Department of the Air Force

Integrated Natural Resources Management Plan

USAF Academy

2023 - 2028

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.

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 adopt the most recent version of this template available in the Plan Tool.

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

INRMP APPROVAL/SIGNATURE

This Integrated Natural Resources Management Plan (INRMP) has been prepared in accordance with the regulations, standards, and procedures of the Department of Defense, the U.S. Air Force, and the Sikes Act Improvement Act 0f 1997 (16 United States Code [U.S.C.] 670a) in cooperation with the U.S. Fish and Wildlife Service (USFWS) and Colorado Parks and Wildlife (CPW). This INRMP provides for management and stewardship of all natural resources present on the U.S. Air Force Academy (Academy), including Farish Recreation Area (Farish) and Bullseye Auxiliary Airfield (Bullseye).

To the extent that resources permit, the USFWS, CPW, and the Academy, by signature of their agency representative, do hereby agree to enter a cooperative program for the conservation, protection, and management of natural resources present on the Academy. The intention of this agreement is to develop functioning, sustainable ecological communities on the Academy that integrate the interests and missions of the agencies charged with conservation, protection, and management of natural heritage in the public interest. This agreement may be modified and amended by mutual agreement of the authorized representatives of the three agencies. This agreement will become effective upon the date of the last signatory and shall continue in full force for a period of 5 years or until terminated by written notice to the other parties signing the agreement.

By their signature below, or an attached letter of concurrence, all parties grant their concurrence with and acceptance of the following document.

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Date: 2023.04.10 11:51:04 -06'00'

Colorado Ecological Services Field Supervisor, U.S. Fish and Wildlife Service

Tim Kroening Digitally signed by Tim Kroening
Date: 2023.03.23 09:58:04 -06'00'

Area 14 Wildlife Manager, Colorado Parks and Wildlife

LEONARD.CHRISTOPHER.J.1100996371 Digitally signed by LEONARD.CHRISTOPHER.J.1100996371
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Commander, 10th Air Base Wing

[SIGNATURE]

EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) has been developed for the U.S. Air Force Academy (Academy) and the Air Force Civil Engineer Center (AFCEC) in accordance with Air Force Manual (AFMAN) 32-7003, Environmental Conservation; 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.). This revised INRMP provides an updated description of the Academy, the Farish Recreation Area (Farish), and Bullseye Auxiliary Airfield (Bullseye) and presents various management practices designed to mitigate impacts and enhance the local and regional ecosystems in support of the Academy's training/education mission. These recommendations have been balanced against the requirements of the Academy to accomplish its mission at the highest possible level of efficiency. To obtain an accurate assessment of the Academy's influences, analyses were conducted to determine the physical and biotic nature of the Academy and the surrounding environment, as well as the operational activities taking place.

This INRMP is a practical guide for the management and stewardship of all natural resources present on the Academy, while ensuring the successful accomplishment of the military mission. The original baseline INRMP (version 2008-2013) was developed using an interdisciplinary approach in which information was gathered from a variety of organizations, including the U.S. Fish and Wildlife Service (USFWS), Colorado Parks and Wildlife (CPW), U.S. Forest Service (USFS), and Colorado Natural Heritage Program (CNHP).

Coordination of the INRMP with USFWS and CPW satisfies the Sikes Act (16 U.S.C. §670a et seq.) requirement that the plan be prepared in mutual agreement with the USFWS and the appropriate state fish and wildlife agency. On an annual basis, the Academy meets with USFWS and CPW representatives to discuss the previous year's management accomplishments, Sikes Act compliance, and the workplan for the upcoming year. Updates or revision of the INRMP is accomplished in a timely manner by editing this eINRMP document.

The maintenance and enhancement of regional biological diversity and ecosystem function is particularly important in the management of natural resources and will be accomplished through the implementation of specific management practices identified in this INRMP. For example, by protecting the riparian corridors and their associated habitats—areas which not only protect and support regional biodiversity, but also provide and protect important ecosystem functions—this INRMP will help perpetuate the form and function of native communities and natural processes.

The Plan presents practicable alternatives and recommendations that would minimize impact on the Academy missions while providing for management and stewardship of natural resources that will conserve and enhance the regional ecosystems in which the Academy, Farish Recreation Area, and Bullseye Auxiliary Airfield, are embedded.

The overarching goals of the INRMP are as follows:

- Manage for no net loss in the capability to support the military mission
- Minimize habitat fragmentation and promote the natural connectivity of habitats
- Protect native species and discourage nonnative, invasive species
- Protect rare and ecologically important species and unique or sensitive environments
- Maintain or mimic natural ecological processes
- Protect genetic diversity and population-level interchange
- Conserve and enhance species, communities, and ecosystems on a regional basis
- Monitor and mitigate impacts on biodiversity
- Provide quality, sustainable outdoor recreation opportunities
- Evaluate and mitigate the effect of climate change in natural resource management and land use practices

From these goals, specific objectives and management actions were identified that structure this Plan's guidance and implementation. However, each of the strategies described should be monitored so that adaptive management modifications can be made during implementation as conditions change.

Throughout the development of this INRMP, management issues were identified in a number of natural resources subject areas. Some of these natural resource concerns could have an adverse impact on the Academy's mission or future planning operations. The potential negative impacts could range from delays in the construction of new buildings to loss of life resulting from severely damaged aircraft. One of the purposes of this INRMP is to identify goals and objectives and to obtain workable and useful solutions for each topic of concern. Examples of such issues include:

- Any projects which are anticipated to impact wetlands must acquire approval and the appropriate permits from the U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (USEPA), and the Colorado Department of Natural Resources (CDNR). Jurisdictional delineations must be accomplished for each potentially affected wetland.

- Any projects that are anticipated to significantly impact floodplains must undergo the National Environmental Policy Act (NEPA) process per 32 Code of Federal Regulations (CFR) 989. Any projects that permanently alter the hydrology of a floodplain must be reported to the Federal Emergency Management Agency (FEMA).
- The Academy possesses populations of, and habitat features that are attractive to, species that pose a high Bird/Wildlife Aircraft Strike Hazard (BASH) threat.
- The Academy supports a population of the federally threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*) that must be protected and conserved in accordance with the Endangered Species Act and the Academy's Conservation Agreement with the USFWS.
- Development within the Monument Creek Watershed has caused significant hydro-modification that is affecting the wetland and riparian habitat and infrastructure of the Academy.
- Climate change, forest pests, and the potential for wildland fires is threatening to dramatically alter the Academy's forested landscape.

Substantive updates or additions to the previously approved INRMP include:

- Section 2.2.1. Updated the weather data to include a summary from 1967-2022.
- Section 2.2.4. Included surface area and water volume data for the USAFA and Farish lakes and reservoirs; added new watershed maps.
- Section 2.3.1. Added new mapping of the Potential Conservation Areas identified by the Colorado Natural Heritage Program.
- Section 2.3.2.2. Added new mapping of the USAFA, Farish, and Bullseye vegetation cover.
- Section 2.3.3. Added information on bat species occurring or potentially occurring on the installation.
- Section 2.3.4. Included a discussion on USAFA's participation on the Preble's Site Conservation Team; included information on surveys for tricolored bat and eastern black rail (potential listed species on USAFA); added new maps of the mouse conservation zone and off-base critical habitat; added a list of state and federal species of concern and updated their current conservation status.
- Section 2.3.5. Added new maps of USAFA and Farish wetlands and floodplains.
- Section 2.4.2. Added maps of USAFA and Farish Land Use Designations and recreational trails.
- Section 7.8. Updated beetle and forest pest infestation information.
- Section 7.9. Added information on the 5-year fuels management plan.
- Section 7.11. Added a table of noxious weeds observed on the installation.
- Section 7.16. Included a discussion of natural resource climate change vulnerability.
- Section 8.3.3.4. Added a new project to utilize beaver dam analogs to stabilize creeks and restore riparian habitat.
- Section 10. Updated the annual work plans for 2023-2028.

1 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

This Integrated Natural Resources Management Plan (INRMP) has been developed for use by the U.S. Air Force (USAF) Academy (the Academy) and the Air Force Civil Engineer Center (AFCEC) in accordance with AFMAN 32-7003, Environmental Conservation; Air Force Policy Directive (AFPD) 32-70, Environmental Quality; and the provisions of the Sikes Act (16 United States Code [U.S.C.] 670a et seq.).

This INRMP provides a description of the Academy, Farish Recreation Area, and Bullseye Auxiliary Airfield (e.g., location, history, and mission), information about the surrounding physical and biotic environment, and an assessment of the impacts on natural resources as a result of mission activities. Furthermore, the INRMP recommends various management practices, in compliance with Federal, state, and local standards, designed to mitigate negative impacts and to enhance the positive effects of the Academy's mission on local ecosystems.

This INRMP integrates all aspects of natural resources management with the rest of the base's mission, and therefore becomes the primary tool for managing the base's ecosystems while ensuring the successful accomplishment of the military mission at the highest possible levels of efficiency. The INRMP is a guide for the management and stewardship of all natural resources present on the base. A multiple-use approach is implemented to allow for mission-oriented activities, as well as environmental quality and outdoor recreation through the efficient management of natural resources.

The information presented in this INRMP is incorporated into the Installation Development Plan. The Academy's comprehensive management planning process should continually incorporate the concerns presented in this INRMP so that the growth and use of the base can progress in a manner consistent with, and complementary to, the objectives of the USAF with respect to the protection of natural resources. Note that the cultural resources present on the Academy are addressed fully in a separate Integrated Cultural Resources Management Plan (ICRMP), and, as such, are only briefly discussed in the Cultural Resources Plan section of this plan.

1.2 Management Philosophy

This INRMP presents practicable alternatives and recommendations that allow for the protection and enhancement of natural resources and conservation of existing ecosystems, while minimizing impacts on the base's missions. Consequently, the implementation of some of these recommendations will sacrifice improvement of the Academy's natural resources in deference to the safety and efficiency of the mission. The Management Philosophy and INRMP was developed through interdisciplinary input and coordination between the Air Force Academy, US Fish and Wildlife Service, and Colorado Parks and Wildlife during annual Sikes Act Coordination meetings, draft plan reviews, and other routine interactions.

The mission of the Academy's Natural Resources Office is "*In support of the military education and training mission, conserve and enhance the Air Force Academy's natural resources through the application of sound science and proactive stewardship practices.*".

1.3 Authority

This INRMP is developed under, and proposes actions in accordance with, applicable Department of Defense (DOD) and USAF policies, directives, and instructions. The Sikes Act (Title 16 U.S.C.) and AFMAN 32-7003, Environmental Conservation, 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 that include DOD Directive 4715.3, Environmental Conservation Program; AFPD 32-70, Environmental Quality; AFI 32-7065, Cultural Resources Management; and AFMAN 32-7003. DOD Directive 4715.3 provides direction for DOD installations in establishing 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. Appendix A summarizes key legislation and guidance used to create and implement this INRMP.

This INRMP is a "living" document, subject to periodic updates or changes, which integrates all aspects of natural resources management at the Academy. Proper utilization of this Plan for the conservation of natural resources should not impair the ability of the base to perform its missions.

The USAF considers its goals and objectives with respect to the protection and enhancement of natural resources when planning projects and mission changes. Potential impacts are assessed, and possible alternatives that reduce negative impacts are explored through the planning and NEPA process. Applicable sections of this Plan are referenced when establishing new natural resources management strategies in response to changing missions or new projects.

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

Overarching Environmental Standards	USAFA-specific Standards provided to organizations, consultants, contractors, and partners to promote environmental compliance and protection.
USAFAI 32-7001	Natural Resources on the USAF Academy, 30 January 2019
USAFA Pest Management Plan	Policies and procedures for the control and management of plant and animal pests
USAFA Erosion Control, Revegetation , and Tree Care Standards	USAFA-specific site restoration Standards included as part of the Overarching Environmental Standards
USAFA 91-212 BASH Plan	Bird-Aircraft Strike Hazard (BASH) Plan
Preble's Meadow Jumping Mouse Conservation Plan and Agreement	USAFA/USFWS policies and conservation practices for managing the threatened Preble's mouse

1.4 Integration with Other Plans

AFMAN 32-7003, Environmental Conservation, requires that natural resources management is integrated with key AF programs. AFI 32-7062, Air Force Comprehensive Planning, specifies the INRMP is a key component plan of the Installation Development Plan (IDP). Additionally, AFMAN 32-7003, section 3.12.3, *Integration with Other Installation Programs*, states, "Coordinate draft INRMP revisions through the installation chain of command and other identified stakeholders involved in INRMP implementation, to include the Bird Hazard Working Group. Ensure that the INRMP, Integrated Cultural Resources Management Plan (ICRMP), Bird/Wildlife Aircraft Strike Hazard (BASH) Plan (see Section 3M), Integrated Pest Management Plan, and Air Installation Compatible Use Zone studies are mutually supportive and not in conflict." Natural Resources Management is also integral to Readiness and Environmental Protection Integration (REPI) and Facility Excellence Plan (FEP). The purpose of INRMP integration with the IDP is to consider natural resources constraints and management strategies in conjunction with base development. The purpose of INRMP integration with the ICRMP is to assure elements of the natural resources program that may potentially affect cultural resources on the installation are properly identified and addressed. The purpose of INRMP integration with the BASH Plan is to ensure 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" (AFMA 32-7003, 3.64.1). The purpose of INRMP integration with the IPMP is to safeguard effective strategies for the management of pests and confirm the two plans are mutually supportive in these efforts and not in conflict of each other. The purpose of AICUZ study integration with the INRMP is to ensure AICUZ guidelines are incorporated into on-base land use planning within the natural resource program. The purpose of INRMP integration with REPI is to assess existing and future natural resources projects outlined in an approved INRMP for opportunities to merge conservation with land use objectives that benefit mission. The purpose of INRMP integration with the FEP is to align natural resources management efforts with established design guidance for standardizing and improving the quality of the total installation environment. Specifically, the FEP's outlined Landscape Design Standards addressing the natural environment with regard to objectives, guidelines, recommended plant selections, plant spacing, and site furnishings – i.e., approved tree species selection and site-specific seed mix requirements – compatible with INRMP goals and objectives.

2 INSTALLATION PROFILE

Office of Primary Responsibility (OPR)	10 CES/CEIEA 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)	Brian Mihlbachler, Ph.D. (719) 333-3308 brian.mihlbachler@us.af.mil
State and/or local regulatory POCs (Include agency name for Sikes Act cooperating agencies)	U.S. Fish and Wildlife Service (Sikes Act) – Rickey Jones Colorado Parks and Wildlife (State/Local)- Mitch Martin
Total acreage managed by installation	19,322
Total acreage of wetlands	253
Total acreage of forested land	10,500
Does installation have any Biological Opinions? (If yes, list title and date, and identify where they are maintained)	ES/GJ-6-CO-00-F-009, Preble's Meadow Jumping Mouse, 12 Apr 2000 Biological Opinion and Conservation Agreement documents are maintained at 10 CES/CEIEA
Natural Resources Program Applicability (Place an X in the brackets "[X]" next to each program that must be implemented at the installation. Document applicability and current management practices in Section 7.0)	[X] Fish and Wildlife Management [X] Outdoor Recreation and Access to Natural Resources [ ] Conservation Law Enforcement [X] Management of Threatened, Endangered, and Host Nation-Protected Species [X] Water Resource Protection [X] Wetland Protection [X] Grounds Maintenance [X] Forest Management [X] Wildland Fire Management [ ] Agricultural Outleasing [X] Integrated Pest Management Program [X] Bird/Wildlife Aircraft Strike Hazard (BASH) [ ] Coastal Zone and Marine Resources Management [X] Cultural Resources Protection [X] Public Outreach [X] Geographic Information Systems (GIS)

2.1 Installation Overview

2.1.1 Location and Area

Air Force Academy

The 18,471-acre Academy is situated along the Rocky Mountain Front Range in Colorado about 6 miles north of downtown Colorado Springs and approximately 60 miles south of Denver. The Academy covers a land area about 5-miles wide by 7-miles long. The Rampart Range, which forms the western boundary of the Academy, is a north-south trending uplift within the Front Range that extends from Platte Canyon near Denver south to Pikes Peak. The Academy's shares its western boundary with the US Forest Service (USFS) Pike National Forest. Private property north, east, and south of the installation has rapidly developed, for both commercial and residential use, since the 1990's. The Academy is bisected north-south by the Union Pacific railway, Interstate 25, and El Paso County's New Santa Fe Trail easement.

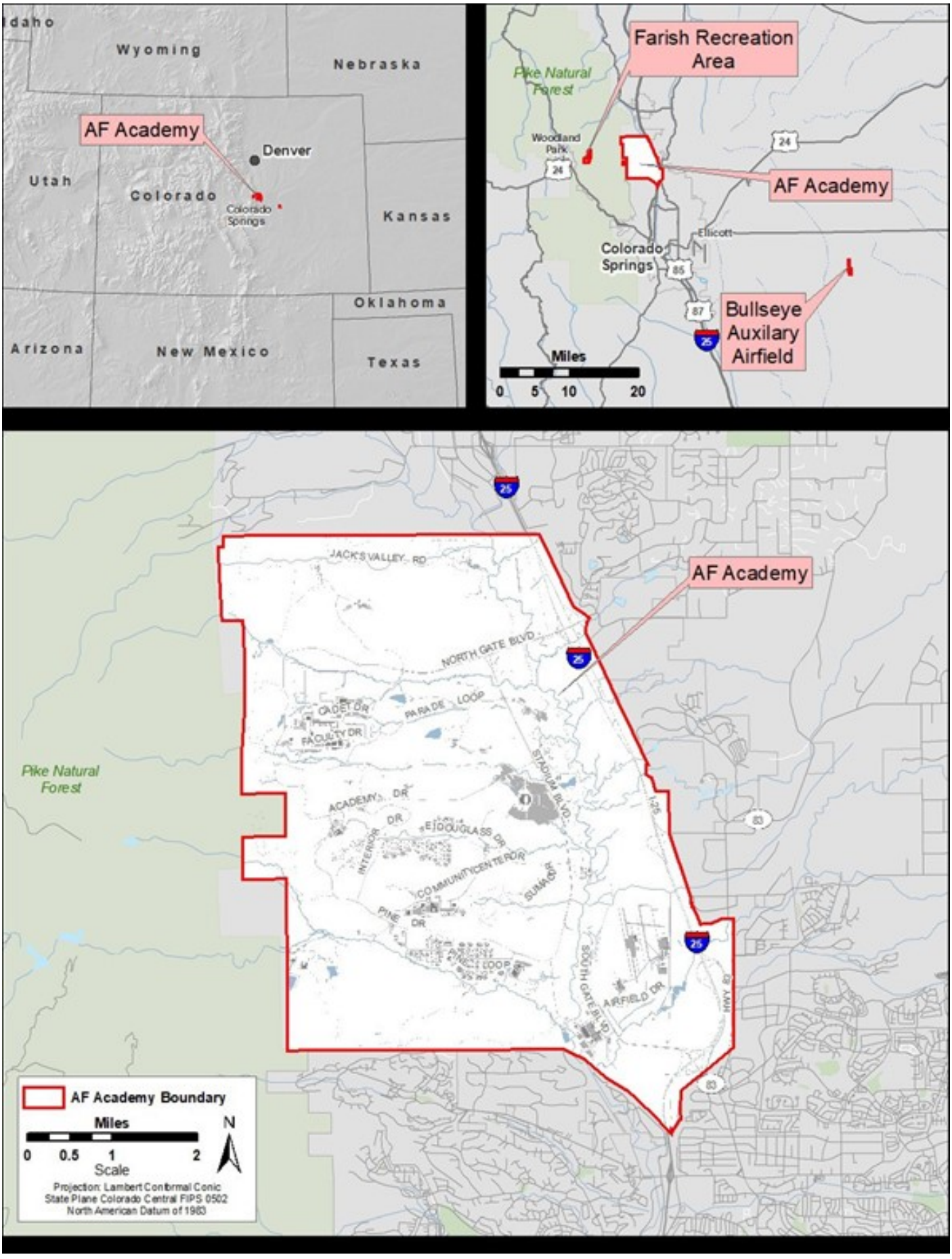
Farish Recreation Area

The 654-acre Farish Recreation Area is a detached unit to the Academy approximately 4.5 aerial miles northeast of Woodland Park in El Paso County in the Rampart Range. Farish is accessed from the Academy by car via U.S. Highway 24 and Rampart Range Road, or by foot or horseback via Pike National Forest Trail 707/721 through Stanley Canyon. Farish is bordered by private property and the Pike National Forest. There is a 10-acre privately-owned parcel within the middle of Farish.

Bullseye Auxiliary Airfield

The 197-acre Bullseye Auxiliary Airfield is approximately 8 aerial miles east-southeast of Ellicott, El Paso County, Colorado on rural land leased from the Colorado State Land Board.

