands of considerable biological value in Massachusetts. Largely due to the absence of fish predators, the breeding strategies of numerous amphibian species have evolved to the point of total reliance on these isolated wetlands. In addition, vernal pools provide important habitat for many vertebrate and other invertebrate wildlife species.

Terrestrial Ecosystems. A survey of botanical resources present on Westover ARB conducted in 1994 (Jenkins 1995) reported that the major native-plant communities on the Base are deciduous woodlands, native grasslands, and open wetlands. The survey also noted that there are pine plantations and large areas of alien-dominated grasslands and weedy barren areas. The survey identified a total of 463 species (Jenkins 1995).

Flora. Westover ARB lies within the Eastern Broadleaf Forest (Oceanic) Province (Bailey 1995). Temperate deciduous forests characterize this eco-region, which is dominated by tall, broadleaf trees that provide a continuous and dense canopy in the summer, but shed their leaves completely in the fall. The forests in the area of Westover ARB are dominated by white oak and red oak. The forests in the area were logged during the 1800s and cleared for agricultural uses, such as row crops and tobacco. Farming and urban development have resulted in limited forest acreage in the vicinity of the Base.

Fauna. The environmental setting of Westover ARB, with its open grasslands, wooded and riparian areas, and wetlands, make it an attractive habitat to many animal species. Numerous surveys have been undertaken on the Base to assess and inventory the biological resources

present (Doyle and Maier 1995, MDFW 1993, Mello 1995, Shetterly 1994, USDA 1993, USDA 1995, and Whitlock et. al. 1994).

Birds. The most abundant native birds in the area include the mourning dove, eastern kingbird, bluejay, American crow, American robin, killdeer, red-winged blackbird, black-capped chickadee, bobolink, and eastern phoebe. Common seasonal granivores (i.e., seed-eaters) present on the Base include the eastern meadowlark, horned-lark, field sparrow, and Savannah sparrow. Starlings, house sparrows, rock doves, house finches, and miscellaneous black birds are also common. Common birds of prey include red-tailed hawk, American kestrel, and turkey vulture. The peregrine falcon (*Falco peregrinus*), state-listed as endangered, has also been documented on the Base as a transient species (USDA 1993). Wading birds include great blue heron, greater yellowlegs, and white-rumped sandpiper. Waterfowl species include the mallard, Canada goose, and black duck. The herring gull, ring-billed gull, and greater black-backed gull are also present.

Reptiles and Amphibians. Common amphibian species identified on Westover ARB include the wood frog, bullfrog, gray tree frog, spring peeper, green frog, American toad, Fowler's toad, redback salamander, and eastern spotted newt. Common reptilian species include the eastern garter snake, northern ringneck snake, black racer, northern water snake, common snapping turtle, and spotted turtle.

Mammals. Common mammalian species within the local area and located on Westover ARB include the white-tailed deer, red fox, coyote, raccoon, woodchuck, gray squirrel, southern flying squirrel, eastern chipmunk, northern short-tailed shrew, and white-footed mouse (Doyle and Maier 1995, USDA 1993, USDA 1995, and WARB 1998a).

Invertebrates. Additional surveys have identified 370 species of moths, 41 species of butterflies, 18 species of dragonflies and damselflies, and five species of tiger beetles at Westover ARB (Mello 1995 and Shetterly 1994).

Endangered, Threatened, and Rare Species. The USFWS and the MNHESP were contacted in the past regarding whether threatened and endangered species were present in the geographic area of Westover ARB to satisfy section 7(c) of the ESA (16 U.S.C. 1536) and the Massachusetts Endangered Species Act (General Laws of the Commonwealth of Massachusetts [M.G.L.] c.131A and regulation 321 Code of Massachusetts Regulations [CMR] 10.00). MNHESP completed several Base-wide surveys in 1995 to confirm the presence or absence of Federally and state-listed endangered, threatened, and candidate plant and animal species and Massachusetts

special concern species. No Federally listed plant or animal species were identified as inhabiting the Base. However, several state-listed plant and animal species were documented on Westover ARB. Table 3-1 lists the state-listed species that have been documented on or that migrate through Westover ARB. In addition, the *Grammia Phyllira* Tiger Moth, state-listed as endangered, was discovered on Base by Mike Nelson of MNHESP in 2003.

