U. S. AIR FORCE

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Westover Air Reserve Base, Massachusetts

(See INRMP signature pages for plan approval date)

ABOUT THIS PLAN

This installation-specific Environmental Management Plan (EMP) is based on the United States Air Force's (USAF) standardized Integrated Natural Resources Management Plan (INRMP) template. This INRMP has been developed in cooperation with applicable stakeholders, which includes Sikes Act cooperating agencies and/or local equivalents, to document how natural resources will be managed. Where applicable, external resources, including Air Force Instructions (AFIs); Department of Defense Instructions (DoDIs); USAF Playbooks; federal, state, and local requirements; Biological Opinions; and permits are referenced.

Certain sections of this INRMP begin with standardized, USAF-wide "common text" language that address USAF and Department of Defense (DoD) policy and federal requirements. This common text language is restricted from editing to ensure that it remains standard throughout all plans. Immediately following the USAF-wide common text sections are installation sections. The installation sections contain installation-specific content to address local and/or installation-specific requirements. Installation sections are unrestricted and are maintained and updated by the approved plan owner.

NOTE: The terms "Natural Resources Manager," "NRM," and "NRM/POC" are used throughout this document to refer to the installation person responsible for the natural resources program, regardless of whether this person meets the qualifications within the definition of a natural resources management professional in DoDI 4715.03, Natural Resources Conservation Program.

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DOCUMENT CONTROL

Standardized INRMP Template

In accordance with (IAW) the Air Force Civil Engineer Center (AFCEC) Environmental Directorate (CZ) Business Rule (BR) 08, *EMP Review, Update, and Maintenance*, the standard content in this INRMP template is reviewed periodically, updated as appropriate, and approved by the Natural Resources Subject Matter Expert (SME).

This version of the template is current as of 06/26/2020 and supersedes the 2018 version.

NOTE: Installations are not required to update their INRMPs every time this template is updated. When it is time for installations to update their INRMPs, they should refer to the eDASH EMP Repository to ensure they have the most current version.

Installation INRMP

Record of Review – The INRMP is updated no less than annually, or as changes to natural resource management and conservation practices occur, including those driven by changes in applicable regulations. IAW the Sikes Act and AFMAN 32-7003, *Environmental Conservation*, the INRMP is required to be reviewed for operation and effect no less than every five years. An INRMP is considered compliant with the Sikes Act if it has been approved in writing by the appropriate representative from each cooperating agency within the past five years. Approval of a new or revised INRMP is documented by signature on a signature page signed by the Installation Commander (or designee), and a designated representative of the United States Fish and Wildlife Service (USFWS), state fish and wildlife agency, and National Oceanic and Atmospheric Administration (NOAA) Fisheries when applicable (AFMAN 32-7003).

Annual reviews and updates are accomplished by the installation Natural Resources Manager (NRM), and/or a Section Natural Resources Media Manager. The installation shall establish and maintain regular communications with the appropriate federal and state agencies. At a minimum, the installation NRM (with assistance as appropriate from the Section Natural Resources Media Manager) conducts an annual review of the INRMP in coordination with internal stakeholders and local representatives of USFWS, state fish and wildlife agency, and NOAA Fisheries, where applicable, and accomplishes pertinent updates. Installations will document the findings of the annual review in an Annual INRMP Review Summary. By signing the Annual INRMP Review Summary, the collaborating agency representative asserts concurrence with the findings. Any agreed updates are then made to the document, at a minimum updating the work plans.

INRMP APPROVAL/SIGNATURE PAGES

Integrated Natural Resources Management Plan

Signature Page

Westover Air Reserve Base

Chicopee, Massachusetts

This Integrated Natural Resource Management Plan meets the requirements of the Sikes Act (15 USC 570a et seq.)as amended.

Approving Officials:

LTC Joseph D. Janik **Date**

Commander, Westover Air Reserve Base

United States Air Force

XXXXXXXXXXXX **Date**

Project Leader - New England Field Office

U.S. Fish and Wildlife Service

Mark Tisa **Date**

Director

Division of Fisheries and Wildlife (MassWildlife)

EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) has been developed for Westover Air Reserve Base (ARB) and the Air Force Reserve Command (AFRC) in accordance with Air Force Instruction (AFMAN) 32-7003, Integrated Natural Resources Management, and Air Force Policy Directive (AFPD) 32-70, Environmental Quality, and the provisions of the Sikes Act, as amended (16 United States Code [U.S.C.] 670a et seq.) The INRMP provides Westover ARB with a description of the Base and the surrounding environments, and presents various management practices designed to mitigate negative impacts and enhance the positive effects of the Base's mission on regional ecosystems. These recommendations are balanced against the requirements of Westover ARB to accomplish their mission at the highest possible level of efficiency. This INRMP is a practical guide for the management and stewardship of all natural resources present on Westover ARB, while ensuring the successful accomplishment of the military mission. Information for this plan was gathered from a variety of organizations.

This INRMP has a few changes from the previous 2016 INRMP. The changes that were included in the INRMP were discussed with all agencies involved. We increased the allowable acreage for prescribed in consultation with Massachusetts fish and wildlife. In 2015, Westover completed an Environmental Assessment "Manage Airfield Vegetation to Protect Flight Safety". This EA resulted in recommendations for herbicides, prescribed fire, and selective mowing to maintain compliance with the Air Force Safety Center standards for grass height.

The recent grassland bird inventory of 2018 indicates that we have a stable population of neotropical song birds. Further, our management methods have resulted in increased warm season grassland habitat. The increased warm season grassland habitat allows for use of less herbicide to achieve the goals of the INRMP.

One of the purposes of this INRMP is to identify goals and objectives for the Base and to obtain workable and useful solutions for each topic of concern. The overriding objectives for this INRMP are to:

Outline the military mission and its effects on the natural resources on the installation;

Provide for the management and protection of natural resources on the installation;

Maintain biological diversity and sustainability of the training site for mission use;

Describe the physical characteristics of the installation; and

Determine ways to resolve conflicts between mission and mission specific projects and conservation of natural resources.

Based upon document reviews, field inspections and discussions with other agencies; a list of management concerns was developed. These issues and concerns include natural resource/mission conflicts, natural resource inventories necessary to provide baseline data from which to develop management procedures, resource preservation or enhancement needs and opportunities, and actions dictated by Air Force natural resource management policies. These management issues and concerns were then used to develop goals and objectives for natural resource management. Each goal was subdivided into a series of objectives or practical recommendations to achieve the goal, and the objectives subdivided into specific projects that can be accomplished within a single year. The goals are ideals for resource management. As natural resource management is dependent upon

Air Force mission, policy, available funding, and available manpower, achievement of goals is not necessarily bound to a specific schedule. This INRMP describes military mission constraints such as Bird/Wildlife Aircraft Strike Hazard (BASH) and how these limit enhancement of natural areas on the Base.

The concept of ecosystem management is integral to all natural resource planning at WARB. Provided below are the five major management goals for implementation:

- Manage for no net loss in Westover ARB's capability to support the military mission of the Base.
- Remain in compliance with federal, state, and local laws and regulations governing natural resources
- Protect native species, discourage non-native exotic species, and work to eliminate invasive species.
- Protect wetlands from operational activities at WARB and maintain healthy, functional wetlands without increasing BASH risks;
- Maintain outdoor recreation and public access to natural resources

The 2016 Westover INRMP incorporated a change from Air Force Instruction (AFI) 91-202. The 2016 INRMP specified grass height requirements under the Aviation Safety Program referred to as the Bird/Wildlife Aircraft Strike Hazard (BASH) Program. Westover has not changed any of those plans or procedures in the 2021 INRMP. AFI 91-202 directed all US Air Force organizations and personnel, including US Air Force Reserve Command units, to:

Mow aircraft movement area (AMA) to maintain a grass height between 7 and 14 inches. The AMA, as defined in UFC 3-260-01, Airfield and Heliport Planning and Design, is that area of the airfield encompassed by the Primary Surface and the Clear Zones, as well as apron areas and taxiways, regardless of their location. As a minimum, turf shall be maintained 500 feet outside the AMA boundary where able. Installations located in arid climates where growing grass is difficult may develop natural vegetation on the airfield to limit attractiveness to wildlife. These situations require comprehensive vegetation/wildlife hazard management and will be reviewed individually by Headquarters Air Force Safety Center (HQ AFSC/SEFW) for approval.

AFCEC prepared an Environmental Assessment to evaluate the impact of altering mowing schedules and applying a plant growth regulator. That analysis supports the implementation of the new vegetation management procedures described in this INRMP.

Westover ARB intends to focus on plant growth regulator (PGR) herbicide applications on the airfield cool season grasses. The largest patches of cool season grasses will be given first priority for treatment with diminishing area applications leading up to mid-May. To assess the effectiveness of the herbicide application, vegetation height will be monitored and measured at least weekly during the growing season by Westover ARB Environmental, USDA, and Base Operations personnel.

The inputs from the various airfield monitors will be used in management decisions of where and when to mow in order to comply with the applicable AFI grass height standards while minimizing the adverse impact to grassland habitat. Westover ARB intends to make every reasonable effort to avoid mowing areas that do not exceed grass height thresholds. (See Section 7.7)

1.0 OVERVIEW AND SCOPE

This INRMP was developed to provide for effective management and protection of natural resources. It summarizes the natural resources present on the installation and outlines strategies to adequately manage those resources. Natural resources are valuable assets of the USAF. They provide the natural infrastructure needed for testing weapons and technology, as well as for training military personnel for deployment. Sound management of natural resources increases the effectiveness of USAF adaptability in all environments. The USAF has stewardship responsibility for the physical lands on which installations are located to ensure all natural resources are properly conserved, protected, and used in sustainable ways. The primary objective of the USAF natural resources program is to sustain, restore, and modernize natural infrastructure to ensure operational capability and no net loss in the capability of USAF lands to support the military mission of the installation. The plan outlines and assigns responsibilities for the management of natural resources, discusses related concerns, and provides program management elements that will help to maintain or improve the natural resources within the context of the installation's mission. The INRMP is intended for use by all installation personnel. The Sikes Act is the legal driver for the INRMP.

1.1 Purpose and Scope

The primary objective of U.S. Air Force (USAF) natural resources programs is to sustain, restore and modernize natural infrastructure to ensure operational capability and no net loss in the capability of Air Force lands to support the military mission of the installation (Air Force Manual [AFMAN] 32-7003).

The principal tool for managing Base ecosystems is the INRMP. The INRMP outlines and assigns responsibilities, identifies concerns, and establishes standard operating procedures for the management of significant natural resources associated with WARB. Additionally, natural resource data is incorporated into an Environmental Management System (EMS) to help support integrated planning. The INRMP provides guidance for sound stewardship to protect natural resources and the necessary processes and procedures for maintaining these resources. This INRMP integrates all aspects of natural resource management (such as the management of sensitive species, wetlands, watershed protection, fish and wildlife, outdoor recreation, and public access) with the current military mission. Other studies that are relevant to these activities will be consulted and integrated into this plan as developed.

This INRMP also includes:

Long-term goals, objectives, and implementation strategies;

A framework for identifying resource management issues;

A tool for decision makers to direct day-to-day activities;

Necessary procedures for the protection and use of natural resources; and

A means to assess, monitor, and evaluate the impacts of base activities on natural resources.

The INRMP is a road map for natural resources management on USAF property. It helps in the coordination of USAF goals with those of other federal and state agencies. WARB, in consultation with U.S. Fish and Wildlife Service and Massachusetts Department of Fish and Game, and Massachusetts Wildlife's Nautural Heritage & Endangered Species Program (NHESP) has determined that there are significant natural resources on base to warrant an INRM

1.2 Management Philosophy

The INRMP serves as a key component of the Installation Development Plan, which provides background and rationale for the policies and programming decisions related to land use, resource conservation, facilities and infrastructure development, and operations and maintenance to ensure that they meet current requirements and provide for future growth. The INRMP supports the mission by identifying the natural resources present on the installation, developing management goals for these resources, and integrating these management objectives into the military requirements for mission operations/support and regulatory compliance to minimize natural resource constraints.

This INRMP outlines the steps needed to fulfill compliance requirements related to natural resources management and fosters environmental stewardship. It is organized into the following principal sections:

- An overview of the current status and potential future conditions of the natural resources
- Identification of potential impacts to or from natural resources
- The key natural resource management areas addressed
- Management recommendations that incorporate the installation's goals and objectives for natural resource management areas
- Specific work plans for effective implementation of the INRMP

Management issues and concerns, as well as goals and objectives, are developed from analysis of all the gathered information, and are reviewed by Westover ARB environmental personnel involved with or responsible for various aspects of natural resources management.

The INRMP was developed using an interdisciplinary approach and is based on existing information of the physical and biotic environments, mission activities, and environmental management practices at Westover ARB. Information was obtained from a variety of documents, interviews with installation personnel, on-site observations, and communications with both internal and external stakeholders. Coordination and correspondence with these agencies is documented and satisfies a portion of the requirements of 32 Code of Federal Regulations (CFR) 989, *Environmental Impact Analysis Process (EIAP)*. Goals and objectives require monitoring on a continuous basis and management strategies are updated whenever there are changes in mission requirements, adverse effects to or from natural resources, or changes in regulations governing management of natural resources.

1.3 Authority

The Sikes Act, 16 United States Code (USC) § 670a, requires an INRMP be written and implemented for all DoD installations with significant natural resources. This plan has been developed cooperatively between the installation, the USFWS, and Massachusetts Natural Heritage Endangered Species Program (MNHESP). The USAF natural resources program ensures continued access to land, air, and water resources to conduct realistic military training and testing, as well as to sustain the long-term ecological integrity of the resource base.

This INRMP is developed under, and proposes actions IAW, applicable DoD and USAF policies, directives, and instructions. AFMAN 32-7003 provides the necessary direction and instructions for preparing an INRMP. Issues are addressed in this plan using guidance provided under legislation, Executive Orders (EOs), Directives, and Instructions including DoDI 4715.03; Air Force Policy

Directive (AFPD) 32-70, *Environmental Quality*; and AFMAN 32-7003. DoDI 4715.03 provides direction for DoD installations to establish procedures for an integrated program for multiple-use management of natural resources. AFPD 32-70 discusses general environmental quality issues, including proper cleanup of polluted sites, compliance with applicable regulations, conservation of natural resources, and pollution prevention. AFMAN 32-7003 provides guidance on the preservation of cultural resources at USAF installations. The 'Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP' Table, included as an appendix to this plan, summarizes key legislation and guidance used to create and implement this INRMP. Refer to the complete listing of AFIs, AFMANs, the Federal Register, and the USC to ensure that all applicable guidance documents, laws, and regulations are reviewed. Installation-specific policies, including state and local laws and regulations are summarized in the table below.

Installation-Specific Policies (including State and/or Local Laws and Regulations)	
N/A	N/A

1.4 Integration with Other Plans

INRMP revisions and concurrence with the final plan must be coordinated through the installation chain of command and the U.S. Fish and Wildlife Service, Massachusetts Department of Fish and Game, and Massachusetts Wildlife's Nautural Heritage & Endangered Species Program (NHESP). The NRM must ensure that the INRMP, Integrated Cultural Resources Management Plan (ICRMP), Bird/Wildlife Air Strike Hazard (BASH) Plan, Integrated Pest Management Plan (IPMP), and Air Installation Compatible Use Zone (AICUZ) studies and any other plans that may affect natural resources, are mutually supportive and not in conflict.

The purpose of the INRMP being a key component of the Installation Development Plan (IDP) is to consider natural resources constraints and management strategies in conjunction with base development.

INRMP integration with the ICRMP assures elements of the natural resources program that may potentially affect cultural resources on the installation are properly identified and addressed.

INRMP integration with the BASH Plan ensures natural resources management aligns with maintaining continued military flying readiness and actions outlined in the INRMP act to reduce any existing and potential risk for human health and flight safety. In addition, "the INRMP must address habitat management techniques that can reduce the potential for wildlife hazards to aircraft operations" (AFMAN 32-7003).

INRMP integration with the IPMP safeguards effective strategies for the management of pests and confirms the two plans are mutually supportive in these efforts and not in conflict with each other.

AICUZ study integration with the INRMP ensures AICUZ guidelines are incorporated into on-base land use planning within the natural resource program.

INRMP integration with REPI ensures assessment of opportunities to merge conservation with land use objectives that benefit mission

2.0 INSTALLATION PROFILE

Office of Primary Responsibility (OPR)	339 MSG/CEV has overall responsibility for implementing the natural resources management program and is the lead organization for monitoring compliance with applicable federal, state, and local regulations.
Natural Resources Manager/Point of Contact (POC)	Name: John Cody Phone: 413-557-3036 Email: john.cody.9@us.af.mil
State and/or local regulatory POCs (Include agency name for Sikes Act cooperating agencies)	Jason Zimmer, MADWF Cynthia Corsair, USFWS
Total acreage managed by installation	2390 Acres
Total acreage of wetlands	182.62
Total acreage of forested land	224.52
Does installation have any Biological Opinions? (If yes, list title and date, and identify where they are maintained)	EPA MSGP New Permit Consultation Letter MSGP - May 10, 2021- U.S. Fish and Wildlife Service Concord, NH
Natural Resources Program Applicability (Place a checkmark next to each program that must be implemented at the installation. Document applicability and current management practices in Section 7.0)	☒ Fish and Wildlife Management ☒ Outdoor Recreation and Access to Natural Resources ☐ Conservation Law Enforcement ☒ Management of Threatened, Endangered, and Host Nation-Protected Species ☒ Water Resource Protection ☒ Wetland Protection ☒ Grounds Maintenance ☒ Forest Management ☒ Wildland Fire Management ☐ Agricultural Outleasing ☒ Integrated Pest Management Program ☒ Bird/Wildlife Aircraft Strike Hazard (BASH) ☐ Coastal Zone and Marine Resources Management ☒ Cultural Resources Protection ☒ Public Outreach ☒ Geographic Information Systems (GIS)

2.1 Installation Overview

2.1.1 Location and Area

Westover ARB is comprised of approximately 2,390 acres of land within the communities of Chicopee and Ludlow in the northern portion of Hampden County, Massachusetts. The Base is close to the cities of Holyoke and Springfield; and the towns of West Springfield, Granby, and South Hadley. Westover ARB is 35 miles north of Hartford, Connecticut, and 90 miles west of Boston,

Massachusetts. The Base is 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 or bound by Cooley, Stony, and Willimansett brooks.

State Route 33, the main thoroughfare providing access to Westover ARB, is less than 1 mile west of the Base. Approximately 2 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. Figure 1 shows the location of Westover ARB in relation to Massachusetts and the surrounding region.

During the 2000s the annualized population growth rate was close to 0.2%. A slight reversal of recent growth trends is expected after 2015 (Renski et al 2013). Between 2010 and 2030 the region will shrink at an annualized rate of 0.1%. Models predict that by 2030 the region will have approximately 580,000 residents, slightly below its size as measured in the 2000 Census.

The Base has two active runways, Runway 05-23, which is 300 feet wide by 10,400 feet long, and Runway 15-33, which is 150 feet wide by 7,050 feet long. Runway 05-23 is oriented approximately southwest to northeast, while Runway 15-33 is oriented approximately northwest to southeast. A series of taxiways extending from the flight line parking apron provide access to the runways.

The activities and operations at Westover ARB are grouped by functional areas and land use categories, including aviation support, residential, commercial, industrial, medical, administrative, public facilities/recreation, and open space. The two primary land use categories are aviation support and industrial activities, which account for more than 50 percent of all facilities and square footage on Base

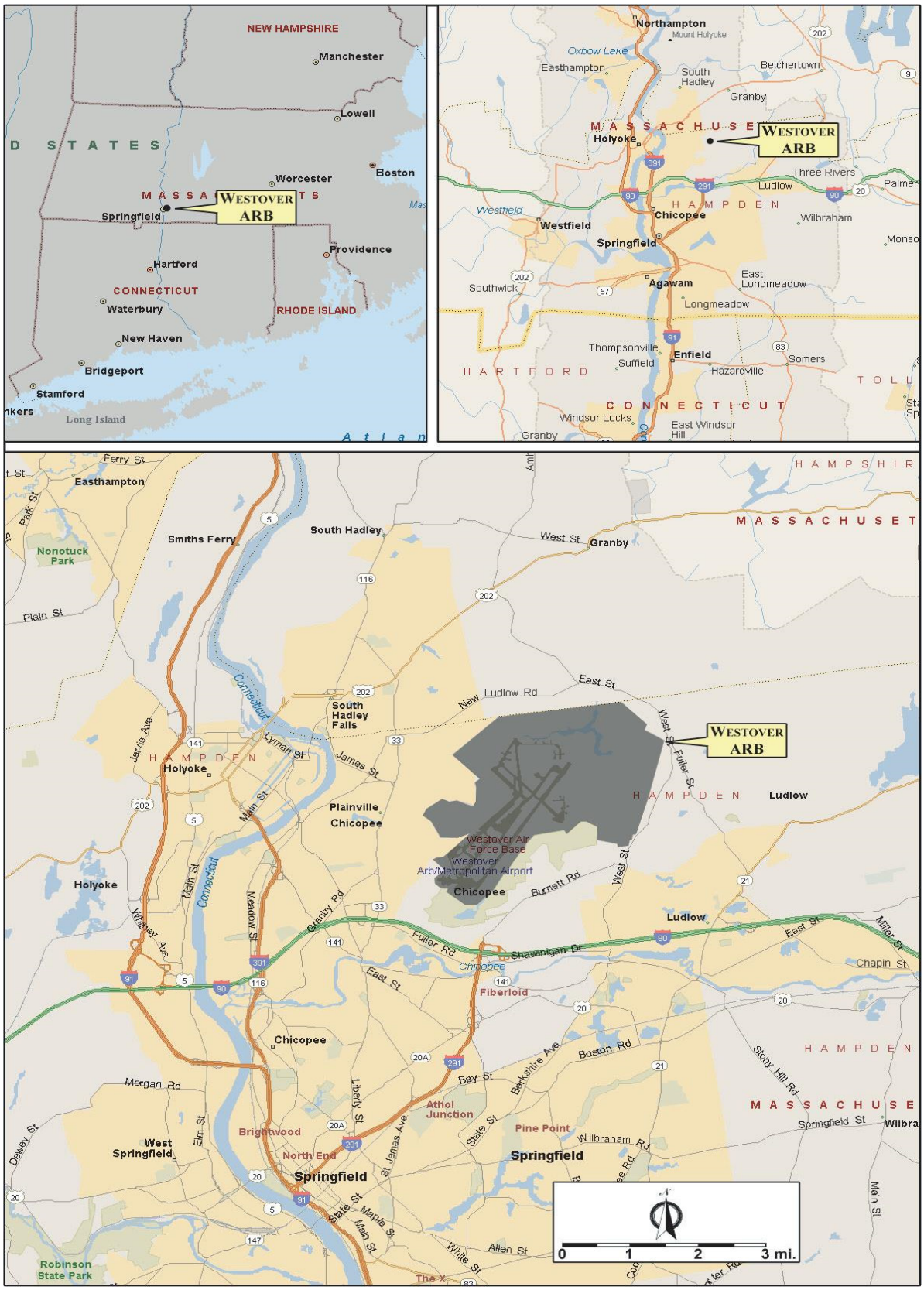


Figure 1. Location of Westover Air Reserve Base

Installation/GSU Location and Area Descriptions

Installation/ Geographically Separated Unit (GSU)	Main Use/ Mission	Acreage	Addressed in INRMP?	Describe Natural Resource Implications
Westover ARB	Aviation support/ Industrial activities	2,390	INRMP Section 2.1.1	Natural Resources Management

2.1.2 Installation History

Prior to construction of Westover ARB, the area where the Base now resides consisted mainly of tobacco fields. In 1939, following the Nazi invasion of Poland, a 7.5-mile tract of land was chosen for the construction of the Northeast Air Base, which was to serve as an important link in the chain of East Coast defense. A portion of the land was acquired by condemnation proceedings. The airfield was dedicated later in that same year as Westover Field in honor of Major General Oscar Westover. Major General Westover had served as Chief of the U.S. Army Air Corps before dying in a plane crash in 1938 at the age of 55. The Base was formally dedicated in April 1940 and by the next year was fully operational.