U.S. Air Force Academy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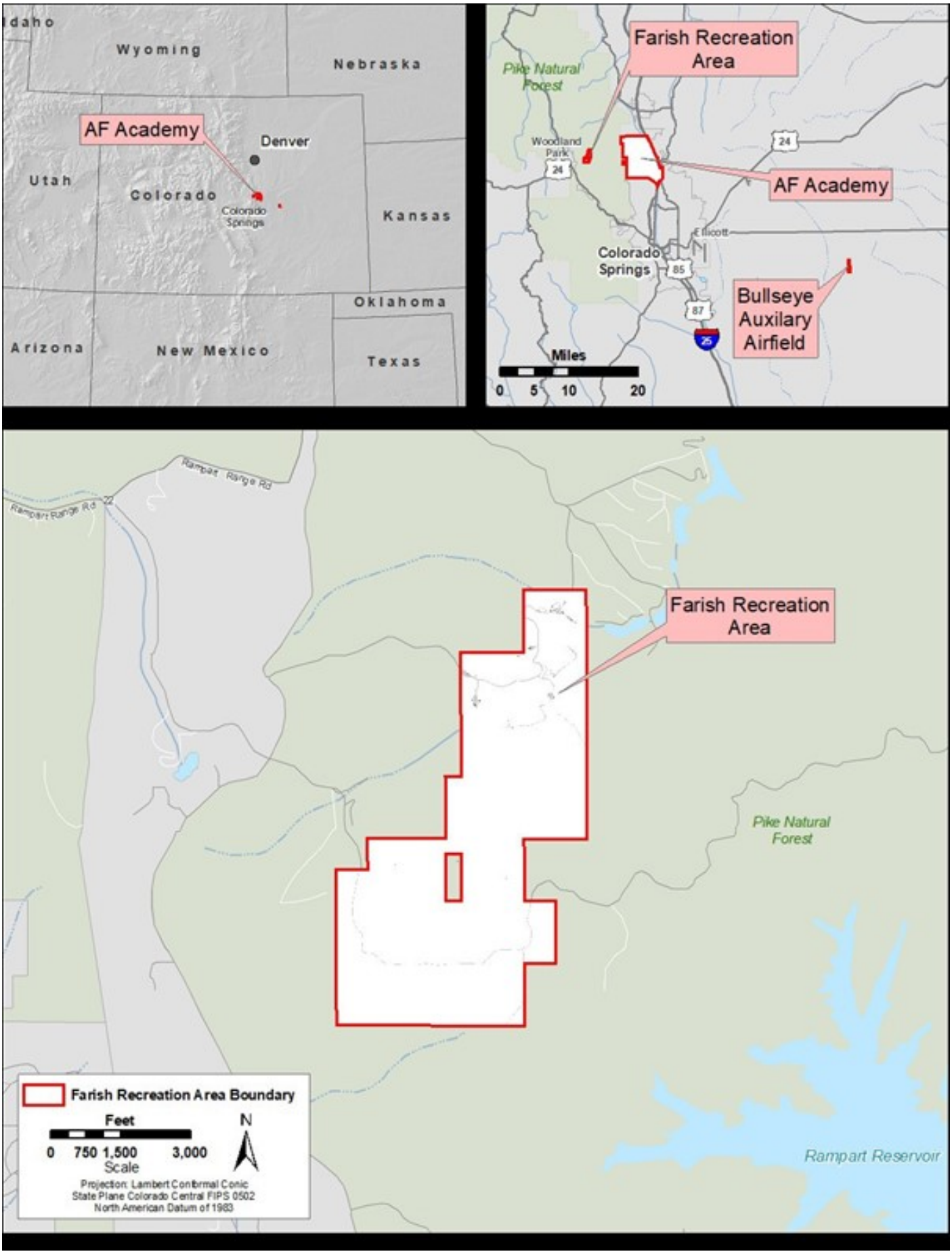
Farish Recreation Area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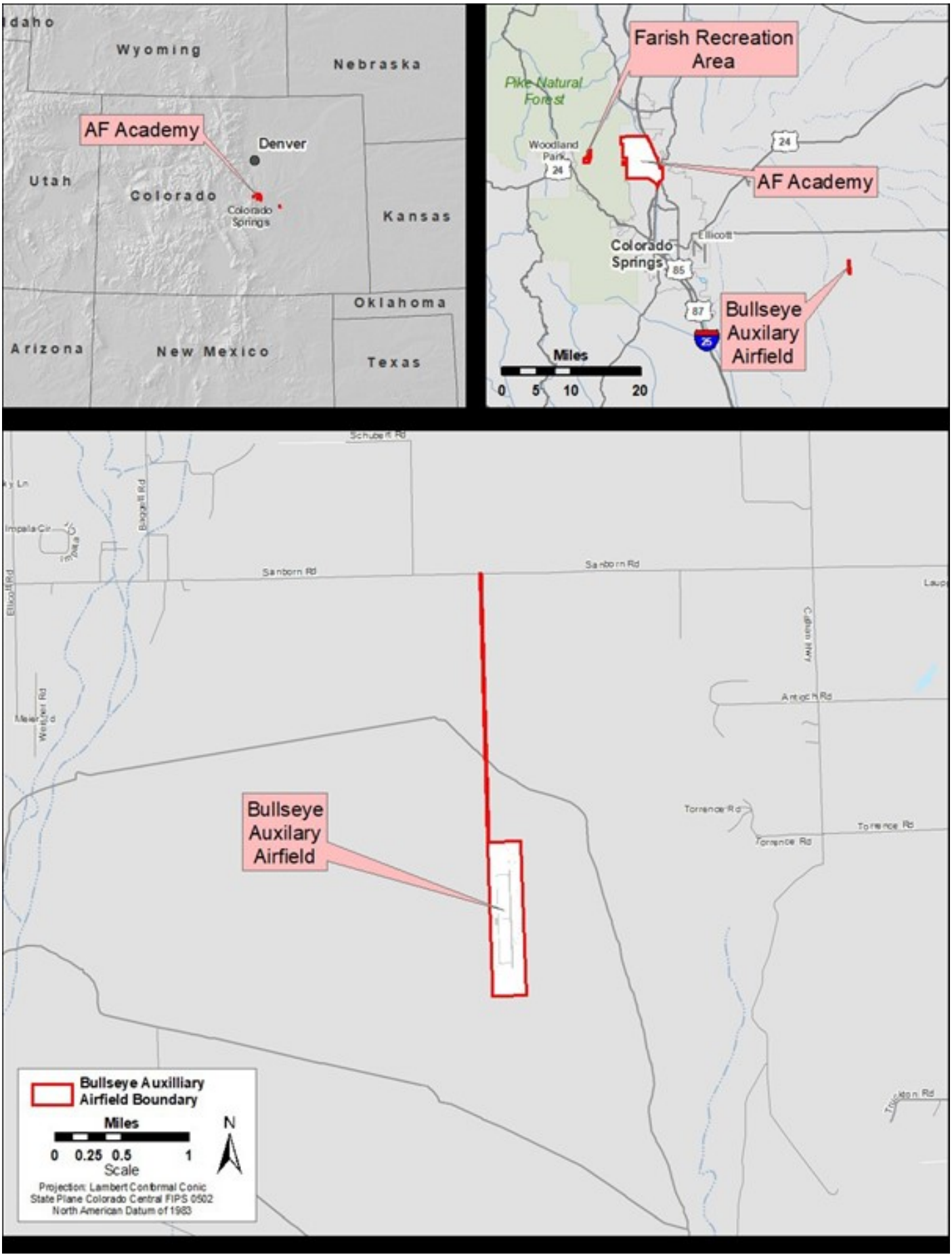
Bullseye Auxiliary Airfield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Installation/GSU Location and Area Descriptions

Installation/ Geographically Separated Unit (GSU)	Main Use/Mission	Acreage	Addressed in INRMP?	Describe Natural Resource Implications
Farish Recreation Area	Recreation: camping, hiking, fishing, wildlife viewing	654	*yes*	No federally listed species. Forestry, trails, noxious weeds, and recreational fisheries are primary management concerns
Bullseye Auxiliary Airfield	Flight training	197	yes	No federally listed species. Migratory bird/BASH and other wildlife issues are primary management concerns
US Air Force Academy	Military training, education	18,471	yes	Federally threatened species present. Forestry, fish and wildlife, range and watershed protection, wildland fire, outdoor recreation are primary management concerns

2.1.2 Installation History

Air Force Academy

The idea for the Academy surfaced almost six decades ago, but did not become a reality until April 1, 1954, when President Dwight D. Eisenhower signed the bill establishing the USAF Academy. The legislation required that a five-member commission be appointed to advise the Secretary of the USAF of a permanent location for the Academy. The site-selection criteria the commission developed were similar to those of the first site-selection board, with the addition of size. They determined that a minimum of 15,000 acres would be required to accommodate academic facilities, flight training, rifle and machine gun ranges, maneuver areas, athletic fields, and space for future expansion. The group also foresaw that the Academy would become a national monument, as had the U.S. Military Academy at West Point, New York, and the U.S. Naval Academy at Annapolis, Maryland, and decided that consideration should be given to the natural beauty of the site.

Congress authorized creation of the Academy in 1954. Harold E. Talbott, then Secretary of the USAF, visited three possible sites presented to him by the site selection commission, and on June 24, 1954, he selected the Colorado Springs site. Commission members were favorably impressed by the fact that both the City of Colorado Springs and the State of Colorado wanted the Academy. They also cited the natural beauty of the site and the way the scenic quality appropriately symbolized USAF character and tradition.

On July 11, 1955, the same year construction began, the first class of 306 men was sworn in at a temporary site at Lowry Air Force Base, Denver. Lt. Gen. Hubert R. Harmon, a key figure in the development of the Academy since 1949, was recalled from retirement to become the first superintendent.

Two years later, Maj. Gen. Briggs took over as the Academy's second superintendent. During his tour, on Aug. 29, 1958, the wing of 1,145 cadets moved to its present site from Denver. Less than a year later the Academy received accreditation. On March 3, 1964, the authorized strength of the Cadet Wing was increased to 4,417 and later reduced to its present number of approximately 4,000.

President Gerald R. Ford signed legislation Oct. 7, 1975, permitting women to enter the nation's military academies. Women entered the USAF Academy for the first time on June 28, 1976. The first class with women graduated in May 1980.

The Academy supports a total population of more than 4,000 cadets and 25,000 military and civilian personnel. Its sporting events and recreational opportunities attract thousands of visitors annually, and its scenic beauty creates a magnificent entry to the City of Colorado Springs.

Farish Recreation Area

The Farish Recreation Area has been owned and operated as an off-base military recreation area since 1959 when a 60-acre parcel containing two lodges was purchased and donated to the Academy. Its purpose is to provide an off-base, high-quality, natural, mountain outdoor recreation setting for the DOD community. The land was given in memory of First Lieutenant William

S. Farish Jr. who lost his life in the service of the Army Air Corps in World War II. Subsequent gifts and land purchases occurred in 1963, 1967, and 1969 bringing Farish to its current size of 654 acres. The two lodges and the caretaker's residence were designed by Colorado Springs architect Charles E. Thomas in the 1920s and 1930s. Grace Lake was created in 1930, Leo Lake was formed in the 1950s, and Sapphire Lake was built in 1965. Ranching, potato farming, and a small amount of mining have occurred in the southern part of the site, and there are remnants of agricultural fields, an icehouse, and a stock corral.

Since the USAF acquired the Farish Recreation Area, the property has been modified to meet the recreation needs of the Academy community. The area contains hiking trails and three fishing lakes. Entrance fees as well as overnight lodging and camping fees are charged. Paddleboats, cross-country skis, mountain bikes, fishing poles, and other equipment are available for rent. Facilities include small lodges, RV and tent campsites, picnic pavilions, cottages, a multipurpose building, a program barn, an entrance station and store, a bathhouse, and camper cabins.

Bullseye Auxiliary Airfield

The Academy acquired the use of the Bullseye Auxiliary Airfield in 1988 through a long-term lease from the State of Colorado to accommodate increases in T-41 pilot training, glider activity, and other types of aircraft operations that exceeded the capacity of USAFA's Davis Airfield. Considerations of safety, operational efficiency, and the Academy mission to better prepare cadets for more advanced pilot training established the need for a new auxiliary airfield.

2.1.3 Military Missions

The Academy’s mission is to educate and train cadets to be future leaders of the USAF and provide direct support for cadets and the base community. The natural resources management mission is to help the Academy maintain the natural setting for training and enjoyment, comply with environmental laws and regulations, and maintain healthy forest, range, and wildlife resources that provide multiple opportunities for consumptive and non-consumptive use. Oversight of the Academy’s natural resource management is the responsibility of the 10th Air Base Wing, 10th Mission Support Group, and 10th Civil Engineer Squadron. Significant coordination also occurs with the Cadet Training Wing, the 306th Flight Training Group, and the Force Support Squadron.

Tenants with Natural Resources Responsibility

Tenant Organization	Natural Resources Responsibility
U.S. Fish and Wildlife Service, Colorado Fish and Wildlife Conservation Office	Through a Cooperative Agreement, the U.S. Fish and Wildlife Service manages the Academy's Natural Resources Office and all natural resources on the installation
U.S. Department of Agriculture - Wildlife Services	USDA-WS implements the USAFA BASH plan and conducts wildlife hazard assessments

2.1.4 Natural Resources Needed to Support the Military Mission

The landscape of the Air Force Academy is a diverse assemblage of plant communities that offer a varied and challenging military training environment. Forests, shrublands, grasslands, and riparian areas offer realistic land resources for conducting close- combat training scenarios. Proper management of the natural landscape is critical for sustaining the long-term use and quality of the land-based resources needed to provide the required training environment. Revegetation and soil erosion control, noxious weed and fire management, watershed protection and restoration, and forest insect and disease control are management activities necessary to sustain the training landscape, aesthetics of the Academy, and outdoor recreation amenities.

2.1.5 Surrounding Communities

The Academy is in El Paso County, which has a population of 730,395 (2020). The City of Colorado Springs, located south and southeast of the Academy, is the largest nearby city with a population of 478,961 (2020) residents. Commercial and residential development north and east of the Academy is expanding and has created airfield noise and airspace encroachment concerns, stormwater management issues, and wildlife habitat (including T&E species) and wetlands impacts. The Academy pursues partnerships with local governments, developers, and private landowners to address these issues.

2.1.6 Local and Regional Natural Areas

The Rampart Range, which forms the western boundary of the Academy, is a north-south trending uplift within the Front Range that extends from Platte Canyon near Denver south to Pikes Peak. The Academy's western boundary is contiguous with that of the Pike National Forest. Other local natural areas include the Garden of the Gods Regional Park, Monument Fire Center, Fox Run Regional Park, and Black Forest Regional Park.

Farish Recreation Area

The Farish Recreation Area is embedded within the Pike National Forest and also bordered by several low-density private home sites.

Bullseye Auxiliary Airfield

The Bullseye Auxiliary Airfield is surrounded by shortgrass and mixed-grass prairie primarily used for cattle grazing. Property around Bullseye is owned by the State Land Board (SLB) and most is designated as State Stewardship Trust. This designation conveys additional resource "protection" above that on other SLB property.

2.2 Physical Environment

2.2.1 Climate

The Academy has a semi-arid climate, receiving approximately 15 inches of annual precipitation as rainfall and snow. Most precipitation occurs from April through September, with the highest amounts occurring as rainfall in July and August. Temperatures range from a mean of 25 degrees Fahrenheit (°F) in December to 67°F in July. The prevailing wind direction is from the north-northwest, with an average wind speed of 10 miles per hour. Wind velocities in excess of 70 miles per hour can occur, especially during the winter.

The weather data below summarizes information collected at the USAFA airfield from 1967-2022.

LOCATION_ID: FAA_KAFF
STATION: USAF ACADEMY AFLD, CO
LOCATION (DD): N 38.97 W 104.813
ELEVATION: 6572 ft / 2003.14 m
UTC to LST: -7
POR (Mean): 2012/01/01 - 2021/12/31
POR (Extreme): 1967/11/27 - 2022/10/31
PREPARED BY: 557 WW / 14 WS
POR (Detailed): 1967-1970, 1977-2021
YEARS: Period of Record (see mean POR >>>)
Authoritative climate summary - data quality and quantity sufficient to produce accurate climatological values

Temperature

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Extreme Max (F)	73	74	78	82	93	99	100	97	93	86	79	70	100
Average Max (F)	46	45	55	60	67	82	84	82	78	64	54	46	64
Daily Average (F)	29	27	37	42	51	66	68	66	61	46	37	28	46
Average Min (F)	18	18	26	32	40	51	55	53	48	34	25	17	35
Extreme Min (F)	-21	-22	-8	0	18	27	40	36	21	-4	-12	-21	-22
Max Diurnal Range (F)	50	58	50	50	52	52	47	49	52	56	54	56	58
Average # Days >= 90 F	0	0	0	0	0	5	5	3	1	0	0	0	14
Average # Days <= 32 F	30	26	25	19	5	0	0	0	1	14	25	30	174
Average # Days <= 0 F	2	2	1	0	0	0	0	0	0	#	1	2	8

* = Data not Available # = Occurrences rounded to zero

Precipitation

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Monthly Max (In)	1.1	1.1	3.2	8.4	10.3	6.4	6.7	6.3	5.7	4.1	2.0	1.5	23.5
Monthly Average (In)	0.3	0.3	0.9	1.3	2.1	1.8	2.5	2.6	1.2	0.7	0.5	0.3	14.9
Monthly Min (In)	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.0	0.0	7.5
Daily Max (In)	0.8	0.6	1.6	4.1	2.4	3.4	3.6	3.1	2.9	2.4	1.3	1.5	4.1
Monthly Max Snowfall (In)	13.6	23.0	24.6	22.6	14.0	0.4	0.0	0.0	8.2	21.5	21.2	15.7	93.6
Monthly Average Snowfall (In)	5.0	5.7	7.6	6.7	1.7	0.0	0.0	0.0	0.5	2.8	4.7	4.8	38.5
Daily Max Snowfall (In)	7.8	16.3	10.9	14.0	10.0	0.4	0.0	0.0	5.0	12.5	10.0	14.9	16.3
Days with Liquid = Trace	7	7	6	9	8	9	8	10	7	6	6	7	89
Days with Liquid >= 0.01"	3	5	5	7	11	8	13	10	6	5	3	4	80
Days with Liquid >= 0.5"	0	0	1	1	2	0	2	1	1	0	0	0	7
Days with Frozen = Trace	5	5	5	4	2	1	0	0	1	2	4	4	31
Days with Frozen >= 0.05"	4	5	5	4	1	0	0	0	0	2	4	4	29
Days with Frozen > 1.5"	1	1	2	2	0	0	0	0	0	1	1	1	9

* = Data not Available # = Occurrences rounded to zero T = Trace

Farish Recreation Area

Farish is approximately 2500-feet higher in elevation than the Academy, therefore the average temperature is expected to be lower and the amount of precipitation is expected to be higher. Woodland Park, Colorado has the most similar weather and climate.

Bullseye Auxiliary Airfield

Bullseye is east of the Academy on the Plains, therefore the average temperature is expected to be higher and the amount of precipitation is expected to be lower. Ellicott, Colorado has the most similar weather and climate.

2.2.2 Landforms

The boundary of the Academy was established based on the need for airspace, land-based military training, room for future expansion, and viewshed protection. The Academy was comprehensively master planned before construction began. The original master plan clustered development into separate functional use areas and devoted nearly 70 percent of the base to natural open space. The master plan regarded open space as integral to the overall design concept of the Academy, with uses intended to preserve views, restrict development in environmentally sensitive or unsuitable areas, separate and buffer subareas and functions, and provide for recreation.

Located at the base of Rampart Range, their are five distinct landforms that occur on the Academy, including the steep slopes of the Rampart Range; ridges of sedimentary rock parallel to the range; mesas and foothill ridges separated by broad valleys extending eastward from the mountains; the valley of the southward-flowing Monument Creek; and gentle rolling plains sloping southwestward toward Monument Creek.

At Farish Recreation Area the dominate landform is gently rolling hills and broad valleys.

The Bullseye Auxiliary Airfield landform is flat to slightly undulating plains.

2.2.3 Geology and Soils

Geology

Air Force Academy

The physiography of the Academy generally consists of a series of west-to-east trending ridges interspersed by valleys. Valley streams drain eastward into Monument Creek. Gentle southwest-trending slopes drain toward Monument Creek from the areas east of the Academy. The western boundary of the west-to-east traveling mesas and valleys is formed by an abrupt, north-south trending ridge of sedimentary rock, with the steep slopes of the Rampart Range forming the visual and physical backdrop to the Academy. Elevations range from 6,376 feet at Monument Creek near the South Gate to 7,800 feet at the base of the Rampart Range at Stanley Canyon.

The dominant physiographic feature and geologic Influence In this area is the Pikes Peak batholith, a huge mass of magma that pushed its way upward through existing rock approximately one billion years ago. The resultant rock type, reddish-pink Pikes Peak granite, is prevalent. An associated formation, the Dawson Arkose, underlies much of the Academy and is visible at several areas, especially along Monument Creek where it is exposed, and in several picturesque geologic monuments known locally as "hoodoos," including Cathedral Rock on the western end of Jacks Valley. These formations consist of sandstones that have been created by the weathering of the Pikes Peak Granite.

Farish Recreation Area

The topography of the Farish Recreation Area is characterized by rolling terrain associated with South Beaver Creek and several unnamed tributaries that flow to the northeast across the recreation area. Sapphire, Leo, and Grace Lakes are impoundments along the main stem of Beaver Creek in the northeast section of the recreation area. Elevation ranges from approximately 9,360 feet in its southwest corner to approximately 9,040 feet in its northeast corner where South Beaver Creek flows off of the recreation area.

The Farish Recreation Area is located in the Rampart Range, which is part of the eastern edge of the Front Range. The north striking Rampart Range Fault forms the east flank of the Rampart Range and extends from near Larkspur, south toward Colorado Springs, where it ends near State Highway 24. The fault occurred as a result of uplifting of the Pikes Peak Granite during the Laramide Orogeny, dating from the Late Cretaceous, 70-80 million years ago to the Oligocene, 23-36 million years ago.

Bullseye Auxiliary Airfield

Bullseye Auxiliary Airfield is characterized by a gently sloping to a nearly level plain of low topographic relief at an elevation of approximately 6,000-feet.

Bullseye lies within the southern portion of the Denver Basin structural province, in an area of geographically extensive, but stable, sand deposits. It is probable that the sand material was deposited during the early Holocene period (the present to 10,000 years ago) and during the Pinedale Glaciation when climatic conditions were different.