Table 3-1. State Listed Threatened and Endangered Species that Have Been Documented on Westover ARB

Scientific Name	Common Name	Presence on Westover ARB ¹	Status ²	
			Federal	State
PLANTS				
Lygodium palmatum	Hartford fern (or climbing fern)	O	NL	SC
Lupinus perennis	Wild lupine	O	NL	S
Isotria verticillata	Large whorled pogonia	O	NL	WL
BIRDS				
Bartramia longicauda	Upland sandpiper	O	NL	E
Ammodramus savannarum	Grasshopper sparrow	O	NL	T
Circus cyaneus	Northern harrier	O	NL	T
Falco peregrinus anatum	American peregrine falcon	M	NL	E
Dendroica striata	Blackpoll warbler	M	NL	SC
Accipiter cooperii	Cooper’s hawk	M	NL	SC
Accipter striatus	Sharp-shinned hawk	M	NL	SC
AMPHIBIANS				
Ambystoma laterale	Blue-spotted salamander	O	NL	SC
Hemidactylium scutatum	Four-toed salamander	O	NL	SC
REPTILES				
Clemmys guttata	Spotted turtle	O	NL	SC
INSECTS				
Zanclognatha Martha	Pine Barrens zanclognatha moth	O	NL	T

Sources: MNHESP 1995 and USDA 1993

Notes:

- O = Occurs - refers to a species documented as inhabiting or occurring on Westover ARB on a continual basis.
M = Migrates through – refers to a species inhabiting Westover ARB on an indiscriminate basis.
 - E: Endangered
T: Threatened
NL: Not Listed
WL: Watch List
- SC: Special Concern
R: Rare
S: Scarce

It should be noted that Westover ARB supports the largest populations of two State-listed bird species in the six-state New England region: the upland sandpiper (*Bartramia longicauda*) and the grasshopper sparrow (*Ammodramus savannarum*). The upland sandpiper and the grasshopper sparrow are considered the most important threatened and endangered species resource on Westover ARB (WARB 1998a).

3.5 Cultural Resources

3.5.1 Definition of Resource

Cultural resources represent and document activities, accomplishments, and traditions of previous civilizations and link current and former inhabitants of an area. Depending on their condition and historic use, these resources may provide insight to the living conditions of previous civilizations and may retain cultural and religious significance to modern groups.

Archaeological resources are areas where prehistoric or historic activity measurably altered the earth or where deposits of physical remains (i.e., arrowheads, pottery) have been discovered. Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic or aesthetic significance. Traditional cultural resources can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

Several Federal laws and regulations have been established to manage and protect cultural resources, including the National Historic Preservation Act of 1966, Archaeological and Historic Preservation Act of 1974, American Indian Religious Freedom Act of 1978, Archaeological Resource Protection Act of 1979, and Native American Graves Protection and Repatriation Act of 1990.

3.5.2 Existing Conditions

Several potentially significant archeological sites on Westover ARB were identified during a cultural resources survey completed in 1995 (OPA 1995). There are no known or suspected cultural or archeological sites present in or near the proposed prescribed fire units, however.

3.6 Socioeconomics and Environmental Justice

3.6.1 Definition of Resource

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Human population is affected by regional birth and death rates, as well as net in or out migration. Economic activity typically comprises employment, personal income, and industrial growth. Impact on these two fundamental socioeconomic indicators also can influence other components, such as housing availability and the provision of public services.

3.6.2 Existing Conditions

The primary concern regarding socioeconomic resources pertains to changes in population, housing, and economic conditions. The Proposed Action does not involve any activities that would contribute to changes in socioeconomic resources. There would be no change in the number of personnel assigned to Westover ARB, therefore there would be no changes in area population or associated changes in demand for housing and services. Infrequent, temporary generation of smoke from fires managed as prescribed, or the sale of herbicides or growth retardants would have no or negligible impact. Accordingly, the USAF has omitted detailed examination of socioeconomics.

Ethnicity and poverty status in the study area have been considered to determine if the Proposed Action or Alternatives could disproportionately affect minority or low-income groups. Much of the base is surrounded by industrial/manufacturing, conservation, golf or park land. Most of the housing in the area of the base is single family and/or occupied by the owners. There are few, if any, low income housing units in the vicinity where any impacts may occur (AICUZ 1996, HNTB 2004). Ethnicity appears to be spread over the area immediately off base.

3.7 Hazardous Material and Waste

3.7.1 Definition of Resource

Hazardous material (HAZMAT) is defined as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that may cause an increase in mortality, a serious irreversible illness, incapacitating reversible illness, or pose a substantial threat to human health or the environment. Hazardous waste is defined as any solid, liquid, contained gaseous, or

semisolid waste, or any combination of wastes that poses a substantial present or potential hazard to human health or the environment.