In 1989, Air Force Reservists and C-5 aircraft from the 439 MAW, in conjunction with active-duty crews and aircraft, transported equipment and supplies to Panama to ensure the canal's continued operation and to protect U.S. citizens and resources there. In December 1990, the 439 MAW was activated and supported airlift operations as Westover ARB became a major staging base in support of Operation Desert Shield. During Desert Shield and Desert Storm, more than 63,000 military passengers and 121,000 tons of cargo flowed through Westover ARB to and from the Persian Gulf with more than 3,600 aircraft transitioning through the Base. At that time, Westover ARB was in operation full time with 1,500 activated Reservists living on Base. Westover ARB performed maintenance on all aircraft, and served as command and control for incoming and outgoing military air traffic.

In 1992, the 439 MAW was re-designated as the 439 AW. The same year, aircraft from the 439th flew food, medical supplies, and clothing to the new Commonwealth of Independent States in the former Soviet Union; ferried supplies, vehicles, and personnel to Homestead AFB, Florida, to assist in the relief efforts following Hurricane Andrew; and took humanitarian supplies to Croatia. They also assisted Pakistani citizens when floodwaters raged throughout the southwest Asian nation and played a role in Operation Restore Hope, a United Nations effort in Somalia.

The next year, Westover aircrews flew relief missions from Cairo, Egypt, into Mogadishu, Somalia, and the 74th Aeromedical Evacuation Squadron medics provided medical assistance. As tension in Somalia escalated, the U.S. sent more troops and equipment to Mogadishu. Westover sent three aircraft and three crews for a total of six missions.

In September 2001, a Westover C-5A aircrew that originally flew a routine mission to Travis AFB, California, found itself heading suddenly eastward with emergency supplies following the terrorist attacks on New York and Washington, DC. The C-5 aircrew was on the first leg of a mission to Australia when it was tasked to transport a rescue team and equipment to New York City. The aircrew delivered about 72 members of an urban search-and-rescue team, their vehicles,

and nine pallets of equipment to McGuire AFB, New Jersey, on the September 11. The team included medical personnel, firefighters, chaplains, and rescue dogs.

In October, Operation Enduring Freedom called up more than 1,000 Air Force reservists to fight the war on terrorism. By February, the number of activated Westover men and women had reached 1,150. Members of the 439th Airlift Wing found themselves deployed to more than 20 countries across the globe.

While most of the members of the 439th Airlift Wing were demobilized by October 2002, the 439th Security Forces Squadron entered its second year of activation, tasked with around-the-clock security of Westover ARB

2.1.3 Military Missions

Westover ARB is home to the 439 AW, which operates and maintains up to 8 C-5 aircraft, representing 5 percent of the total U.S. airlift capability. Westover's vision is to build on their 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 AFB. The 439 AW oversees three flying squadrons and 40 supporting units which are responsible for the movement of troops, equipment, and supplies; and the performance of medical evacuations. The major tenant organizations on the Base are the U.S. Army, U.S. MEPCON and the U.S. Marine Corps Reserve.

The 439 AW is capable of providing air movement of troops, supplies, equipment, and medical patients. Airlift includes airdrop and combat off-load operations. Support units provide communications, engineering, logistical, medical, and security support. The 439 AW also manages aircraft maintenance and all assigned Air Force real property, equipment, and supplies.

Listing of Tenants and Natural Resources Responsibility

Tenant Organization	Natural Resources Responsibility
U.S. Army	439 MSG/CEV
U.S. Marine Corps	439 MSG/CEV
U.S. MEPCON (United States Military Entrance Processing Command)	439 MSG/CEV

2.1.4 Natural Resources Needed to Support the Military Mission

Vegetation management is required for safety reasons to support the mission on Westover ARB. In 2015 the grass height regulations changed and as a result of an environmental assessment and Westover conducted an environmental analysis and partnered with the Chicopee Conservation Commission to create a Vegetation Management Plan (VMP). In particular, two vegetation management projects have the potential to have environmental effects on the Base. Airfield grass management is necessary to maintain airfield safety. Typically, these mowing standards would have little effect on natural resources, however Westover ARB supports nesting habitat for two state listed species, upland sandpiper (Bartramia longicauda) and state threatened grasshopper sparrow (Ammodramus savannarum). Methods to minimize impacts to these species were developed by incorporating the use of plant growth regulators, pre-emergent herbicides, and prescribed burns, prior to initiating mowing, which can have direct effects on nests.

Westover ARB intends to focus the plant growth regulator (PGR) herbicide applications on the airfield cool season grasses. The largest patches of cool season grasses will be given first priority

for treatment with diminishing area applications leading up to mid-May. Any herbicide application after 15 May will be very selective. The herbicides to be used include Plateau (4 oz. /AC), Escort XP, Milestone and Vanquish as needed to control broadleaf and shrubby weeds. The herbicide applicator will use tractor mounted boom sprayers that will begin when vegetation begins to "green up". It is feasible to spray up to 100 acres per day.

To assess the effectiveness of the herbicide application Westover ARB Environmental personnel will monitor the vegetation height by visual observation of scaled reference field markers placed in each the burn units at least weekly during the growing season, from 1 April through 1 August. Particular attention and consideration will be given to areas of little bluestem grasses. USDA/WS personnel will also be conducting weekly point counts at (10) locations throughout the airfield using scaled ruler measurements at 3 or 4 points in vegetation stands that appear to be approaching the grass height conformance standards. Base Operations personnel also conduct daily inspections of the airfield.

The input from the various airfield monitors will be used in management decisions of where and when to mow in order to comply with the applicable AFI grass height standards while minimizing the adverse impact to the grassland habitat. Westover ARB intends to make every reasonable effort to avoid mowing areas that do not exceed tolerances

The second vegetation management action that could have environmental effects is the need to remove obstructions from the imaginary surface of the airfield (see section 7.0). These actions could have impacts to wetlands.

2.1.5 Surrounding Communities

The areas surrounding Westover ARB consist of the city of Chicopee and the towns of Ludlow and Granby in the northern portion of Hampden County, Massachusetts. The city of Chicopee is a diverse urban community that depends on Westover ARB as an integral part of the local economy, employing about 1,000 local residents and housing 2,500 reservists of the 439th Military Airlift Wing. As of the 2010 census, there were 55,298 people residing in the city. The portions of the Base that border Chicopee are primarily residential to the south and west with some industrial areas to the southwest and northwest (CPI 2004a).

The town of Ludlow is a suburban community with a manufacturing past. The town had 21,103 residents in the 2010 census, and is zoned primarily for agriculture (~75%); followed by residential (~16%), industrial (~7%), and business (~1%); and the remaining unzoned water. The portions of Ludlow that border the northeastern portion of the Base are primarily agricultural, light industrial, and unzoned water (CPI 2004b).

The town of Granby is a formerly rural community that is becoming suburbanized. The population was 6,420 at the 2010 census. The town economy was historically based on farming and light industry. In the early 19th century, crops consisted of grains, turnips, pumpkins, and hops, with surplus grain being utilized in small distilleries. Dairy farming and the manufacturing of buttons and palm-leaf hats soon followed. Granby is zoned primarily as residential (~95%), followed by industrial (~2%), business (~2%), and municipal (< 1%). The portions of the Base that border Granby are residential single family units to the north (CPI 2004c).

The Base is also close to the cities of Holyoke and Springfield and the towns of West Springfield and South Hadley.

2.1.6 Local and Regional Natural Areas

Westover ARB lies within the Silvio O. Conte National Fish and Wildlife Refuge. In addition, a number of state parks and recreational areas in Holyoke, Chicopee, Springfield, and Ludlow are within a 3-mile radius of the Base. Several historic sites, including archaeological sites and designated historic areas, are on or in close proximity to the Base.

The Silvio O. Conte National Fish and Wildlife Refuge Act ("the Conte Act"), signed by President Bush in 1991, charged the USFWS to study the entire 7.2-million-acre Connecticut River watershed and create a new national fish and wildlife refuge. As previously stated, the long-term purposes of the refuge include the protection, conservation, and enhancement of ecosystems and populations of plants, fish, and wildlife; and the restoration and maintenance of the chemical, physical, and biological integrity of the waters and wetlands within the refuge, with primary emphasis on environmental education, and cooperative agreements with state and local governments and private landowners (USWFS 1995). The Connecticut River and its riparian lands are unique environmental resources which provide habitat for migratory and resident fish, migratory water fowl, and other wildlife species, including threatened and endangered species.

To accomplish the goals of the Conte Act, areas which contribute substantially or in unique ways to protecting fish, birds, federally listed species, wetlands, and overall biodiversity within the watershed were identified. Each focus area was assigned a priority of either high, medium, or low, based on the biological value of each site. Westover ARB has been identified as a "Special Focus Area" with "high" priority within the Silvio O. Conte National Fish and Wildlife Refuge. The "high" priority designation was assigned to Westover ARB because the Base has the largest contiguous grassland in the watershed, and is inhabited by and provides habitat for the largest populations of grasshopper sparrow and upland sandpiper in the watershed (USWFS 1995).

Several state parks and recreation areas are in close proximity to the Base. Parks and recreational areas in Chicopee include the Sarah Jane Sherman Park to the southwest, River's Park to the west, the Chicopee Memorial State Park and the Chicopee Municipal Golf Course to the east, and Szot Park to the southwest. Blunt Park, Five Mile Pond Park, and Hubbard Oak Park are south and southeast of Westover ARB in Springfield. Natural areas in close proximity to the Base in Ludlow include Facing Rock Wildlife Management Area, Camp White, the Stony Brook Wetlands, and Haviland Park. Springdale Park, in Holyoke, is approximately 3 miles west of the Base. The Mount Tom State Reservation is also in Holyoke and Skinner Mountain State Park and Holyoke Range State Park are both in South Hadley. These parks and recreational areas offer numerous opportunities for baseball, softball, bicycling, hiking, picnicking, tennis, and cross-country skiing.

Wade Lake, another natural resource lying in close proximity to the Base, is adjacent to the northeastern boundary of the Base. Westover ARB has signed a 5-year lease for Wade Lake which offers a picnic shelter, access for launching nonmotorized watercraft, fishing access, and opportunities for bird and wildlife observation. This area is a Restricted Recreation Area. Access to Restricted Recreation Areas is limited to: Military Members of the Reserve, National Guard and Active Duty with a DOD identification card; Department of Defense Civilian Employees with a DOD identification card; Active Duty Military Dependents with a DOD identification card; Military Retirees with a DOD identification card; Department of Defense Civilian Retirees with a DOD identification card; Employees of Installation Prime Contractors (defined as a contractor with a five or more year term contract) with a DOD identification card; Family Members and Friends of

any of the people listed above, and the General Public, with prior, written approval of the Installation Commander.

2.2 Physical Environment

2.2.1 Climate

Westover ARB lies in an area dominated by a continental climatic regime, which ensures a strong annual temperature cycle, with cold winters and warm summers. The average annual temperature at Westover ARB is 50 degrees Fahrenheit (°F) (14th Weather Squadron). July is the hottest month, with an average maximum temperature of 85 °F. January is the coolest month, with an average temperature of 28 °F (14th Weather Squadron). The area surrounding Westover ARB experiences an average of 141 days annually with a temperature less than 33 °F (14th Weather Squadron).

Precipitation is relatively stable throughout the year. The mean average precipitation at Westover ARB, based on data collected during a 10-year period (01/01/2009–12/31/2018), is 44.2 inches per year. The area experiences an average snowfall of 50.0 inches per year, 49.5 inches per season (October-May), and an average of 10 days annually with a snowfall greater than 1.5 inches (14th Weather Squadron). The prevailing winds throughout the late spring and summer months are from the south at approximately 5 knots, while the prevailing winds during the remainder of the year are from a more northerly direction at approximately 5 knots (14th Weather Squadron).

2.2.2 Landforms

The region surrounding Westover ARB is bound on the west by the Berkshire Hills and on the east by low hills associated with the Worcester Plateau. The topography of the area is characterized by gently sloping terraces that flank the Connecticut River. The topographic relief ranges from about 40 feet above sea level (ASL) south of Westover ARB near the Connecticut state border to 1,200 feet ASL atop the summit of Mount Tom, north of the Base in South Hadley, Massachusetts (OPA 1995). The topography of Westover ARB is relatively flat with occasional small rises and several low wetlands. Elevations within the cantonment area range from 230 feet ASL in the southern portion of the Base to 250 feet ASL in the northern portion of the Base. The runway at Westover ARB is 244 feet ASL (USDA 1993).

2.2.3 Geology and Soils

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

The original soils mapping of Westover ARB was completed sometime between 1960 and 1973. Following the completion of the field mapping in Hampden County, the USDA NRCS, compiled, edited, and published the Soil Survey of Hampden County, Massachusetts, in 1978. The soil mapping unit present on most of Westover ARB is the Urban land-Hinckley-Windsor association, which contains relatively deep, excessively drained soils formed on glacial outwash terraces (NRCS 1978). Other than limitations related to their structural stability for cut slopes and use for ponds, these soils are considered to be deep and well drained and would not be expected to contain

significant areas of hydric soil inclusions. The undisturbed soils along the southwestern edge of the Base, on the banks of Cooley Brook, are Windsor loamy sands, except for a small area of Hinckley loamy sands at the southern tip of the Base. The soils surrounding Stony Brook and the north and northwest portions of the Base are primarily areas of Sudbury fine sandy loams, Scarboro fine sandy loams, and Deerfield loamy sands (OPA 1995).

Much of the Base has been developed since these soil classifications were prepared in 1978 by the USDA NRCS (NRCS 1978). Due to development, many of the native soil profiles have been disturbed and no longer exist. The developed lands were graded and filled and are now classified within the modern soil taxonomy criteria as Udorthents-Urban (Gilbert 1997). The soils description closest to Udorthents in the Soil Survey of Hampden County, Massachusetts, is presented for the Ub (Urban land) mapping unit. The Ub description suggests that these soils have been so altered that the classification of the original soil is impossible. The soil survey suggests that onsite investigations of these soil-mapping units are necessary to determine the potentials and limitations for any proposed use (SCS 1978). It is difficult to define the characteristics of these man-made lands, but the National Cooperative Soil Survey has identified several possible limitations affecting the development of these soils. These limitations include a potentially high seasonal water table, shallowness to bedrock, slow permeability, and excessive coarse stone fragment content (Gilbert 1997). The significance of the Udorthents areas to Westover ARB is that the soils within these areas are highly variable and may contain significant amounts of hydric soil inclusions. In addition, due to the disturbed nature of these soils, it is recommended that areas proposed for development be individually evaluated to assess their limitations.

(Appendix C- USDA Web Soil Survey)

2.2.4 Hydrology

Westover ARB has extensive natural and man-made surface drainage, as well as underground storm sewer lines. Cooley, Stony, and Willimansett brooks are the primary drainages of Westover ARB.

Cooley Brook flows south from extensive wetlands along the southeastern boundary of Westover ARB into the Chicopee River. Cooley Brook receives discharges from most of the industrial areas of the Base, including flight line hangars and runways via storm sewers, culverts, and ditches. The southern portion of the brook has been dammed to form the Chicopee Reservoir. The Chicopee Reservoir, primarily fed by Cooley Brook, is within Chicopee Memorial State Park, on the south and southeastern boundaries of Westover ARB. The reservoir comprises approximately 16 acres and is only 1,200 feet from the end of Instrument Runway 23.

The slow-moving waters of Stony Brook, fed by Wade Lake, enter the Base from the northeast, initially forming a wetland, and eventually leaving the northern boundary of the Base. Wade Lake, a 16-acre pond primarily fed by Muddy Brook, is 2,200 feet from the end of the runway. Stony Brook flows north after leaving the Base, toward South Hadley center, on its circuitous route to the Connecticut River. Stony Brook receives drainage from the Base through a network of storm sewers.

Drainage from the northwestern section of Westover ARB flows into the headwaters of the Willimansett Brook, and eventually flows through Mountain Lake. Willimansett Brook receives drainage from the Base through a storm drainage system, which primarily serves office buildings and abandoned or renovated Base housing areas.

Nine locations pinpoint the discharge of storm water collected from impervious surfaces, such as roads, airfield pavement, and buildings. This flow is conveyed into Cooley, Stony, and Willimansett brooks. To the south and southeast, Outfalls 001, 002, 003, 006, 007, and 009 flow into Cooley Brook. Outfalls 001 and 002 receive runoff from the flight line apron, as well as most of the hangars along the apron.

Outfall 003 drains the Massachusetts Army National Guard (MA ARNG) helicopter ramp. Runoff from the North Ramp area flows to Outfall 006. Outfall 007 receives runoff predominantly from runways and grassy areas in the northeastern portion of the Base. Outfall 003 drains the property that is leased by the Westover Metropolitan Development Corporation / Municipal Airport. Outfall 009 also receives runoff predominantly from runways and grassy areas. Outfall 004, receiving storm water flow from the administrative cantonment area, flows into the headwaters of Willimansett Brook. Finally, Outfall 005, on the northern side of the base, receives storm water from the Fire Training Area, taxiways, and the Air Park North industrial park, and then flows into Stony Brook. All of the outfalls eventually flow into the Connecticut River, 2 miles west of the Base.

The most recent Westover Multi Sector General Permit was issued 2 July 2021. Westover ARB has developed a storm water monitoring plan (SWPPP) to satisfy the EPA's requirements.

Figure 1 illustrates the cantonment area boundary, watershed boundaries, and industrial outfall points at Westover ARB.

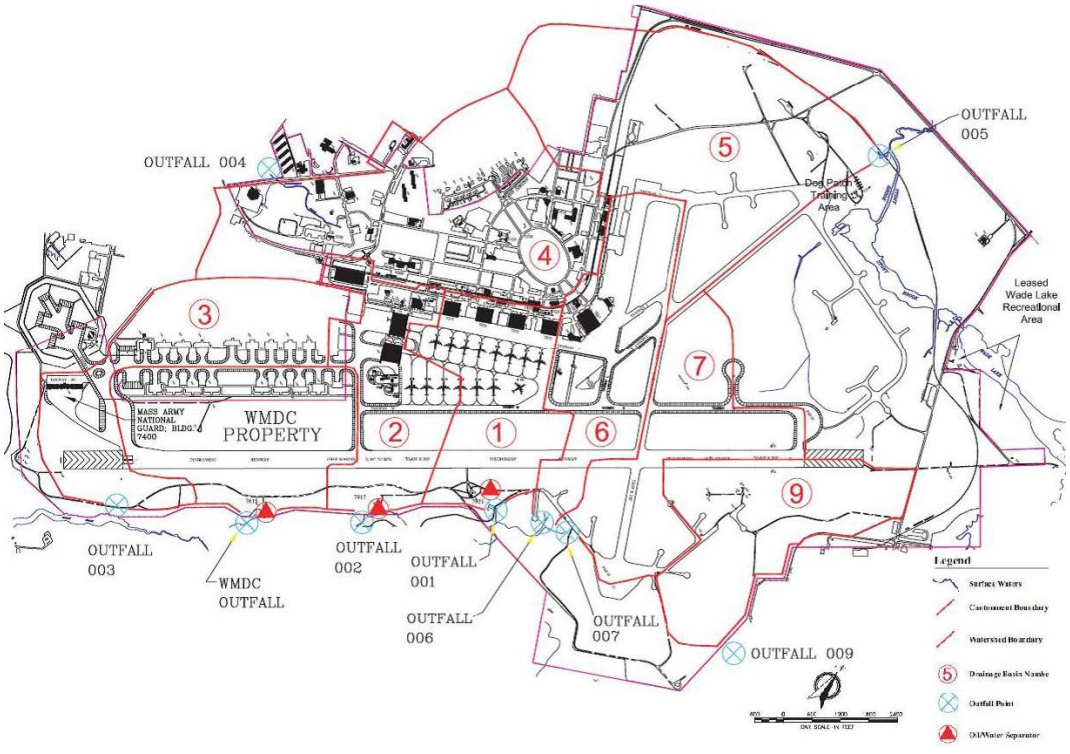


Figure 2. Westover ARB Overall Facility Map Showing Cantonment Area Boundary, Watershed Boundaries, and Industrial Outfall Points

2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification

Westover ARB lies within the Domain of Humid Temperate, the Ecoregion of 220 Hot Continental Division, and the Province of 221 Eastern Broadleaf Forest (Oceanic) (Bailey 1995). This Ecoregion is characterized by temperate deciduous forests. It is dominated by tall, broadleaf trees that provide a continuous and dense canopy in summer, but shed their leaves completely in winter.

2.3.2 Vegetation

Westover ARB lies within the Eastern Broadleaf Forest (Oceanic) Province (Bailey 1995). This Ecoregion is characterized by temperate deciduous forests. It is dominated by tall, broadleaf trees that provide a continuous and dense canopy in summer, but shed their leaves completely in winter.

2.3.2.1 Historic Vegetation Cover

The forests in the area of Westover ARB were dominated by white oak (Quercus alba) and red oak (Quercus rubra). Other tree species included red maple (Acer rubrum), sugar maple (Acer saccharum), black birch (Betula lenta), bitternut hickory (Carya cordiformis), pignut hickory (Carya glabra), mockernut hickory (Carya tomentosa), chestnut (Castanea dentata), American beech (Fagus grandifolia), yellow-poplar (Liriodendron tulipifera), white pine (Pinus strobus), scarlet oak (Quercus coccinea), scrub oak (Quercus ilicifolia), chinkapin oak (Quercus muehlenbergii), chestnut oak (Quercus prinus), black oak (Quercus velutina), and hemlock

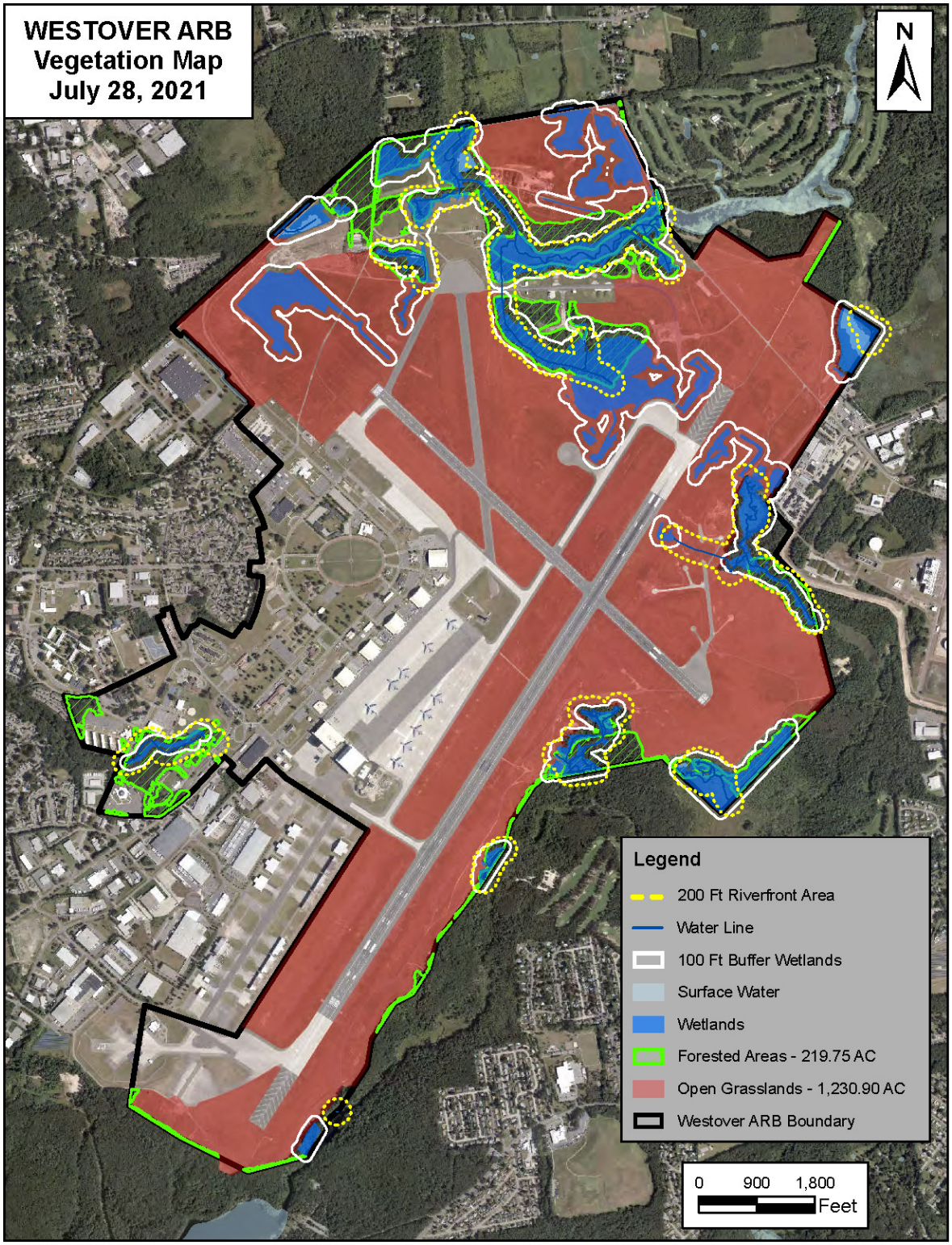
(Tsuga canadensis). These forests, however, were logged during the 1800s and cleared for agricultural uses, such as row crops and tobacco. Farming and urban development have resulted in limited forest acreage in the vicinity of the Base.