Soils

The protection of soil and water resources is required under the following laws, regulations, and policies:

- Clean Water Act of 1977, as amended
- EO 11514, Protection and Enhancement of Environmental Quality
- Federal Land Policy and Management Act of 1976
- Federal Water Pollution Control Act of 1977
- Soil and Water Conservation Act
- Food Security Act of 1975

The following are examples of criteria the Natural Resources Conservation Service (NRCS) uses to describe soils:

- Slope. Slope is the inclination of the land surface from horizontal. The percentage of slope is defined as the vertical distance divided by the horizontal distance.
- Erodibility Index. A numerical expression of the potential of a soil to erode, considering the physical and chemical properties of the soil and climatic conditions where it is located. The higher the index, the greater the investment needed to maintain the sustainability of the soil resource base if intensively cropped. Erodibility Index scores of 8 or above are equated to highly erodible land.
- Water Permeability. Permeability refers to the ability of water to move downward through saturated soil. It is measured in inches per hour.
- Shrink-Swell. Shrink-swell is the contraction (shrinking) of soil when dry and expansion (swelling) when wet. This can cause damage to roads, dams, building foundations, and other structures.

Air Force Academy

Most of the soils at the Academy are derived from a granitic parent material that is are moderately to highly erodible. They are generally very shallow (horizons are not defined) and have very little fine or organic material. Deeper soils with finer particles and organic matter occur as outwash deposition in the valleys. Soils in a few areas (surrounding the airfield, in the vicinity of Falcon Stadium and Douglass Valley Housing, and just east of the Community Center, cemetery, and golf course) have a slight-to- moderate erosion potential. Most of these areas are already associated with some type of fairly intensive human use. Very thin soils found on the steeper slopes of the southern and western boundaries have an extremely high erosion potential.

The NRCS identifies 26 soil mapping units on the Academy (NRCS 2006). The mapping units are composed of phases of 19 soil series and urban land. The following text provides general descriptions of the soil series mapped on the Academy.

Ascalon. The Ascalon series consists of deep, well-drained soils that formed in mixed alluvium and wind-laid materials. These soils are on uplands. They have slopes of 1 to 9 percent.

Blakeland. The Blakeland series consists of deep, somewhat excessively drained soils. These soils formed in arkosic sandy alluvium and eolian sediment on uplands. They have slopes of 1 to 20 percent.

Blendon. The Blendon series consists of deep, well-drained soils that formed in sandy arkosic alluvium. These soils are on terraces, floodplains, and in drainageways. They have slopes of 0 to 3 percent.

Besser. The Besser series consists of deep, well-drained soils that formed in alluvium and residuum derived from arkosic sedimentary rock. They have slopes of 0 to 20 percent.

Columbine. The Columbine series consists of deep, well-drained to excessively drained soils that formed in very gravelly arkosic alluvium. These soils are on terraces, floodplains, and alluvial fans and in drainageways. They have slopes of 0 to 3 percent.

Cruckton. The Cruckton series consists of deep, well-drained soils that formed in arkosic sandy loam deposits. These soils are on uplands. They have slopes of 1 to 9 percent.

Cushman. The Cushman series consists of moderately deep, well-drained soils that formed in calcareous loamy materials derived from weakly consolidated beds of mixed mineralogy. These soils are on uplands. They have slopes of 1 to 15 percent.

Ellicott. The Ellicott series consists of deep, somewhat excessively drained soils that formed in non-calcareous stratified sandy alluvium derived from arkose beds of granite. These soils are on terraces and floodplains. They have slopes of 0 to 5 percent.

Jarre. The Jarre series consists of deep, well-drained soils that formed in alluvium derived from sandy sediment. These soils are on alluvial fans or old terraces. They have slopes of 1 to 30 percent.

Kutler. The Kutler series consists of moderately deep, somewhat excessively drained soils that formed in material weathered from granite bedrock. These soils are on mountains. They have slopes of 25 to 65 percent.

Kettle. The Kettle series consists of deep, well-drained soils that formed in sandy arkosic deposits. These soils are on fans and uplands. They have slopes of 3 to 40 percent.

Kutch. The Kutch series consists of moderately deep, well-drained soils that have formed in calcareous clay over shale. These soils are on uplands. They have slopes of 3 to 20 percent.

Perrypark. The Perrypark series consists of deep, well-drained soils that formed in arkosic alluvium derived from sedimentary and granite bedrock. These soils are on alluvial fans and valley side slopes. They have slopes of 3 to 9 percent.

Peyton. The Peyton series consists of deep, well-drained soils that formed in arkosic alluvium and residuum. These soils are on uplands. They have slopes of 1 to 15 percent.

Pring. The Pring series consists of deep, well-drained soils that formed in arkosic sandy sediment. They have slopes of 3 to 30 percent.

Sampson. The Sampson series consists of deep, well-drained soils that formed in alluvium derived from sedimentary rock. These soils are on alluvial bottom lands that are commonly in small, closed basins. They have slopes of 0 to 3 percent.

Tomah. The Tomah series consists of deep, well-drained soils that formed in alluvium or residuum derived from arkose beds. These soils are on upland alluvial fans, hills, and ridges. They have slopes of 3 to 15 percent.

Travessilla. The Travessilla series consists of shallow, well-drained soils that formed in residuum derived from sandstone. These soils are on rocky uplands. They have slopes of 0 to 75 percent.

Truckton. The Truckton series consists of deep, well-drained soils that formed in alluvium and residuum derived from arkosic sedimentary rock. These soils are on uplands. They have slopes of 0 to 20 percent.

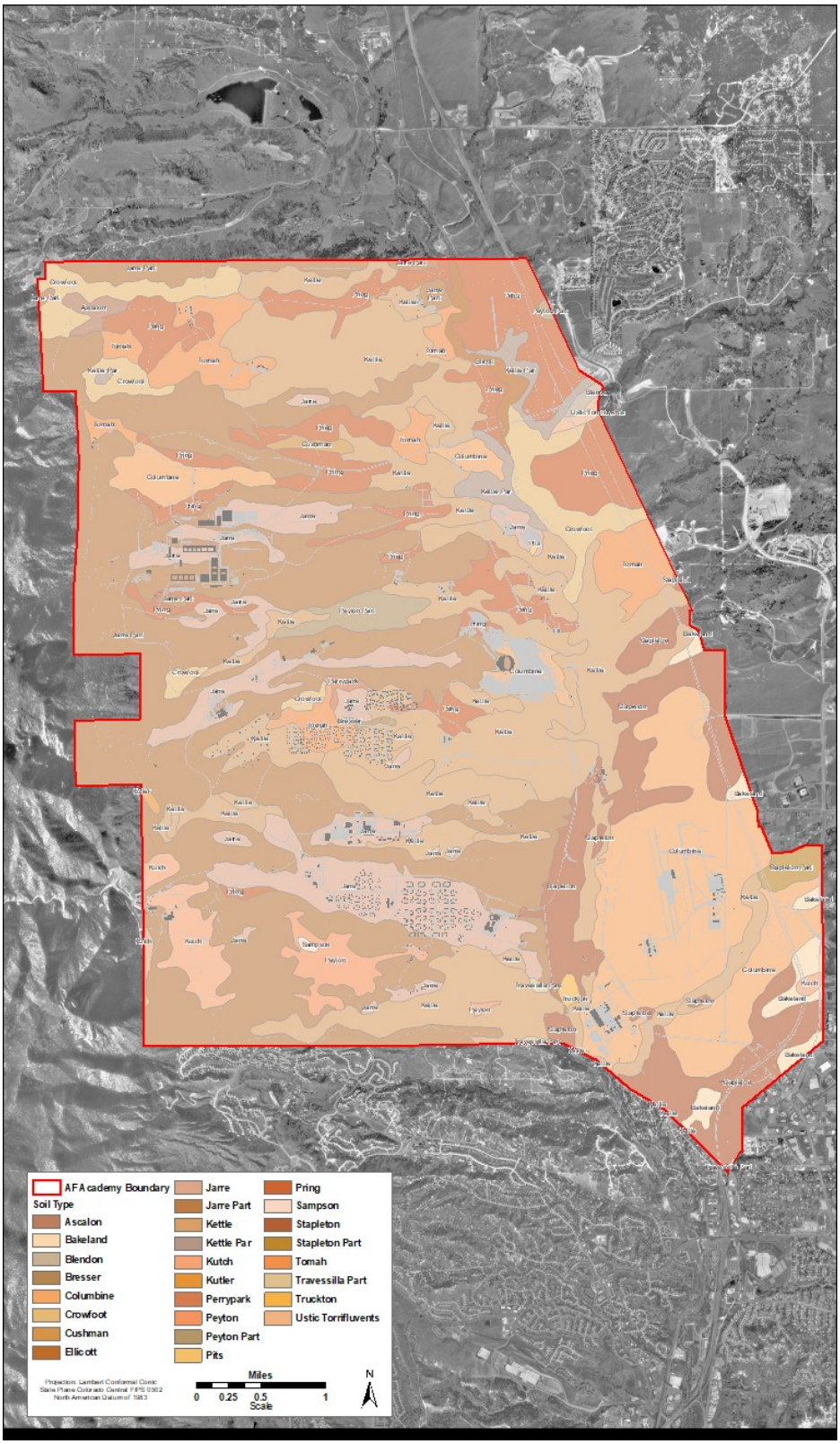
Farish Recreation Area

The soils at Farish are composed mainly of weathered Pikes Peak granite. Sphinx gravelly coarse sandy loam is the dominant soil type. This soil is well-drained, yet due to soil particle size, steep slopes, and intensive thunderstorms, the erosion potential is extreme. The depth of the organic layer varies with location, but it is generally less than 4 inches. Because the soil is formed of decomposing rock, natural fertility is low. Depth to bedrock is 10 to 20 inches. Aquolls, the soil type found in drainageways and valley bottoms, are much deeper. They typically have a top organic layer about 12 inches deep with a layer of very fine sandy loam as much as 60 inches in depth. The NRCS has not mapped the soils at Farish.

Bullseye Auxiliary Airfield

The NRCS identifies one soil mapping unit on the Bullseye Auxiliary Airfield, Wigton loamy sand, with 1 to 8 percent slopes. The typical Wigton soil profile in El Paso County is composed of surface soil of brown loamy sand to a depth of 19 inches, underlain by very pale brown sand to a depth of 60 inches or more. The soil is rapidly permeable and dry because of its high sand content. Precipitation percolates rapidly, enhancing drainage.

The Wigton loamy sand map unit also includes small areas of Bijou loamy sand, with 1 to 8 percent slopes; Bijou sandy loam, with 1 to 3 percent slopes; Bijou sandy loam with 3 to 8 percent slopes: and Valent sand, with 1 to 9 percent slopes. Bijou soils differ from Wigton by having a subsoil horizon of slightly finer texture where some clay has accumulated. Valent soils have predominately fine and very fine sand whereas Wigton soils have a high proportion of medium and coarse sand.



Soils of the U.S. Air Force Academy

2.2.4 Hydrology

The stream corridors are among the most important natural resources features on the Academy, representing areas of concentrated biodiversity and important habitats. The predominant surface water feature on the base is Monument Creek, which runs approximately 12-miles from north to south through the eastern side of the Academy. The headwaters of Monument Creek are in springs in the Rampart Range north and west of the Academy. The Academy covers approximately 12% of the Monument Creek Watershed, but nearly 75% of the watershed's drainage flows though the base in Monument Creek before exiting the southern boundary. The Academy plays an important role in preserving Monument Creek, which is one of the best remaining high plains streams in the upper Arkansas River drainage. Monument Creek is a refuge for several species of rare plants and for the Preble's meadow jumping mouse, a federally-threatened species.

Other perennial and intermittent streams on base are in very poor to good condition depending on floodplain and channel erosion and riparian vegetation cover. All tributary streams flowing into Monument Creek from the east have been eroded by increased stormwater volume from urban development. Some of the western tributaries have also been degraded by increased runoff from the Cadet Area, housing, and other on-base developments. Open water on the Academy consists of five man-made recreational lakes and four non-potable reservoirs.

Riparian corridors at the lower elevations support primarily willow (*Salix* spp.)/cottonwood (*Populus angustifolia* and *P. deltoides*), changing to alder (*Alnus* spp.) and then to spruce (*Picea*)/Douglas fir (*Pseudotsuga menziesii*) at higher elevations. These corridors function as vital links between the different watershed sub-basins and plant communities described in the Vegetation section (2.3.2).

Open Water on the Academy

Name	Surface Area (Acres)	Volume (Acre Feet)
Non Potable Reservoir No. 1	8.89	145
Non Potable Reservoir No. 2	11.68	335
Non Potable Reservoir No. 3	8.92	150
Non Potable Reservoir No. 4	3.0	35
Deadmans Lake	2.08	14
Ice Lake	5.39	28
Kettle Lake No. 1	2.06	18.2
Kettle Lake No. 2	3.5	33
Kettle Lake No. 3	6.75	47

Farish Recreation Area

Water from springs originating on Farish and surrounding lands forms South Beaver Creek, which flows eastward out of the Rampart Range into Monument Creek. The Monument Creek corridor bisects the eastern part of the Academy and drains into Fountain Creek and eventually the Arkansas River at Pueblo, Colorado. Grace Lake, Leo Lake, and Sapphire Lake are all man-made impoundments.

Open Water at Farish Recreation Area

Name	Surface Area (Acres)	Volume (Acre Feet)
Grace Lake	5.05	14.96
Leo Lake	3.97	21.49

Mel's Pond	0.09	Unknown
Sapphire Lake	3.55	Unknown

Bullseye Auxiliary Airfield

There are no surface drainages or water bodies found on Bullseye Auxiliary Airfield due to the flat topography and deep sandy soils which have a high permeability.

Water Quality at the Academy

Surface water quality at the Academy can be detrimentally impacted by fuel or other hazardous material spills or leaks, air pollution sources, seepage from Environmental Restoration Program (ERP) sites, and off-base land use. Pollutants from these sources 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 nutrient loads (e.g., phosphorus or nitrogen). High BOD can result in fish kills and other damage to surface water ecology. Monument Creek is currently on the state's 303(d) List of Impaired Water Bodies for *Escherichia coli*, manganese, macro-invertebrates (provisional), and temperature.

Sedimentation due to erosion also impacts water quality. Erosion disturbs existing plant communities, and the resulting siltation in streams can degrade benthic habitat and fish spawning grounds. In an effort to protect surface water quality, the Academy employs soil erosion/construction BMPs and watershed protection controls, and has an aggressive channel stabilization and habitat restoration program.

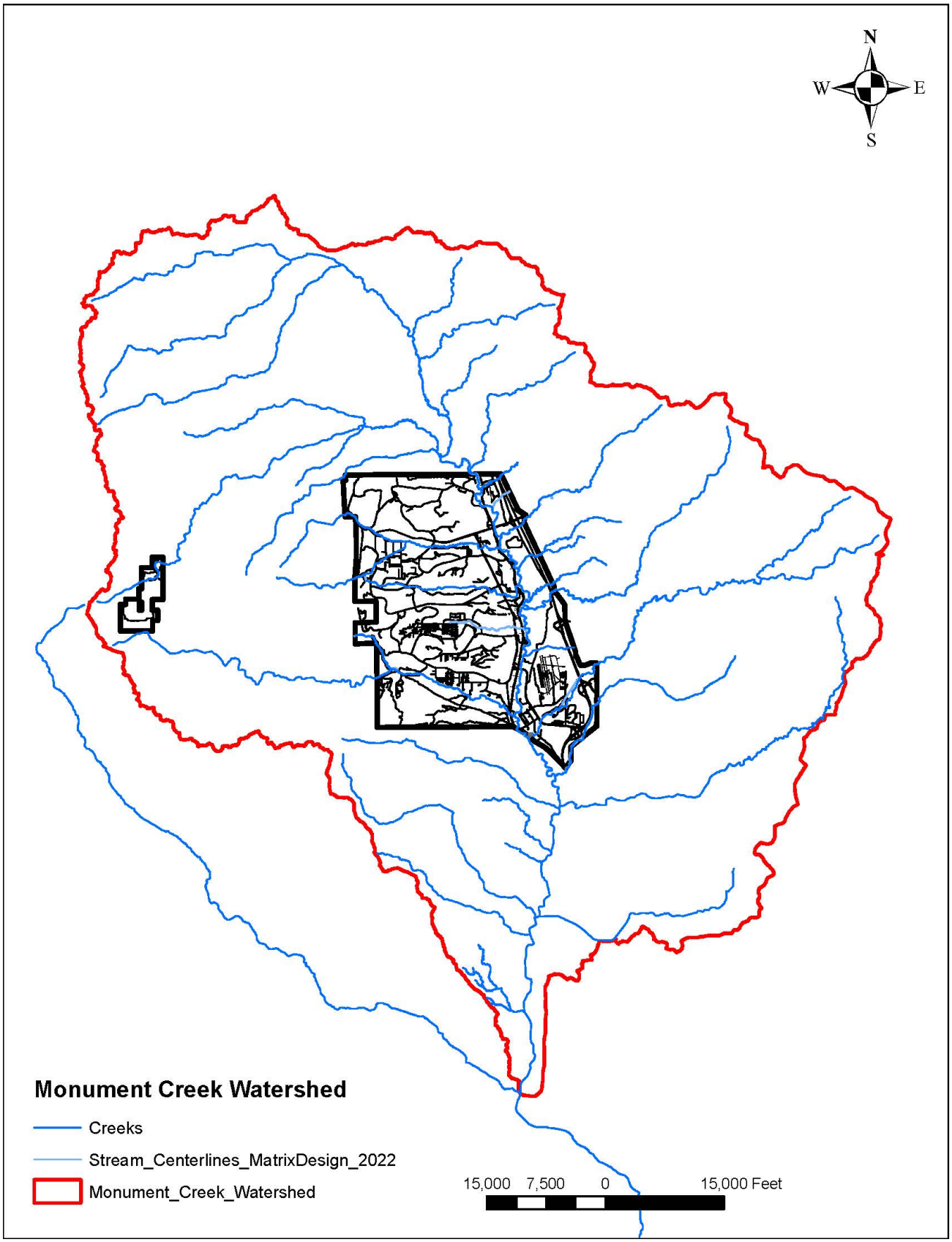
The Academy's Stormwater Pollution Prevention Plan identifies BMPs that prevent hazardous materials from contacting and contaminating stormwater runoff. Examples of BMPs include secondary containment structures, covered (sheltered) work areas, and personnel training. Stormwater BMPs were developed for Jacks Valley (URS Group 2006a), the Cadet Area (URS Group 2006b), the Community Center (URS Group 2006c), the Main Airfield (URS Group 2006d), and the base composting facility. The Monument Creek Watershed Restoration Master Plan (2016) also identifies numerous on-base and off-base projects and priorities for controlling erosion and sedimentation throughout the watershed.

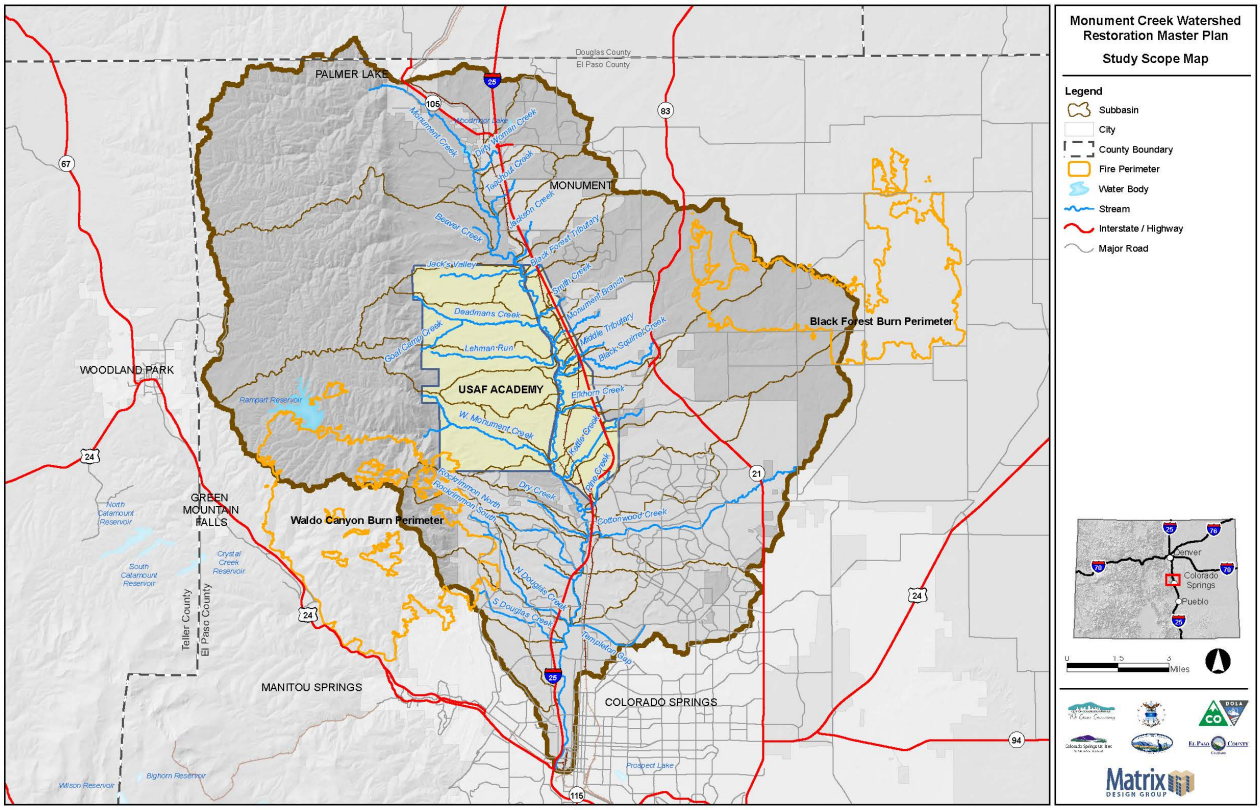
Farish Recreation Area

Threats to water quality at Farish occur from erosion and sediment transport after intense rainstorms, especially from roadways and campsites.