Issues associated with hazardous material and waste typically center around underground storage tanks (USTs); aboveground storage tanks (ASTs); and the storage, transport, and use of pesticides, fuels, and petroleum, oils, and lubricants (POL). When such resources are improperly used in any way, they can threaten the health and well being of wildlife species, botanical habitats, soil systems, water resources, and humans.

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, DoD has dictated that all facilities develop and implement *Hazardous Material Emergency Planning and Response Plans* or *Spill Prevention, Control, and Countermeasure Plans*. Also, DoD has developed the Installation Restoration Program (IRP), intended to facilitate thorough investigation and cleanup of contaminated sites located on military installations. These plans and programs, in addition to established legislation (i.e., the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] and Resource Conservation and Recovery Act [RCRA]) effectively form the “safety net” intended to protect the ecosystems on which most living organisms depend.

3.7.2 Existing Conditions

Hazardous Material Management. HAZMATs are used at Westover ARB during aircraft, motor vehicle, and aerospace ground equipment maintenance activities, and during Base operation and maintenance activities. If released to the environment, these materials have the potential to harm by impacting air, soil, and/or water quality. The activity at the Base that poses the greatest potential threat to the local environment is the transfer and storage of POL materials. An underground jet fuel pipeline enters the Base from Ludlow in a unit where brush will be burned and extends along the grassland units to be burned southeast of the runway.

The Civil Engineer Environmental office (CEV) at Westover ARB maintains all of the environmental compliance and planning documents for the Base. The *Hazardous Materials Emergency Planning and Response Plan*, 2003, provides guidance on HAZMAT and POL product response measures.

Installation Restoration Program (IRP). On June 2, 1993, USEPA Region I informed Westover ARB that the Revised Hazard Ranking System score for the facility had been completed and the

Base would not be placed on the CERCLA National Priorities List (NPL or “Superfund”). Westover ARB began environmental restoration efforts under the IRP in 1981. The Base currently conducts the IRP in accordance with the Massachusetts Contingency (MCP), the National Oil and Hazardous Substance Pollution Contingency Plan, CERCLA guidance and policy, and Superfund Amendments and Reauthorization Act guidance and policy. No IRP sites will be impacted by the proposed use of prescribed fire or the alternatives.

4. Environmental Consequences

This section assesses potential environmental consequences associated with the Proposed Action and Alternatives. It assesses known, potential, and reasonably foreseeable environmental consequences. Section 4.1 presents potential effects in the context of the scope of the Proposed Action and in consideration of the affected environment. Section 4.2 evaluates Alternative 1: Use of herbicides and growth retardant. Section 4.3 considers Alternative 2: Plow the vegetation underground. Section 4.4 addresses implementation of the No Action Alternative that reflects the continuation of existing baseline conditions as described in Section 3.0. Cumulative effects are discussed in Section 4.5.

4.1 Proposed Action (Use of Prescribed Fire on Six Burn Units)

Potential consequences associated with the Proposed Action are discussed in this section for each resource area described in Section 3.0. The potential effects that would be expected as a result of implementation of the Proposed Action for each resource area are presented in the following paragraphs.

4.1.1 Air Quality

No significant adverse effects would be expected. The proposed action will temporarily generate smoke and ash. The Base has received a permit to conduct several individual prescribed burns between April 1st and April 30th 2005 from the Massachusetts Department of Environmental Protection Western Regional Office. The permit is conditioned upon the Base: a) burning between the hours of 10:00 AM and 4:00 PM on days that meteorological conditions allow for optimum dissipation of smoke and; b) that the burns be conducted without causing a nuisance, health or safety hazard. Fires not meeting these requirements must be extinguished immediately.

Westover ARB anticipates that the proposed burning can be accomplished in three days or less. The smoke generated will be equivalent to a tiny percentage of Westover ARB's yearly air emissions. Those emissions make up less than 1% of the total emissions in Hampden County. Thus the proposed use of fire will not significantly increase pollutant emissions; exceed National Ambient Air Quality Standards (NAAQS) and other Federal, state, and local limits; or impact existing air permits. For more information on the effects of prescribed fire on air quality see Sandberg, et al 2002, available online at http://www.fs.fed.us/rm/pubs/rmrs_gtr42_5.pdf

4.1.2 Geological Resources

No significant adverse effects would be expected. Native grassland vegetation is adapted to living with fire. It will regenerate quickly as nutrients sequestered in the dead portions of plants are made available to living roots via the ashes. The regenerating plants will serve to prevent soil erosion and sedimentation.