2.3.2.2 Current Vegetation Cover

A survey conducted in 1994 reported three major native plant communities on Westover ARB. These native plant communities include deciduous woodlands, native grasslands, and open wetlands (Jenkins 1995). Open wetlands are divided into Stony Brook wetland and sedge meadow communities (Table 1). This survey also noted that there are approximately 60 acres of pine plantations, large areas of alien-dominated (e.g., crabgrass [*Digitaria spp*.]) grasslands, and weedy barren areas. A total of 463 vegetation species were identified during the survey. Of the 463 species identified, 354 were native and 81 were exotic to the area (Jenkins 1995). The western and central portions of the Base have been altered by development, construction, landscaping, and other disturbances, limiting the opportunity for historic native plant communities to establish. Figure 3 shows general vegetation communities present on Westover ARB.

Notable Plant Communities Documented on Westover ARB

Plant Community	Location on Westover ARB
Moist, wet woods	Along northern fence and east of departure end of Runway 33
Native grasslands	Main Base – northwest portion, along east border, and southern part
Sedge meadow	West of departure end of Runway 33
Stony Brook wetland	Northeast portion of Base


WESTOVER ARB
Vegetation Map
July 28, 2021
N
Legend
200 Ft Riverfront Area
Water Line
100 Ft Buffer Wetlands
Surface Water
Wetlands
Forested Areas - 219.75 AC
Open Grasslands - 1,230.90 AC
Westover ARB Boundary
0
900
1,800
Feet

2.3.2.3 Future Vegetation Cover

Westover can expect to have longer, hotter summers and shorter, warmer winters because of the predicted climate changes. The vegetative community will likely transition to species that can tolerate droughtier conditions. The bases current land management practices coupled with climate change will lead to a more drought tolerant landscape.

2.3.2.4 Turf and Landscaped Areas

Turf grasses and various broad-leaf weeds are the dominant vegetation type within the improved areas of Westover ARB. Grass varieties consist of common introduced species including Kentucky bluegrass (Poa pratensis), tall fescue (Festuca arundinacea), creeping red fescue (Festuca rubra), chewing fescue (Festuca altissima), perennial ryegrass (Lolium perenne), colonial bent grass (Agrostis tenuis), and timothy (Phleum pratense). A variety of shrubs and trees are also present on Westover ARB. Shrub species that are common on the Base include northern white cedar, eastern red cedar, and spreading yew (Taxus caspidata). Tree species that are common on the Base include white pine, Scotch pine, red maple, red oak, white oak, and Norway spruce.

2.3.3 Fish and Wildlife

The environmental setting at 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, MDFW 1995, Mello 1995, Shetterly 1994, USDA 1993, USDA 1995, Whitelock et al. 1994).

Bird populations in the region are plentiful. Surveys have reported that more than 70 bird species inhabit Westover ARB either temporally or permanently (Doyle and Maier 1995, USDA 1993, USDA 1995). Westover ARB supports the largest populations of two state-listed species in the six-state New England region: the upland sandpiper (Bartramia longicauda), state-listed as endangered; and the grasshopper sparrow (Ammodramus savannarum), state-listed as threatened. In addition, several other state-listed species have been documented on the Base, including the state-listed as endangered, loggerhead shrike (Lanius ludovicianus); the state-listed as threatened, vesper sparrow (Pooecetes gramineus); and the state-listed special concern species, blackpoll warbler (Setaphaga striata).

Despite the fact that much of the native vegetation supported at Westover ARB has been disturbed or replaced with managed landscapes, a variety of mammals inhabit or use the habitat that is provided. In addition, feral and domestic cats are present. Examples of mammals known to be found on the Westover ARB include: white-tailed deer (Odocoileus virginianus), coyote (Canis latrans), red fox (Vulpes vulpes), black bear (Ursus americanus), beaver (Castor canadensis), muskrat (Ondatra zibethicus) and porcupine (Erethizon dorsatum). Previous surveys have identified 11 species of amphibians and 7 species of reptiles on Westover ARB (Whitlock et al. 1994).

Common dace and shiners have been noted in Stony Brook (WAFB 1987). As part of the Fish and Wildlife/Threatened and Endangered Species Management Plan prepared for Westover ARB in 1999, electroshock surveys were conducted in Stony Brook, Willimansett Brook, and Cooley Brook. These surveys noted yellow bullhead (Ameriurus natalis), white sucker (Catostomus commersoni), chain pickerel (Esox niger), brown bullhead (Ictalurus nebulosus), pumpkinseed sunfish (Lepomis gibbosus), bluegill (Lepomis macrochirus), largemouth bass (Micropterus

salmoides), golden shiner (Notemigonus crysoleucus), yellow perch (Perca flavescens), and brook trout (Salvelinus fontialis) in Stony Brook. The surveys documented no fish species within Willimansett Brook. White sucker, pumpkinseed, golden shiner, and brook trout were documented in Cooley Brook.

2.3.4 Threatened and Endangered Species and Species of Concern

A base wide vegetation survey did not report finding of any federally listed threatened or endangered species on Westover ARB (Jenkins 1995). In April of 2015, the northern long-eared bat (Myotis septentrionalis) was listed as threatened by the U.S. Fish and Wildlife Service. In the summer of 2017, the University of Montana conducted a bat survey and no northern long eared bats were present or observed on Westover ARB. In 2021, U.S. Fish and Wildlife was consulted for the Northern Long eared bat due to a the new EPA MSGP permit and a biological opinion was given with the result being that Westover contains no species of concern present on the installation. Several species of state-wide management concerns have been documented on the Base.

(Appendix F- MA Natural Heritage & Endangered Sensitive Species)

(Appendix B- Biological Assessment for Endangered Species Act Consultation Species)

Rare or Uncommon Plant Species

Westover ARB supports several coastal plant species that reach their inland and northern range limits in the Connecticut River Valley. Most of these species are found in wet, wooded areas and in the Base's northwestern grasslands. Wet, wooded areas support dangleberry (*Gaylussacis frondosa*), white azalea (*Rhododendron viscosum*), and Massachusetts fern (*Thelypteris simulata*). Meadow beauty (*Rhexia virginica*) and colicroot (*Alextris farinosa*) contribute to wet sedge communities on the Base (WARB 1998).

Species warranting particular management attention on the Base include the climbing fern (*Lygodium palmatum*), formerly known as Hartford fern, which is listed as a Massachusetts special concern species (MNHESP 2015). The climbing fern is primarily associated with openings and edges of moist woods (Jenkins 1995). The wild lupine (*Lupinus perennis*) and large whorled pogonia (*Isotria verticillata*), both on the informal Massachusetts "watch list" (pers. comm., P. Somers, MNHESP, March 30, 2006), have also been documented on the Base. Associated with early successional environments, the wild lupine is considered scarce statewide (but not rare) and is locally common on one of the Base's grasslands (G1). The large whorled pogonia (locally scarce) is found in two Base woodlands and characterized as uncommon throughout the state.

Rare or Uncommon Invertebrate Species and Associated Habitats

Westover ARB contains several increasingly uncommon xeric community types that are known to support butterflies and moths (Lepidoptera) of management concern (MNHESP 2004). One state-threatened representative of this group found on the Base is the pine barrens zanclognatha moth (*Zanclognatha martha*). This species has a limited and disjunct distribution in Massachusetts and is most typically associated with maturing pitch pine (*Pinus rigida*) communities that also feature scrub oak and ericaceous understory components. The state-endangered Phyllira Tiger Moth (*Grammia phyllira*) and threatened sandplain euchlaena (*Euchlaena madusaria*) have been

documented on adjacent lands and are associated with dry barren-type woodlands and shrublands, respectively.

Rare or Uncommon Vertebrate Species and Associated Habitats

Several herpetiles observed on the Base are afforded special management status in Massachusetts (MNHESP 2006). The blue-spotted/Jefferson complex salamander (*Ambystoma laterale*/ *jeffersonianum*), a state-listed special concern species, was documented using two vernal pools and other temporarily-flooded depressions on the Base (Whitlock et al. 1994, MNHESP 2004). This salamander species typically spends most of the year in well-drained deciduous or mixed cover woodlands in the vicinity of breeding pools.

Two adult four-toed salamanders (*Hemidactylium scutatum*) (former special concern species), were observed in the South Forest (Whitlock et al 1994, MNHESP 2004). Four-toed salamanders were delisted in Massachusetts in 2006 (NHESP 2010). Four-toed salamanders typically breed in hummocky moss-covered areas with adjacent pools and spend the rest of the year in upland habitats. As suggested by its affinity for sphagnum hummocks, this species is tolerant of acidic conditions that are found in some of the Base's areas.

A spotted turtle (*Clemmys guttata*), was also observed in a small bog between the railroad tracks and the northwestern ARB boundary (Whitlock et al. 1994). Spotted turtles are known to inhabit a variety of wetland types, but tend to be associated most with those having soft substrates. This species is subject to delayed maturation, taking 8-10 years to reach breeding condition. Formerly a special concern species, the spotted turtle has been removed from the list due to widespread documentation of the species in recent years.

Several state-listed bird species have been observed on the Base. Eighty-one adult upland sandpipers (*Bartramia longicauda*) a Massachusetts endangered species, were observed during surveys in 2012 on the ARB (Melvin 2012). Supporting the largest population of upland sandpipers in the Northeast, the Base's extensive grasslands represent an uncommonly important breeding area for this species (MNHESP 2004).

Another grassland specialist, the grasshopper sparrow (*Ammodramus savannarum*), was also present in relatively high numbers during 2012 surveys. Two hundred and thirty six singing males of this state-threatened species were observed by field biologists, indicating that Westover supports the largest population of this species in the Northeast (MNHESP 2004). One Vesper Sparrow (*Pooecetes gramineus*), another state-threatened species, was observed on the Base during the same surveys (Scott Melvin, Massachusetts Division of Fisheries and Wildlife, unpublished data). For upland sandpipers, the total count from the 2012 survey is lower than those of any of the previous 5 surveys, although it is essentially unchanged from the 2009 count of 85 adults. The singing male grasshopper sparrow count was the highest tally recorded during a Westover survey. However, the previous survey in 2009 had a low count of only 137 singing male grasshopper sparrows. Peregrine falcon (*Falco peregrinus*), sharp-shinned hawk (*Accipiter striatus*), and blackpoll warbler (*Dendroica striata*) migrate through Westover ARB.

2.3.5 Wetlands and Floodplains

Thirty-four wetlands comprising approximately 160 acres were documented on Westover ARB. Examples of emergent, scrub-shrub, and forested wetland classes are present in both palustrine and riverine systems. These broad categories include a suite of diverse communities such as wet

meadows (often associated with Base grasslands), cranberry bogs, hardwood swamps and, as in some cases, complexes composed of several classes (WARB 2005). Many of these wetlands have been subject to historic perturbations such as ditching and other hydrologic modifications (WARB 2005). Westover ARB recently conducted a wetland validation survey performed, which confirmed and/or slightly re-aligned the boundaries of some of the base wetlands. Additionally, a few small wetland areas, not identified in 2005, were added (AECOM 2015). However, the recent wetland survey was not accompanied by a USACE Jurisdictional Determination.

(Appendix H- 100 Year Floodplain Map)

2.3.6 Other Natural Resource Information

The MNHESP has identified the presence of four Certified Vernal Pools (CVPs) on Base. Vernal pools are often small isolated wetlands although they can occur as part of larger wetland complexes. The classic example of a vernal pool is a wetland that supports no fish community due to less than permanent flooding and often protracted emersion of the pool's substrate. The lack of predatory fish and timing of flooding facilitates ideal conditions for obligate faunal communities that use pools for the brief, but critical breeding/nursery season, such as ambystomid salamanders. Other vernal pool specialists have the ability to use these wetlands throughout all life-history phases because they possess adaptations necessary for weathering the extremes associated with prolonged exposure of the pool's substrate.

2.4 Mission and Natural Resources

2.4.1 Natural Resource Constraints to Mission and Mission Planning

- Federally threatened northern long-eared bat (*Myotis septentrionalis*) was listed in April 2015. A constraint could be imposed on the mission due to the need to keep the airspace clear of obstructions. In the summer of 2017, the University of Montana conducted a bat survey and no northern long eared bats were present or observed on Westover ARB.

- State endangered upland sandpiper (*Bartramia longicauda*) and state threatened grasshopper sparrow (*Ammodramus savannarum*) breeding populations occur on the Base. These species are impacted by the mission due to the need to maintain grassland vegetation in the airfield at safe heights according to Air Force Instruction (AFI) 91-202, paragraph 7.3.1.5.9 grass height standard (maintaining grass height within 500 feet of an Aircraft Movement Area (AMA) at a height between 7 and 14 inches). Westover ARB completed an Environmental Assessment in 2015 (Manage Airfield Vegetation to Protect Flight Safety) to assess impacts of managing vegetation at this level. This project was designed to minimize impacts to these species by incorporating the use of plant growth regulators, pre-emergent herbicides, and prescribed burns, prior to initiating mowing, which can have direct impacts on nests. The USAF will conduct, or participate in, annual breeding season (mid-June) surveys of grassland birds at Westover ARB. In addition, agencies and organizations will continue to be granted access to work with Westover ARB environmental staff (consistent with Base security and mission) in conducting field data collection and analyses to determine the short and long term and direct and indirect effects of the management.

- Wetlands occur on the Base. These wetlands were validated by a new survey in 2015, but this survey was not accompanied by a U.S. Army Corps of Engineers jurisdictional determination. Wetlands can be impacted by missions and planning due to need to

maintain vegetation at safe heights. Projects, such as the 2015 Westover EA to Manage Airfield Vegetation to Protect Flight Safety described above, will prescribe Project Design Features and utilize standard Best Management Practices to minimize effects to wetlands.

- Some on-Base land-disturbing activities could cause erosion and sediment problems if disturbed areas are not protected by adequate erosions and sediment controls. Therefore, erosion and sediment mitigation guidelines need to be strictly enforced.

- Current and planned construction and facility expansion activities, especially within the industrialized portion of the Base, may increase the Base's impervious acreage. Recent demolition projects have removed approximately 4 acres of base pavements.

- Bird-aircraft strikes (as well as other animal strikes) on the runway and during takeoffs and landings have been documented as an ongoing hazard. Conflicting land uses outside the Base, including landfills and golf courses, can also attract high BASH-threat avian species .The threat of bird-aircraft strikes is one of the highest constraints on the Base mission due to the risks to safety. The base has a BASH program to help minimize the potential for migratory birds to congregate on Base. Additionally, U.S. Department of Agriculture, Wildlife Services (USDA-WS) is responsible for monitoring nuisance wildlife that have the potential to create a wildlife aircraft strike hazard on the Base.

  (Tab 2- Bird/Wildlife Aircraft Strike Hazard (BASH) Plan)

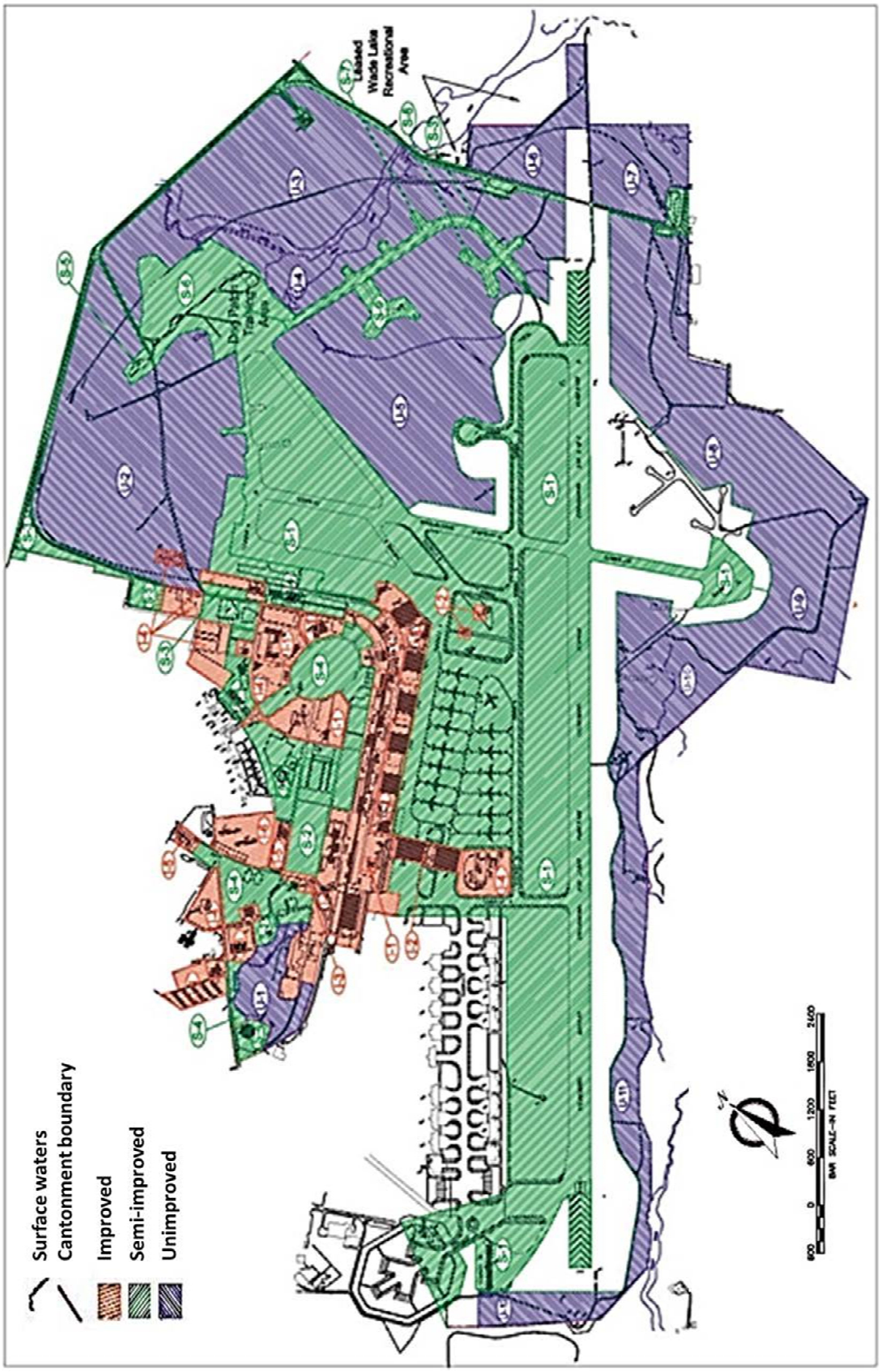
2.4.2 Land Use

Westover ARB is composed of approximately 2,511 acres of land. Approximately 55 percent of the acreage at Westover ARB has been developed for industrial, administrative, or recreational uses (Figure 4, Table 3). The remaining 45 percent of the acreage has not been developed and is considered unimproved and semi-improved grasslands. These areas consist of Cooley, Stony, and Willimansett brooks; stream beds and banks; open grasslands; and forested areas. Site descriptions in Figure 4 include: I-1 Administrative, I-2 Aircraft Operations and Maintenance, I-3 Community and Commercial, I-4 Industrial, I-5 Medical, I-6 Housing, S-1 Aircraft Parking Apron, Runways, Taxiways, and Infield, S-2 Outdoor Recreation, S-3 Open Area, S-4 Open Area – Urban, S-5 Open Area – Small Arms Range , S-6 Open Area – Dogpatch, S-7 Open Area – Vehicle Training Area, S-8 Open Area – Old Engine Test Stand, U-1 Willimansett Brook Area, U-2 Mixed Grasslands/Forests/Wetlands – West, U-3 Mixed Grasslands/Forests/Wetlands – Antennae Farm, U-4 Stony Brook Area, U-5 Mixed Grasslands/Forests/Wetlands – Drop Zone, U-6 Mixed Grasslands/Forests – North, U-7 Mixed Grasslands/Forests/Wetlands – Northeast, U-8 Cooley Brook Area, U-9 Mixed Grasslands/Forests/Wetlands – East, U-10 Mixed Grasslands/Forests/Wetlands – Southeast, U-11 Mixed Grasslands/Forests - Southwest. Areas with an (I) designation are Improved, (S) are Semi- Improved, and (U) are Unimproved.

Land Use Management Units (LMU) Found on Westover ARB

Land Use Category	Approximate Acreage/Brief Description
Improved	Improved grounds are developed areas of the Base that have either an impervious surface (e.g., streets, sidewalks, and buildings, excluding runway and apron areas) or lawns and landscape plantings that require intensive maintenance and upkeep. Improved grounds at Westover

Land Use Category	Approximate Acreage/Brief Description
	ARB account for approximately 219 acres or 8.7 percent of the Base. Improved grounds are primarily on the southwestern portion of the Base.
Semi-Improved	Semi-improved grounds occupy approximately 1,370 acres or 50.6 percent of the Base. These are grounds where periodic grounds maintenance activities are performed for operational or aesthetic reasons. Semi-improved grounds are primarily located in the central portion of the Base and consist of runways, aircraft parking aprons, and clear zones.
Unimproved	Unimproved grounds occupy 1,022 acres or 40.7 percent of the Base and consist of stream channels, beds and banks, forests, and open grassland areas. These areas of the Base are primarily in the northern and eastern areas of Westover ARB.



Land Use Management Units

2.4.3 Current Major Mission Impacts on Natural Resources

The operation of aircraft, vehicles, and equipment requires the use of various hazardous materials, including fuels, solvents, lubricants, and caustics. If released to the environment, these materials have the potential to harm by impacting air, soil, or water quality. The activity at the Base that poses the greatest potential threat to the local environment is the transfer and storage of petroleum, oils, and lubricants (POL). The Base has implemented several environmental programs (e.g., spill control and response, hazardous waste management, and storm water pollution prevention) that have been successful in controlling hazardous materials and waste releases to the environment.

The Base spill plan (i.e., HAZMAT Plan) describes preventive actions that are designed to lower the potential for hazardous material spills and prevent them from entering the environment (Tab 6- Spill Plan). The HAZMAT Plan also presents required notification procedures and detailed responses to releases that might occur. In addition, Westover ARB has implemented a pharmacy distribution system for hazardous materials. The purpose of the pharmacy system is to minimize and organize the use of hazardous materials, thus reducing hazardous waste generation. Furthermore, all hazardous materials used are assessed to determine if less-toxic alternative materials could be utilized during industrial processes. Materials are allocated from the pharmacy for use at the Base's industrial shops on an as-needed basis. Any unused portion of the material is returned to the pharmacy, where it can be made available for other users.

Industrial activities at Westover ARB fall into four general categories: aircraft maintenance, vehicle maintenance, facility maintenance, and POL operations. Specific waste streams are associated with each activity.

Maintenance shops are responsible for conducting repairs, inspections, and regular maintenance on the C-5 aircraft. These shops include refueler maintenance, motor pool, corrosion control, wheel and tire, battery, nondestructive inspection, engine, fuel cell, avionics, and phase dock. Typical hazardous materials and wastes that are stored and generated at these shops include aerosol lubricants and paints, POLs, solvents, purging fluid, and degreasers.

Vehicle maintenance occurs at the motor pool and aerospace ground equipment shops. These shops are responsible for the regular maintenance of government-owned motor vehicles and aerospace ground equipment, respectively. These shops use and store a variety of oils, antifreezes, and transmission fluids. The waste products are stored at the shops and are recovered by a waste oil recycler. Painting and degreasing operations are also performed on the vehicles and equipment, which results in the generation of waste paint and paint thinner, waste paint filters, and bead blast media, which are treated as hazardous waste. Other non-hazardous degreasing solvents are generated and recycled under contract by qualified companies.