Bullseye Auxiliary Airfield

There is no surface water at Bullseye Auxiliary Airfield; therefore no water quality issues.


N
W
E
S
Monument Creek Watershed
Creeks
Stream_Centerlines_MatrixDesign_2022
Monument_Creek_Watershed
15,000 7,500 0 15,000 Feet



2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification

The Academy represents a rapidly disappearing Front Range transitional ecosystem of varied wildlife habitats. Similar habitats north and south of the Academy are rapidly being lost to development. Development on the Academy has also resulted in selective habitat fragmentation and degradation.

Because of habitat diversity and preservation efforts, there are more native wildlife species on the Academy than would be expected in an area of equivalent size and proximity to an urban center. Factors contributing to the high biodiversity on the Academy are the topographic variation, the location at the convergence of north-south and plains-mountains transition zones, the presence of high-quality riparian habitat, and the proximity to the undeveloped forested expanses of the Pike National Forest. The large percentage of undeveloped natural areas and the numerous vegetation types and their resulting mosaic, or pattern, provide a high degree of connectivity between habitat types and maintain essential movement corridors for mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*), American elk (*Cervus elaphus*), black bear (*Ursus americanus*), and mountain lion (*Felis concolor*).

Monument Creek and its tributaries are important riparian habitats for wildlife, especially white-tailed deer, Preble's meadow jumping mouse, amphibians, neotropical migratory birds, and native fish species. The highest diversity of species occurs in the riparian and shrub communities. Mature ponderosa pine stands with a grass understory provide habitat for Abert's squirrel *(Sciurus aberti*). Ridges and valleys that run west to east across are common wildlife travel corridors. South-facing slopes are important feeding and warming areas for deer and elk and north slopes are often used as bedding and thermal cover areas.

Areas containing natural resources warranting special protection have been identified and designated by the Colorado Natural Heritage Program and the Academy as Potential Natural Areas and Species of Concern. Through vegetation and noxious weed surveys, wildlife monitoring activities, and biological inventories (CNHP 2012, 2018), several plant communities and plant or animal species that represent the natural, historic biological diversity of the Academy and Farish Recreation Area have been identified. Data from those surveys is cataloged in the Colorado Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS) for future use in conservation planning and management.

2.3.2 Vegetation

The following sections describe the vegetative environment on the Air Force Academy, Farish Recreation Area, and Bullseye Auxiliary Airfield. Due to variation in topography, elevation, hydrology, soils, and historical land use, these properties support a high diversity of native and non-native plant species and vegetative communities.

2.3.2.1 Historic Vegetation Cover

Air Force Academy

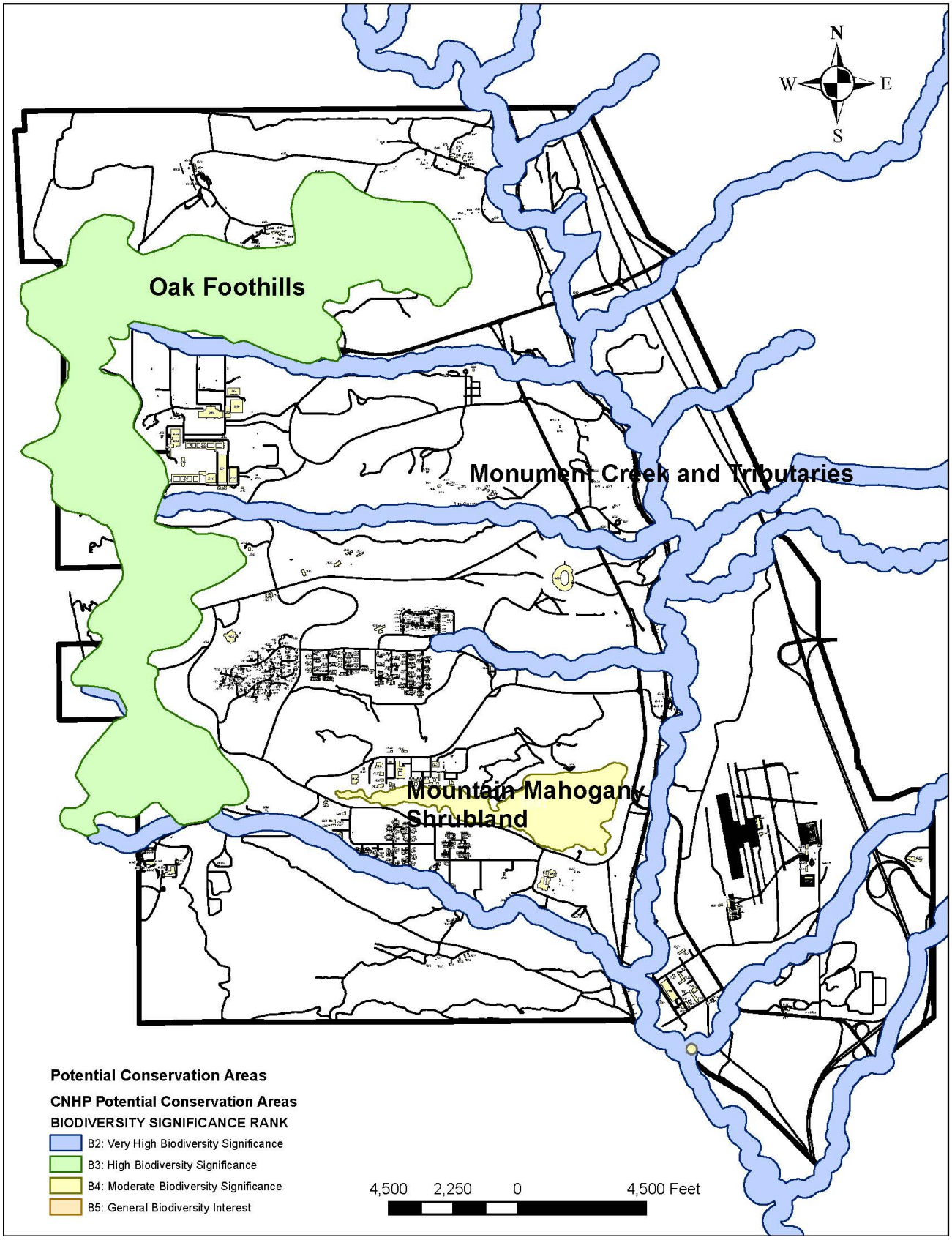
The vegetation of the Academy includes the Southern Rocky Mountain EcoRegion (Crystalline Mid-Elevation Forests) and the Southwestern Tablelands EcoRegion (Foothills Grasslands), represented by montane, foothill, and grassland zones (Ripley 1994). Plant communities of coniferous forest, shrubland, grassland, and riparian dominated the historic landscape and still persist today. Grazing, mining, agriculture, railroads, fire suppression, and logging activities as early as the 1860's, however, significantly altered the plant cover and diversity, and likely contributed to current management issues such as noxious weed invasion, soil erosion, and stream instability.

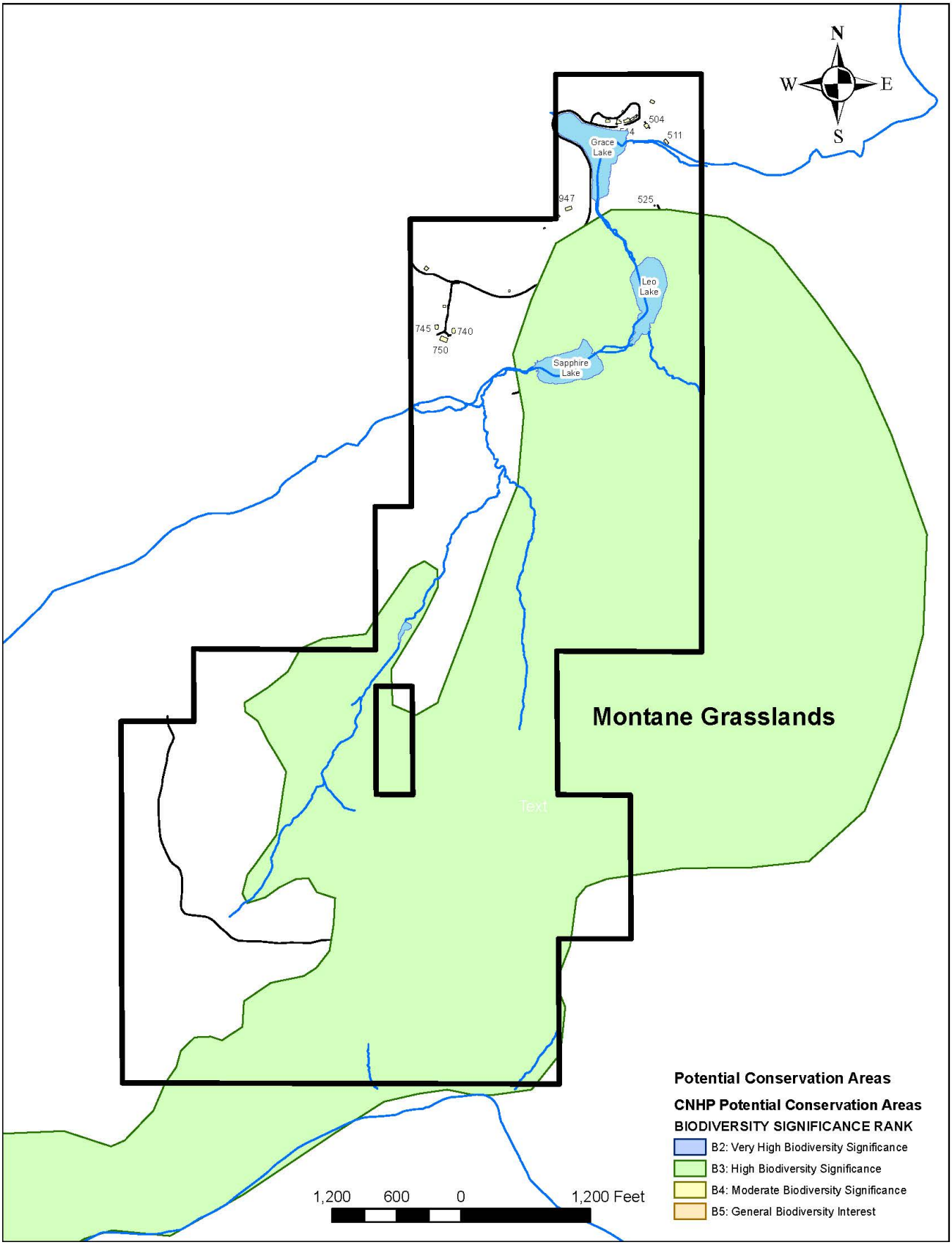
Farish Recreation Area

Montane forest, with interspersed with grassy meadows, dominated the historic landscape at Farish. Much of the grassland meadows were historically modified and used for livestock grazing and potato farming, resulting in the invasion of non-natives grasses (e.g., smooth brome [*Bromis inermis]*). With wildfire suppression, coniferous forest of spruce and fir has also slowly encroached into the meadows.

Bullseye Auxiliary Airfield

The historic landscape at Bullseye was characterized as shortgrass and mixed-grass prairie. Despite a long history of livestock grazing in the area, non-native species, including noxious weeds, are virtually non-existent.


N
W
E
S
Oak Foothills
Monument Creek and Tributaries
Mountain Mahogany Shrubland
Potential Conservation Areas
CNHP Potential Conservation Areas
BIODIVERSITY SIGNIFICANCE RANK
B2: Very High Biodiversity Significance
B3: High Biodiversity Significance
B4: Moderate Biodiversity Significance
B5: General Biodiversity Interest
4,500 2,250 0 4,500 Feet



2.3.2.2 Current Vegetation Cover

Air Force Academy

In his 1994 book, *Vegetation of the U.S. Air Force Academy and the Adjacent Regions of the Pike National Forest*, *El Paso County, Colorado*, Dr. Douglas Ripley listed 649 different plant species on the Academy and adjacent Pike National Forest lands. Of those, 528 (81.3 percent) are native plants and 121 (18.7 percent) are introduced. About 70 percent of the flora of El Paso County and 20 percent of all the plants in Colorado are represented on the Academy (Ripley 1994).

The Academy's vegetation resources are significant in that they encompass the elevation-related gradient from prairie grasslands to montane forests. The mosaic, or the pattern the different plant communities create in relationship to one another, is a critical aspect of the biodiversity found at the Academy. Data from the 2020 CEMML vegetation classification and GIS mapping project indicates the combined natural and semi-natural vegetated area of the Academy, Farish, and Bullseye combined is approximately 17,153 acres, or 88% of the total installation area.

Because the foothills are prime development areas along the Front Range, relatively intact foothills vegetation communities are declining in number and area. The Academy, along with Roxborough State Park (about 50 miles to the north), represents one of the last remaining relatively "untouched" mature ponderosa pine (*Pinus ponderosa*)/scrub oak (*Quercus gambelli*) habitat type on the Front Range. Fire is a known disturbance mechanism affecting the health and distribution of these vegetation communities.

Ecological research in the Front Range, starting in the early 20th Century, has identified trends in the vegetation composition as influenced by fire and other disturbances. The major compositional trend of the vegetation over time is toward an increased density of conifers, especially in the montane zone. Forests that were open woodlands prior to European settlement are now often densely populated with smaller trees. In the absence of natural fires, many grasslands are succeeding to forests. This trend is dramatic in many cases and is a widespread pattern throughout the Western United States.

There are many types of vegetative cover on the Academy that are influenced by local site conditions, hydrology, soils, topography, elevation, and aspect.

Vegetation types on the Academy can be generally divided into montane and foothill zones. The montane zone includes the mixed conifer forests between 8,000- and 9,000-feet elevation. The foothill zone occurs between 6,000- and 8,000-feet elevation. The foothills zone is further subdivided into the Douglas-fir/white fir woodlands, ponderosa pine woodlands, oak shrubland, grasslands, and riparian community types (USAFA 2003).

Montane Zone (8,000 to 9,000 feet). This zone consists of mixed conifer forests along the western edge of the Academy and the steep slopes of the Rampart Range. Species include Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine, white fir (*Abies concolor*), limber pine (*Pinus flexilis*), blue spruce (*Picea pungens*), Englemann spruce (*Picea englemannii*), and common juniper (*Juniperus communis*). Dominant shrubs include kinnikinnik (*Arctostaphylus adenotricha*), waxflower (*Jamesia americana*), and mountain mahogany (*Cercocarpus montanus*).

Foothills Zone (6,000 to 8,000 feet). This zone is subdivided into four community types:

1. Woodlands dominated by Douglas-fir, with some white fir occurring on moist, north-facing slopes. In some areas, white fir occurs with high frequency, such as on the slopes west of the Visitor Center. Important associates include common juniper, waxflower, and mountain mahogany.
2. Ponderosa pine woodlands are the most prevalent woodland community in the foothills. This community occurs on sites drier than those supporting Douglas-fir/white fir, but moister than those dominated by grasslands. Trees are often clumped in groups of a few individuals separated by openings with a sparse herb cover in a parklike setting. Common associates are gooseberries and currants (*Ribes aureum* and *R. cereum*), yellow mountain parsley (*Pseudocymopterus montanus*), mountain muhly (*Muhlenbergia montana*), ninebark (*Physocarpus monogynus*), and Gambel oak (*Quercus gambelii*).
3. The oak shrubland community dominates the mesas and dry, south-facing slopes in the foothills. The dominant species is Gambel oak. The oak often forms in dense clumps on sites with the deepest soils. Piñon pine (*Pinus edulis*) and one- seeded juniper (*Sabina monosperma*) are small trees found in this community in the southern parts of the Academy. Also, occasional ponderosa pines occur in this community. Important shrubs include mountain mahogany, ocean spray (*Holodiscus dumosus*), Boulder raspberry (*Oreobatus deliciosus*), and snowberry (*Symphoricarpus albus*). This shrubland represents a mixture of plains and foothill species.
4. Grasslands occur on much of the eastern portion of the Academy. The grasslands community is dominated by short-grass prairie species that include blue grama (*Bouteloua gracilis*), little bluestem (*Schizchyrium scoparium*), fringed sage (*Artemisia frigida*), and Spanish bayonet (*Yucca glauca*). It extends into forested communities of the upper foothills zone. Grassland composition has been somewhat altered by historical grazing prior to the 1950s.

Three grassland complexes are of particular interest:

- Parry's oatgrass (*Danthonia parryi*) grassland, which occurs at two sites along the Academy's west boundary. This might represent a once-dominant assemblage that has been reduced by historic grazing, as well as fire suppression.
- Tallgrass prairie species merging with ponderosa pine and Gambel oak, including sandreed (*Calamovilfa longifolia*), big bluestem (*Andropogon gerardii*), little bluestem, and needle-and- thread grass (*Stipa comata*), east of Monument Creek and south of Falcon Stadium.
- Tallgrass and mixed grass prairie communities west of Interstate 25 (I-25) and south of the South Gate are dominated by big bluestem, needle-and-thread grass, sandreed, and fringed sage.

Monument Creek is the most important and extensive of the riparian communities. The creek and its major tributaries are lined with cottonwoods (*Populus angustifolia* and *P. deltoides*) and willows. Stream banks along smaller waterways leaving the Rampart Range are characterized by many showy herbs such as shooting star (*Dodecatheon pulchellum*), bunchberry (*Chamaepericlymenum canadense*), and twinflower (*Linnea borealis*).

The Center for Environmental Management of Military Lands (CEMML) at Colorado State University recently conducted a vegetation classification and GIS mapping project for the Academy, Farish, and Bullseye (CEMML 2020). The classification followed the National Vegetation Classification system (version 2.03, March 2019), using a minimum mapping unit of 0.5 hectare (1.236 acres) for natural communities. A minimum mapping unit of 0.25-hectare (0.618 acre) was used for cultural (artificial) plant communities. A total of 38 vegetative communities and land cover types were identified with forest, shrubland, and grassland communities being dominant.

Urban Habitats

The Cadet Area, housing areas, the Community Center, the median strips on South-Gate, Stadium, and North-Gate Boulevards, elementary schools, and the Air Academy High School comprise about 1,900 acres, or 10 percent of the total Academy area. These areas are largely characterized by nonnative vegetation including Kentucky bluegrass and ornamental trees and shrubs. Semi-natural habitats, such as the Eisenhower Golf Course, primarily contain native shrub and tree canopies, but can also include bluegrass groundcover.

Farish Recreation Area

Farish falls within the montane vegetation zone. Ponderosa pine (Pinus ponderosa), limber pine, and Engelmann spruce (*Picea engelmannii*) occur on dry areas; and Douglas-fir (*Pseudotsuga menziesii*) occur on the moister slopes. Aspen (*Populus tremuloides*) occurs on areas that have had prior natural disturbance. A variety of tree species exist where vegetation communities converge. Ponderosa pine, Douglas-fir, limber pine, Englemann spruce, and aspen grow on a ridge along the east boundary. Rolling meadows contain Arizona fescue (*Festuca arizonica*), Parry's oatgrass (*Danthonia parryi*), and mountain muhly (*Muhlenbergia montana*). Prairie sage (*Artemisia ludoviciana*), fringed sage (*Artemisia frigid*), yarrow (*Achillea lanulosa*), and Colorado loco (*Oxytropis lambertii*) are common in sunny areas. Drainages are characterized by willows (*Salix* spp.), shrubby cinquefoil (*Pentaphylloides floribunda*) and other grasses and sedges. Porter feathergrass (*Ptilagrostis porteri*), a state rare grass species in Colorado, was discovered in a bog at Farish (ESCO Associates, Inc. 1992) and warrants special monitoring and protection.

The Farish Recreation area also possesses a significant grassland in the southern conservation zone bordered by Schubarth Road. Prior to fire suppression early in the 20th Century, wildfires, coupled with earlier ranching and agricultural practices helped to maintain these grasslands. As discussed in the Landscape Fire Ecology section, fire suppression and the curtailment of agricultural practices are resulting in a gradual invasion of these grasslands by coniferous forests. Without some level of management, these grasslands will eventually succeed to forest land.