4.1.3 Water Resources

No significant adverse effects would be expected. No sediment is expected to enter streams or wetlands from fire areas. Vegetation will regenerate quickly, so erosion is unlikely.

4.1.4 Biological Resources

Wetlands. No significant adverse effects would be expected. None of the prescribed fire units proposed to be burned are in wetlands. Westover ARB had applied for and received a Massachusetts wetlands permit (Determination of Applicability) in 2004 for prescribed fires in 2004 and 2005 in case it had been necessary.

Terrestrial Ecosystems. Beneficial effects would be expected. Natural grasslands evolved with and are maintained by fire. Fire eliminates brush and tree species not adapted to fire that might otherwise encroach upon grasslands. Prescribed fire mimics this natural disturbance. Westover ARB would reintroduce fire to the grassland ecosystem here.

Flora. Beneficial effects would be expected. As stated above, native grassland vegetation is adapted to living with fire. It will regenerate quickly as nutrients sequestered in the dead portions of plants are made available to living roots via the ashes (Brown and Smith 2000). While some invasive plants may also respond favorably, Westover ARB will begin an integrated pest management approach to eradicating invasive plants via the present (and soon to be updated) Vegetation Management Plan (WARB 1999b). For more information on the effects of fire on flora, see Brown and Smith 2000, available online at:
http://www.fs.fed.us/rm/pubs/rmrs_gtr42_2.pdf

Fauna. Beneficial effects would be expected. Implementation of the Proposed Action would result in improved habitat conditions for native grassland bird and animal species and reduce habitat for species that are hazardous to safe aircraft operations (Smith 2000). The fires would be burned before the nesting season for rare bird species. Large mammals, some small mammals

and birds would move to areas not burned. Some small mammals such as mice and voles would stay underground as the fire passed. It is possible that a small number of them may die from the effects of the fire. For more information on the effects of fire on fauna, see Smith 2000, available online at: http://www.fs.fed.us/rm/pubs/rmrs_gtr42_1.pdf

Endangered, Threatened, and Rare Species. Beneficial effects would be expected for all special status species at Westover ARB.

4.1.5 Cultural Resources

No impacts to cultural or archeological resources would be expected as a result of the use of prescribed fire at Westover ARB. No structures exist above ground in the fire units proposed for burning (OPA 1995). Burning will not impact any potential resources below ground.

4.1.6 Socioeconomics and Environmental Justice

No socioeconomic effects would be expected. No disadvantaged or minority population would be disproportionately impacted by the Proposed Action.

4.1.7 Hazardous Material and Waste

No effects would be expected. The underground fuel pipeline would not be exposed to or at risk from the transitory fire on the surface. Fire will not be used in the vicinity of any pipeline vents. Fuel used in the drip torches and Terra Torch is consumed by the fire it carries to the vegetative fuel.

4.2 Use of Herbicides and Growth Retardants

Herbicides have their place in integrated pest management. Their use for other purposes will be included in the Base's Vegetation Management Plan. Selective use of herbicides will help to eliminate broad-leafed weeds that produce fruits and seeds and are food for insects that attract BASH risk birds and animals. Herbicides may be the only effective way to control or eradicate invasive plants.

Growth retardants also have their place in integrated pest management and reduction of BASH risk. They decrease or eliminate the need to mow vegetation. Less mowing would produce less thatch on the ground.

Air, geological and water pollution from the use of these chemicals and those used to “carry” them to the vegetation would be negligible. All such chemicals must be approved by the Armed Forces Pest Management Board prior to use. Some of them become inert upon contact with soil and others are designed for use in or around water. Use of chemicals with significant environmental side effects is not likely to be approved by the Board.

Herbicides and growth retardants would primarily impact the vegetation they were intended for. That impact would act upon the biological resources that depend upon the target vegetation.

No cultural, socioeconomic or environmental justice impacts would be expected from the airfield use of these chemicals.

The contractor using herbicides and growth retardants would be required to follow hazardous materials and hazardous waste protocols in their handling and application. They would not usually be stored on Westover ARB. The contractor would be required to follow the appropriate spill plan and notify base and regulatory officials of the uncontrolled release of any chemicals.