CE is responsible for the upkeep of the Base's facilities, roads, and fuel system. Shops under CE include welding, electrical, paint, liquid fuels maintenance, plumbing, and air conditioning and refrigeration. Typical wastes generated by the CE shops include paints, degreasing solvent, fuel spill residues, and POLs.

POL transfer and storage operations take place throughout the base. POL operations include the receiving, storing, and dispensing of jet petroleum-8 (JP-8) fuel. Westover ARB has a hydrant fueling system that is comprised of a single new fueling center, consisting of two aboveground storage tanks and an associated pumphouse. The hydrant system fuels both aircraft and R-11 refueling trucks. JP-8 is loaded into the Base's seven R-11 refueler trucks for the purpose of fueling transient aircraft. The three fueling centers are the primary POL transfer areas. Fuel is supplied to the Base via pipeline. If the pipeline is down, fuel is brought

in by commercial tankers. Average annual throughput of JP-8 is approximately 8 million gallons. Daily throughput can vary greatly, depending upon the demands of military operations. Spills that occur on the flight line are generally small in nature. If a large release occurs along the flight line, drainage from the spill area will eventually flow to one of two 35,000-gallon oil/water separators. Accidental JP-8 spills occurring at the refueler loading and unloading area are also protected from entering the storm sewer system by oil/water separators.

Wastes generated by POL operations include fuel-contaminated water and fuel-contaminated absorbent. The quantities of these wastes increase depending on the sizes of releases that occur at the POL Complex. Releases vary from inadvertent releases of small quantities of fuel, which cannot be avoided, to more catastrophic releases (100 gallons or larger). Releases of any quantity of fuel at Westover ARB are extremely infrequent.

Waste petroleum products, including used oil, diesel, JP-8, purging fluid, and hydraulic fluid, are recycled through a Defense Reutilization and Marketing Office (DRMO) contract. These waste petroleum products are typically picked up at each generating shop by a contractor-owned vacuum truck.

The Hazardous Waste Management Plan outlines procedures for the proper accumulation; collection, transportation, and disposal of hazardous wastes (Tab 7- Hazardous Waste Management Plan). It is designed to ensure that hazardous wastes are disposed in a legal and timely manner as required by the Resource Conservation and Recovery Act (RCRA) of 1976 and the Solid Waste Disposal Act of 1980. The Base generates greater than 1,000 kilograms of hazardous waste per month and is, therefore, a large quantity generator of hazardous waste. However, Westover ARB is not a permitted treatment, storage, or disposal facility. Therefore, as a large quantity generator, Westover ARB can accumulate wastes for a maximum period of 90 days. Within this period, the Base must ship its wastes to a permitted treatment, storage, or disposal facility. A USEPA hazardous waste generator number has been issued to Westover ARB for the use of tracking hazardous waste.

The majority of the wastes generated on Westover ARB are the result of C-5 aircraft maintenance, especially degreasing operations. Degreasing solvent vats are maintained by an outside contractor who routinely picks up the contaminated solvent and refills the vats with fresh solvent. Other hazardous wastes generated on the Base include waste paint, solvent-contaminated rags, and dye penetrants. Waste paint and solvent-contaminated rags are accumulated in 55-gallon drums at 11 satellite accumulation points throughout Westover ARB. When a drum reaches its capacity, it is transferred to the 90-day hazardous waste accumulation point at the pharmacy. The drums stay at this location for a period of up to 90 days. Currently, the Base transports approximately 60 to 80 percent of its hazardous wastes to the DRMO for final disposal by a private contractor. Otherwise, waste is disposed of directly by the Base through a private contractor.

Environmental Restoration Programs

The DoD established the Environmental Restoration Program (ERP) to ensure that military installations identify and evaluate suspected problems associated with past waste disposal actions. On June 2, 1993, USEPA Region I informed Westover ARB that the Revised Hazard Ranging System score for the facility had been completed and the Base would not be placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List. Therefore, Westover ARB is not required to have a Federal Facility Agreement with USEPA.

Westover ARB began environmental restoration efforts under the ERP in 1981. The Base currently conducts the ERP in accordance with the Massachusetts Contingency Plan (MCP), the National Oil and

Hazardous Substance Pollution Contingency Plan, CERCLA guidance and policy, and Superfund Amendments and Reauthorization Act guidance and policy. All site investigation reports and related pertinent documents are regularly forwarded to the MADEP for review and consideration in the ongoing site restoration strategy development (WARB 1995b). In addition, all ERP sites have been identified by Massachusetts as subject to the MCP (310 CMR 40.000) which implements portions of the Massachusetts Superfund Law (M.G.L. c.21E). The MCP provides for negotiations of consent orders, issuance of administrative orders, and issuance of notice of violations from improperly conducting or failing to conduct required actions (310 CMR 40.171) (WARB 1995b).

ERP sites can adversely affect the local natural environment if contaminants are able to migrate into surface waters, or if they are conveyed through groundwater. During the original records search in 1982, 15 ERP sites were identified. Since that initial study, an additional eight sites were added to the ERP. During the course of the investigations, nine of the ERP sites were determined to pose no threat to human health. No further actions are required at those nine sites. Two sites, Area of Concern (AOC)-2 (Runway 23 Overrun Area) and AOC-3 (JP-4 Fuel Supply Line) have been removed from consideration (WARB 1996).

Of the 21 original Installation Restoration Program sites, 18 have been closed out in accordance with 310 CMR 40.0000 (the Massachusetts Contingency Plan). The current status of the three remaining sites is:

-- Landfill A (Site LF002): Undergoing annual inspections.

-- Landfill B (Site LF002): Undergoing annual inspections and biennial long term sampling of groundwater, surface water, sediment, and monitoring of landfill gas.

-- East Ramp Sites: There is ongoing remediation at two sites on the East Ramp (E-2 and E-7 aircraft parking locations). These sites were caused by leaks into the subsurface sandy formation from the underground pipeline which supplied JP-8 fuel for the C5-B aircraft. The remediation is currently being performed by Weston Solutions, Inc., a subcontractor to Bristol Industries, LLC. The remediation methods are: (1) Multi-Phase Extraction High Intensity Treatment using a vacuum truck to remove product and groundwater from installed monitoring wells and (2) Monitored Natural Attenuation. The remediation work is reviewed each year in a Restoration Strategy Workshop by members of AFCEC, the DLA, and by contractors. Project cost estimates are made for continuing the cleanup in future fiscal years.

Water Quality

Surface water quality at Westover ARB can be detrimentally impacted by fuel or other hazardous material spills or leaks, air pollution sources, seepage from ERP sites, deicing chemicals, and sediments from soil erosion. There are several pollutants that could be present in the storm water at the Base and potentially enter waters of the state. These pollutants are detergents and soaps, glycols, oil and grease, miscellaneous solvents, and various hazardous constituents of fuels used at the Base (i.e., benzene, toluene, xylene, cyclohexane, ethylbenzene, and naphthalene). These contaminants can enter storm water via spills during aircraft and vehicle fueling, leaks from underground fuel pipelines and other hazardous material spills and leaks. These pollutants can degrade water quality either through toxicity effects on organisms in the water, or through ancillary effects, such as high biological oxygen demand (BOD) from increased microbial activity in the water or eutrophication due to excess nutrients loads (e.g., phosphorus or nitrogen). High BOD can result in fish kills, and other damage to surface water ecology.

The application of deicing fluids to aircraft during conditions of snow and freezing rain generates runoff laden with deicing fluids. The deicing fluid used at the Base is propylene glycol, which is applied in a diluted form, generally 60 percent glycol/ 40 percent water. The deicing runoff is further diluted due to

the mixing with precipitation and snowmelt runoff. At Westover ARB, deicing can be conducted numerous times throughout the winter depending upon weather conditions.

The primary environmental concern regarding aircraft deicing is the effect that deicing runoff has on surface water quality. Deicing compounds, because of their organic nature, exert a high BOD on receiving streams, and are toxic to aquatic organisms. Other environmental impacts include glycol odors and glycol-contaminated surface water and groundwater systems.

The Base has elected to replace urea with potassium acetate for airfield deicing operations, because it is nontoxic. The use of potassium acetate began in the winter of 1997–98 with the arrival of new application equipment.

Although Base wastewater is sent to the sanitary sewer system and is, therefore, treated prior to discharge into the environment, hazardous materials and wastes reaching storm water could have a significant impact on the quality of water and the organisms that are dependent on it. Similarly, hazardous materials and wastes could have effects on the quality of soil on, and immediately surrounding, the Base.

The Water Quality Act of 1987 amended the CWA to include the regulation of storm water discharges. In November 1990, USEPA published its Phase I storm water regulations that required large municipalities and specific industrial classes to be covered under an NPDES storm water permit by October 1, 1993. Westover is covered under the Multi-Sector General Permit which regulates the installation's industrial stormwater run-off from aircraft and vehicle maintenance activities.

Sedimentation due to erosion can also impact water quality. The Base often has several land development projects occurring at any one time. Erosion disturbs existing terrestrial plant systems, and the resulting siltation in streams can degrade benthic habitat and fish spawning grounds. The Base must implement soil erosion control best management practices (BMPs) at all of its land-disturbing sites

Noise

Noise is perhaps the most identifiable environmental problem associated with aircraft operations. Although many other sources of noise are present in today's communities, aircraft noise is often singled out for special attention and criticism. The aircraft operating at Westover ARB include C-5 aircraft and numerous other military and civilian transient aircraft.

The significant noise source at Westover ARB is the result of aircraft warm-ups, maintenance and testing, taxiing, takeoffs, approaches, and landings. An air installation compatible use zone (AICUZ) study was prepared for Westover ARB in 2020. An AICUZ study addresses safety issues and identifies hazard potential due to aircraft accidents, obstructions to navigation, and compatible land uses based on exposure levels to aircraft noise in the surrounding area.

While the noise generated from low-altitude military overflights might be initially startling, habituation to jet aircraft noise occurs with most wildlife and domestic species. Species-specific responses to low-altitude overflights vary considerably, and responses from individual animals might have the potential to cause injury. Variations in responses have also been documented among homogeneous species under similar environmental conditions (USDA 1992). However, animal responses to aircraft noise depend on numerous factors, such as the physical features of the environment and the animals' own physiological attributes. Wildlife populations are usually affected only when a variety of factors combine to affect them, including declines or fluctuations in the availability of a food source, habitat destruction or alteration, predation, hunting, trapping, poaching, disease, or inclement weather, rather than noise alone.

Normally, it would be unrealistic to predict or attribute any wildlife population decline to a single stressor, such as noise. In addition, no published scientific evidence was identified that indicated harm might occur to wildlife as a result of exposure to the levels of noise generated by military aircraft that would utilize Westover ARB.

Air Pollution

Although the effects of air pollution are not immediately apparent in the local area, the release of air pollutants into the atmosphere could contribute to the degradation of natural resources on and off the Base. The release of air pollutants is regulated under both federal and state statutes, with which all federal installations must comply.

Westover ARB is 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. The Northeast Ozone Transport Region extends from Virginia to Maine along the eastern seaboard, and is used by USEPA to manage interstate air pollution and administer air quality standards. The Northeast Ozone Transport Region was established because precursors to ozone (i.e., volatile organic compounds and nitrogen oxides) are often trapped in an inversion layer of an air mass and transported from south to north accumulating additional pollutants as the air mass moves up the Northeast corridor.

AQCR No. 42 is in attainment (i.e., compliance) with all National Ambient Air Quality Standards (NAAQS) pollutants, except for ozone. The high ozone levels occur more in the summer months when longer periods of daylight, combined with the high levels of pollutants, become stagnated over an area producing high ozone levels. These conditions can become exacerbated by local conditions in Hampden County, such as the concentration of industry combined with the volume of vehicular traffic on Interstate 91 crossing the Massachusetts Turnpike just south of Westover ARB.

Westover ARB has two separate categories of air pollution, referred to as stationary and mobile sources. The stationary sources comprise boilers, emergency generators, aircraft ground powered equipment, vehicle/aircraft refueling operations, and aircraft maintenance activities (painting, engine testing, fuel cell repair, parts cleaning). Stationary sources are stringently regulated by MADEP and require Westover ARB to maintain a 50 percent CAP on stationary emissions. Mobile emissions from vehicle and aircraft operations are the second category. The major source of air pollution at Westover ARB is aircraft operations (taxiing, runup, takeoff, and landing), which contribute approximately 70 percent of the total air emissions at the Base. 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. Therefore, Westover ARB would not be considered a major contributor to air pollution in AQCR No. 42.

Vegetation Management Required to Support Airfield Operations or Ranges

Vegetation management is required for safety reasons to support the mission on Westover ARB. In particular, two vegetation management projects have the potential to have environmental effects on the Base. Airfield grass management is necessary to maintain airfield safety. Typically, these mowing standards would have little effect on natural resources, however Westover ARB supports nesting habitat for two state listed species, upland sandpiper (*Bartramia longicauda*) and state threatened grasshopper sparrow (*Ammodramus savannarum*). Methods to minimize impacts to these species were developed by incorporating the use of plant growth regulators, pre-emergent herbicides, and prescribed burns, prior to initiating mowing, which can have direct effects on nests.

Westover ARB intends to focus the plant growth regulator (PGR) herbicide applications on the airfield cool season grasses. The largest patches of cool season grasses will be given first priority for treatment with diminishing area applications leading up to mid-May. Any herbicide application after 15 May will be very selective. The herbicides to be used include Plateau (4 oz. /AC), Escort XP, Milestone and Vanquish as needed to control broadleaf and shrubby weeds. The herbicide applicator will use tractor mounted boom sprayers that will begin when vegetation begins to "green up". It is feasible to spray up to 100 acres per day.

To assess the effectiveness of the herbicide application, Westover ARB personnel will monitor the vegetation height by visual observation of scaled reference field markers placed during the growing season, from 1 April through 1 August. Particular attention and consideration will be given to areas of little bluestem grasses. USDA/Westover personnel will also be conducting weekly point counts at ten locations throughout the airfield using scaled ruler measurements at three or four points in vegetation stands that appear to be approaching the grass height conformance standards. Base Operations personnel also conduct daily inspections of the airfield.

The input from the various airfield monitors will be used in management decisions of where and when to mow in order to comply with the applicable AFI grass height standards while minimizing the adverse impact to the grassland habitat. Westover ARB intends to make every reasonable effort to avoid mowing areas that do not exceed tolerances.

The second vegetation management action that can have environmental effects is the need to remove obstructions from the imaginary surface of the airfield (see section 7.9). These actions could have impacts to wetlands. Additionally, the action will need to be analyzed for potential effects to the northern long eared bat. This project is currently in development under the leadership of the US Army Corps of Engineers.

(Tab 3- Vegetation Management Plan)

2.4.4 Potential Future Mission Impacts on Natural Resources

Westover ARB has constructed new buildings and facilities in support of its tenants' changing missions and will continue to do so. Plans to add other military or civilian tenants to Westover ARB are uncertain at this time. The discrete and cumulative impacts on the local environment must be evaluated continually.

Open habitats with vegetation heights meeting Air Force standards, such as maintained open fields, is the primary natural resource needed to support the military mission at Westover ARB.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The USAF environmental program adheres to the Environmental Management System (EMS) framework and its Plan, Do, Check, Act cycle for ensuring mission success. Executive Order (EO) 13834, *Efficient Federal Operations*; DoDI 4715.17, *Environmental Management Systems*; AFI 32-7001, *Environmental Management*; and International Organization for Standardization (ISO) 14001 standard, *Environmental Management Systems – Requirements with guidance for use*, provide guidance on how environmental programs should be established, implemented, and maintained to operate under the EMS framework.

The natural resources program employs EMS-based processes to achieve compliance with all legal obligations and current policy drivers, effectively manage associated risks, and instill a culture of continual improvement. The INRMP serves as an administrative operational control that defines compliance-related activities and processes.

4.0 GENERAL ROLES AND RESPONSIBILITIES

General roles and responsibilities that are necessary to implement and support the natural resources program are listed in the table below. Specific natural resources management-related roles and responsibilities are described in appropriate sections of this plan.

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
Installation Commander	The Commander ensures an INRMP is developed, maintained, and implemented. The Commander is responsible for approving the INRMP, providing appropriate staffing for implementation of the INRMP, and controlling access to and use of the installation's natural resources
AFCEC Natural Resources Media Manager/SME/Subject Matter Specialist (SMS)	AFCEC provides expertise and professional services necessary to protect, preserve, restore, develop, and sustain environmental and installation resources. AFCEC assists with implementation of the INRMP and with reach back support and funding
Installation Natural Resources Manager/POC	• INRMP updates and monitoring • Natural Resource Management • Nature Education • Air Quality Monitoring/Compliance • Water Quality Compliance • Environmental Impact Assessment Process • Environmental Regulatory Coordination
Installation Security Forces	Physical enforcement
Installation Unit Environmental Coordinators (UECs); see AFI 32-7001 for role description	Ensures NRM is coordinated with to address Westover ARB natural resources in the AF Environmental Maintenance System (EMS) process and remain in compliance with AF EMS ARB
Installation Wildland Fire Program Manager	Fire Department coordinates with 439 CE/CEV NRM on development of a Wildland Fire Management Plan
Pest Manager	Pest Management (including airfield animal dispersal and control) Other Pest Control
Range Operating Agency	N/A
Conservation Law Enforcement Officer (CLEO)	N/A
National Environmental Policy Act (NEPA)/Environmental Impact Analysis Process (EIAP) Manager	Coordinates with NRM to ensure natural resources are properly addressed in the Environmental Assessment and project planning process
NOAA)/ National Marine Fisheries Service (NMFS)	N/A
US Forest Service	N/A
USFWS	The USFWS is a cooperating agency in implementation of this INRMP. INRMP reviews are coordinated with the USFWS Deputy Regional Director and appropriate field station. The Sikes Act Coordinator, organizationally located under the Assistant Regional Director of Fisheries, serves as the primary point of contact for installations during the formal INRMP review process. MAFB has an embedded USFWS employee

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
	serving as a project manager on NR project implementation.
Natural Resources Conservation Service (NRCS)	Soil conservation assistance
Judge Advocate	Regulatory Interpretation Off-base Dispute/Complaint Resolution Legal Representation
439 Safety Office	BASH Monitoring and Mitigation (on and off base) Organize and conduct Bird-Wildlife Hazard Working Group (BHWG) and hold required meetings
Bioenvironmental Engineer	Wastewater quality monitoring
Military Public Health	Mosquito and tick surveillance
Airfield Management	Airfield Grounds Maintenance, BASH Monitoring and Mitigation
Engineering	Storm water/Erosion Control and Landscaping Specifications for New Construction Installation Development Plan (IDP)
Base Operating Support (BOS) Contractor	Oil/Water Separator Maintenance General Grounds Maintenance Pest Management (including airfield animal dispersal and control)Other Pest Control
Outdoor Recreation	Nature Education/Outdoor Recreation Activities Outdoor Recreation Equipment Rental/Check Out
USACE	CWA Section 404 Permitting Wetland Jurisdictional Determinations

5.0 TRAINING

USAF installation NRMs/POCs and other natural resources support personnel require specific education, training, and work experience to adequately perform their jobs. Section 107 of the Sikes Act requires that professionally trained personnel perform the tasks necessary to update and carry out certain actions required within this INRMP. Specific training and certification may be necessary to maintain a level of competence in relevant areas as installation needs change, or to fulfill a permitting requirement.

Installation Supplement – Training

- NRMs at Category I installations must take the course DoD Natural Resources Compliance, endorsed by the DoD Interservice Environmental Education Review Board and offered for all DoD Components by the Naval Civil Engineer Corps Officers School (CECOS). See http://www.netc.navy.mil/centers/csfe/cecos/ for CECOS course schedules and registration information. Other applicable environmental management courses are offered by the Air Force Institute of Technology (http://www.afit.edu), the National Conservation Training Center managed by the USFWS (http://www.training.fws.gov), and the Bureau of Land Management Training Center (http://training.fws.gov)
- Natural resource management personnel shall be encouraged to attain professional registration, certification, or licensing for their related fields, and may be allowed to attend appropriate national, regional, and state conferences and training courses

- All individuals who will be enforcing fish, wildlife, and natural resources laws on USAF lands must receive specialized, professional training on the enforcement of fish, wildlife, and natural resources in compliance with the Sikes Act. This training may be obtained by successfully completing the Land Management Police Training course at the Federal Law Enforcement Training Center (http://www.fletc.gov/)
- Individuals participating in the capture and handling of sick, injured, or nuisance wildlife should receive appropriate training, to include training that is mandatory to attain any required permits
- Personnel supporting the BASH program should receive flight line drivers training, training in identification of bird species occurring on airfields, and specialized training in the use of firearms and pyrotechnics as appropriate for their expected level of involvement
- The DoD supported publication Conserving Biodiversity on Military Lands -- A Handbook for Natural Resources Managers (http://dodbiodiversity.org) provides guidance, case studies, and other information regarding the management of natural resources on DoD installations

Natural resources management training is provided to ensure that installation personnel, contractors, and visitors are aware of their role in the program and the importance of their participation to its success. Training records are maintained IAW the Recordkeeping and Reporting section of this plan. Below are key natural resources management-related training requirements and programs:

- Due to the Category 1 designation of Westover ARB, the Natural Resources Manager is required to attend an approved DoD Natural Resources Compliance Course.
- Outside Contractors are informed of site-specific information regarding natural and cultural resources prior to the commencement of any project work. All proposed projects are reviewed by the NRM to determine impact to the Natural Resources.

6.0 RECORDKEEPING AND REPORTING

6.1 Recordkeeping

The installation maintains required records IAW Air Force Manual 33-363, *Management of Records*, and disposes of records IAW the Air Force Records Management System (AFRIMS) records disposition schedule (RDS). Numerous types of records must be maintained to support implementation of the natural resources program. Specific records are identified in applicable sections of this plan, in the Natural Resources Playbook, and in referenced documents.

Installation Supplement – Recordkeeping

All Westover ARB NRM official records are kept electronically and physical files are located at the NRM office. Unofficial MAFB NRM electronic working files are located on the CE CEV installation shared drive. These unofficial electronic records are updated regularly. Individual reports are located on the Westover ARB eDash website

6.2 Reporting

The installation NRM is responsible for responding to natural resources-related data calls and reporting requirements. The NRM and supporting AFCEC Natural Resources Media Manager and SMS should refer to the Environmental Reporting Playbook for guidance on execution of data gathering, quality control/quality assurance, and report development.

Installation Supplement – Reporting

Westover ARB is required, in accordance with the Prescribed Burn Permit with MassDEP, to submit an annual Prescribed Burn Summary Report if any burns have taken place the previous year.

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

This section describes the current status of the installation's natural resources management program and program areas of interest. Current management practices, including common day-to-day management practices and ongoing special initiatives, are described for each applicable program area used to manage existing resources. Program elements in this outline that do not exist on the installation are identified as not applicable and include a justification, as necessary.

Installation Supplement – Natural Resources Program Management

This INRMP has been organized to ensure the implementation of year-round, cost-effective management activities and projects that meet the requirements of Westover ARB's mission. Various organizations on Westover ARB that are responsible for the implementation of the INRMP are described in the following subsections.

Property Owner (439 Airlift Wing)

Westover ARB property is owned by the 439th Airlift Wing (439 AW) of AFRC. Oversight and implementation of this INRMP are ultimately the responsibility of the 439 AW. As owner of the property, the 439 AW is afforded all rights and responsibilities conferred under applicable laws and regulations and the Sikes Act.

CFT/ BASH Team Working Groups

The CFT/ BASH Team Working Groups is a subgroup of the Westover ARB Environmental, Safety, and Occupational Health Committee (ESOHC) and is responsible for the overall implementation of the INRMP. The INRMP Working Group is made up of the key Installation personnel from Westover ARB, and will assume an oversight role to ensure the effective implementation of this Plan. Westover ARB shall establish subcommittees comprised of Base personnel and outside agencies to focus on high-level priority natural resources management issues such as, wetlands management erosion and sedimentation, fish and wildlife management, airfield grass management, and breeding state-listed grassland birds. Top- and middle-level management representation, as well as representation from several individuals with day-to-day on-Installation field experience, will provide the CFT/ BASH Team Working Groups with the leadership and structure necessary for the successful implementation of this INRMP.