Bullseye Auxiliary Airfield

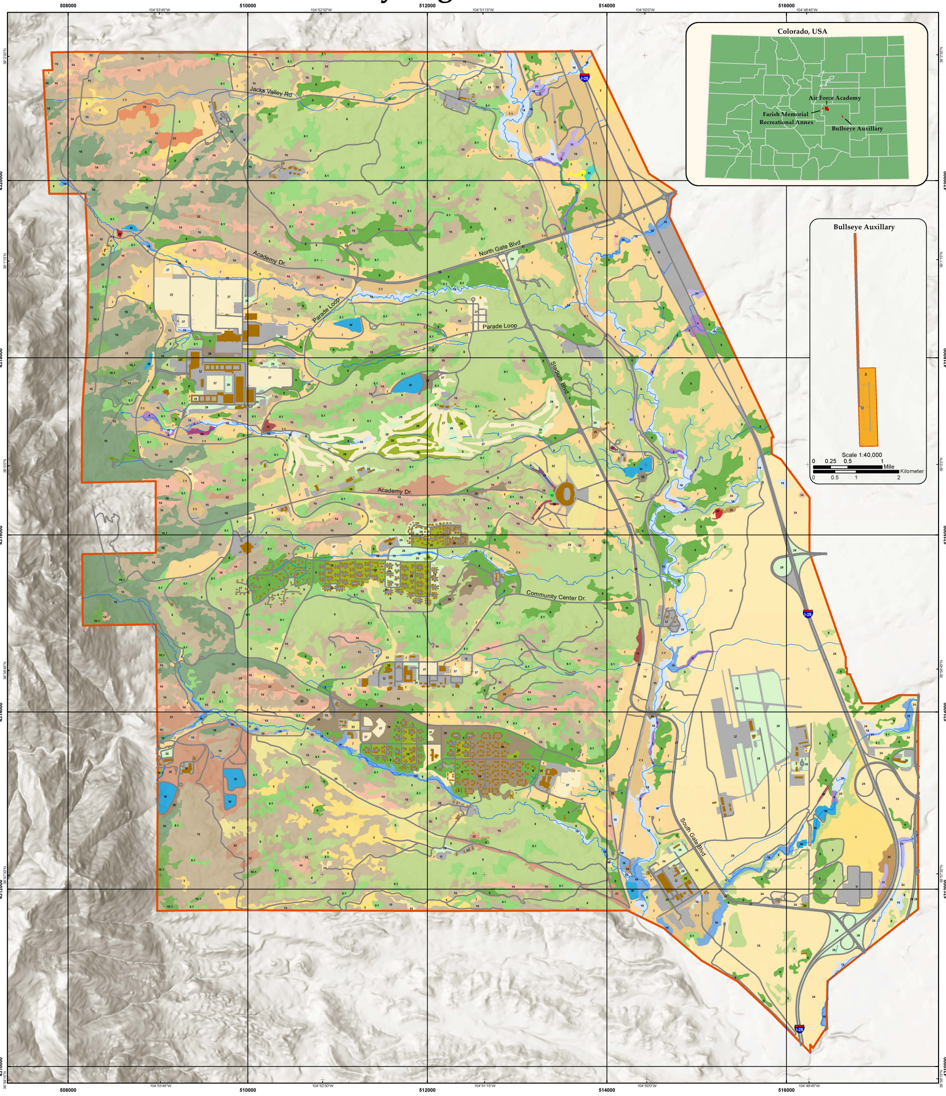
Bullseye is part of a large rangeland ecosystem comprised of units of agricultural land, short grass prairie, and mixed-grass prairie. The shortgrass prairie is dominated by blue grama (*Bouteloua gracilis*). The mixed-grass prairie is dominated by tall grasses such as blowout grass (*Redfieldia flexuosa*) and sand bluestem (*Andropogon hallii*) with an understory of blue grama. Other species of grasses observed on Bullseye include red threeawn (*Aristida longiseta*), needle-and-thread, sedge species (*Carex sp.*), and sand dropseed (*Sporobolus cryptandrus*).

Species of forbs observed include greenthread (*Thelesperma megapotamicum*), annual buckwheat (*Eriogorum annum*), penstemon (*Penstemon sp.*), trailing fleabane (*Erigeron flagellaris*), goosefoot (*Chenopodium sp.*), and stickseed (*Lappula redowskii*). Species of shrubs include fringed sage (*Artemisia frigida*), spreading eriogonium (*Eriogonum effusum*), calylophus (*Calylophus sp.*), and prickly pear (*Opuntia polyacantha*).

The Bullseye Auxiliary Airfield falls within the Central Shortgrass Prairie Ecoregion. In 2006, the Nature Conservancy of Colorado, working with land managers, landowners, state and federal agency representatives, including from the Academy, and scientists conducted an assessment of the conservation needs for this ecoregion (Neeley et al. 2006). This project conducted a collaborative ecoregional assessment and developed a conservation implementation strategy, identified a set of conservation areas that best represent the native species, natural communities, ecosystems, and ecological processes of the ecoregion; developed critical data, analyses, and tools to support biodiversity conservation; established an ecological context to help facilitate effective management at multiple scales; and prepared a set of management guideline to facilitate conservation action for species at risk.

While the Bullseye Auxiliary Airfield represents but a very small fraction of the Central Shortgrass Prairie Ecoregion, it lies within the Chico Basin conservation site identified by the Central Shortgrass Prairie Ecoregion Initiative (Neeley et al. 2006). It is also surrounded by the Bohart Ranch, a site managed for its conservation values by The Nature Conservancy (TNC) and a local ranch family. The Academy is pursuing a conservation easement on the Bohart Ranch through the DoD Readiness and Environmental Protection Integration (REPI) program.

U.S. Air Force Academy Vegetation



Alliance Level Classification

- 1 **A0954 *Crataegus douglasii - Crataegus succulenta* Shrubland Alliance**
- 2 A0958 *Dasiphora fruticosa* Wet Shrubland Alliance
- 3 **A1201 *Calamovilfa longifolia* Sand Prairie Alliance**
- 4 **A1374 *Juncus arcticus* ssp. *littoralis - Juncus mexicanus* Wet Meadow Alliance**
- 5 **A1540 *Yucca glauca* Prairie Scrub Alliance**
- 6 A2036 *Populus tremuloides* Rocky Mountain Forest and Woodland Alliance
- 6.1 CEGL003748 (A2036) *Populus tremuloides* / Invasive Perennial Grasses Forest Association
- 7 **A3254 *Agropyron cristatum - Bromus inermis - Poa pratensis* Ruderal Grassland Alliance**
- 7.1 **CEGL005264 (A3254) *Bromus inermis - (Pascopyrum smithii)* Ruderal Grassland Association**
- 8 **A3398 *Pinus ponderosa* Southern Rocky Mountain Forest and Woodland Alliance**
- 8.1 **CEGL000870 (A3398) *Pinus ponderosa / Quercus gambelii* Woodland Association**
- 9 **A3419 *Pinus ponderosa* / Grass Understory Southern Rocky Mountain Open Woodland Alliance**
- 9.1 **CEGL000862 (A3419) *Pinus ponderosa / Muhlenbergia montana* Woodland Association**
- 10 **A3454 *Pseudotsuga menziesii* Southern Rocky Mountain Forest and Woodland Alliance**
- 10.1 **CEGL000452 (A3454) *Pseudotsuga menziesii / Quercus gambelii* Forest Association**
- 11 **A3575 *Juniperus monosperma* Wooded Grassland Alliance**
- 12 **A3577 *Pinus edulis - Juniperus monosperma* Grassy Woodland Alliance**
- 13 A3641 *Abies lasiocarpa - Picea engelmannii* Southern Rocky Mountain Dry-Mesic Forest Alliance
- 14 **A3732 *Amelanchier utahensis - Cercocarpus montanus - Cercocarpus intricatus* Shrubland Alliance**
- 15 **A3735 *Quercus gambelii - Symphoriocarpus oreophilus* Shrubland Alliance**
- 16 **A3759 *Populus angustifolia* Riparian Forest Alliance**
- 17 A3769 *Salix boothii - Salix geyeriana - Salix lutea* Montane Wet Shrubland Alliance
- 18 **A3800 *Salix exigua - Salix irrorata* Shrubland Alliance**
- 19.1 CEGL001792 (A3804) *Carex microptera* Wet Meadow Association
- 20 **A3807 *Eleocharis palustris - Eleocharis acicularis* Marsh Alliance**
- 21 **A3896 *Typha domingensis - Typha latifolia - Phragmites australis* ssp. *americanus* Western Marsh Alliance**
- 22 **A3953 *Festuca arizonica - Muhlenbergia montana - Poa fendleriana* Southern Rocky Mountain Montane Grassland Alliance**
- 23 **A3964 *Rhus glabra - Rhus trilobata* Central Rocky Mountain Montane-Foothill Shrubland Alliance**
- 24 **A4001 *Bouteloua gracilis - Bouteloua hirsuta - Bouteloua curtipendula* Shortgrass Prairie Alliance**
- 25 **A4033 *Hesperostipa comata* Northwestern Great Plains Grassland Alliance**
- 26 **A4042 *Schizachyrium scoparium - Bouteloua curtipendula* Central Great Plains Grassland Alliance**
- 27 **CSF20 Lawn and Recreational Grassland Cultural Subformation**
- 28 **CSG033 Cool-Season Open Lawn with Trees Cultural Subgroup**
- 29 **CSG034 Cool-Season Open Lawn Cultural Subgroup**
- 30 **XQPZ_0001 *Caragana arborescens* Ruderal Shrubland Alliance**
- 31 **XQPZ_0002 *Carex* spp. *- Juncus arcticus - Asclepias speciosa* Seep Alliance**
- 32 **XQPZ_0003 *Equisetum arvense - Sporobolus cryptandrus* Wet Meadow Alliance**
- 33 **XQPZ_0004 Mixed Herbaceous Ruderal Alliance**
- U **Urban**
- W **Water**

Additional Features

- Roads
- Streams
- Air Force Academy Boundary
- Buildings

Scale 1:19,000

0 0.25 0.5 1 Mile

0 0.25 0.5 1 1.5 2 Kilometers

SPHEROID.....................................WORLD GEODETIC SYSTEM 1984
HORIZONTAL DATUM..................WORLD GEODETIC SYSTEM 1984
PROJECTION.......................UNIVERSAL TRANSVERSE MERCATOR
GRID...2000 METER UTM ZONE 13N

The classification system used is consistent with the United States National Vegetation Classification system version 2.03, March 2019, and utilizes the framework of the National Vegetation Classification Standard (NVCS), Version 2.0 February 2008. FGDC-STD-05-2008. This vegetation classification was developed in November 2020 by the Center for Environmental Management of Military Lands (CEMML) at Colorado State University. Funding was provided by AFCEC under master agreement number W9126G-13-2-0012 and cooperative agreement number W9126G-18-2-0033

The NVCS is based on work of the United Nations Educational Scientific Cultural Organization and the U.S. Forest Service as refined by The Nature Conservancy. It strives to provide a hierarchical approach to vegetation classification based on physiognomic and floristic characters. There are 8 levels starting with Class as the most general followed by Subclass, Formation, Division, Macrogroup, Group, Alliance, and Association.

The first three upper levels are defined by a combination of physiognomic and ecological characteristics such as growth form; moisture, temperature, and other climatic conditions; and substrate or aquatic conditions. The next three mid-level units are defined by a combination of physiognomic and floristic characteristics such as growth form, and combinations of plant taxa that reflect biogeographic differences in composition and differences in mesoclimate, geology, substrate, hydrology, and disturbance regime at increasingly finer scales. The two lower level units are defined by floristic characteristics such as species composition and diagnostic species.

Alliance names assigned to the vegetation communities at U.S. Air Force Academy follow NVCS naming conventions:
- A hyphen ("-") indicates species occurring in the same stratum.
- A slash ("/") indicates species occurring in different strata.
- Species that occur in the uppermost stratum are listed first, followed successively by those in lower strata.
- Parentheses around a species name indicate the species is less consistently found in the community type.
- Order of species names generally reflects decreasing levels of dominance, constancy, or indicator value.

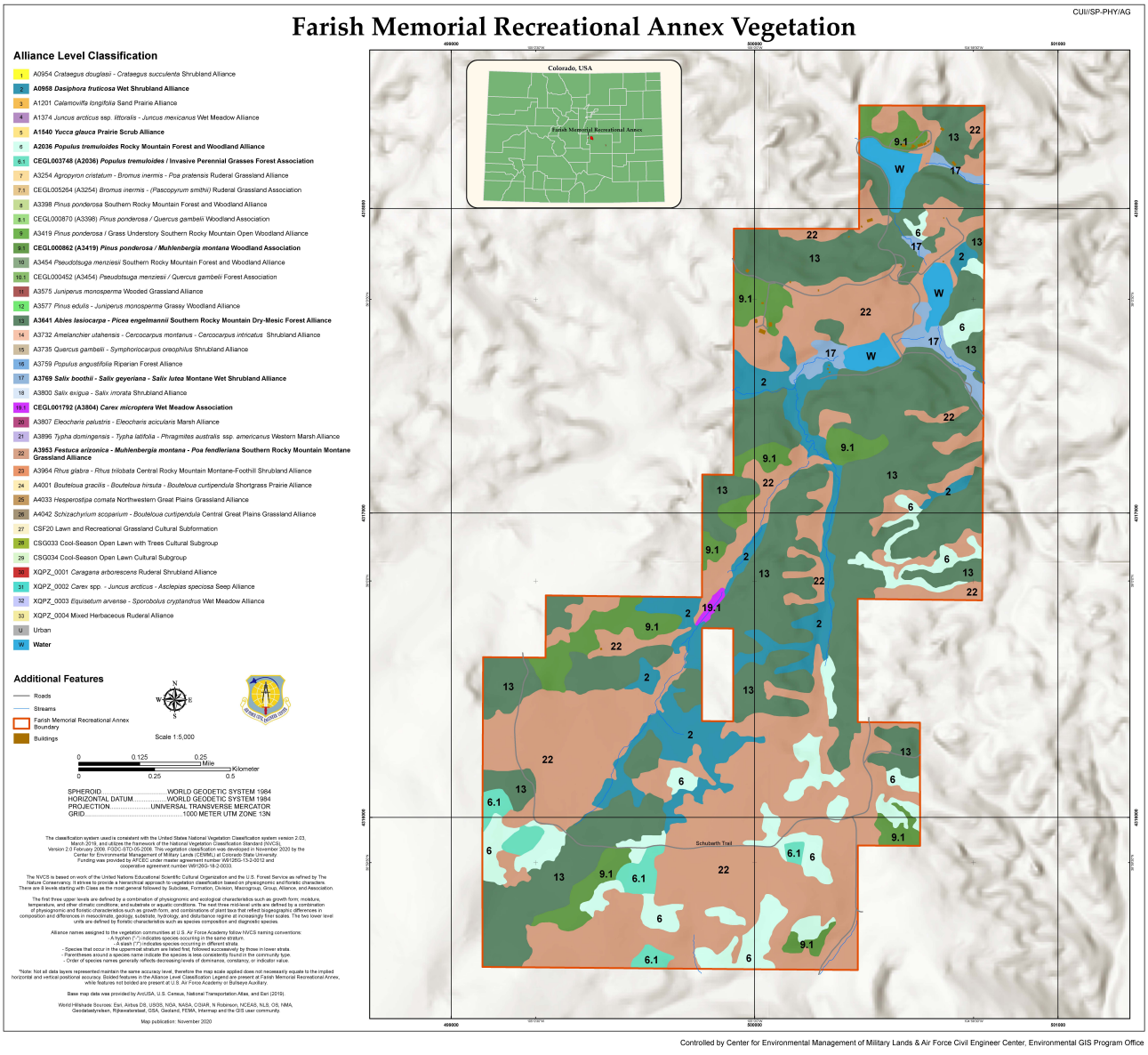
*Note: Not all data layers represented maintain the same accuracy level, therefore the map scale applied does not necessarily equate to the implied horizontal and vertical positional accuracy. Bolded features in the Alliance Level Classification Legend are present at U.S. Air Force Academy and Bullseye Auxilary, while features not bolded are present at Farish Memorial Recreation Annex.

Base map data was provided by ArcUSA, U.S. Census, National Transportation Atlas, and Esri (2019).

World Hillshade Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community.

Map publication: November 2020

Controlled by Center for Environmental Management of Military Lands & Air Force Civil Engineer Center, Environmental GIS Program Office



2.3.2.3 Future Vegetation Cover

Maintaining the native vegetation cover is critical for sustaining and protecting the military training environment, wildlife habitat, soil and water resources, and the aesthetics of the installation. As envisioned by the original Academy master plan, the Natural Resources program consistently advocates for sustaining at least 70% of the installation as designated natural open space. Land management activities such as forest thinning, noxious weed control, prescribed fire, erosion control, and revegetation with native species is utilized to maintain native plant communities and vegetation that is resilient to various environmental stressors, including the long-term effects of drought and climate change.

2.3.2.4 Turf and Landscaped Areas

Air Force Academy

Approximately 854 acres of the Academy is turf/landscaped area (CEMML 2020), including the Cadet Area, golf course and athletic fields, road medians, cemetery, base housing, and administrative areas. Bluegrass irrigated with both potable and non- potable water is the main turf grass. A variety of deciduous and coniferous trees and shrubs are used for screening and landscaping.

The base has reduced its irrigation requirements somewhat by removing small areas of turf and replacing with more drought tolerant, low maintenance landscaping. A more intensive assessment of potential turf conversion and water saving practices is being performed through an Irrigation System and Landscaping Vegetation Evaluation Technical Memorandum review (in draft).

There are no turf or landscaped areas at Farish or Bullseye.

2.3.3 Fish and Wildlife

Air Force Academy

The opportunity to view an abundance and diversity of wildlife in their natural habitat is an important part of what makes the Air Force Academy a unique military base and educational institution. Numerous mammals, reptiles, amphibians, fish, and birds make their home in the installation's open space and natural areas. The Academy works closely with US Fish and Wildlife Service and Colorado Parks and Wildlife biologists to protect and manage the habitat and wildlife, which is vulnerable to human activity and development.

Birds

Examples of birds in the area include the red-tailed hawk (*Buteo jamaicensis*), Merriam's turkey, prairie falcon (*Falco mexicanus*), scrub jay (*Aphelocoma coerulescens*), and spotted towhee (*Pipilo erythrophthalmus*). Grassland birds include rough-legged hawk (*Buteo lagopus*), prairie falcon (*Falco mexicanus*), Western kingbird (*Tyrannus tyrannus*), Western bluebird (*Sialia mexicana*), and vesper sparrow (*Pooecetes gramineus*). Representative birds occurring in or near riparian areas include great blue heron (*Ardea herodias*), spotted sandpiper (*Actitis hypoleucos*), orange-crowned warbler (*Vermivora celata*), common yellowthroat (*Geothylpis trichas*), Wilson's warbler (*Wilsonia pusilla*), yellow warbler (*Dendroica petechia*), American goldfinch (*Carduelis tristis*), and broad- tailed hummingbird (*Selasphorus platycercus*). The many reservoirs, lakes, and beaver ponds on the Academy support a variety of waterbirds such as green-winged teal (*Anas crecca*), mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), Canada goose (*Branta canadensis*), great blue heron (*Ardea herodias*), and belted kingfisher (*Ceryle alcyon*). An extensive list of 160+ bird species observed on the Academy is available at eBird.org.

Reptiles and Amphibians

Reptiles including the shorthorned lizard (*Phrynosoma douglassi*), bullsnake (*Pituophis melanoleucus*), and Western rattlesnake (*Crotalus viridis*) occur in various habitats. Chorus frog (*Pseudacris triseriata*), northern leopard frog (*Lithobates pipiens*), and other amphibians live in the riparian areas.

Mammals

Mammals in the grassland's community include coyote (*Canis latrans*), red fox (*Vulpes vulpes*), Gunnison's prairie dog (*Cynomys gunnisoni*), spotted ground squirrel (*Spermophilus spilosoma*), northern pocket gopher (*Thomomys talpoides*), and Western harvest mouse (*Reithrodontomys megalotis*). Mammals common to the forested and riparian communities include mule deer (*Odeocoileus hemonus*), white-tailed deer (*O. virginianus*), elk, beaver (*Castor canadensis*), muskrat (*Ondatra zibethica*), gray fox (*Urocyron cinereoargenteus*), raccoon (*Procyon lotor*), meadow vole (*Microtus pennsylvanicus*), Montane shrew (*Sorex monticolus*), and Preble's meadow jumping mouse. Black bears (*Ursus americanus*) can be a attracted to the housing areas and other facilities, but the problem is managed by deploying bear-proof dumpsters. Sightings of mountain lion (*Felis concolor*) and bobcat (*Lynx rufus*) are common. Smaller mammals such as coyote, red fox, striped skunk (*Mephitis mephitis*), and raccoon are frequent visitors in the housing areas. Echo-location acoustic surveys (see Table below) have identified up to 19 bat species potentially occurring on the Academy, but these findings need further verifications with additional acoustic and mist-netting sampling.

Fish

The Academy's coldwater streams (West Monument and Stanley Creek) support reproducing populations of brook trout (*Salvelinus fontinalis*). Nine species of nongame fish occur in the warmer water of Monument Creek: white sucker (*Catostomus commersoni*), longnose sucker (*Catostomus catostomus*), longnose dace (*Rhinichthys cataractae*), creek chub (*Semotilus atromaculatus*), brook stickleback (*Culaea inconstans*), fathead minnow (*Pimephales promelas*), Central stoneroller (*Campostoma anomalum*), bigmouth shiner (*Notropis dorsalis*), and green sunfish (*Lepomis cyanellus*). The Arkansas darter (*Etheostoma cragini*) and greenback cutthroat trout (*Oncorhynchus clarki stomias*) have been extirpated from Monument Creek and its tributaries.

The recreational fishing lakes are stocked with hatchery-raised rainbow trout (*Oncorhynchus mykiss*). Sterile hybrid grass carp (*Ctenopharyngodon idella*) are also occasionally stocked to control aquatic weeds.

Farish Recreation Area

Wildlife found on Farish are similar to those occurring on the Academy. Common species include, turkey (*Meleagris gallopavo*), mule deer, elk (*Cervus canadensis*), and black bear. Bear sightings are frequent and can be a potential nuisance in the camping areas. Frequent and heavy elk use, particularly during the winter, is evident from the browse line on aspen trees and the lack of young aspen sprouts.

The Farish lakes are stocked with rainbow trout and grass carp.