Herbicides and growth retardants will not remove the existing thatch layer and do not replicate a natural grassland disturbance regime, however. Further, the Air Force is committed to reducing the use of chemicals in the environment (DODI 4150.7 1996).

4.3 Plow Vegetation Underground

Plowing vegetation underground would remove both the vertical structure and thatch. It would be useful in a comprehensive approach to replacing the existing vegetation. On a large scale it would also subject the soil to wind and water erosion, cause dust storms unacceptable for safe maintenance and operation of aircraft, radically alter habitat, and expose insects and earthworms attractive to BASH risk birds. While unlikely, it could also disturb buried cultural resources. Plowing would not have socioeconomic, environmental justice or hazardous materials or wastes impacts. It would not replicate a natural grassland disturbance regime, however.

4.4 No Action Alternative

Adoption of the No Action Alternative would mean that Westover ARB would continue existing conditions and management practices. This amounts to mowing per the BASH plan. Mowing will not remove the existing thatch layer that can increase fire risk, encourage rodents and hamper “weak scratchers” such as Grasshopper Sparrows that need to make contact with mineral soil.

Mowing in the units proposed does not remove stump sprouts and other brush that pose a BASH risk as food and cover for problem wildlife. Finally, mowing does not replicate a natural grassland disturbance regime.

4.5 Cumulative Impacts

Cumulative impacts on environmental resources result from incremental impacts of Proposed Actions, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from minor, but collectively substantial, actions undertaken over a period of time by various agencies (local, state, and Federal) or individuals. NEPA requires a discussion of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the near future.

Continued use of prescribed fire would be part of a comprehensive natural resource management strategy for Westover ARB. That strategy must ensure the sustainability of the military mission. It is designed to comply with applicable laws, restore/maintain environmental health, prevent uncontrolled wildfires, and conserve native plants and animals.

Some urban and suburban development can be expected to continue outside of Westover ARB and within some of the surrounding natural areas. This will bring people closer to smoke and potential fire risk from prescribed fire and will further fragment that habitat. Following the prescription designed for each fire will minimize risks to human life and property and increase the value of Westover ARB's already significant grassland wildlife habitat.

5. Findings Related to the Proposed Action

The EA has examined potential effects of the Proposed Action and alternatives on air quality, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, and hazardous material and waste. The evaluation of the Proposed Action identified as Westover ARB's preferred alternative indicates that proceeding with the use of prescribed fire would not significantly impact the physical and socioeconomic environments at and near Westover ARB.

6. List of Preparers

Andrew Milroy

Natural/Cultural Resources Manager
439 MSG/CEV, Westover ARB, MA

J.D.

M.S. Wildlife and Fisheries Conservation (in progress)

B.S. Behavioral Science

Years of Experience: 9

This EA was adapted from one prepared under the direction of the Air Force Center for Environmental Excellence and Environmental Planning Branch of the Air Force Reserve Command for Implementation of the Westover ARB INRMP. The individuals who contributed to the preparation of that document are listed below.

Suanne Collinsworth

engineering-environmental Management, Inc. (e²M)

M.S. Environmental Sciences and Engineering

B.S. Geology

Certificate of Water Quality Management

Years of Experience: 5

Melissa Ellinghaus

e²M

M.E.S. Environmental Policy

B.S. Biology

Years of Experience: 3

Gino Giumarro

e²M

M.S. Natural Resources Planning

B.S. Wildlife Biology

Years of Experience: 4

Marty Heigh

e²M

M.S. Civil Engineering

B.S. Civil Engineering

Professional Engineer (State of Nebraska)

Years of Experience: 20

Brian Hoppy

e²M

B.S. Biology

Certificate of Environmental Management

Years of Experience: 11

Cheryl Myers

e²M

A.A.S. Nursing

Year of Experience: 2

7. References

AICUZ Study 1996. United States Air Force, Westover ARB, MA

Air Force Pamphlet 91-212 2004. *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques*. US Government Printing Office, Washington D.C.

Brown, James K.; Jane Kapler Smith, eds. 2000. *Wildland fire in ecosystems: effects of fire on flora*. Gen. Tech. Rep. RMRS-GTR-42-vol. 2.: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Ogden, UT

DOD Instruction 4150.7 1996. *Department of Defense Pest Management Program*. US Government Printing Office, Washington D.C

HNTB Corporation 2004. *Westover Metropolitan Airport Westover Air Reserve Base/ 14 CFR Part 150 Noise Exposure Map Update*. Westover Metropolitan Development Corporation, Chicopee, MA.