Commander (439 AW/CC)

The Westover ARB Commander (439 AW/CC) oversees the Base and serves as the Chairman of the ESOHC. In these capacities, the 439 AW/CC will ensure the implementation of the INRMP to the fullest extent practicable based on funding and manpower availability. The final approval of the INRMP and approval of any future changes rests with the 439 AW/CC.

Base Civil Engineer (439 MSG/CE)

The Westover ARB Base Civil Engineer (439 MSG/CE) plans, budgets, approves, and oversees all infrastructure maintenance and construction activities performed on the Base. All maintenance- and construction-related projects or management activities proposed in this Plan should be approved by the Base Civil Engineer (CE) to ensure that (1) funding is available and (2) these projects are complementary to the Installation's comprehensive planning processes.

Base Environmental Office (439 MS/CEV)

The Westover ARB Base Environmental Office (439 MS/CEV) plans, budgets, approves, and oversees all environmental activities performed on the Base and is responsible for ensuring that activities associated with the implementation of this Plan adhere to applicable federal, state, local, and Air Force environmental regulations and guidelines. The 439 MS/CEV should independently review deviation from the projects proposed in this Plan.

Natural Resources Manager (439 MS/CEV)

The Westover ARB Natural Resources Manager oversees the management of natural resources on the Base. The Natural Resources Manager, in conjunction with the Public Affairs Office, is responsible for establishing and implementing a conservation education program to instruct Base personnel on the protection and enhancement of biological diversity on Westover ARB. The Natural Resources Manager directs most of the ongoing natural resources management activities presented in this Plan. However, several management activities (e.g., BASH) fall under the responsibilities listed for other Installation organizations. The Natural Resources Manager will act as a technical point-of-contact for those activities for which they are not directly responsible for implementing. The Natural Resources Manager is a required member of the installation BASH working group. Coordination of natural resource issues is critical with the Airfield Manager Chief, Chief of Safety and the U.S. Department of Agriculture, Wildlife Services (USDA-WS).

Airfield Manager Chief (439 OG/OFA)

The Westover ARB Airfield Manager Chief, in conjunction with the 439 AW Chief of Safety, is responsible for implementing activities presented in this Plan that pertain to the BASH Reduction Program. In addition, the Westover ARB Airfield Manager Chief in cooperation with the USDA-WS is responsible for maintaining the MDFW depredation permit. The Westover ARB Airfield Operations Manager (AOM) will obtain the required depredation permits and report to the USFWS or MDFW in the event of an incidental take of a listed species occupying the airfield. Coordinates with Natural Resources Manager regarding issues in management of natural resources on Westover ARB.

Chief of Safety (439 AW/SE)

The 439 AW Chief of Safety (439 AW/SE), in conjunction with the Westover ARB Airfield Manager Chief, is responsible for implementing all activities presented in this Plan that pertain to the BASH Reduction Program at Westover ARB. The 439 AW/SE also ensures that bird/wildlife strikes that occur with aircraft assigned to host/tenant/transient units at Westover ARB are accurately documented and reported to the USAF BASH Team, Kirtland Air Force Base (AFB), New Mexico. Recovered wildlife specimens are submitted by SE to the Smithsonian Institution's Feather Identification Laboratory, Washington, D.C., for proper identification. The Chief of Safety, in cooperation with USDA-WS, is the lead for maintaining the USFWS depredation permit and the U.S. Fish and Wildlife subcontract for Integrated Pest Management. In addition, the Chief of Safety and Airfield Manager Chief ensure that the Bird Hazard Working Group (BHWG) conducts meetings as prescribed in the BASH Reduction Plan and AFIs. Coordinates with Natural Resources Manager regarding issues in management of natural resources on Westover ARB.

Staff Judge Advocate (439 AW/SJA)

The Staff Judge Advocate (SJA) is responsible for ensuring that the implementation of the management objectives contained within this INRMP meet all of the AFRC's regulatory and statutory requirements

that pertain to natural resources management. The SJA will review any future natural resources management proposals and alert the 439 AW/CC and Westover ARB Natural Resources Manager should there be any regulatory conflicts or shortfalls. In addition, the legal office will keep the 439 AW/CC, 439 MSG/CEV, and the Westover ARB Natural Resources Manager apprised of any new statutes or regulations that might affect natural resources management on the Base.

Public Affairs Office (439 AW/PA)

The Public Affairs Office (439 AW/PA) serves as the point-of-contact to interface between the 439 AW/CC, the media, and civilian groups interested in knowing about or using the Installation for environmental, educational, or other purposes. The 439 AW/PA is responsible for the coordination of access for public events at the Installation. Public Facilities/Recreation land use is oriented to providing recreational opportunities to assigned Installation personnel, members of reserve components and their families, active and retired military, and civil service personnel. The military mission and the limited amount of resources on Westover ARB preclude open public recreational use of the Installation. However, there are several opportunities for certain groups (e.g., Boy Scouts, birding groups) to utilize the Installation.

Contractor Quality Assurance Evaluators (439 MSG/CERQ)

The appropriate Westover ARB Contractor Quality Assurance Evaluators (439 MSG/CERQ) are responsible for overseeing current and future contractor activities and ensuring that the contractor follows the protocols established in the Plan, as incorporated by reference into the contract.

Base Contracting Office (439 CONF/LGC)

The Base Contracting Office (439 CONF/LGC) is responsible for updating or revising applicable contracts in order to implement the adaptive management strategies identified in this Plan. Security Police (439 SFS/MSG)

Westover ARB Security Police (439 SFS/MSG) are responsible for enforcement of the no-hunting policy and coordination of the feral animal removal plan on the Base. 439 SFS/MSG personnel inform civilian groups and other visitors to Westover ARB of (1) the restricted areas on the Base, (2) notification and evacuation procedures in the case of an on-Base emergency, and (3) areas of the Base open to recreation.

U.S. Department of Agriculture, Wildlife Services (USDA-WS)

While under contract with Westover ARB safety office, USDA-WS is responsible for monitoring nuisance wildlife that have the potential to create a wildlife aircraft strike hazard. USDA-WS personnel support activities that pertain to the BASH Reduction Program. USDA-WS personnel are also responsible for coordinating their activities with the 439 MS/CEV, 439 AW/SE, 439 OG/OFA, and Security Police. Coordinates with Natural Resources Manager regarding issues in management of natural resources on Westover ARB.

Other Agencies

The US Fish and Wildlife Service, through agreement with the USAF, provides planning, training, personnel, and equipment to conduct prescribed fires on Westover ARB.

The USFWS can provide technical and financial assistance to Westover ARB due to its designation as a “Special Focus Area” within the Silvio O. Conte National Fish and Wildlife Refuge.

The MDFW, via its Massachusetts Natural Heritage Endangered Species Program (MNHESP), is responsible for the protection and management of state-listed rare species, game birds, and mammals within Massachusetts. The MDFW is the regulating state agency responsible for administering the Massachusetts Endangered Species Act (ESA), and periodically surveys the grassland bird species populations and their habitats on Westover ARB.

7.1 Fish and Wildlife Management

Applicability Statement

This section applies to all USAF installations that maintain an INRMP. The installation is required to implement this element.

Program Overview/Current Management Practices

Non-consumptive fish and wildlife management opportunities exist in the nonindustrial areas of Westover ARB. Management for the consumptive use of game species on Westover ARB is limited because the Base is situated in a suburban and industrial area. In addition, safety and security issues raised as a result of the proximity of game species' habitats to the runways and taxiways further contribute to the impracticality of consumptive use management. Wildlife population and habitat management on Westover ARB will attempt to (1) deter animals from foraging or roosting in areas near or adjacent to the runway, (2) attract wildlife away from the runway, and (3) protect and conserve threatened and endangered species through habitat conservation at selected locations on the Base. This approach has been chosen due to the relative abundance and variety of wildlife species present on Westover ARB and the unlikelihood of excluding all wildlife species from the Base that pose a major threat to the safety of the flying mission.

Observations and discussions among Base, federal, and state agency personnel identified a number of important wildlife species at the Base. The variety of habitats present on the Base (e.g., grasslands, wetlands, forested areas) contributes to the diversity of species found on the Base. Game species that have been documented on Westover ARB include the white-tailed deer, coyote, red fox, gray squirrel, cottontail rabbit, wild turkey, ruffed grouse, pheasant, Canada geese, and various duck species. Populations of these species are limited by the reduction, fragmentation, and isolation of habitats on the Base. In addition, Westover ARB actively discourages their population growth because of their incompatibility with flying operations. However, grassland birds have maintained numbers in recent surveys (Melvin 2012). An expansive and relatively contiguous area of open grasslands provides ample nesting and foraging habitats for these species. Numerous other nongame species inhabit Westover ARB including raptors, gulls, killdeer, large flocks of migrating starlings and cowbirds, woodchucks, miscellaneous waterfowl and wading birds, song birds, and feral cats.

Coyote and red fox have been sighted and signs of both species were noted throughout the Base's semi-improved and unimproved acreage. A relatively large population of woodchucks and other small mammals has been documented on the Base. In addition, a large number of wild turkeys have been recorded within the forested areas in the northern portion of Westover ARB. These species provide suitable prey for the mammalian and avian predators that inhabit or migrate through the Base.

Westover ARB has a current USFWS Depredation Permit to authorize the taking of nuisance species to lessen the danger of bird/wildlife strikes with aircraft. However, depredation permits are not required for killing house sparrows (*Passer domesticus*), European starlings (*Sturnus vulgaris*), mute swans (Cygnus olor) and common pigeons or rock doves (*Columba livia*). In addition, 50 CFR 21.43 excludes the need for a depredation permit for red-winged blackbirds (*Agelaius phoeniceus*), Brewer's blackbirds (*Euphagus cyanocephalus*), brown-headed cowbirds (*Mologhrus ater*), common grackle (*Quiscalus quiscula*), and American crows (*Corvus brachyrhynchos*) when concentrated in such numbers and manner

to constitute a health hazard or other nuisance. In addition, Westover ARB maintains a current MDFW Depredation Permit to authorize the taking of white-tailed deer and other species when necessary on Westover ARB.

Westover ARB is within the Atlantic Flyway bird migration route, and within the Connecticut River Valley, which is a major raptor migration corridor. The Base is situated within a major duck migration corridor and lies between two major goose migration corridors (Belrose 1980). The duck migration corridor predicts populations between 50,000 and 225,000 flying through the area. The goose migration corridor to the east of the Base predicts populations between 5,000 and 25,000, whereas the goose migration corridor to the west of the Base, predicts 26,000 and 75,000 flying though the area.

Beaver have been identified as a significant nuisance problem on the Base and measures have been taken to remove this species. Past actions involving the removal of beaver and their dams have proven to be temporarily successful. Beavers have built dams within Stony Brook and its tributaries, which increases the potential for the flooding of roads. Specific regulation limits lethal control methods in the Commonwealth of Massachusetts, and permits have been obtained for lethal control of beaver.

7.2 Outdoor Recreation and Public Access to Natural Resources

Applicability Statement

This section applies to all USAF installations that maintain an INRMP. The installation is required to implement this element.

Program Overview/Current Management Practices

Outdoor recreation activities at Westover ARB are limited due to the amount of open space that is inaccessible or is restricted for use by the current military mission. The Base's primary outdoor recreation goal is to conserve and protect current resources in an effort to foster the morale of Base employees. Current outdoor recreation activities consist of picnicking at the pavilions near the Base Exchange, walking on the Patriot Nature Trail, jogging, rollerblading, biking, and use of the softball fields. In addition, the Base Morale, Welfare, and Recreation Office provides rental equipment for on- and off-Base recreational activities.

The public has been allowed access to Westover ARB for escorted grassland bird tours. In addition, the Base is the host of the Great New England Air Show, a biannual event that attracts as many as 400,000 people onto Westover ARB in a 2-day period. Although the Base has a 5-year renewable lease for the Wade Lake area, access has been restricted for security reasons. Access to Restricted Recreation Areas is limited to: Military Members of the Reserve, National Guard and Active Duty with a DOD identification card; Department of Defense Civilian Employees with a DOD identification card; Active Duty Military Dependents with a DOD identification card; Military Retirees with a DOD identification card; Department of Defense Civilian Retirees with a DOD identification card; Employees of Installation Prime Contractors (defined as a contractor with a five or more year term contract) with a DOD identification card; Family Members and Friends of any of the people listed above, and the General Public, with prior, written approval of the Installation Commander. Leased access to Wade Lake is available for uses such as paddle sports and fishing involving low numbers of people.

7.3 Conservation Law Enforcement

Applicability Statement

This section applies to all USAF installations that maintain an INRMP. The installation is required to implement this element.

Program Overview/Current Management Practices

Westover ARB Security Police (439 SFS/MSG) are also responsible for enforcement of the no-hunting policy and coordination of the feral animal removal plan on the Base. 439 SFS/MSG personnel inform civilian groups and other visitors to Westover ARB of (1) the restricted areas on the Base, (2) notification and evacuation procedures in the case of an on-Base emergency, and (3) areas of the Base open to recreation.

7.4 Management of Threatened and Endangered Species, Species of Concern, and Habitats

Applicability Statement

This section applies to USAF installations that have threatened and endangered species on USAF property. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

In April of 2015, the northern long-eared bat (Myotis septentrionalis) was listed as threatened by the U.S. Fish and Wildlife Service. In the summer of 2017, the University of Montana conducted a bat survey and no northern long eared bats were present or observed on Westover ARB. Surveys have been conducted for this species, and it does not occur on the Base (Appendix B- Biological Assessments for Endangered Species Act Consultations).

Westover works with Massachusetts Natural Heritage and works closely with them to protect state threatened and endangered species occurring on base such as: Phyllira Tiger Moth (E), upland sandpiper (E), grasshopper sparrow (T), vesper sparrow (T), northern harrier (T), pine barrens zanclognatha (T), and peregrine falcon (E).

Northern long-eared bat

Roosting and Foraging Habitat

Northern long-eared bats emerge from hibernation in April and May. During the summer NLE bats roost singly, or in colonies in cavities, underneath bark, crevices, or hollow of both live and dead trees and/or snags (typically greater than or equal to three inches d.b.h.). Suitable summer habitat for NLE bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts, as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of other forested/wooded habitat. NLE bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat (USDI FWS 2015).

Males typically roost singly and prefer conifer in conifer dominated stands, while females roost singly or in small groups, preferring shade tolerant deciduous trees in mature stands. Females may form small maternity colonies behind exfoliating bark, in tree snags, stumps, and in buildings. Females have a high fidelity to their natal sites (USDI-FWS 2011), although roost fidelity is low and individual bats switch roosts about every two days during the summer (USDI FWS 2015).

The northern long-eared bat appears to be somewhat flexible in tree roost selection, selecting varying roost tree species and types of roosts throughout its range. Northern long-eared bats have been documented in roost in many species of trees, including species such as black oak (*Quercus velutina*), northern red oak (*Quercus rubra*), silver maple (*Acer saccharinum*), black locust (*Robinia pseudoacacia*), American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), sourwood (*Oxydendrum arboreum*), and shortleaf pine (*Pinus echinata*) (USDI FWS 2015).

The NLE bat is an opportunistic insectivore, using both hawking and gleaning to forage on a variety of small insects including moths (*Lepidoptera*), flies (*Diptera*), leafhoppers and beetles (*Coleoptera*) (USDI FWS 2011), with moths and beetles being the most common. Most foraging occurs above the understory, 1 to 3 m (3 to 10 ft) above the ground, but under the canopy on forested hillsides and ridges, rather than along riparian areas (Nagorsen and Brigham 1993 In USDI FWS 2015). Upland mature forests are an important habitat type for foraging NLE bats, although occasional foraging occurs over forest clearings, water and along roads. Northern long-eared bats have a high frequency call, giving them a foraging advantage, because moths are less able to detect their call (USDI FWS 2015). Roosts are also largely selected below the canopy, which could be due to the species' ability to exploit roosts in cluttered environments (USDI FWS 2015).

Winter Habitat

In general, NLE bats arrive at the hibernacula in August or September, enter in October and November, and leave in March or April. However hibernation may begin as early as August. They have shown a high degree of philopatry (using the same site for multiple years) for a hibernaculum, although they may not return to the same hibernaculum in successive seasons (USDI FWS 2015). They may hibernate solitarily or in multispecies hibernacula and are commonly found in caves or inactive mines. This species appears to favor small cracks or crevices in cave ceilings preferring cooler temperatures (USDI FWS 2011). Breeding and swarming occurs from mid-August through mid-October (USDI FWS 2015).

Typically, NLE bats are not abundant and compose a small proportion of the total number of bats hibernating in a hibernaculum. Although usually found in small numbers, the species typically inhabits the same hibernacula with large numbers of other bat species, and occasionally are found in clusters with these other bat species. Other species that commonly occupy the same habitat include: little brown bat, big brown bat, eastern small-footed bat, tri-colored bat, and Indiana bat (USDI FWS 2015).

Access to suitable, undisturbed hibernacula is essential to the survival of the Northern long-eared bat, and protection of known sites is paramount. Human disturbance of hibernacula can be discouraged or prevented with the use of gated entrances, in order to avoid arousal of hibernating bats and the spread of fungal spores. In winter, Northern long-eared bats hibernate in natural caves and abandoned mines, preferring habitats where the humidity is so high that water droplets sometimes cover there fur. Massachusetts heritage data system has records of a winter hibernacula in Hampden County (MHDS 2012).

Threats

No other threat is as severe and immediate for the NLE bat as the disease, white-nose syndrome (WNS). Since symptoms were first observed in New York in 2006, WNS has spread rapidly in bat populations from the Northeast to the Midwest and the Southeast. Population numbers of NLE bats have declined by 99 percent in the Northeast, which along with Canada, has been considered the core of the species’ range. Although there is uncertainty about how WNS will spread through the remaining portions of the species’ range, it is expected to spread throughout the United States. In general, the FWS believes that WNS has reduced the redundancy and resiliency of the species (USDI FWS 2015).

Declines due to WNS have significantly reduced the number and size of NLE Bat populations in some areas of its range. This has reduced these populations to the extent that they may be increasingly vulnerable to other stressors that they may have previously had the ability to withstand. These potential impacts (USDI FWS 2015) include:

- Forest management activities that reduce roosting, foraging or migration habitat or result in direct mortality.
- Use of pesticides and herbicides that expose NLE bats to adverse effects or significantly reduce prey.
- Removal of occupied suitable man-made structures
- Wind energy development that kills bats during migration
- Mortality or disturbance to hibernating bats.
- Impacts to hibernacula that modify air flow or microclimate.

Projects affecting any suitable NLEB habitat on the base should examine effects for including but not limited to; the determination of presence/absence, habitat suitability and the potential to reduce effects by implementing mitigations standards.

In May of 2021 Westover consulted with the U.S. Fish and Wildlife service and received a Biological Assessment and the Northern long-eared bat does not have any critical habitats within the boundary of Westover.

(Appendix B- Biological Assessments for Endangered Species Act Consultations)

Grassland bird species

Grassland bird species are monitored with regular frequency (Melvin 2012), while surveys for other species are relatively dated. The last bird survey was conducted in 2018. Mr. Drew Vitz MA FWS, State Ornithologist conducted the bird surveys with the help of USFWS and Westover ARB environmental personnel. In the past, mowing of grasslands was deferred until after the nesting season to facilitate the stability of grassland bird populations. New grass height standards prescribed in Air Force Instruction (AFI) 91-202 have necessitated changes to this policy. The AFI specifically states: Mow aircraft movement area (AMA) to maintain a grass height between 7 and 14 inches. The AMA is that area of the airfield encompassed by the Primary Surface and the Clear Zones, as well as apron areas and taxiways, regardless of their location. The height of the additional grasslands beyond the inner airfield area will be maintained at 7-14 inches through a multi-component management approach, including the application of pre-emergent herbicides, plant growth regulator, prescribed burns, and mowing when needed to meet the Air Force Safety Center threshold not to exceed 14 inches. These activities are presented in greater detail in the Vegetation Management Plan (WARB 2015) and the Manage Airfield Vegetation to Protect Flight Safety Environment Assessment (WARB 2015). Best management practices to ensure minimized effects of airfield management to grassland birds follow. The USAF will conduct, or participate in, annual breeding season (mid-June) surveys of grassland birds at Westover ARB. To facilitate comparability of data, it is anticipated that the bird surveys would attempt to follow the methodology and protocols that have been recommended by MA DFW / MA NHESP. In addition, agencies and organizations will continue to be granted access to work with Westover ARB environmental staff (consistent with Base security and mission) in conducting field data collection and analyses to determine the short and long term and direct and indirect effects of the airfield

grassland management. No prescribed burning will occur in habitats where birds are actively breeding and/or rearing young (and thus would not be able to escape the fire).

7.5 Water Resource Protection

Applicability Statement

This section applies to USAF installations that have water resources. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Watershed management is important to natural resources management at Westover ARB because it directly affects both surface water and groundwater quality and is critical to maintain valuable aquatic habitats. Westover ARB currently protects its watershed through compliance with a number of federal, state, local, and USAF environmental regulations that require the Base to have detailed spill control/response procedures and to implement storm water pollution prevention BMPs. The objective of these regulations is to prevent pollutants (e.g., fuels, solvents, sediments) from entering the watershed, thus protecting surface waters. Watershed management is particularly important at Westover ARB because all surface waters from the Base drain into Cooley, Stony, or Willimansett brooks, which, in turn flow into the Connecticut River. Specific watershed management measures employed by the Base include spill clean-up equipment at industrial locations, integrated pest management, and reduction of fertilizer applications.

An Erosion and Sedimentation Control Manual was prepared for Westover ARB. The Manual provides guidance on the development of project-specific erosion and sediment control plans for construction activities on the Base. All earth-moving activities, including contractor and tenant activities, must comply with the specifications of the site-specific plan. Any contractual agreement prepared must incorporate a statement requiring the contractor to adhere to the sediment and erosion control procedures identified in the Manual. The Manual reviews the critical slopes on Westover ARB, and identifies the different soil types present on the Base, as described in the Soil Survey for Hampden County (Rising 1996). Erosion and sediment control BMPs are identified, and standard maintenance and inspection guidance is provided to ensure each BMP's effectiveness.

7.6 Wetland Protection

Applicability Statement

This section applies to USAF installations that have existing wetlands on USAF property. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Current practices have maintained wetlands in good health. However, the delineation of the wetlands is from 2004 and a new delineation is needed. A wetland delineation validation survey was conducted in June 2015. It addressed many, but not all, of the wetlands on base. The June 2015 effort focused on the wetlands closest to the runways and taxiways (and other clear zones). The 2015 wetland survey was not accompanied by a USACE Jurisdictional Determination. There are no current or pending 401certifications or 404 permits (of the Clean Water Act), but permits may be needed for removal of tree obstructions that are in wetlands

7.7 Grounds Maintenance

Applicability Statement

This section applies to USAF installations that perform ground maintenance activities that could impact natural resources. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Most grounds-maintenance activities at Westover ARB are performed by contracted Base grounds maintenance personnel. Typical grounds maintenance activities performed at Westover ARB consist of lawn mowing, mulching, tree planting and pruning, and snow removal. Fertilizer and pesticide applications for ground maintenance on the Base have been minimized.

7.8 Forest Management

Applicability Statement

This section applies to USAF installations that maintain forested land on USAF property. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

The majority of the wooded acreage at Westover ARB is currently concentrated in the northern half of the Base. Most of this acreage contains either mixed hardwood species of poor form with low existing and potential commercial value or red pine/scotch pine plantations. Due to the poor form, species composition, disease, and insect-related problems, the "standing" commercial value of these forests is low.

Commercial forest management does not occur on Westover ARB, but clearing of obstructions in the imaginary surface of the runway is necessary as detailed in the Vegetation Management Plan (WARB 2015). Imaginary surfaces exist primarily to prevent existing or proposed manmade objects, objects of natural growth or terrain from extending upward into navigable airspace. They are determined by the criteria in Federal Air Regulation Part 77.25. The imaginary surfaces for Westover ARB are detailed in the VMP. An evaluation of obstructions is ongoing under the leadership of the US Army Corps of Engineers. The current effort utilizes Lidar technology to determine obstructions. The VMP will be updated with new obstruction areas as the full analysis is completed. Procedures for woody debris removal, new logging, and re-seeding in these areas are described below.