Bullseye Auxiliary Airfield

Wildlife at Bullseye is typical of the short-grass prairie ecosystem. Some of the more common species include pronghorn (*Antilocapra americana*), black-tailed prairie dog (*Cynomys ludovicianus*), coyote, swift fox (*Vulpes velox*) red-tailed hawk (*Buteo jamaicensis*), vesper sparrow (*Pooecetes gramineus*), horned lark (*Eremophila alpestris*), turkey vulture (*Cathartes aura*), Swainson's hawk (*Buteo swainsoni*), common raven (*Corvus corax*), and lark bunting (*Calamospiza melanocorys*). The uniformity of the vegetation and terrain and the absence of habitat features such as large trees, rock outcrops, and water accounts for the relatively low diversity and abundance of

wildlife at Bullseye.

Bat species identified at USAFA properties[a]	Scientific name	USAFA	Farish	Bullseye
Species that hibernate in Colorado				
pallid bat	*Antrozous pallidus*	X		
Townsend's big-eared bat	*Corynorhinus townsendii*	X		
big brown bat	*Eptesicus fuscus*	X	X	X
western small-footed bat	*Myotis ciliolabrum*	X	X	
long-eared myotis	*Myotis evotis*	X	X	
little brown bat	*Myotis lucifugus*	X	X	
fringed myotis	*Myotis thysanodes*	X	X	
long-legged myotis	*Myotis volans*	X	X	
Yuma myotis	*Myotis yumanensis*	X	X	
Mexican free-tailed bat	*Tadarida brasiliensis*	X		
Long-distance migrating bats				
eastern red bat	*Lasiurus borealis*	X		X
hoary bat	*Lasiurus cinereus*	X	X	X
silver-haired bat	*Lasionycteris noctivagans*	X	X	X
Species likely mis-identified by software	**Likely alternative species identification**			
western red bat	eastern red bat	X		
big free-tailed bat	Mexican free-tailed bat		X	
Arizona myotis	little brown bat	X		
California myotis	Myotis spp.	X		
canyon bat	tri-colored bat (*Perimyotis sublavus*)	X		

[a] Acoustic surveys conducted by Tennessee Tech University (Carver, 2019), USAFA Department of Biology (Norat et al., 2021), and USAFA Natural Resources (NaBat National Data Processing Lab, 2022). Species identifications reviewed by a local third-party bat specialist (Rob Schorr, Colorado Natural Heritage Program)

2.3.4 Threatened and Endangered Species and Species of Concern

Birds of Conservation Concern

The U.S. Fish and Wildlife Service has identified numerous birds of conservation concern in Bird Conservation Regions (BCR) 16 (Southern Rockies/Colorado Plateau) and 18 (Shortgrass Prairie) which include the Air Force Academy, Farish Recreation Area, and Bullseye Auxiliary Airfield. A complete list is available at https://www.fws.gov/mountain-prairie/migbirds/prioritySpecies.php

Air Force Academy

In 2012 and 2018, the Colorado Natural Heritage Program conducted surveys for rare species, species of special concern, intact natural plant communities, and Potential Conservation Areas on the Academy, Farish, and Bullseye (CNHP 2012,2018). Animals studied included Gunnison's prairie dog, Hops azure butterfly (*Celastrina humulus*), Northern leopard frog, Ovenbird (*Seiurus aurocapilla*), and Preble's. Plants included dwarf wild indigo (*Amorpha nana*), grassy slope sedge (*Carex oreocharis*), plains frostweed (*Crocanthemum bicknellii*), Rocky Mountain blazing star (*Liatris liguilistylls*), Southern Rocky Mountain cinquefoil (*Potentilla ambigens*), Porter's feathergrass (*Ptilagrostis porteri*), American currant (*Ribes americanum*), and plains ironweed (*Veronica marginata*). High-quality natural plant communities consist of mixed-mountain shrublands, montane grasslands, and Great Plains mixed grass prairie. The Potential Conservation Areas CNHP identified highlight Monument Creek and its tributary creeks, the Academy's oak foothills, and much of the Farish forest and meadows.

Field surveys by Ellington et al. (1996) also previously identified numerous plant communities and species of conservation interest, including:

Monument Creek. This area was identified as being of very high significance for biodiversity, and the area contains important native fish communities (described above) and habitat for the following significant species: Preble's meadow jumping mouse, Hops azure butterfly, southern Rocky Mountain cinquefoil, New Mexico cliff fern (*Woodsia neomexicana*), cedar waxwing (*Bombycilla cedrorum*), gray catbird (*Dumatella carolinesis*), and northern leopard frog.

Stanley Canyon. This site spans the transition from montane canyon to foothills stream. It supports several bird and butterfly species that are rare within Colorado, including ovenbird (*Seiurus aurocapillus*), evening grosbreak (*Coccothraustes vespertinus*), Snow's skipper butterfly (*Paratrytone snowi*), and Morrison skipper butterfly (*Stinga morrisoni*).

Jacks Valley. Habitat on this site supports Moss' elfin (*Callophrys mossii*), a butterfly that is rare in Colorado. The prevalence of suitable habitat in Jack's Valley indicates that the area might support a large number of butterflies.

East Pine Valley. A small patch of remnant midgrass prairie provides high-quality habitat for the Merriam's shrew (*Sorex merriami*), a rare mammal in Colorado.

Lehman Run. Lehman Run near the intersection of Cross Drive and Interior Drive provides habitat for the small-leaved leadplant (*Amorpha nana*), known from only a few scattered populations in Colorado.

Pine Creek. Pine Creek south of South-Gate Entrance, near Interstate 25 provides habitat for the American gooseberry (*Ribes americanum*), a State of Colorado rare plant species.

South Leo Lake, Farish Recreation Area. Habitat for Porter's feathergrass (*Ptilagrostis porteri*), a globally rare plant species.

Shortgrass and Mixed Grass Prairies of the Academy. Although not yet documented, these areas may provide habitat for the rare pocket mouse (*Peromyscus fasciatus infraluteus*) (Siemers et al. 2003).

Threatened or Endangered Species

Threatened and endangered species are federally protected plants and animals that are in danger of becoming endangered or extinct, respectively. Species can be threatened or endangered for a variety of reasons, but this status is often due to specialized habitat needs or habitat destruction or modification. The Endangered Species Act (ESA) of 1973 protects listed species against any action that would adversely affect them, including "taking," defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Further, any adverse impact to the habitat of a listed species is strictly prohibited without ESA consultation.

All DOD installations are required to perform threatened and endangered species surveys periodically and prior to any activities that disturb land potentially occupied by listed species. The Academy has completed extensive surveys to document the status of rare species, including a 1992 natural areas inventory, a 1996 survey of significant natural heritage resources, biological Inventories (CNHP 2012, 2018), and annual Preble's meadow jumping mouse surveys since 1997. In addition, numerous biological inventories and surveys have been conducted by faculty members and cadets in the Academy's Department of Biology. Examples include Ripley (1994) for plants, DeFusco and Cassel (1988) for birds, and Langlois and Munson (1991) for mammals. The CNHP has also identified several new rare plant sites while conducting noxious weed monitoring and inventories.

Surveys for the possible occurrence of eastern black rail (*Laterallus jamaicensis*) and bats of conservation concern, including tri- colored bat (*Perimyotis subflavus*), are ongoing.

Preble's Meadow Jumping Mouse

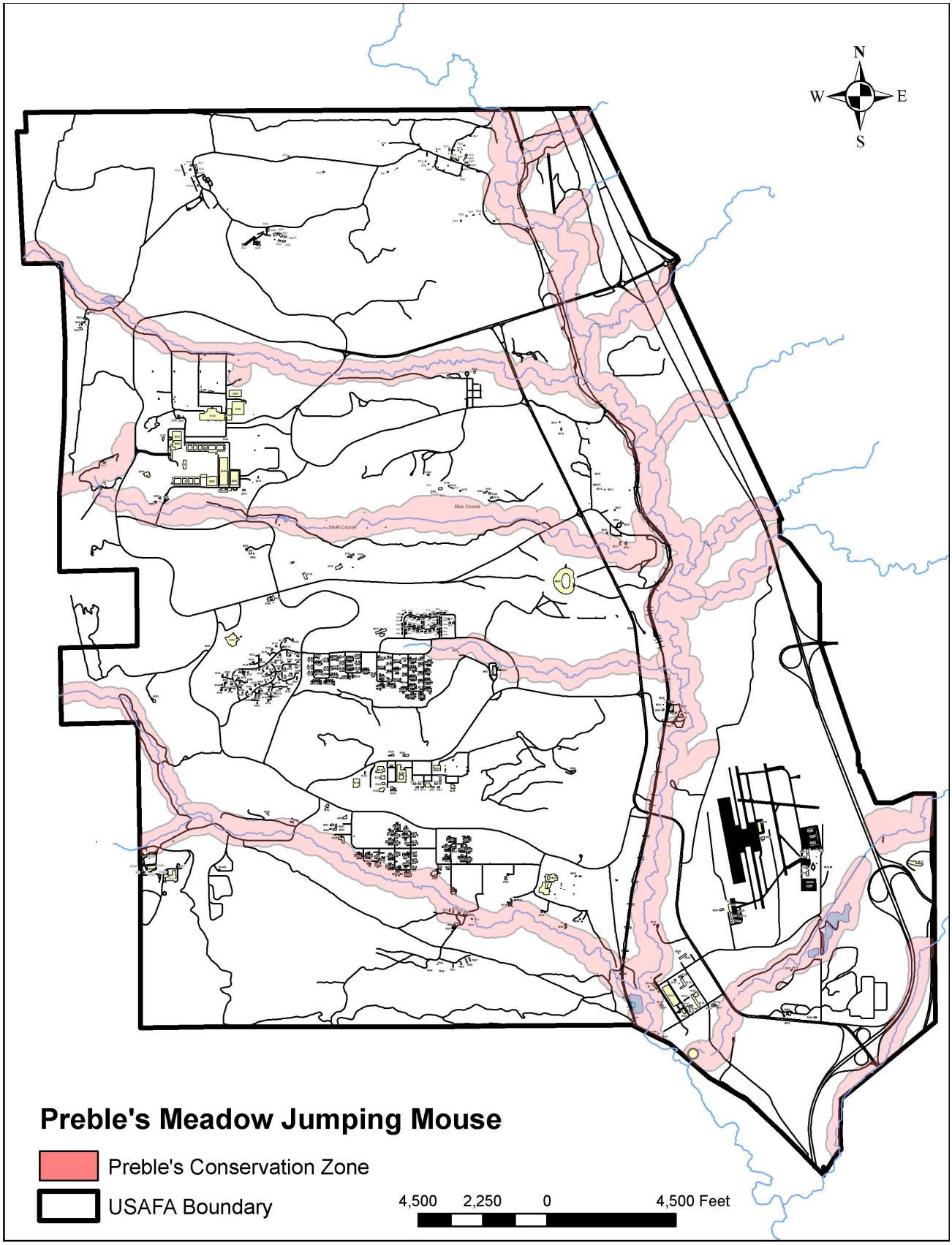
The federally threatened Preble's meadow jumping mouse is a small rodent with a conspicuous dark dorsal band, large well- developed hind legs and feet, and an extremely long tail. This meadow jumping mouse subspecies only occurs in foothill riparian systems from southeastern Wyoming to central Colorado in the North Platte, South Platte, and Arkansas River watersheds. In Colorado, the subspecies is currently documented in seven counties, with one of the larger and more stable populations occurring on the Academy within the Monument Creek watershed and Arkansas River drainage (Siemers et al. 2003). Because there are only a handful of medium and large populations targeted for conservation in the Preble's Recovery Plan (USFWS 2018), the Academy's medium population designation is invaluable for rangewide recovery of the subspecies.

Initially found on the Academy in 1994 by the CNHP, the Preble's was listed as threatened by the USFWS in May 1998. Following listing, the Academy entered formal ESA Section 7 consultation with USFWS and in April 2000 and received a "no jeopardy" Biological Opinion for proposed infrastructure repair and maintenance actions in mouse habitat. The USFWS declined to designate Critical Habitat for Preble's on the Academy at that time due to the conservation provisions already included in the INRMP. Conditions of the "no jeopardy" Biological Opinion included the development of a conservation agreement which the Academy and USFWS signed in June 2000. Since its inception, the Academy has adhered to the terms and conditions of the conservation agreement. A Preble's Conservation Zone, which includes both riparian and upland mouse habitat, covers approximately 3,300 acres of the installation. The Conservation Zone is a delineation of habitat within 300-feet of the upper edge of a 100-year floodplain.

The primary reason for Preble's decline is habitat loss along riparian corridors throughout its range (USFWS 2018). Loss and fragmentation of habitat is attributed to urban development, construction of highways and bridges, water development, increased runoff and flood control, mining (sand, gravel), and overgrazing. The most significant issue for Preble's management and conservation on the Academy is riparian habitat loss caused by damaging storm water runoff from urban development. Since the listing of Preble's in 1998, the landscape east of the Academy has experienced a dramatic increase in residential and commercial development. The associated increase in impervious surface has increased the frequency, rate, and volume of storm water runoff and the degree of flooding that occurs on the Academy. This impacts not only the population of Preble's at the Academy, but also jeopardizes the conservation of the subspecies in the southern part of its range and the ultimate success of the Recovery Plan.

The Preble's Recovery Plan requires a medium (500-2500 individuals) population be sustained in the Fountain Creek HUC. Within the HUC, only drainageways in the Monument Creek Watershed are known to support Preble's, and the majority of the watershed's mouse habitat and population occurs within the Air Force Academy. Therefore, the Academy's management and conservation of Preble's is crucial for sustaining a mouse population that meets the Recovery Plan objective. To this end, the Academy is an important stakeholder and participant on the Monument Creek Watershed Preble's Site Conservation Team (SCT) that will identify and nominate a Recovery population to the USFWS for the Fountain Creek HUC. Implementation of the SCT's strategy for sustaining the Recovery population is bolstered by the USAFA/USFWS Conservation Plan and Agreement that provides compatible habitat management, population monitoring, and threat abatement protocols.

Preble's Meadow Jumping Mouse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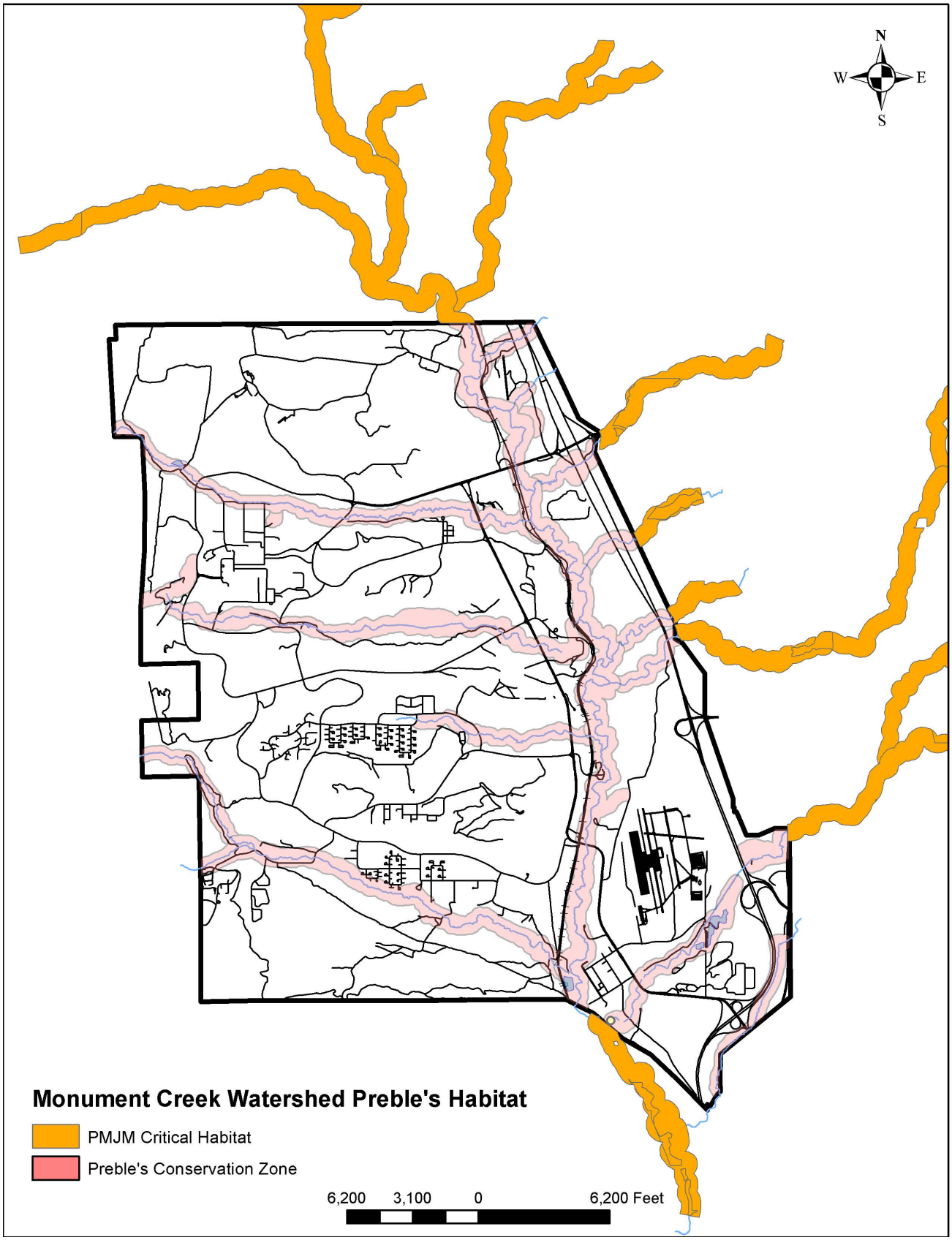
Preble's Meadow Jumping Mouse
Preble's Conservation Zone
USAFA Boundary
4,500 2,250 0 4,500 Feet



Potential Threatened and Endangered Species

Other threatened, endangered, or candidate species, and Colorado species of concern that could potentially occur on the Academy include the Mexican spotted owl (*Strix occidentalis lucida*), Arkansas darter (*Etheostoma cragini*), and the orchid Ute ladies' tresses (*Spiranthes diluvialis*), but previous surveys for these species have been negative. Mexican spotted owl has been observed in the higher elevation canyons west of the Academy on the Pike National Forest. Eastern black rail (*Laterallus jamaicensis*), listed as threatened in 2020, could potentially occur on the Academy but its preferred wetland marsh habitat is very limited. Acoustic surveys for black rail were conducted in 2022 with negative observations; an additional two years of survey is planned for 2023 and 2024. Tri-colored bat (*Perimyotis subflavus*), listed as endangered in 2022, could potentially occur on the Academy but there are presently no records for El Paso County. Recent NABat echo-location acoustic surveys on the Academy did not detect Tri-colored bat, however, additional surveying is planned for 2023 and 2024.

Other Animal Species of Special Concern

Air Force Academy

The CNHP biological Inventories (CNHP 2012, 2018) of the Academy observed Gunnison's prairie dog (*Cynomys gunnisoni*), Hops Azure (*Celastrina humulus*), Northern Leopard Frog (*Lithobates pipiens*), and Ovenbird (*Seiurus aurocapillus*), which are state species of conservation concern.

The monarch butterfly (*Danaus plexippus*) was considered for federal listing in 2020 but is currently recognized as a candidate species. Long-time Academy biologists recall rarely observing monarch's 30+ years ago, and then mostly along Monument Creek. Over the past several decades the frequency of monarch sightings on the Academy has continued to decline. The installation is situated along the western fringe of the butterfly's typical spring and fall migration route. Grassland communities on the Academy are known to include small, dispersed patches of milkweed (*Asclepias speciosa, A. viridiflora*) that the butterfly prefers as a food source.

Farish Recreation Area

No plant or animal species listed as threatened or endangered occur on Farish. Porter's feathergrass, a state species of conservation concern, is found in a small wetland fen.

Bullseye Auxiliary Airfield

No plant or animal species listed as threatened or endangered occur at Bullseye. Burrowing owl, a state species of conservation concern, has previously nested in the area when prairie dog burrows were available. Burrowing owl have not been documented since a small prairie dog colony was eradicated in the early 2000's for BASH management. Swift fox has been observed hunting and denning within the Bullseye fenced area, and several animals have been trapped and relocated with CPW guidance.

Federally-Listed Species, Colorado Species of Concern, and Colorado Natural Heritage Program State-Ranked Species Known or Potentially Occurring on The Air Force Academy, Farish Recreation Area, or Bullseye Auxiliary Airfield

Species		**Status**	
Common Name	**Scientific Name**	**Federal**	**Colorado**
Amphibians			
Northern leopard frog	*Rana pipens*		S3
Reptiles			
Texas horned lizard	*Phrynosoma cornutum*		SC
Common garter snake	*Thamnophis sirtalis*		SC
Plants			
American currant	*Ribes americanum*		S2
Rocky Mountain blazing star	*Liatris ligulistylis*		S1S2

Ute ladies'-tresses orchid	*Spiranthes diluvialis*	T	T
Plains ironwood	*Vernonia marginata*		S1
Plains frostweed	*Crocanthemum bicknellii*		S2
Southern Rocky Mountain cinquefoil	*Potentilla ambigens*		S1S2
Porter's feathergrass	*Ptilagrostis porterii*		S2
Richardson's alum-root	*Heuchera richardsonii*		S1
Dwarf wild indigo	*Amorpha nana*		S2S3
New Mexico cliff fern	*Woodsia neomexicana*		S2
Prairie violet	*Viola pedatifida*		S2
Grassy slope sedge	*Carex oreocharis*		S1
Birds			
American peregrine falcon	*Falco peregrinus anatum*		SC
Ovenbird	*Seiurus aurocapilla*		S2B
Bald eagle	*Haliaeetus leucocephalus*		SC
Ferruginous hawk	*Buteo regalis*		SC
Long-billed curlew	*Numenius americanus*		SC
Burrowing owl	*Athene cunicularia*		SC
Mexican spotted owl	*Strix occidentalis lucida*	T	T
Mountain plover	*Charadrius montanus*		SC
Eastern black rail	*Laterallus jamaicensis jamaicensis*	T	T
Mammals			
Black-tailed prairie dog	*Cynomys ludovicianus*		SC
Gunnison's prairie dog	*Cynomys gunnisoni*		S2
Gray wolf	*Canis lupus*	E	E
Tricolored bat	*Perimyotis subflavus*	PE	S2
Northern pocket gopher	*Thomomys talpoides macrotis*		SC
Swift fox	*Vulpes velox*		SC
Townsend's big-eared bat	*Corynorhinus townsendii pallescens*		SC

Preble's meadow jumping mouse	*Zapus hudsonius preblei*	T	T
Invertebrates			
Monarch butterfly	*Danaus plexippus*	C	-
Hops Azure	*Celastrina humulus*		S2
Cross-line skipper	*Polites origenes*		S3
Buckmoth	*Hemileuca grotei diana*		S2
Moss's elfin	*Callophrys mossii schryveri*		S2S3

T - Threatened
E - Endangered
C - Candidate
SC - State Special Concern
S# - Colorado Natural Heritage Program State-rank

2.3.5 Wetlands and Floodplains

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands are typically found along streams, rivers, springs, ponds, and drainage ditches. Riparian areas refer to banks associated with ponds and streams that support a variety of vegetation not typically found in drier upland areas and are often a subset of the wetlands classification. Vegetation along riparian corridors supports a variety of habitats and associated plant and wildlife species. Riparian zones serve as nutrient filters, sediment traps, climatic regulators, and wildlife refuges; thus, their disturbance can have far-reaching effects on the structure and function of stream and watershed ecosystems.