Sandberg, David V.; Roger D. Ottmar; Janice L. Peterson; John Core. 2002. *Wildland fire in ecosystems: effects of fire on air*. Gen. Tech. Rep. RMRS-GTR-42-vol. 5. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Ogden, UT

Smith, Jane Kapler, ed. 2000. *Wildland fire in ecosystems: effects of fire on fauna*. Gen. Tech. Rep. RMRS-GTR-42-vol. 1. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Ogden, UT

References from the original engineering-environmental Management, Inc. (e²M) EA on Implementation of the Westover ARB INRMP:

439th Airlift Wing (AW). 1996. *United States Air Force Fact Sheet*. Westover Air Reserve Base (ARB). 1996.

Bailey, Robert G. 1995. *Description of the Ecoregions of the United States*. 2nd edition revised and expanded (1st edition 1980, Miscellaneous Publication No. 1391 (rev.)). U.S. Department of Agriculture—Forest Service. Washington, DC.

Doyle, Katherine L. and Thomas J. Maier. 1995. *Small Mammal Survey at Westover Air Reserve Base*. A Report for MNHSEP Research Contracts Program (MA HER PSR9590). October 15, 1995.

Jenkins, Jerry. 1995. *Summary report on the 1994 Botanical Survey of Westover Air Force Reserve Base*. White Creek Field School. White Creek, New York. March 1995.

Massachusetts Division of Fisheries and Wildlife (MDFW). 1993. *1993 Census Results and Management Recommendations for Grassland Birds at Westover ARB*. Westborough, Massachusetts. 04 August 1993.

Massachusetts Division of Fisheries and Wildlife (MDFW). 1995. *Biological Inventory Final Report to Westover ARB*. Natural Heritage and Endangered Species Program Contract Number M67004-91-D0010. WST 93-5106. November 1995.

Massachusetts Natural Heritage and Endangered Species Program (MNHESP). 1995. *State Listed and Notable Plant Communities Found at Westover*. Chicopee Massachusetts.

Mello, Mark J. 1995. *Lepidoptera Survey of Grasslands and Other Significant Habitats at Westover Air Force Base in Massachusetts*. Report to the Massachusetts Natural Heritage and Endangered Species Program from the Lloyd Center for Environmental Studies. Lloyd Center Report #95-1. South Dartmouth, Massachusetts.

Office of Public Archaeology (OPA). 1995. *Results of a Cultural Resources Reconnaissance Survey for Westover Air Reserve Base in Massachusetts*. Boston University. June 1995.

Shetterly, John A. 1994. *Tiger Beetle Survey Report – Westover Air Force Base, May – October 1994*. Cambridge, Massachusetts.

U.S. Department of Agriculture (USDA). 1993. *Wildlife Hazards to Aircraft Management Plan at Westover Air Reserve Base*. Amherst, MA. 20 May 1993.

U.S. Department of Agriculture (USDA). 1995. *Wildlife Hazards to Aircraft Management Plan at Westover Air Reserve Base. FY95 Annual Summary*. Amherst, MA. 08 December 1995.

U.S. Bureau of Census. 1990. Census of Population and Housing. Generated using Harden Political InfoSystem. <<http://govinfo.library.orst.edu>>. Accessed August 6, 2001.

U.S. Bureau of Census. 2000. Census of Population and Housing. Generated using Quickfacts. <<http://quickfacts.census.gov>>. Accessed August 6, 2001.

Westover Air Reserve Base (WARB). 1995a. *Natural Resources Comprehensive Base Layout Map*. Westover ARB. Chicopee, Massachusetts. July 21, 1995.

Westover Air Reserve Base (WARB). 1998a. *Integrated Natural Resources Management Plan*. April 1998.

Westover Air Reserve Base (WARB). 1998b. *Wetland Identification and Delineation Report*. September 1998.

Westover Air Reserve base (WARB). 1999a. *Draft Environmental Assessment of Proposed Construction Projects at Westover Air Reserve Base*. March 1999.

Westover Air Reserve Base (WARB). 1999b. *Vegetative Management Plan*. May 1999.

Whitlock, Alison L., Scott D. Jackson, and Alan Richmond. 1994. *Herptile Surveys at Westover Air Force Base*. A report for MNHSEP Research Contracts Program (MA HER 945MM8). University of Massachusetts, Amherst. December 31, 1994.

8. Map of 2005 Prescribed Fire Areas