Grind Stumps and Remove Woody Debris in Uplands or Buffer Zones

Approximately 27 acres of vegetation in upland and wetland buffer zones on or near the airfield currently cannot be maintained as required by the Base mowing plan. The ground in these areas is uneven. Areas that now have brush, stumps, fallen logs and overgrown vegetation need to be cleared and converted to grassland that can be mowed and maintained with the equipment now in possession of Westover ARB. Some of these areas are of potential archaeological significance (WARB 2009). Westover ARB will not pull stumps in those areas to avoid disturbing the ground.

Woody Vegetation Control

After the selected seeding is reasonably well-established, mowing techniques to control woody sprouts will be employed. Selective herbicide use to control woody vegetation is an option to consider if a regime of plant growth regulator, pre-emergent herbicide and mowing does not appear to be effective. Glyphosate is recommended for woody vegetation control. This herbicide is approved by the Massachusetts Department of Agricultural Resources. It binds strongly to soils and does not persist in the environment (MAC 1998). Glyphosate is the active ingredient in two commercial products, including Roundup™ and Accord™.

Vegetation Re-establishment

It is the consensus of the Westover ARB Airfield Operations and Environmental Staff that the former wooded upland areas that have been cleared or that will be cleared within the Clear Zones will be converted entirely to grasslands. Preparation of the cleared areas is necessary for establishment of grasses. The seedbed should be as firm as possible and free of excessive weeds. Disking, harrowing, and rolling or

cultipacking generally are required to establish an acceptable seedbed. If disking and harrowing are done early, weeds can be allowed to grow and can be controlled with a contact herbicide such as glyphosate or an additional light harrowing or disking just before seeding. Seeding for vegetation re-establishment will be accomplished between early April and mid-May, unless unusual weather conditions persist (i.e., drought or heavy rain).

The Westover ARB Bird Hazard Working Group has selected little bluestem (Schizachyrium scoparium) grass seed for planting in cleared areas. This seed was selected to deter high-ranking hazardous wildlife while providing habitat for the state-endangered upland sandpiper (Bartramia longicauda) and threatened grasshopper sparrow (Ammodramus savannarum).

Little bluestem is a native, warm-season, bunch grass that germinates late in the growing season. This is compatible with mowing later in the season to reduce impacts to rare grassland birds. The NRM will select the varieties of little bluestem to plant.

Annual ryegrass (Lolium multiflorum) may be used within the seed mix as a "nurse crop." Traditional cereal grain nurse crops are not recommended with these seedings due to the potential to attract granivorus bird species. Nurse crops are used to provide shade necessary to foster growth of the desired seed crop. Annual ryegrass is a short-lived grass that usually germinates in 4 to 7 days creating a very effective soil erosion control. Annual ryegrass will be seeded at a rate of 20 to 30 pounds per acre.

New Logging and Land-clearing

Proposed areas for new logging and land-clearing are shown in Figures 4-5 through 4-9 of the VMP. Please note the -10 foot contour representing the extent of clearing is not shown on project plans.

A total of approximately 135 acres of off-Base uplands, including private and public lands, are proposed to be cut. The majority of these areas totaling approximately 77 acres are private owned lands off-Base primarily located to the north of Runway 15 and 23. To the east of Runway 33, approximately 39 acres of trees now grow in the Runway 05 Clear Zone and Primary Surface. Roughly half of these trees are on Base and the other half are on Chicopee Memorial State Park. Vegetation shall be removed to limit vegetation in all zones to the height of the herbaceous zone until no trees violate the 7:1 criteria for obstructions in the imaginary surface. The tree obstructions will be clear cut in order to create a safe zone for aircraft in accordance with federal aircraft safety regulations, while also increasing the grassland habitat available for wildlife that currently occur at Westover ARB and surrounding vicinity. The area of the proposed treatment in Chicopee Memorial State Park equals approximately 20 acres.

The tree obstructions in Chicopee Memorial State Park will be cleared via a timber sale conducted by the Massachusetts Department of Conservation and Recreation (DCR). Per a Memorandum of Agreement between Westover ARB and DCR, the Base will request funds in its budget to maintain areas logged in the State Park per the VMP as shrubland, while transitioning to grassland where applicable. Stumps in the state park will be managed by cutting sprouts and prescribed fire, if feasible. Stumps on Westover ARB may also be managed by herbicide, mechanical grinding, or removal.

Stumps on steep slopes will not be removed to reduce the possibility of erosion. Another goal is to convert this area to grassland contiguous to the existing grassland on Base. Steep terrain outside the Westover ARB perimeter fence that cannot be mowed will be managed as early successional shrub habitat.

On-Base logging of upland pine plantations will affect 4.6 acres at Landfill A (at the northern portion of the Base). It will also affect 28.6 acres north of Stony Brook where over-mature, planted red pine and sapling white pine dominate the area. At the east side of the base, planted Scotch pine, volunteer white pine, diseased over-mature red pine, and scattered hardwoods (red maple and red oak) comprise 22.9 acres that will be affected. On-Base logging will also occur where obstructions occur in the 50:1 approach-departure surface as well as other areas associated with the Cooley Brook wetlands east of Runway 33.

City of Chicopee land that is marked by steep slopes will be subject to selective cutting of penetration hazards is approximately 5 acres. In these areas, regeneration will be cut by hand, with remaining trees (red oak, white oak, scrub oak [Q. ilicifolia], red maple, and white pine) left to maintain slope stability.

Also off Base, approximately 26 acres of Massachusetts Municipal Wholesale Electric Company (MMWEC) land dominated by planted red pine will be logged. These areas are located to the east of Runway 33, abutting the Chicopee Memorial State Park. These areas will be cleared of stumps and converted to grasslands by planting little bluestem.

A total of approximately 6.3 acres of upland are proposed to be treated on land owned by the Town of Ludlow. Additionally, 4.90 acres of wetland resource area and 1.14 acres of Riverfront Area are proposed to have cutting to remove obstructions. The Rivers Protection Act, Chapter 258 of the Acts of 1996, created a 200-foot riverfront area that extends on both sides of rivers and streams. (MADEP 2015).

Wetland Areas

Jurisdictional Wetland areas located in or near the airfield and imaginary surfaces are dominated mostly by herbaceous, emergent vegetation. Grassy areas on the airfield will be mowed according to the current Airfield Mowing Map. Removal of woody vegetation should be timed to avoid the nesting season of local bird species and the potential presence of northern long-eared bat.

Appropriate permits are necessary for any further modification or impacts to these areas. In addition, all mowing should be timed to minimize soil disturbance of the wetland areas. Optimum mowing periods occur when the surface soil is dry enough to traverse with tractors and mowing equipment without creating ruts in the soil. Control of woody vegetation within emergent wetland areas can be accomplished by hand removal wherever mechanical mowing cannot be used. Approved herbicides may be used on Westover ARB. Pesticide application, including pre-emergent and plant growth regulator treatments, would be consistent with the herbicide label.

A management impact that will also be considered is parking for the Great New England Air Show. This airshow generally occurs bi-annually and was last held on Westover ARB in 2018. Vehicles would be allowed to park in the buffer zone only with the condition that rutting does not occur. Future airshows will not be scheduled in the spring.

Removing Large Diameter Trees and Shrub Cover and Reducing Mast

Removing large diameter trees and shrub cover and reducing mast will decrease the BASH threat on Westover ARB. This goal can be accomplished while also providing habitat for low BASH risk species and while protecting wetland and stream resources. The areas to be managed in these ways are in wetlands or riparian buffers on Westover ARB.

American kestrels (Falco sparverius) collide with aircraft at the Base as much as or more than any other bird species (Milroy 2007). These and other birds need nesting cavities in trees - greater than 12 inches diameter at breast height (DeGraaf and Yamasaki 2001). Eliminating these large trees on Base will discourage kestrels from nesting there. Large diameter trees also provide roosts for turkey vultures (Cathartes aura) and wild turkeys (Meleagris gallopavo), and perches and nesting sites for red-tailed hawks (Buteo jamaicensis) (DeGraaf and Yamasaki 2001). All of these large birds are present at Westover ARB and can cause significant damage if they collide with aircraft.

Low tree branches and vegetation in the shrub layer provide food and cover habitat for white-tailed deer (Odocoileus virginianus), coyotes (Canis latrans), and wild turkeys (DeGraaf and Yamasaki 2001). Eliminating the shrubs and pruning trees to a level above the browse height of deer will discourage those BASH-risk species from entering or staying on the Base. It will also allow USDA-WS personnel to better observe these species.

Mast is fruit or seeds (including nuts) produced by trees. Oak, hickory, beech, maple and birch are among the mast-producing tree species on Westover ARB. This mast attracts wildlife that presently poses a BASH-risk or their prey. Eliminating these tree species on the airfield portion of the Base will further reduce the attractiveness of the area to problem wildlife.

Westover ARB plans to replace large or mast-producing trees with species less attractive to problem wildlife. These include black spruce (Picea mariana), and American larch (Tamarack) (Larix larcina) in wet soils, pitch pine in dry sandy soils and red spruce (Picea rubens) in rocky, upland soils. Each of these conifers is native to Hampden County (Sorrie and Somers 1999).

7.9 Wildland Fire Management

Applicability Statement

This section applies to USAF installations with unimproved lands that present a wildfire hazard and/or installations that utilize prescribed burns as a land management tool. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Recent and long-term wildland fire histories on the installation and in the region are as follows. In 2002 WARB introduced prescribed fire by qualified crews to mimic natural disturbance of the grassland ecosystem. The natural return rate for fire in grassland is between 5 and 10 years. The WARB goal is to burn all of the grasslands on the installation with a 5-year return rate. This has not been possible as funding, personnel or weather has restricted burning to every other year until 2008. Prescribed burning has occurred most recently in 2021. Actual wildfires are very infrequent and relatively small due to quick response and measured suppression. Regionally there has been a history of wildfire in the pitch pine stands in the Montague Plains to the north. There are small, scattered stands of pitch pine on WARB, in Chicopee State Park, and in the community nearby. More recently the number of homes built in areas that had wildland fire potential is increasing. Human populations will increase in the wildland/urban interface, and over 90 percent of wildland fires are human-caused.

Controlled burn of portions of the airfield grassland will occur each year in accordance with Westover ARB's Prescribed Fire Plan (Westover ARB, 2017). The annual controlled burns are anticipated to slowly transition the ecosystem towards one with a greater dominance of warm season grasses, rather than cool season grasses and broad-leafed weeds (both of which tend to require earlier mowing to maintain heights below the 14-inch threshold).

Westover ARB is divided into 29 fire unit areas. Annually, approximately 200 to 300 acres will be burned during the dormant season (primarily during March and April), with an expected period of return of 7 years to include all the airfield grasslands. Burns will be performed by trained U.S. Fish and Wildlife and Department of Defense personnel, between the hours of 1000 and 1730 (to comply with Massachusetts Department of Environmental Protection standards). It should be noted that there are a number of constraints around which burning must be scheduled, e.g. red flag conditions, U.S. Fish and Wildlife crew availability, wind, precipitation, cloud cover, air quality, and aircraft movement.

(Tab 1- Wildland Fire Management Plan).

7.10 Agricultural Outleasing

Applicability Statement

This section applies to USAF installations that lease eligible USAF land for agricultural purposes. This section **IS NOT** applicable to this installation.

Program Overview/Current Management Practices

7.11 Integrated Pest Management Program

Applicability Statement

This section applies to USAF installations that perform pest management activities in support of natural resources management (e.g., invasive species, forest pests, etc.). This section **IS** applicable to this installation.

Program Overview/Current Management Practices

Detailed information for individual species can be found in the Vegetation Management Plan. The Vegetation Management Plan was created in 2015. The Chicopee Conservation Commission extended the plan to 2023 in 2020. (WARB 2015)

Noxious weeds are mainly located along the north and east boundaries. Based on anticipated results and previous successes on Westover ARB (PES 2009), the recommended actions for noxious weed control include mowing, hand pulling, and application of herbicides. Pre-emergent herbicides and plant growth regulators applied to grassland areas will continue to control broadleaf noxious weeds and undesirable annual grasses. Spot application of selective and non-selective herbicide to noxious weed infestations in other areas is appropriate and recommended in order to achieve the desired level of control.

Noxious weed species, invasive species and undesirable native vegetation documented on Westover ARB are listed with recommended actions for control.

(Appendix F- Known invasive and undesirable vegetation and control methods)

(Tab 5- Integrated Pest Management Plan (IPMP)

7.12 Bird/Wildlife Aircraft Strike Hazard (BASH)

Applicability Statement

This section applies to USAF installations that maintain a BASH program to prevent and reduce wildlife-related hazards to aircraft operations. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

The Westover ARB BASH Plan 2019 provides a local program for minimizing bird strikes to aircraft by (1) providing guidelines for the Base's BHWG, (2) providing procedures for reporting hazardous bird activity and altering or discontinuing flying operations, (3) providing procedures to disseminate information to all assigned and transient aircrews for specific bird hazards and procedures for avoidance, (4) providing procedures to eliminate or reduce environmental conditions that attract birds to the airfield, and (5) providing procedures to disperse birds on the airfield. The plan includes maintenance specifications for grass mowing between 7 to 14 inches essentially all of the airfield; seasonal inspection requirements for grain type grasses that attract high-threat avian species; and periodic inspection requirements for ponding and proper drainage on the airfield whenever possible to reduce insect breeding, a major food source for birds during much of the year. The BASH Plan also established an educational program to acquaint crew members with the hazards associated with birds. In addition, Westover ARB has established a cooperative agreement and contracts the USDA-WS, formerly USDA, Animal Damage Control, to regularly monitor and reduce wildlife hazards to aircraft occurring on the Base. BASH reduction techniques currently employed by the Base and USDA-WS; include abating nuisance avian species with pyrotechnics and

depredation when necessary. A new revision of the BASH plan is underway to account for changes in the grass height standard.

(TAB 2- Bird/Wildlife Aircraft Strike Hazard (BASH) Plan)

7.13 Coastal Zone and Marine Resources Management

Applicability Statement

This section applies to USAF installations that are located along coasts and/or within coastal management zones. This section **IS NOT** applicable to this installation.

Program Overview/Current Management Practices

7.14 Cultural Resources Protection

Applicability Statement

This section applies to USAF installations that maintain a BASH program to prevent and reduce wildlife-related hazards to aircraft operations. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

According to the Westover ARB Cultural Resources Management Plan (ICRMP), various zones have the potential for prehistoric remains, prehistoric deposits, and significant historical archaeological remains (WARB 1995). Westover follows all current cultural resource management procedures in the ICRMP.

The Cultural Resources Management Plan divides Westover ARB into three broad environmental zones for potential for prehistoric remains: Cooley Brook, Stony Brook, and Willimansett Brook. The area surrounding Westover ARB was considered an “active zone” during all phases of New England prehistory. However, activity during the Late Archaic period (9,000 to 3,000 years before present [BP]), and the Woodland period (3,000 to 500 years BP) appear to have been the times of most extensive occupation.

In 2017 Westover ARB received National Register Eligibility Opinion with the State Historic Preservation Officer (SHPO) and established a list of potential buildings to be considered on the National Register of Historic Places.

(Appendix K- 2017 MA SHPO National Register Eligibility Opinion)

(Tab 4- Integrated Cultural Resources Management Plan (ICRMP))

7.15 Public Outreach

Applicability Statement

This section applies to USAF installations that maintain a BASH program to prevent and reduce wildlife-related hazards to aircraft operations. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

The Public Affairs Office (439 AW/PA) serves as the point-of-contact to interface between the 439 AW/CC, the media, and civilian groups interested in knowing about or using the Installation for environmental, educational, or other purposes.

The 439 AW/PA is responsible for the coordination of access for public events at the Installation. Public Facilities/Recreation land use is oriented to providing recreational opportunities to assigned Installation personnel, members of reserve components and their families, active and retired military, and civil service personnel. The military mission and the limited amount of resources on Westover ARB preclude open public recreational use of the Installation. However, there are several opportunities for certain groups (e.g., Boy Scouts, birding groups) to utilize the base.

7.16 Climate Change Vulnerabilities

Applicability Statement

This section applies to USAF installations that have identified climate change risks, vulnerabilities, and adaptation strategies using authoritative region-specific climate science, climate projections, and existing tools. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

The U.S. Department of Defense (DoD) owns or manages more than 25 million acres of lands, representing a wide array of natural ecosystems that support numerous rare and endangered species. These lands are critical to maintaining the nation's security by supporting military training and testing that can take place under realistic conditions. Over the coming decades, DoD installations may experience significant impacts from climate change, which could compromise their capacity to support the military mission and undermine DoD's ability to protect and restore native species and ecosystems. Given that Westover ARB is located in the northeast, a state which historically has experienced very little catastrophic weather events, its mission should not be significantly impacted.

In the 2018 National Climate Assessment by NOAA, chapter 18 discusses the Impacts, Risks, and Adaptions of the northeast. Westover will have shorter warmer winters and longer hotter summers but the mission should not be impacted significantly by these factors. The most recent assessment indicates that the state of Massachusetts can expect rising temperatures and more extreme flooding in the future. Additionally, as average temperatures rise, due in part to heat-trapping pollution released from fossil fuels, severe weather events are predicted to become more extreme. That means periods of drought will be more severe, while storms will be more intense and lead to greater flooding and snowfall. The climate changes may affect all of the following natural resources, vegetation, forestry, stream flow, water runoff, water availability, forest management, pest management, birds, and wildlife.

In 2020 Westover created an Emergency Management Office Hazard Assessment and has ranked all possible natural resource hazards and has ranked them by probability and severity.

(Appendix D -2020 Emergency Management Office Hazard Assessment)

7.17 Geographic Information Systems (GIS)

Applicability Statement

This section applies to all USAF installations that maintain an INRMP, since all geospatial information must be maintained within the USAF GeoBase system. The installation is required to implement this element.

Program Overview/Current Management Practices

Resource data will be collected with GPS units and maintained in a GIS database by the Westover ARB GIS Specialist.

8.0 MANAGEMENT GOALS AND OBJECTIVES

The installation establishes long term, expansive goals and supporting objectives to manage and protect natural resources while supporting the military mission. Goals express a vision for a desired condition for the installation's natural resources and are the primary focal points for INRMP implementation. Objectives indicate a management initiative or strategy for specific long or medium range outcomes and are supported by projects. Projects are specific actions that can be accomplished within a single year. Also, in cases where off-installation land uses may jeopardize USAF missions, this section may list specific goals and objectives aimed at eliminating, reducing, or mitigating the effects of encroachment on military missions. These natural resources management goals for the future have been formulated by the preparers of the INRMP from an assessment of the natural resources, current condition of those resources, mission requirements, and management issues previously identified. Below are the integrated goals for the entire natural resources program.

The installation goals and objectives are displayed in the 'Installation Supplement' section below in a format that facilitates an integrated approach to natural resource management. By using this approach, measurable objectives can be used to assess the attainment of goals. Individual work tasks support INRMP objectives. The projects are key elements of the annual work plans and are programmed into the conservation budget, as applicable.

Installation Supplement – Management Goals and Objectives

Goal 1: Manage for No Net Loss in Westover ARB's Capability to Support the Military Mission of the Base

OBJECTIVE 1.1: Maintain vegetation to ensure safety of military personnel.

PROJECT 1.1.1: Maintain grass height standards according to Air Force Instruction (AFI) 91-202 by implementing plant growth regulator, herbicide and mowing treatments to lessen impacts to native species.

PROJECT 1.1.2: Plan and implement the removal of obstructions in the imaginary runways surfaces in cooperation with the US Army Corps of Engineers.

Goal 2: Remain in Compliance with Federal, State, and Local Laws and Regulations Governing Natural Resources

OBJECTIVE 2.1: Cooperatively support USFWS and state protection goals

PROJECT 2.1.1: Annually review and update the INRMP, incorporating management changes as necessary IAW adaptive management and any newly identified information.

PROJECT 2.1.2: Maintain correspondence with USFWS, state and Natural Heritage Inventory regarding updates to federal and state threatened, endangered, and species of concern lists.

OBJECTIVE 2.2: Maintain appropriate state and federal permits to enable necessary wildlife control

PROJECT 2.2.1: Maintain depredation at airports permit under the Migratory Bird Treaty

Act. Assess BASH-related populations annually and apply for depredation permit for appropriate species.

Goal 3: Protect Native Species, Discourage Non-native Exotic Species, and Work to Eliminate Invasive Species

OBJECTIVE 3.1.1- Transition the ecosystem towards one with a greater dominance of warm season grasses, rather than cool season grasses and broad-leafed weeds

PROJECT 3.1.1: Prescribed burns on approximately 200 to 300 acres each year in accordance with Westover ARB's Prescribed Fire Plan (Westover ARB, 2013). Burning will occur during the dormant season (primarily during March and April), with an expected period of return of 5 years to include all the airfield grasslands.

OBJECTIVE 3.2.1 Reduce nonnative invasive species on WARB

PROJECT 3.2.1: Treat noxious weed species, invasive species and undesirable native vegetation according to the Vegetation Management Plan, concentrating spot treatments on garlic mustard, phragmites and Japanese knotweed.

Goal 4: Protect Wetlands from Operational Activities at WARB and Maintain Healthy, Functional Wetlands, without Increasing BASH Risks

OBJECTIVE 4.1: Remain in compliance with USACE regulations

PROJECT 4.1.1: Conduct wetland inventory on base to update survey information older than five years

Goal 5: Maintain Outdoor Recreation and Public Access to Natural Resources

OBJECTIVE 5.1: Continue escorted birding opportunities on WARB

PROJECT 5.1.2: Ensure grassland bird nesting activity is not disrupted during the breading season (May to June) by birding groups through providing escorts to the groups and monitoring activity.

9.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

The Natural Resource Manager position is currently staffed on WARB. This position is critical for the implementation of the INRMP. Duties of the position are currently being fulfilled by other WARB staff members and or through contracting. The Base Operating Support (BOS) Contractor maintains the real property on Westover ARB per the contract, and will be responsible for the majority of the on-the-ground implementation of projects. Relevant examples of maintenance include airfield mowing, planting grass, applying pesticides and herbicides, and urban landscape maintenance. The US Fish and Wildlife service, through agreement with the USAF, provides planning, training, personnel, and equipment to conduct prescribed fires on Westover ARB. The Massachusetts Department of Fish and Wildlife/ Massachusetts Natural Heritage & Endangered Species Program (NHESP) periodically survey the grassland bird species populations and their habitats on Westover ARB. In addition, agencies and organizations will continue to be granted access to work with Westover ARB environmental staff (consistent with Base security and

mission) in conducting field data collection and analyses to determine the short and long term and direct and indirect effects of the managing grass heights according to AFI 91-202.

9.2 Monitoring INRMP Implementation

INRMP implementation will be monitored on a yearly basis prior to the INRMP update. Unfinished projects will be evaluated for cause (lack of funding vs. factors which can be remedied) to determine the most efficient way to implement them in the upcoming years. Most of the current projects are unambiguous as to the degree of success, either they are implemented or not. However, the success of maintaining grass heights will have to be monitored in relation to the treatment type and its effectiveness for keeping grass heights in compliance with AFI 91-202.

9.3 Annual INRMP Review and Update Requirements

To ensure that this INRMP properly addresses all aspects of the natural resources present on Base and proposes actions that are in accordance with USAF goals and objectives, this Plan and all its components are subject to approval by the Westover ARB ESOHC, the Westover ARB Natural Resources Manager, and HQ AFRC. Similarly, all changes to be incorporated into this Plan must be approved by the Westover ARB Natural Resources Manager. In the event that a conflict cannot be resolved by the Westover ARB Natural Resources Manager, the Westover ARB Commander, who serves as the Chairman of the Westover ARB ESOHC, will be responsible for attaining and implementing a resolution.

Prior to the annual review of the plan, project implementation will be monitored. Unfinished projects will be added to the schedule for the upcoming year as appropriate. Projects will be modified as needed to make project implementation more feasible. After determining the new schedule of projects, an annual review will take place with the USFWS and MDFW through a conference call or meeting, depending upon the preference of the attendees.