Jurisdictional wetlands are defined by the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (USACE 1987) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." The majority of jurisdictional wetlands (i.e., those wetlands protected by the Clean Water Act [CWA]) meet three wetland delineation criteria: (1) a prevalence of wetland-associated vegetation, (2) hydric (wetland-type) soils, and (3) wetland hydrology.

All areas potentially impacted by Federal actions must be assessed for wetlands and a jurisdictional determination needs to be made by the Albuquerque District of the USACE. EO 11990, Protection of Wetlands, requires all Federal agencies to consider wetland protection in their decision-making process. The CWA requires any action that would directly involve the placement of fill material in wetlands or other waters of the United States to be subject to the permit requirements of Section 404. Under Section 404 (b)(1), the permitting of fill activities will not be approved unless the following conditions are met: no practicable, less environmentally damaging alternative to the action exists; the activity does not cause or contribute to violations of state water quality standards or jeopardize endangered or threatened species; the activity does not contribute to significant degradation of waters of the United States; and all practicable and appropriate steps have been taken to minimize potential adverse impacts on the aquatic ecosystem (Title 40 CFR 230.10). The USACE administers Section 404 of the CWA and in Colorado has primary jurisdictional authority to regulate wetlands and waters of the United States.

As a result of the above-mentioned Federal and state regulations, it is the responsibility of the USAF to identify and locate jurisdictional waters of the United States (including wetlands) occurring on USAF installations where these resources have potential to be impacted by base activities. Such impacts could include construction of roads, buildings, runways, taxiways, navigation aids, and other appurtenant structures or activities as simple as culvert crossings of small intermittent streams, riprap placement in stream channels to curb accelerated erosion, and incidental fill and grading of wet depressions.

Air Force Academy

Previously, the Academy's wetland data consisted of 1993 National Wetland Inventory (NWI) maps that were produced by the USFWS. In 2002, a non-jurisdictional wetland delineation was completed for the Academy using aerial photographs, the NWI maps, existing data on project-specific jurisdictional delineations, and extensive field surveys and ground-truthing of site vegetation and surface hydrology indicators (URS 2002). The purpose of conducting a wetland survey was to provide a database that could facilitate initial master planning, construction planning, and environmental management. A formal jurisdictional delineation of wetland boundaries is required for proposed projects that could affect a wetland or other waters of the United States.

The Academy supports both riverine (wetlands within a channel) and palustrine (nontidal wetlands dominated by trees, shrubs, or emergent plants) wetland habitats. Of the 301 wetlands and other waters of the United States identified on base, 67 areas are in riverine systems (2.2 acres) and 234 areas are within the palustrine system (210.4 acres). Monument Creek, the largest perennial stream on the Academy, was mapped as palustrine habitat because wetland vegetation occupies both banks and low islands within the stream, and typically covers a greater width than the stream itself.

The 2002 survey also identified historic wetlands that have had their hydrology modified, and therefore are no longer wetlands, due to severe channel down-cutting (natural or accelerated by increased runoff). A general shrinking of many of the hillside seeps along Monument Creek was also observed, which could be the result of the recent drought and/or development impacts on groundwater recharge and surface drainage patterns. Any loss of wetland habitat along Monument Creek has the potential to negatively affect the resident population of the federally threatened Preble's meadow jumping mouse and other associated wildlife species.

Farish Recreation Area

The URS study (2002) delineated 12 palustrine wetlands that encompass 40.33 acres, including the open water habitat of the three recreational fishing lakes.

Bullseye Auxiliary Airfield

The Bullseye Auxiliary Airfield has not been formally surveyed for wetlands, but none exist based on the dominant grassland vegetation, lack of surface hydrologic features, and highly permeable soils.

Floodplains

Air Force Academy

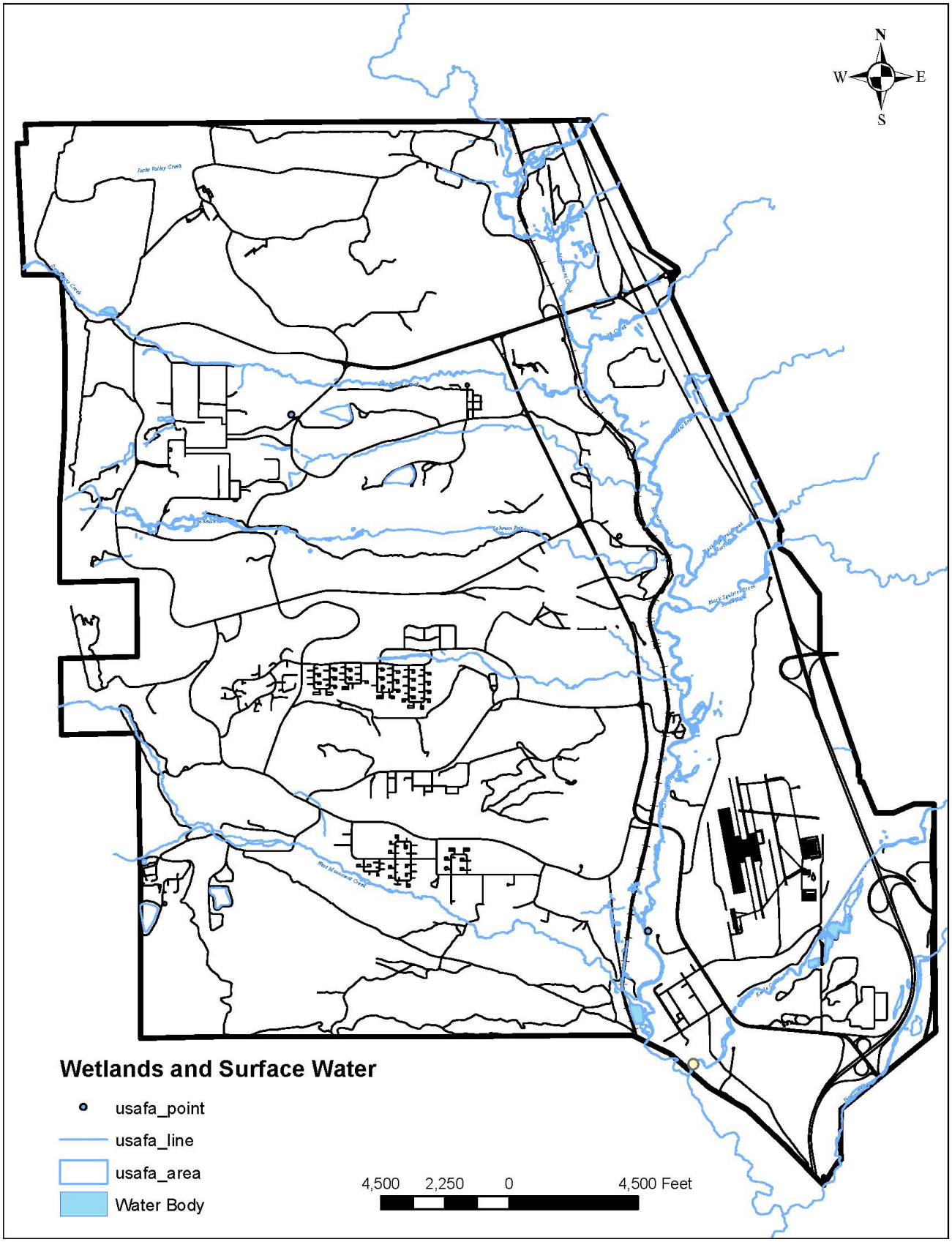
Floodplains at the Academy are most prevalent along Monument Creek and its tributaries. The Academy's 10-year and 100-year floodplains were mapped in 2003 (URS 2003a, 2003b) to help establish the boundary of the Preble's Conservation Zone, defined as the area within 300-feet of the edge of the 100-year floodplain. Colorado State University (CSU) was contracted by the Air Force Civil Engineer Center (AFCEC) in 2022 to remap the 100-year and 500-year floodplains for the Academy, which revealed some minor to major discrepancies with the URS 2003 delineation. Some revision of the Preble's Conservation Zone boundary may be necessary if the CSU delineation is adopted by the base.

Farish Recreation Area

The potential for hazardous flooding of South Beaver Creek at Farish was evaluated in 1997 in conjunction with an assessment of the safety of the dams on the three lakes. Water surface elevations at cross sections within the South Beaver Creek were computed based on future basin development conditions. Those elevations were plotted in profile for the 10-year and 100-year flood peaks.

Bullseye Auxiliary Airfield

Bullseye is not located in a floodplain.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Wetlands and Surface Water
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usafa_line
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Water Body
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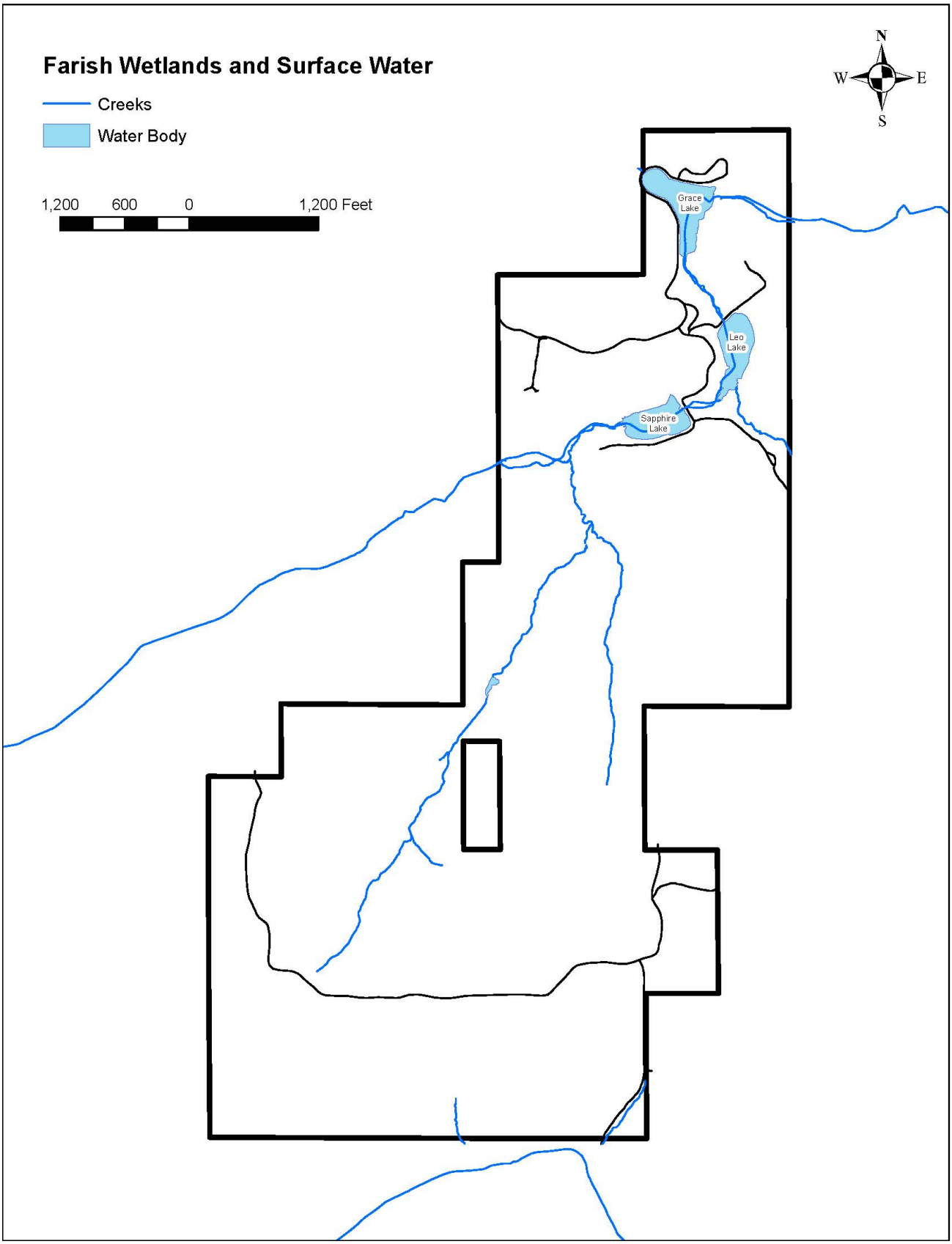
Farish Wetlands and Surface Water
Creeks
Water Body
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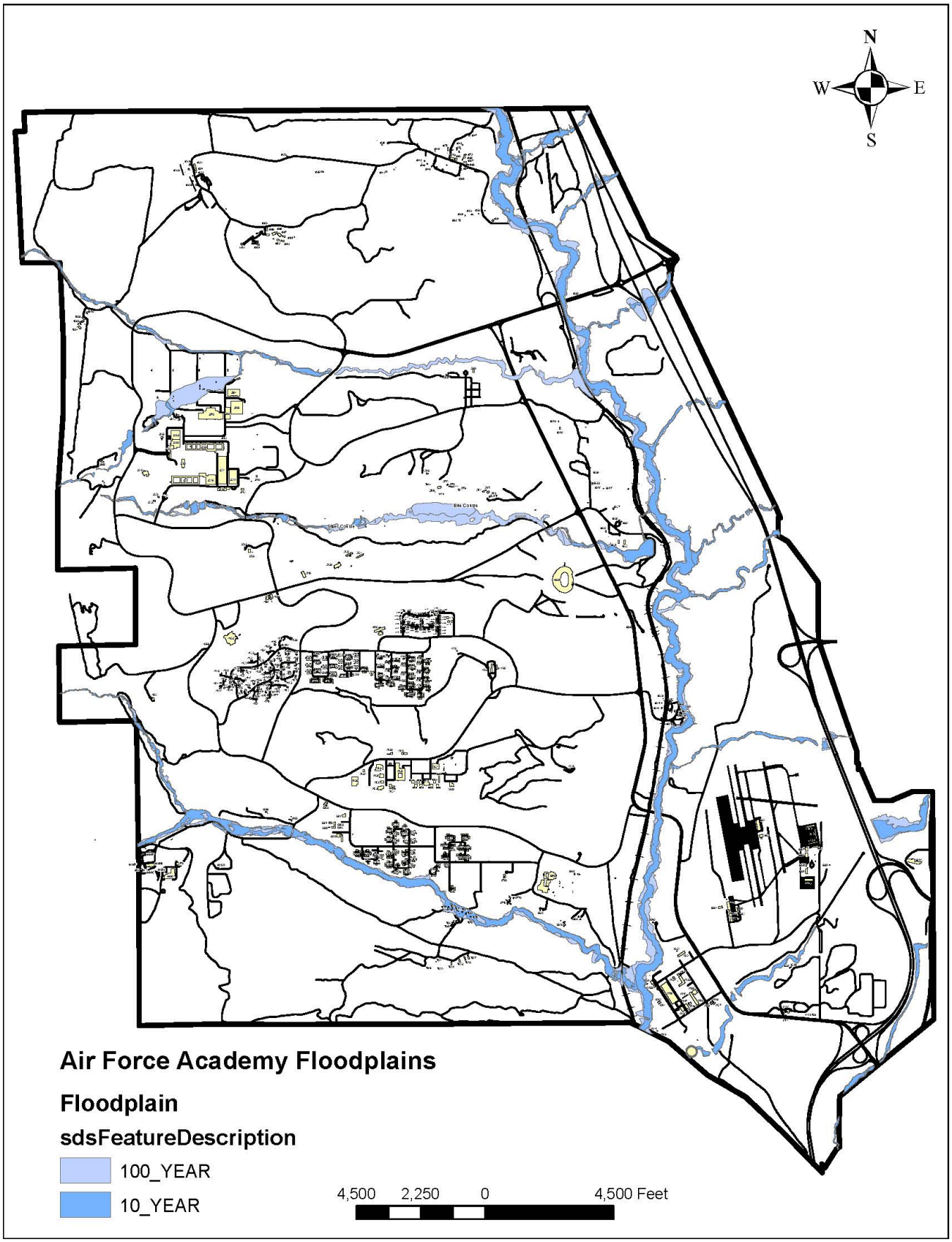
Grace Lake
Leo Lake
Sapphire Lake



2.3.6 Other Natural Resource Information

Air Force Academy

Prior to European settlement, the ponderosa pine forests of Colorado's Front Range experienced fire at approximately 5-to-20-year intervals. These were historically started by lightning strikes, and later by Native Americans. These frequent, low-intensity surface fires removed dead debris from the forest floor and rejuvenated the grass and herbaceous understory. Many thinner- barked seedlings and saplings that had established since the last fire were killed. Some of the younger trees that escaped the fire would grow thicker, more fire-resistant bark before the next event, encouraging the growth of larger, widely spaced trees with an understory of scattered small trees, grasses and herbs. Small groups of pine regeneration would establish in holes left in the canopy from scattered overstory pines that died, often leading to a clumpy mosaic composition. Forests under this natural fire regime perpetuated a more open stand structure with a variety of age and size classes, often described as "park-like."

In contrast to historic Front Range forests, intensive fire suppression over the past century has resulted in a dominance of densely stocked forests. These unnaturally thick forests tend to have a substantial layer of overtopped and suppressed pines, and often a disproportionate amount of Douglas-fir. While the latter occurs naturally on north slopes of the Academy, this tree has proliferated in many areas under the exclusion of fire. Because its thinner bark is much less fire-adapted than ponderosa pine, Douglas-fir succumbs more easily to fire. Its presence would have been naturally limited due to mortality from periodic fires. Douglas-fir is also more tolerant of shady conditions than ponderosa pine, establishing easily under a forest canopy and thriving in lower sunlight levels than the less shade-tolerant ponderosa pine. Its fuller crown and frequent lower position in the forest create a ladder fuel, serving to channel flames up into the main tree canopy. This can lead to a devastating crown fire in which flames race from tree crown to crown, often causing widespread tree mortality. Gambel oak, which also serves as a ladder fuel, appears to be present in greater amounts today than historically. Much of the Gambel oak on the Academy suffered major dieback in 2003-2004 as a result of the drought and the Agrilus oak borer beetle. Many oak clumps have since resprouted, but the number of dead stems within existing oak clumps greatly exacerbate the fuel hazard.

While periodic low intensity surface fires were an integral part of the forest ecosystem, the scene has now been set in much of the ponderosa pine ecosystem for unnaturally catastrophic stand replacement fires. This was evidenced by the 2002 Hayman fire, which burned approximately 135,000 acres. This fire ran 19 miles and exploded by nearly 62,000 acres in one day alone. While extreme drought and weather conditions played a major factor, the devastating fire behavior and nearly unprecedented forest mortality were greatly exacerbated by excessive fuel loadings of the overstocked forest landscape.

In contrast to the ponderosa pine forest, the steep east slopes and dense mixed conifer forests of the west end of the Academy would historically have been under a stand replacement fire regime. Periodicity of fires would have been considerably less frequent than the surface fire regime of the drier and more open ponderosa pine ecosystem, but fire intensity would have been significantly greater. Tree mortality would have been very widespread. A fast-moving crown fire would have been almost a certainty, especially considering the steep terrain in which uphill fuels combust quickly from preheating. These fires probably occurred only every 100-200 years, but nearly the entire forest would be killed in a fire. The length of time to naturally regenerate to ponderosa pine and Douglas-fir would depend on proximity to a seed source of live trees. Douglas-fir would likely be the dominant trees naturally seeding in following a fire, due to the east aspect and greater mobility of the lighter winged fir seeds. White fir would also comprise a component of the newly regenerated forest.

Prescribed fire and mechanical treatments have been used as management tools on the Academy to reduce fuel hazard and lessen the risk of a major wildfire. These programs are discussed further in the Wildland Fire Management section of this plan.

Farish Recreation Area

Fire has also played an integral part of the natural landscape at Farish. Historically, most of its mixed conifer forests would have been characterized by a stand replacement fire regime. This high elevation predominantly Engelmann spruce forest would have burned very infrequently, with a lower fire periodicity than the mixed conifer forests at the Academy. Fire intensity would be very high, leading to nearly total tree mortality and a return to aspen, an early successional species. Some of the drier areas with a higher component of ponderosa pine would have burned under a mixed fire regime, with periodic lower intensity surface fires in between less frequent but more intense stand replacement fires. The surface fires would have encouraged mixed conifer regeneration, while the stand replacing events would have resulted in a return to the pioneer species aspen.