10.0 ANNUAL WORK PLANS

The INRMP Annual Work Plans are included in this section. These projects are listed by fiscal year, including the current year and four succeeding years. For each project and activity, a specific timeframe for implementation is provided (as applicable), as well as the appropriate funding source and priority for implementation. The work plans provide all the necessary information for building a budget within the USAF framework. Priorities are defined as follows:

- High: The INRMP signatories assert that if the project is not funded the INRMP is not being implemented and the USAF is non-compliant with the Sikes Act; or that it is specifically tied to an INRMP goal and objective and is part of a “Benefit of the Species” determination necessary for Endangered Species Act (ESA) Sec 4(a)(3)(B)(i) critical habitat exemption.
- Medium: Project supports a specific INRMP goal and objective and is deemed by INRMP signatories to be important for preventing non-compliance with a specific requirement within a natural resources law or by EO 13112, *Exotic and Invasive Species*. However, the INRMP signatories would not contend that the INRMP is not being implemented if not accomplished within the programmed year due to other priorities.
- Low: Project supports a specific INRMP goal and objective, enhances conservation resources or the integrity of the installation mission, and/or supports long-term compliance with specific requirements within natural resources law; but is not directly tied to specific compliance within the proposed year of execution.

Yearly Annual Work Plan 2021-2026

Project	OPR	Funding Source	Priority Level
PROJECT 1.1.1: Annually review and update the INRMP, incorporating management changes as necessary IAW adaptive management and any newly identified information. Complete update of INRMP and obtain Sikes Act partner signatures by 30 Sep.	CEI	AFRC	High
PROJECT 1.1.2: Maintain correspondence with USFWS, state and Natural Heritage Inventory regarding updates to federal and state threatened, endangered, and species of concern lists.	CEI	AFRC	Medium
PROJECT 1.2.1: Maintain depredation at airports permit under the Migratory Bird Treaty Act. Assess BASH-related populations annually and apply for depredation permit for appropriate species.	SE	AFRC	High
PROJECT 2.1.1: Maintain grass height standards according to Air Force Instruction (AFI) 91-202 by implementing plant growth regulator, herbicide and mowing treatments to lessen impacts to native species. Apply PGR in Spring.	BOS	AFRC	High
PROJECT 2.1.2: Plan the removal of obstructions in the imaginary runways surfaces in cooperation with the US Army Corps of Engineers	CEI	AFRC	Medium
PROJECT 3.1.1: Prescribed burns on approximately 200 to 300 acres each year in accordance with Westover ARB's Prescribed Fire Plan (Westover ARB, 2013). Burning will occur during the dormant season (primarily during March and April), with an expected period of return of 5 years to include all the airfield grasslands.	CEI	AFRC	Medium
PROJECT 3.2.1: Treat noxious weeds (approximately 160 acres) according to the Vegetation Management Plan, concentrating spot treatments on garlic mustard, phragmites and Japanese knotweed.	CEI	AFRC	Medium
PROJECT 4.1.1: Conduct wetland inventory on base to update survey information older than five years.	CEI	AFRC	Medium
PROJECT 5.1: Monitor to ensure escorted birding opportunities do not disrupt nesting activities.	CEI	AFRC	Medium

***Natural Resources Standard Titles by PB28 Code (excluding CZT/CZC titles):**

INRP	MMA	T&E	MNRA	WTLD
P&F, CN	Mgt, Species	Mgt, Habitat	Compliance Public Notification	Mgt, Wetlands / FloodPlains
Interagency/Intraagency, Government, Sikes Act	Interagency/Intraagency, Government, Sikes Act	Mgt, Species	Plan Update, Other	Monitor Wetlands
Interagency/Intraagency, Government, Sikes Act, CLEO	Outsourced Environmental Services, CN	Mgt, Invasive Species	Recordkeeping, Other	Interagency/Intraagency, Government, Sikes Act
Outsourced Environmental Services, CN	Supplies, CN	Mgt, Nuisance Wildlife	Outreach	Outsourced Environmental Services, CN
Supplies, CN	Supplies, CN, CLEO	Interagency/Intraagency, Government, Sikes Act		
Supplies, CN, CLEO	Vehicle Leasing, CN	Interagency/Intraagency, Government, Sikes Act, CLEO		
Equipment Purchase / Maintain, CN		Outsourced Environmental Services, CN		
Vehicle Leasing, CN		Supplies, CN		
Vehicle Fuel & Maintenance, CN		Supplies, CN, CLEO		
Mgt, Wildland Fire		Equipment Purchase / Maintain, CN		
Plan Update, INRMP		Vehicle Leasing, CN		
Plan Update, Other		Vehicle Fuel & Maintenance, CN		
Mgt, Habitat		Plan Update, Other		
Mgt, Species		Environmental Services, CN		
Mgt, Invasive Species				
Mgt, Nuisance Wildlife				
Recordkeeping, Other				
Environmental Services, CN				

11.0 REFERENCES

11.1 Standard References *(Applicable to all USAF installations)*

- AFMAN 32-7003, *Environmental Conservation*
- Sikes Act
- eDASH Natural Resources Program Page
- Natural Resources Playbook
- DoDI 4715.03, *Natural Resources Conservation Program*
- AFI 32-1015, *Integrated Installation Planning*
- AFI 32-10112, *Installation Geospatial Information and Services (IGI&S)*

11.2 Installation References

CHLOETA 2017 Westover ARB Wildland Fire Management Plan 27 December 2017.

Massachusetts Department of Environmental Protection. 2021. Chicopee, MA, Westover ARB, Prescribed Burn Permit.

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Web Soil Survey, accessed on July 25, 2021. Chicopee, Massachusetts, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Westover ARB, 2017. Integrated Cultural Resources Management Plan.

Westover ARB, 2018. Pest Management Plan.

Westover ARB, 2017. Cultrual Resources Plan (ICRMP)

- Westover ARB, 2017. Wildland Fire Management Plan

12.0 ACRONYMS

12.1 Standard Acronyms *(Applicable to all USAF installations)*

- eDASH Acronym Library
- Natural Resources Playbook – Acronym Section
- U.S. EPA Terms & Acronyms

12.2 Installation Acronyms

- AFRC- Air Force Reserve Command
- ARB- Air Reserve Base
- BASH- Bird/Wildlife Aircraft Strike Hazard
- ESOHC- Environmental, Safety, and Occupational Health Committee

- IAW- In Accordance With
- MassDEP- Massachusetts Department of Environmental Protection
- MA NHESP- Massachusetts Natural Heritage and Endangered Species Program
- MA SHPO- Massachusetts State Historic Preservation Office
- MA FWS- Massachusetts Fish and Wildlife Service
- GIS- Geographic Information Systems

13.0 DEFINITIONS

13.1 Standard Definitions *(Applicable to all USAF installations)*

- Natural Resources Playbook – Definitions Section

13.2 Installation Definitions

- N/A

14.0 APPENDICES

14.1. Standard Appendices

Appendix A. Annotated Summary of Key Legislation Related to Design and Implementation of the INRMP

Federal Public Laws and Executive Orders	
National Defense Authorization Act of 1989, Public Law (P.L.) 101-189; Volunteer Partnership Cost-Share Program	Amends two Acts and establishes volunteer and partnership programs for natural and cultural resources management on DoD lands.
Defense Appropriations Act of 1991, P.L. 101-511; Legacy Resource Management Program	Establishes the "Legacy Resource Management Program" for natural and cultural resources. Program emphasis is on inventory and stewardship responsibilities of biological, geophysical, cultural, and historic resources on DoD lands, including restoration of degraded or altered habitats.
EO 11514, *Protection and Enhancement of Environmental Quality*	Federal agencies shall initiate measures needed to direct their policies, plans, and programs to meet national environmental goals. They shall monitor, evaluate, and control agency activities to protect and enhance the quality of the environment.
EO 11593, *Protection and Enhancement of the Cultural Environment*	All Federal agencies are required to locate, identify, and record all cultural resources. Cultural resources include sites of archaeological, historical, or architectural significance.
EO 11987, *Exotic Organisms*	Agencies shall restrict the introduction of exotic species into the natural ecosystems on lands and waters which they administer.
EO 11988, *Floodplain Management*	Provides direction regarding actions of Federal agencies in floodplains, and requires permits from state, territory and Federal review agencies for any construction within a 100-year floodplain and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for acquiring, managing and disposing of Federal lands and facilities.
EO 11989, *Off-Road vehicles on Public Lands*	Installations permitting off-road vehicles to designate and mark specific areas/trails to minimize damage and conflicts, publish information including maps, and monitor the effects of their use.

Federal Public Laws and Executive Orders	
	Installations may close areas if adverse effects on natural, cultural, or historic resources are observed.
EO 11990, *Protection of Wetlands*	Requires Federal agencies to avoid undertaking or providing assistance for new construction in wetlands unless there is no practicable alternative, and all practicable measures to minimize harm to wetlands have been implemented and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.
EO 12088, *Federal Compliance with Pollution Control Standards*	This EO delegates responsibility to the head of each executive agency for ensuring all necessary actions are taken for the prevention, control, and abatement of environmental pollution. This order gives the U.S. Environmental Protection Agency (US EPA) authority to conduct reviews and inspections to monitor federal facility compliance with pollution control standards.
EO 12898, *Environmental Justice*	This EO requires certain federal agencies, including the DoD, to the greatest extent practicable permitted by law, to make environmental justice part of their missions by identifying and addressing disproportionately high and adverse health or environmental effects on minority and low-income populations.
EO 13112, *Invasive Species*	To prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*	The USFWS has the responsibility to administer, oversee, and enforce the conservation provisions of the Migratory Bird Treaty Act, which includes responsibility for population management (e.g., monitoring), habitat protection (e.g., acquisition, enhancement, and modification), international coordination, and regulations development and enforcement.
United States Code	
Animal Damage Control Act (7 U.S.C. § 426-426b, 47 Stat. 1468)	Provides authority to the Secretary of Agriculture for investigation and control of mammalian predators, rodents, and birds. DoD installations may enter into cooperative agreements to conduct animal control projects.
Bald and Golden Eagle Protection Act of 1940, as amended; 16 U.S.C. 668-668c	This law provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
Clean Air Act, (42 U.S.C. § 7401– 7671q, July 14, 1955, as amended)	This Act, as amended, is known as the Clean Air Act of 1970. The amendments made in 1970 established the core of the clean air program. The primary objective is to establish Federal standards for air pollutants. It is designed to improve air quality in areas of the

Federal Public Laws and Executive Orders	
	country which do not meet federal standards and to prevent significant deterioration in areas where air quality exceeds those standards.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (Superfund) (26 U.S.C. § 4611–4682, P.L. 96-510, 94 Stat. 2797), as amended	Authorizes and administers a program to assess damage, respond to releases of hazardous substances, fund cleanup, establish clean-up standards, assign liability, and other efforts to address environmental contaminants. Installation Restoration Program guides cleanups at DoD installations.
Endangered Species Act (ESA) of 1973, as amended; P.L. 93-205, 16 U.S.C. § 1531 et seq.	Protects threatened, endangered, and candidate species of fish, wildlife, and plants and their designated critical habitats. Under this law, no federal action is allowed to jeopardize the continued existence of an endangered or threatened species. The ESA requires consultation with the USFWS and the NOAA Fisheries (National Marine Fisheries Service) and the preparation of a biological evaluation or a biological assessment may be required when such species are present in an area affected by government activities.
Federal Aid in Wildlife Restoration Act of 1937 (16 U.S.C. § 669–669i; 50 Stat. 917) (Pittman-Robertson Act)	Provides federal aid to states and territories for management and restoration of wildlife. Fund derives from sports tax on arms and ammunition. Projects include acquisition of wildlife habitat, wildlife research surveys, development of access facilities, and hunter education.
Federal Environmental Pesticide Act of 1972	Requires installations to ensure pesticides are used only in accordance with their label registrations and restricted-use pesticides are applied only by certified applicators.
Federal Land Use Policy and Management Act, 43 U.S.C. § 1701–1782	Requires management of public lands to protect the quality of scientific, scenic, historical, ecological, environmental, and archaeological resources and values; as well as to preserve and protect certain lands in their natural condition for fish and wildlife habitat. This Act also requires consideration of commodity production such as timbering.
Federal Noxious Weed Act of 1974, 7 U.S.C. § 2801–2814	The Act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.
Federal Water Pollution Control Act (Clean Water Act [CWA]), 33 U.S.C. §1251–1387	The CWA is a comprehensive statute aimed at restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Primary authority for the implementation and enforcement rests with the US EPA.
Fish and Wildlife Conservation Act (16 U.S.C. § 2901–2911; 94 Stat. 1322, PL 96-366)	Installations encouraged to use their authority to conserve and promote conservation of nongame fish and wildlife in their habitats.
Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.)	Directs installations to consult with the USFWS, or state or territorial agencies to ascertain means to protect fish and wildlife resources related to actions resulting in the control or structural modification of any natural stream or body of water. Includes provisions for mitigation and reporting.

Federal Public Laws and Executive Orders	
Lacey Act of 1900 (16 U.S.C. § 701, 702, 32 Stat. 187, 32 Stat. 285)	Prohibits the importation of wild animals or birds or parts thereof, taken, possessed, or exported in violation of the laws of the country or territory of origin. Provides enforcement and penalties for violation of wildlife related Acts or regulations.
Leases: Non-excess Property of Military Departments, 10 U.S.C. § 2667, as amended	Authorizes DoD to lease to commercial enterprises Federal land not currently needed for public use. Covers agricultural outleasing program.
Migratory Bird Treaty Act 16 U.S.C. § 703–712	The Act implements various treaties for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful without a valid permit.
National Environmental Policy Act of 1969 (NEPA), as amended; P.L. 91-190, 42 U.S.C. § 4321 et seq.	Requires federal agencies to utilize a systematic approach when assessing environmental impacts of government activities. Establishes the use of environmental impact statements. NEPA proposes an interdisciplinary approach in a decision-making process designed to identify unacceptable or unnecessary impacts on the environment. The Council of Environmental Quality (CEQ) created Regulations for Implementing the National Environmental Policy Act [40 Code of Federal Regulations (CFR) Parts 1500– 1508], which provide regulations applicable to and binding on all Federal agencies for implementing the procedural provisions of NEPA, as amended.
National Historic Preservation Act, 16 U.S.C. § 470 et seq.	Requires federal agencies to take account of the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). Provides for the nomination, identification (through listing on the NRHP), and protection of historical and cultural properties of significance.
National Trails Systems Act (16 U.S.C. § 1241–1249)	Provides for the establishment of recreation and scenic trails.
National Wildlife Refuge Acts	Provides for establishment of National Wildlife Refuges through purchase, land transfer, donation, cooperative agreements, and other means.
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd–668ee)	Provides guidelines and instructions for the administration of Wildlife Refuges and other conservation areas.
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001–13; 104 Stat. 3042), as amended	Established requirements for the treatment of Native American human remains and sacred or cultural objects found on Federal lands. Includes requirements on inventory, and notification.
Rivers and Harbors Act of 1899 (33 U.S.C. § 401 et seq.)	Makes it unlawful for the USAF to conduct any work or activity in navigable waters of the United States without a federal permit. Installations should coordinate with the U.S. Army Corps of Engineers (USACE) to obtain permits for the discharge of refuse affecting navigable waters under National Pollutant Discharge Elimination System (NPDES) and should coordinate with the USFWS to review effects on fish and wildlife of work and activities to be undertaken as permitted by the USACE.

Federal Public Laws and Executive Orders	
Sale of certain interests in land, 10 U.S.C. § 2665	Authorizes sale of forest products and reimbursement of the costs of management of forest resources.
Soil and Water Conservation Act (16 U.S.C. § 2001, P.L. 95-193)	Installations shall coordinate with the Secretary of Agriculture to appraise, on a continual basis, soil/water-related resources. Installations will develop and update a program for furthering the conservation, protection, and enhancement of these resources consistent with other federal and local programs.
Sikes Act (16 U.S.C. § 670a–670l, 74 Stat. 1052), as amended	Provides for the cooperation of DoD, the Departments of the Interior (USFWS), and the State Fish and Game Department in planning, developing, and maintaining fish and wildlife resources on a military installation. Requires development of an INRMP and public access to natural resources and allows collection of nominal hunting and fishing fees. NOTE: AFI 32-7064 sec 3.9. Staffing. As defined in DoDI 4715.03, use professionally trained natural resources management personnel with a degree in the natural sciences to develop and implement the installation INRMP. (T-0). 3.9.1. Outsourcing Natural Resources Management. As stipulated in the Sikes Act, 16 U.S.C. § 670 et. seq., the Office of Management and Budget Circular No. A-76, Performance of Commercial Activities, August 4, 1983 (Revised May 29, 2003) does not apply to the development, implementation and enforcement of INRMPs. Activities that require the exercise of discretion in making decisions regarding the management and disposition of government owned natural resources are inherently governmental. When it is not practicable to utilize DoD personnel to perform inherently governmental natural resources management duties, obtain these services from federal agencies having responsibilities for the conservation and management of natural resources.
DoD Policy, Directives, and Instructions	
DoD Instruction 4150.07 *DoD Pest Management Program* dated 29 May 2008	Implements policy, assigns responsibilities, and prescribes procedures for the DoD Integrated Pest Management Program.
DoD Instruction 4715.1, *Environmental Security*	Establishes policy for protecting, preserving, and (when required) restoring and enhancing the quality of the environment. This instruction also ensures environmental factors are integrated into DoD decision-making processes that could impact the environment, and are given appropriate consideration along with other relevant factors.
DoD Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*	Implements policy, assigns responsibility, and prescribes procedures under DoDI 4715.1 for the integrated management of natural and cultural resources on property under DoD control.
OSD Policy Memorandum – 17 May 2005 – *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance Concerning Leased Lands*	Provides supplemental guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission. INRMPs must address the resource management on all lands for which the subject installation has real property accountability, including leased lands. Installation commanders may require tenants to accept responsibility for

Federal Public Laws and Executive Orders	
	performing appropriate natural resource management actions as a condition of their occupancy or use, but this does not preclude the requirement to address the natural resource management needs of these lands in the installation INRMP.
OSD Policy Memorandum – 1 November 2004 – *Implementation of Sikes Act Improvement Act Amendments: Supplemental Guidance Concerning INRMP Reviews*	Emphasizes implementing and improving the overall INRMP coordination process. Provides policy on scope of INRMP review, and public comment on INRMP review.
OSD Policy Memorandum – 10 October 2002 – *Implementation of Sikes Act Improvement Act: Updated Guidance*	Provides guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD and replaces the 21 September 1998 guidance Implementation of the Sikes Act Improvement Amendments. Emphasizes implementing and improving the overall INRMP coordination process and focuses on coordinating with stakeholders, reporting requirements and metrics, budgeting for INRMP projects, using the INRMP as a substitute for critical habitat designation, supporting military training and testing needs, and facilitating the INRMP review process.
USAF Instructions and Directives	
32 CFR Part 989, as amended, and AFI 32-7061, Environmental Impact Analysis Process (EIAP)	Provides guidance and responsibilities in the EIAP for implementing INRMPs. Implementation of an INRMP constitutes a major federal action and therefore is subject to evaluation through an Environmental Assessment or an Environmental Impact Statement.
AFI 32-1015, *Integrated Installation Planning*	This publication establishes a comprehensive and integrated planning framework for development/redevelopment of Air Force installations..
AFMAN 32-7003, *Environmental Conservation*	Implements AFPD 32-70, *Environmental Quality;* DoDI 4715.03, *Natural Resources Conservation Program*; and DoDI 7310.5, *Accounting for Sale of Forest Products*. It explains how to manage natural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFMAN 32-7003, *Environmental Conservation*	This Manual implements AFPD 32-70 and DoDI 4710.1, *Archaeological and Historic Resources Management.* It explains how to manage cultural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFI 32-10112 *Installation Geospatial Information and Services (IGI&S)*	This instruction implements Department of Defense Instruction (DoDI) 8130.01, Installation Geospatial Information and Services (IGI&S) by identifying the requirements to implement and maintain an Air Force Installation Geospatial Information and Services program and Air Force Policy Directive (AFPD) 32-10 Installations and Facilities.
AFPD 32-70, *Environmental Quality*	Outlines the USAF mission to achieve and maintain environmental quality on all USAF lands by cleaning up environmental damage resulting from past activities, meeting all environmental standards applicable to present operations, planning its future activities to minimize environmental impacts, managing responsibly the irreplaceable natural and cultural resources it holds in public trust and eliminating pollution from its activities wherever possible. AFPD 32-70 also establishes policies to carry out these objectives.

Federal Public Laws and Executive Orders	
Policy Memo for Implementation of Sikes Act Improvement Amendments, HQ USAF Environmental Office (USAF/ILEV) on January 29, 1999	Outlines the USAF interpretation and explanation of the Sikes Act and Improvement Act of 1997.

14.2. Installation Appendices

Appendix B- Biological Assessments for Endangered Species Act Consultations

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: May 07, 2021
Consultation Code: 05E1NE00-2021-SLI-3032
Event Code: 05E1NE00-2021-E-09284
Project Name: EPA MSGP New Permit Consultation Letter MSGP

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2021-SLI-3032
Event Code: 05E1NE00-2021-E-09284
Project Name: EPA MSGP New Permit Consultation Letter MSGP
Project Type: ** OTHER **
Project Description: Westover ARB is looking to get a new updated consultation letter. I have attached our old correspondence letter for reference.

The EPA MSGP permit quote is below:
"ESA-listed species and critical habitat are under the purview of the NMFS and the USFWS, and in many cases, you will need to acquire species and critical habitat lists from both federal agencies."

Thank you for your help!

My work email is John.cody.9@us.af.mil

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.19481795,-72.53732448147605,14z

Counties: Hampden and Hampshire counties, Massachusetts

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9045

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix C- USDA Web Soil Survey

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hampden County, Massachusetts, Central Part

July 29, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

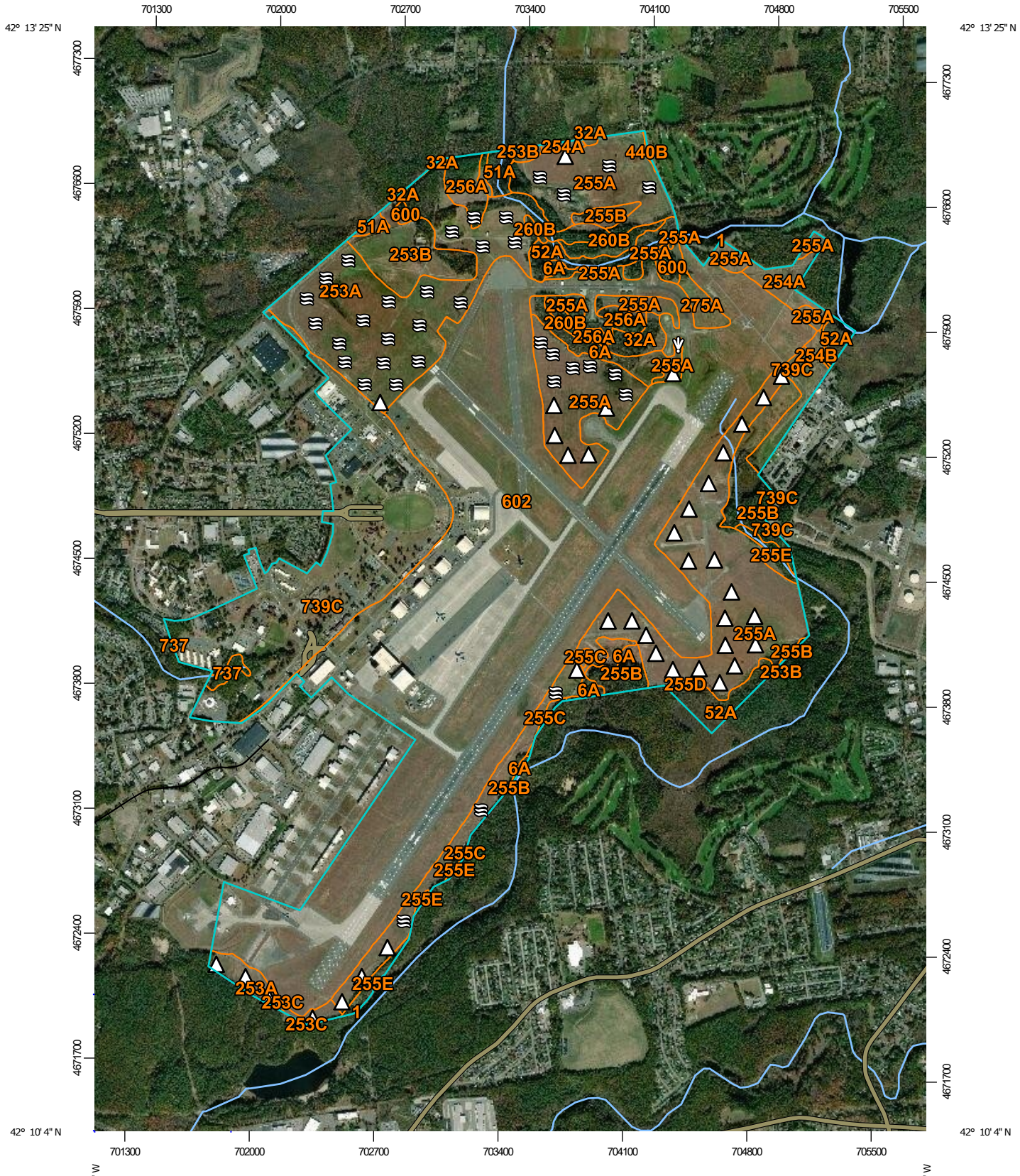
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampden County, Massachusetts, Central Part
Survey Area Data: Version 14, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2016—Oct 30, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	0.0	0.0%
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	30.4	1.3%
32A	Wareham loamy sand, 0 to 3 percent slopes	15.6	0.7%
51A	Swansea muck, 0 to 1 percent slopes	11.2	0.5%
52A	Freetown muck, central lowland, 0 to 1 percent slopes	46.2	1.9%
253A	Hinckley loamy sand, 0 to 3 percent slopes	220.2	9.2%
253B	Hinckley loamy sand, 3 to 8 percent slopes	46.0	1.9%
253C	Hinckley loamy sand, 8 to 15 percent slopes	0.1	0.0%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	17.9	0.7%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	4.8	0.2%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	1.4	0.1%
255A	Windsor loamy sand, 0 to 3 percent slopes	432.2	18.1%
255B	Windsor loamy sand, 3 to 8 percent slopes	59.9	2.5%
255C	Windsor loamy sand, 8 to 15 percent slopes	3.2	0.1%
255D	Windsor loamy sand, 15 to 25 percent slopes	2.2	0.1%
255E	Windsor loamy sand, 25 to 35 percent slopes	14.1	0.6%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	25.9	1.1%
260B	Sudbury fine sandy loam, 0 to 8 percent slopes	15.0	0.6%
275A	Agawam fine sandy loam, 0 to 3 percent slopes	10.1	0.4%
440B	Gloucester sandy loam, 3 to 8 percent slopes	0.8	0.0%
600	Pits, gravel	6.8	0.3%
602	Urban land	1,121.1	47.0%
737	Terrace escarpments	4.3	0.2%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
739C	Urban land-Hinckley-Windsor association, 0 to 15 percent slopes	297.8	12.5%
Totals for Area of Interest		**2,387.2**	**100.0%**

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Appendix D- 2020 Emergency Management Office Hazard Assessment

Contact john.cody.9@us.af.mil or 413-557-3036 for more information

Appendix E- MA Natural Heritage & Endangered Sensitive Species

Massachusetts Natural Heritage & Endangered Sensitive Species and Associated Communities Documented Near Westover ARB (July 2021

Common Name	Scientific Name	Taxonomic Group	MESA Status/ Federal Status	Most Recent Observation	Town
Adder's Tongue Fern	Ophioglossum pusillum	Vascular Plant	Threatened	1930	Ludlow
American Bittern	Botaurus lentiginosus	Bird	Endangered	1970s	Granby
Appalachian Bristle-fern	Crepidomanes intricatum	Vascular Plant	Endangered	2012	Granby
Bald Eagle	Haliaeetus leucocephalus	Bird	Threatened	2019	Ludlow
Barn Owl	Tyto alba	Bird	Special Concern	1956	Granby
Blue-spotted Salamander (complex)	Ambystoma laterale pop. 1	Amphibian	Special Concern	2014	Chicopee
				2006	Ludlow
				2017	Granby
Bridle Shiner	Notropis bifrenatus	Fish	Special Concern	1939	Granby
Bristly Buttercup	Ranunculus pensylvanicus	Vascular Plant	Special Concern	1914	Ludlow
Bristly Buttercup	Ranunculus pensylvanicus	Vascular Plant	Special Concern	1925	Granby
Climbing Fern	Lygodium palmatum	Vascular Plant	Special Concern	2010	Chicopee
				2020	Ludlow
				2009	Granby
Common Loon	Gavia immer	Bird	Special Concern	2018	Ludlow
Creeper	Strophitus undulatus	Mussel	Special Concern	2017	Granby
Downy Agrimony	Agrimonia pubescens	Vascular Plant	Threatened	2004	Granby
Drooping Speargrass	Poa saltuensis ssp. languida	Vascular Plant	Endangered	2014	Granby
Dwarf Bulrush	Lipocarpha micrantha	Vascular Plant	Threatened	2002	Ludlow
Dwarf Wedgemussel	Alasmidonta heterodon	Mussel	Endangered/Endangered	Historic	Chicopee
Eastern Box Turtle	Terrapene carolina	Reptile	Special Concern	2009	Chicopee
				1996	Ludlow
				2017	Granby
Eastern Meadowlark	Sturnella magna	Bird	Special Concern	2017	Chicopee
				2015	Ludlow

Common Name	Scientific Name	Taxonomic Group	MESA Status/ Federal Status	Most Recent Observation	Town
Eastern Pondmussel	Ligumia nasuta	Mussel	Special Concern	Historic	Chicopee
Eastern Spadefoot	Scaphiopus holbrookii	Amphibian	Threatened	1866	Chicopee
Eastern Whip-poor-will	Antrostomus vociferus	Bird	Special Concern	2012	Granby
False Hop Sedge	Carex lupuliformis	Vascular Plant	Endangered	2006	Granby
Frosted Elfin	Callophrys irus	Butterfly/Moth	Special Concern	2011	Chicopee
Grasshopper Sparrow	Ammodramus savannarum	Bird	Threatened	2017	Chicopee
				2015	Ludlow
				1974	Granby
Green Rock-cress	Boechera missouriensis	Vascular Plant	Threatened	2019	Granby
Jefferson Salamander (complex)	Ambystoma jeffersonianum	Amphibian	Special Concern	2016	Granby
Large-bracted Tick-trefoil	Desmodium cuspidatum	Vascular Plant	Threatened	2005	Granby
Long-beaked Beaksedge	Rhynchospora scirpoides	Vascular Plant	Special Concern	2002	Ludlow
Longnose Sucker	Catostomus catostomus	Fish	Special Concern	1940s	Chicopee
Long's Bittercress	Cardamine longii	Vascular Plant	Endangered	1925	Granby
Many-fruited Seedbox	Ludwigia polycarpa	Vascular Plant	Endangered	2002	Ludlow
Marbled Salamander	Ambystoma opacum	Amphibian	Threatened	2010	Ludlow
				2010	Granby
Narrow-leaved Spring-beauty	Claytonia virginica	Vascular Plant	Endangered	1932	Granby
Narrow-leaved Vervain	Verbena simplex	Vascular Plant	Endangered	2016	Granby
New England Blazing Star	Liatris novae-angliae	Vascular Plant	Special Concern	1930	Chicopee
				2020	Granby
Orange Sallow Moth	Pyrrhia aurantiago	Butterfly/Moth	Special Concern	2010	Granby
Peregrine Falcon	Falco peregrinus	Bird	Threatened	2019	Chicopee

Common Name	Scientific Name	Taxonomic Group	MESA Status/ Federal Status	Most Recent Observation	Town
Philadelphia Panic-grass	Panicum philadelphicum ssp. philadelphicum	Vascular Plant	Special Concern	2002	Ludlow
Phyllira Tiger Moth	Apantesis phyllira	Butterfly/Moth	Endangered	2011	Chicopee
Pine Barrens Zanclognatha	Zanclognatha martha	Butterfly/Moth	Special Concern	1994	Chicopee
Purple Milkweed	Asclepias purpurascens	Vascular Plant	Endangered	2019	Granby
Putty-root	Aplectrum hyemale	Vascular Plant	Endangered	2017	Granby
Red Mulberry	Morus rubra	Vascular Plant	Endangered	2016	Granby
Riverine Clubtail	Stylurus amnicola	Dragonfly/Damselfly	Endangered	2011	Chicopee
Scrub Euchlaena	Euchlaena madusaria	Butterfly/Moth	Special Concern	2002	Chicopee
				2001	Granby
Sedge Wren	Cistothorus platensis	Bird	Endangered	1928	Granby
Shining Wedgegrass	Sphenopholis nitida	Vascular Plant	Threatened	2009	Granby
Shortnose Sturgeon	Acipenser brevirostrum	Fish	Endangered/ Endangered	2018	Chicopee
Swamp Dock	Rumex verticillatus	Vascular Plant	Threatened	2009	Granby
Tidewater Mucket	Leptodea ochracea	Mussel	Special Concern	2015	Chicopee
Toothcup	Rotala ramosior	Vascular Plant	Endangered	2002	Ludlow
Upland Sandpiper	Bartramia longicauda	Bird	Endangered	2017	Chicopee
				2015	Ludlow
Upright Bindweed	Calystegia spithamaea	Vascular Plant	Endangered	1875	Granby
Vesper Sparrow	Pooecetes gramineus	Bird	Threatened	2017	Chicopee
Violet Wood-sorrel	Oxalis violacea	Vascular Plant	Endangered	2019	Granby
Whorled Milkweed	Asclepias verticillata	Vascular Plant	Threatened	2016	Granby
Wood Turtle	Glyptemys insculpta	Reptile	Special Concern	Historic	Chicopee
				2017	Ludlow
				2013	Granby

Appendix F- Known invasive and undesirable vegetation and control methods

Known invasive and undesirable vegetation and control methods for Westover ARB

Species	Control Actions	Herbicide Application	Known Locations	Estimated acreage
Purple Loosestrife (*Lythrum salicaria*)[1]	Hand-pulling and cutting can be effective for small infestations with easy access. Herbicides are commonly the most effective method of control.	An aquatic formulation of glyphosate herbicide is very effective for killing purple loosestrife, applied before seed set.	Two wetland areas located to the north of the Base near the property boundary bordering Wade Lake contain significant concentrations of purple loosestrife.	14.0
Japanese Knotweed (*Polygonum cuspidatum*) [1]	Repeated cutting throughout growing season can deplete plant reserves. Herbicides are very effective.	Apply glyphosate to cut stems or whole plant.	Wet areas along north and east boundaries.	18.0
Spotted Knapweed (*Centaurea maculosa*)[1]	Biocontrol, hand pulling small infestations, herbicide application.	Apply pre-emergent and Imazapic to grassland areas. Apply selective herbicide as needed after initial mowing. Continue biocontrol releases as available.	Scattered along the eastern boundary and runway.	29.5
Common Reed (*Phragmites australis*)[1]	Combination of cutting and chemical control.	Apply glyphosate to cut stems or whole plant.	Wet areas along the north and east boundaries.	26.3
Oriental Bittersweet (*Celastrus orbiculatus*)[1]	Combination of cutting and chemical control.	Triclopyr or glyphosate application to cut stumps.	On Westover AFB, Oriental bittersweet is found in the northern portion near Stony Brook.	7.5
Multiflora Rose (*Rosa multiflora*)[1]	Repeated cutting, chemical control methods	Apply glyphosate, aminopyralid, or triclopyr to cut stems or whole plant.	Locations unavailable	
Glossy Buckthorn (*Rhamnus frangula*)	Combination of cutting and chemical control.	Triclopyr or glyphosate application to cut stumps or whole plant.	Glossy buckthorn is concentrated in the north and northwest edges of Westover ARB.	22.0
Canada Thistle (*Cirsium arvense*)	Combination of cutting and chemical control	Apply glyphosate to cut stems or whole plant.	Locations unavailable	
Japanese Barberry (*Berberis thunbergii*)[1]	Prescribed fire, pulling, cutting, chemical control.	Fire will top-kill the plant, leaving a much smaller sprouting plant to finish off with glyphosate or triclopyr application.	Locations unavailable	

Known invasive and undesirable vegetation and control methods for Westover ARB

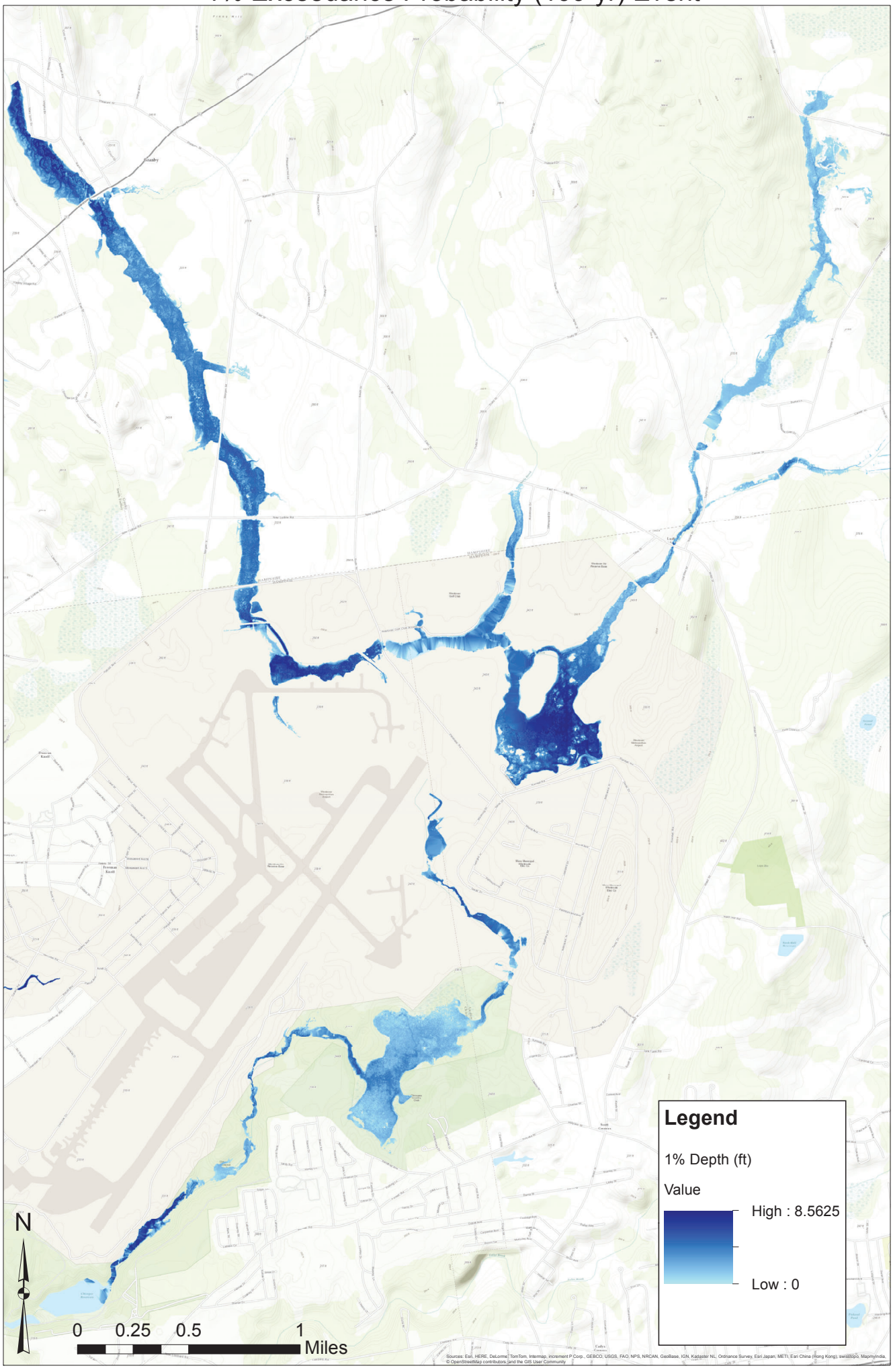
Species	Control Actions	Herbicide Application	Known Locations	Estimated acreage
Winged Burning Bush (*Euonymus alatus*)[1]	Hand pulling small plants, cutting, chemical control.	Apply glyphosate to cut stems or whole plant.	Locations unavailable	
Common Mullein (*Verbascum thapsus*)	Hand pulling, chemical control with pre-emergents or systemic herbicides.	Pre-emergents will prevent seed germination where applied. Apply glyphosate or triclopyr to plants before seed set.	Locations unavailable	
Poison Ivy (*Toxicodendron radicans*) and Poison Sumac (*Rhus vernix*)	Hand pulling, cutting, chemical control.	Pull plants with skin protection. Apply glyphosate or triclopyr to cut stems or whole plant. Repeat application likely necessary.	Locations unavailable	
Autumn Olive (*Elaeagnus umbellata*)[1]	Prescribed fire, cutting, chemical control.	Fire top-kills Autumn olive, but it resprouts. Apply glyphosate to cut stems in late summer/fall.	Autumn olive is present along much of the northern boundaries.	93.5
Garlic Mustard (*Alliaria petiolata*)[1]	Hand pulling, chemical control.	Pre-emergents will prevent seed germination where applied. Hand pulling is effective if entire root is removed. Apply glyphosate to dense infestations in spring or fall.	On Westover AFB, garlic mustard is located in a landfill area at the northern boundary.	5.5
Black swallow-wort (*Cynanchum louiseae*)	Hand pulling, mowing, chemical control.	Hand pulling and mowing can decrease seed production, but plants will sprout back. Pre-emergents will prevent seed germination where applied. Apply glyphosate or triclopyr to cut stems or entire plant during active growing season.	Black swallow-wort is documented in several locations in the northern portion of Westover ARB.	13.0
Tree of Heaven (*Ailanthus altissima*)	Combination of cutting and chemical control	Apply glyphosate, aminopyralid or triclopyr to fresh cut stumps or foliage. Repeat application as needed.	Tree of heaven occurs in relatively few, isolated locations in the south and eastern portions of Westover ARB.	2
Black Locust (*Robinia pseudoacacia*)	Combination of cutting and chemical control	Apply triclopyr or glyphosate to cut stumps, as basal bark application, or to foliage.	Black locust occurs in the northern portion of Westover ARB, predominantly near the old landfill site.	17.5

Appendix G- 2018 NOAA Climate Survey- Chapter 18 Northeast

https://nca2018.globalchange.gov/chapter/18/

Appendix H- 100 Year Floodplain Map

1% Exceedance Probability (100-yr) Event



Appendix I- List of Federal and State Threatened and Endangered Species (Save)

Appendix J- List of Flora and Fauna Species Known to Occur on location (Save)

Appendix K- 2017 MA SHPO National Register Eligibility Opinion

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

December 19, 2017

Colonel Karen Magnus
Commander, 439th Mission Support Group
250 Patriot Avenue
Westover ARB, MA 01022

RE: National Register Eligibility Opinion, Westover Air Reserve Base, Chicopee, MA;
MHC# RC.12313

Dear Ms. Magnus:

The Massachusetts Historical Commission (MHC), office of the Massachusetts State Historic Preservation Officer (MA SHPO), has reviewed the additional information you submitted, received August 29, 2016 and September 22, 2016, concerning Westover Air Reserve Base in Chicopee, MA. The MHC appreciates receiving and reviewing the information that was submitted in response to an MHC letter dated June 17, 2016 requesting additional data in order for the MHC to evaluate your agency's Westover Air Reserve Base (WARB) National Register eligibility opinion of 2011. After a review of the information submitted, MHC staff have the following comments.

The Westover Air Reserve Base (WARB) had conducted a study in 2011 and made a new Determination of Eligibility (DOE) of facilities at WARB. The WARB 1995 evaluation indicated that a historic district consisting of thirty-nine contributing buildings and seven individually eligible buildings met the criteria of eligibility for listing in the National Register of Historic Places (NRHP) (36 CFR 60). On November 1, 1995, the MHC concurred with that 1995 DOE.

Information in the 2011 study indicated that it is WARB's opinion that the 1995 report incorrectly applied National Register Criteria for Evaluation because it based its eligibility determinations primarily on historic significance and downplayed the base's already substantially diminished historic integrity. As of 2011, WARB had demolished twenty of the buildings that were contributing resources identified in the 1995 report. The MHC understands that it is the opinion of the WARB that the WARB has undergone considerable alterations since the period of significance ending in 1973, which the WARB believes have resulted in a substantial loss of integrity. The 2011 WARB DOE indicated the following:

> WARB, while historically significant, does not contain an eligible National Register district due to its substantial loss of historic integrity needed to represent its Period of Significance. However, two of Westover's WWII-era buildings (Buildings 1502 and 1520) retain enough individual significance and integrity to be considered individually eligible for the NRHP.

In a letter dated July 15, 2011, the MHC noted that it was not able to concur with the 2011 WARB DOE and required that all of the buildings; structures; and other facilities, including but not limited to fields, grounds, and tennis courts, be included in the evaluation information, and that this should include resources both currently and previously functionally related to WARB. The MHC also requested additional information about Building 1800, Building 1850, and Buildings 5100-5105.

The MHC very much appreciated that information was submitted. WARB indicated in their submitted informational packet and the revised eligibility opinion that the current base and the former boundaries of the Westover base do not, in their entirety, meet the criteria of eligibility for listing in the National Register of Historic Places as a potential district.

The MHC noted that in portions of WARB's eligibility opinion, the fifty-year cutoff date was used as the end point for eligibility and that in other portions of the submission, 1973 was utilized instead, since that included the period during the Cold War when Westover started to sell off pieces of their property as part of their transitioning to a new role in the Armed Forces. It is the opinion of MHC that

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1973 would be a good ending date for the period of significance since it denotes a major demarcation in the use of Westover and the commencement of selling off portions of its land in response to Westover's changing mission. The MHC had requested that a line map diagram similar to the one that WARB provided of the current WARB boundaries proper be provided that illustrates what was once Westover's boundaries in 1973. Although some of this land has been sold, subdivided, and developed under various owners since it was once part of Westover, its 1973 boundaries are historically noteworthy. After evaluating this newly received information along with the information from 2016, 2011, and updates, the MHC provides the following comments regarding the eligibility opinion of the WARB.

While it is the opinion of MHC staff that the entire WARB in its current boundaries does not meet the criteria of eligibility for listing in the National Register of Historic Places, it is the opinion of MHC staff that the five hangars—Buildings 7087, 7075, 7073, 7072, and 7071—despite having received alterations throughout the years nevertheless retain sufficient integrity to be identified as historic hangars and meet the National Register criteria of eligibility under criteria A and C at the local and state levels of significance (36CFR 60). The juxtaposition of these prominent structures with the nearby runways immediately convey the intent of the Base visually.

The MHC concurs that two of Westover's WWII-era buildings (Buildings 1502 and 1520) retain enough individual significance and integrity to be considered individually eligible for the NRHP (36 CFR 60). It is the opinion of the MHC that the remainder of Westover Air Reserve Base has either seen alteration of historic buildings or has received many demolitions and intrusions in recent years, and it is the opinion of the MHC that this area, which constitutes the majority of the Base, would not meet the criteria of eligibility for listing in the National Register of Historic Places due to a lack of integrity (36 CFR 60).

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), and M.G.L. Chapter 9, sections 26-27C, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71.00). Please do not hesitate to contact Betsy Friedberg at this office if you have any questions regarding this National Register eligibility opinion.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

xc: Chicopee Historical Commission
John Moriarty, Westover Air Reserve Base

15.0 ASSOCIATED PLANS

Tab 1 – Wildland Fire Management Plan

Please Contact Mr. John Cody at john.cody.9@us.af.mil or 413-557-3036 for a copy of the plan.

Tab 2 – Bird/Wildlife Aircraft Strike Hazard (BASH) Plan

Please Contact Mr. John Cody at john.cody.9@us.af.mil or 413-557-3036 for a copy of the plan.

Tab 3 – Vegetation Management Plan

Please Contact Mr. John Cody at john.cody.9@us.af.mil or 413-557-3036 for a copy of the plan.

Tab 4 – Integrated Cultural Resources Management Plan (ICRMP)

Please Contact Mr. John Cody at john.cody.9@us.af.mil or 413-557-3036 for a copy of the plan.

Tab 5 – Integrated Pest Management Plan (IPMP)

Please Contact Mr. John Cody at john.cody.9@us.af.mil or 413-557-3036 for a copy of the plan.

Tab 6 - Spill Plan

Please Contact Mr. John Cody at john.cody.9@us.af.mil or 413-557-3036 for a copy of the plan.

Tab 7- Hazardous Waste Management Plan

Please Contact Mr. John Cody at john.cody.9@us.af.mil or 413-557-3036 for a copy of the plan.