Aspen is a short-lived tree, requiring natural disturbance to reestablish young stands and perpetuate it as a component of the forest ecosystem. Aspen starts declining by 60 years of age, disappearing almost entirely from the forest composition by 100 years of age. It has been decreasing across much of the Rocky Mountains due to the exclusion of fire. New aspen stands can and have been successfully established through forest management practices, as discussed in the Forest Management section of this plan.

As at the Academy, wildfires have been suppressed across much of the landscape in and surrounding Farish, resulting in fairly uniform closed-canopy coniferous forests. Ranching and agriculture at Farish early in this century created open areas, and the diverse, interspersed vegetation pattern remaining at Farish today represents natural conditions more so than does the vegetation pattern on the surrounding lands. While some prescribed burning has been utilized to promote rangeland health and maintain upland meadows at Farish, many openings are being encroached on by invading conifers.

Bullseye Auxiliary Airfield

The mixed grass and short grass prairies found at Bullseye would likely have burned at fairly frequent intervals under a natural fire regime. These fires would have been largely beneficial, moving swiftly due to the flashy fine fuels. Grasses would have been rejuvenated by these fires, with little soil damage due to the quick fire spread.

There has been no prescribed burning to date at Bullseye.

Visual Quality and Viewsheds

Air Force Academy

Important scenic and historic views and viewsheds have been formally defined. For the purposes of this plan, the following general viewpoints and viewsheds that were identified in the 2003 INRMP continue to be of importance to the visual integrity of the Academy.

- Views from I-25 – Views to the west, especially of the Cadet Area, the chapel, and Cathedral Rock, are of primary importance. Views to the east are of secondary importance and contribute to scenic quality in two ways: they create the experience of feeling surrounded by nature on all sides while traveling through the Academy on I-25; and they preserve the scenic, natural approach to the city of Colorado Springs from the north.
- Views from the Cadet Area and athletic fields – The Cadet Area was designed to be a secluded living, learning, and training environment. Natural views from the Cadet Area contribute to the cadets' discipline and focus, yet also provide visual relief from a rigorous and stressful environment.
- Views from the Visitor Center – Views in all directions from the Barry M. Goldwater Visitor Center are important because this is where visitors learn about the Academy and cadet life.
- Views from the two Northgate Boulevard scenic overlooks – These are signed, designated overlooks just north and northeast of the cadet athletic fields. Many visitors who enter or leave the Academy via Northgate Boulevard stop at these overlooks, which provide outstanding views of the Cadet Chapel/Cadet Area and the athletic fields below. Scenic quality to the south and west is especially important, but natural scenery in all directions contributes to the beauty of the Academy and should be preserved.
- View from the Chapel Overlook Trail toward the north – This overlook which is south of the Cadet Area is used by both visitors and cadets. The overlook provides eye-level views of the Cadet Chapel/Cadet Area (framed by vegetation) from a southern vantage point.

When the Academy was master planned in the 1950s, views and scenic quality were major determinants of the placement of roads, facilities, and the Cadet Area. The Academy's scenic quality is also important to the City of Colorado Springs and is a dominant visual feature of the approach to the city along I-25. Colorado Springs' open space plan states that the mountain backdrop preserved by the Academy's grounds currently serves as an invaluable visual gateway to the city.

Farish Recreation Area

While scenic and historic views and viewsheds have not been formally designated at the Farish Recreation Area, the visual quality is excellent. Striking views of Pikes Peak to the southwest are available from every ridge or high point on the property. Documents justifying the acquisition of 60 additional acres for the Farish Recreation Area made this point clear: "the land comprises a hill on its southern extremity which protects the view of Pikes Peak for the Farish Memorial Recreation Area. The land is needed to preserve the value of Farish Memorial Recreation Area as a place of relaxation, solitude, and recreation." Topographic and vegetative diversity lend a vast, unbounded feeling to Farish, even though it is relatively small in size. An absence of nearby urban development and associated ambient light make Farish ideal for stargazing. While the quality of distant views is excellent, some of the near and middle-ground views at Farish have been marred by road scars, parking areas, material sources, camp sites near lakeshores, and maintenance yards that were sited in the past without regard to visual quality.

2.4 Mission and Natural Resources

2.4.1 Natural Resource Constraints to Mission and Mission Planning

This section describes natural resources conditions that could impact the Air Force Academy's training mission. Storm water erosion is a serious issue throughout the installation, but especially along the Interstate 25 corridor. Off-base development has led to severe channel degradation, exposing and damaging previously buried utilities, damaging Preble's Meadow Jumping Mouse habitat, and making some recreational trails and unpaved roads unsafe. Training areas may be impacted if erosion continues at the current rate.

The Preble's Conservation Zone encompasses approximately 3,300 acres of the Academy, but there are no specific restrictions on non-ground disturbing activities within the habitat area that would typically prevent military training such as orienteering or squadron patrols. If training impacts are anticipated ESA consultation with USFWS is required.

Construction, training, and other activities that could cause soil and vegetation damage are generally excluded from wetland and floodplain areas. Where impacts cannot be avoided, a Clean Water Act 404 permit and/or NEPA Finding of No Practicable Alternative is required.

Significant migratory bird activity or congregation on open bodies of water can create adverse Bird-Aircraft Strike Hazard (BASH) conditions that may curtail flight operations due to an elevated Bird Hazard Condition and risk. Monitoring of birds and other wildlife, hazing/harassment, and limited depredation is used to reduce wildlife activity and flight risk. All bird management options are authorized through various Migratory Bird Treaty Act permits.

2.4.2 Land Use

Air Force Academy

Boundaries for the Academy were based on the need for airspace, land-based military training, room for future expansion, and viewshed protection. The Academy was comprehensively master planned before any construction began. The original master plan clustered development into separate functional use areas and devoted nearly 70 percent of the base to open space. The master plan regarded open space as integral to the overall design concept of the Academy, with uses intended to preserve views, restrict development in environmentally unsuitable areas, separate and buffer subareas and functions, and provide for recreation.

Planning Considerations. The architectural firm of Skidmore, Owings, and Merrill prepared the Master Plan for the Academy which they completed in 1955, and provided the primary guidance for the layout and construction of the Academy. With this, the Academy became one of very few higher educational institutions to be master planned before any construction began.

Paramount in the planners' objectives was the protection of scenic quality. For example, views were a primary consideration in the siting of roads and facilities. All roads were sited and designed to traverse the rugged terrain without causing unsightly road cuts and fills. In many areas today, the roads are nearly invisible. Bridges and viaducts were used to span stream drainages, thereby protecting wetlands and riparian habitat. In addition, buildings were clustered in functional planning areas to maximize open space and visual quality.

Other planning principles relevant to natural resources management included the following:

- Establish major functional subareas such as cadet area, airfield/flight line, logistics and support areas, housing and neighborhoods, training areas, and community center
- Use site characteristics and consider functional needs to determine the most advantageous location of major use areas
- Establish a road network that separates the interaction of public, private, and service vehicular traffic
- Respect the natural topography of the site and locate facilities to maintain the natural setting
- Maintain each subarea's own capacity to accommodate expansion
- Maintain the importance of views to and from the various subarea groupings as well as from access points.

The Land Use Plan of the Academy's Base Comprehensive Plan states the three following general environmental objectives for the 12 subareas.

1. *Conservation* – Preserve and protect the physical and visual presence of the natural setting. Protect non-replaceable open space and the existing architectural character.
2. *Continuity* – Ensure functional harmony between new and existing development. Ensure functional harmony between new development and the natural surroundings.
3. *Compatibility* – Ensure visual harmony between new and existing development and the natural surroundings.

Planning principles developed in the original Master Plan and affirmed in the Land Use Plan consider the open space as integral to the overall concept of the Academy. The purpose of designating the open space is to achieve the following:

- Preserve views and thereby maintain the majestic quality of the site
- Restrict development in environmentally sensitive areas (e.g., wetlands)

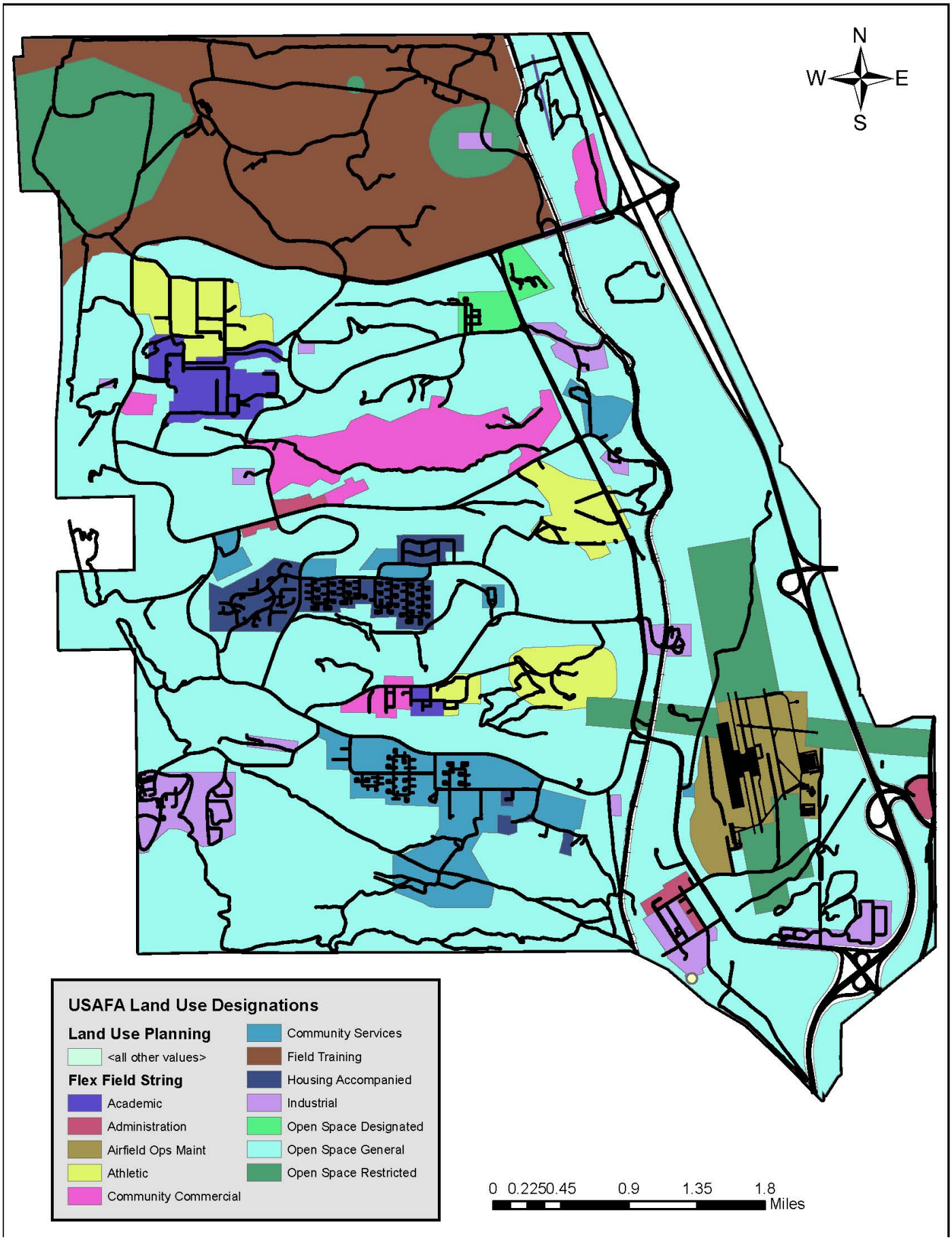
- Separate and buffer subareas and functions
- Provide recreational opportunities.

The Land Use Plan further states that the open space at the Academy is not extraneous; it is the medium in which the built areas are presented and, therefore, contributes to the unity and harmony that make the Academy a distinctive place. There are three open space classifications, as follows:

1. *Natural* – Land that is not appropriate for building and should be preserved in its natural state.
2. *Designated* – Land used for appropriate recreational and outdoor athletic facilities.
3. *General* – Land that surrounds and buffers existing roads, parking, and buildings. It can be used for new development or expansion of existing facilities provided the development location is thoroughly studied and open space remains free of scattered structures.

The land use policies for open space stated in the Land Use Plan are as follows:

1. Maintain preserved open space free from any development. Unpaved roads and trails needed for resources management and protection are allowable.
2. Maintain designated open space free from building construction.
3. Maintain general open space as a visual resource.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USAFA Land Use Designations
Land Use Planning
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Administration
Airfield Ops Maint
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Community Commercial
Community Services
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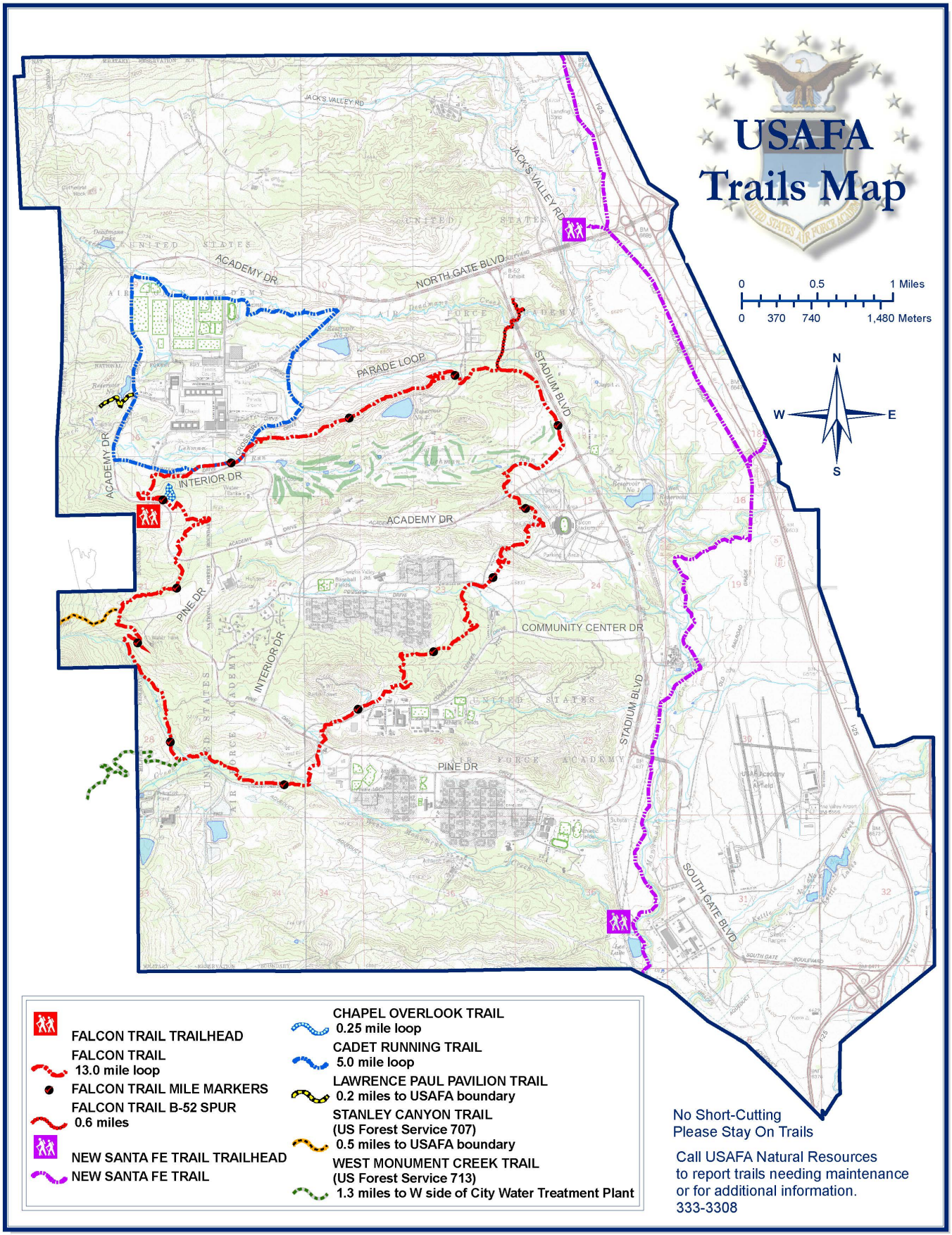


Farish Recreation Area

Farish shares a boundary with the Pike National Forest for approximately 20 percent of its perimeter; national forest lands abut the northeast, north, and northwest Farish boundaries. Owners of private lands around Farish include Carroll Lakes (a fishing resort that is a consortium of 50 private cabin owners) on the northeast boundary, numerous private parcels on the southwest boundary, and several residences with ranching operations on the west, southwest, and southern boundaries. Private residences on adjacent property are visible from the southwest gate and Schubarth Trail areas.

There is one 10-acre inholding in the south-central part of Farish. Access to the inholding is from the southwest gate.

Management Zones

Three Management Zones have been designated at Farish:

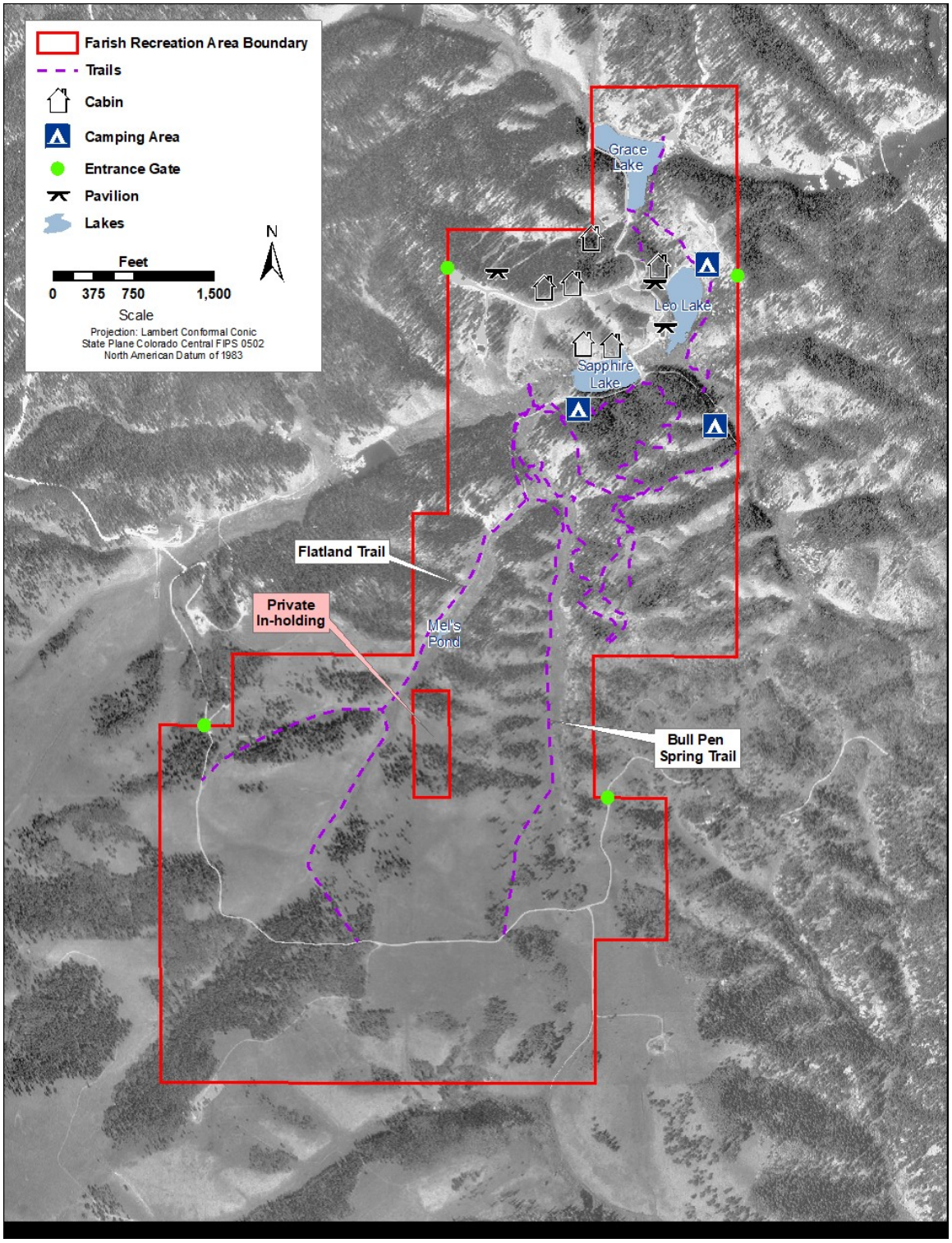
1. **Conservation Zone:** The Conservation Zone is a large, unrestrained natural area where views of Pikes Peak, wildlife, and wildlife habitat prevail. Man-made intrusions are minimized, and visitor use levels are low. Experiencing a sense of solitude and discovery in a natural environment are the primary outdoor recreational opportunities in this zone.
2. **Development Zone:** The Development Zone is set aside for camping, lodging, and day use activities such as fishing. Human activity is evident but harmonious with the natural environment. The area is managed as a roaded natural setting with the objective of maintaining a rural setting to minimize visitor and development impacts to the environment.
3. **Transition Sub-Zone:** The Transition Sub-Zone serves as a buffer between the Conservation Zone and the Development Zone and offers less developed recreational activities. The Transition Sub-Zone feathers the level of development in each zone from more developed in the Development Zone to less developed in the Transition Zone, to undeveloped in the Conservation Zone. It is managed somewhere between a roaded-natural and a semi-primitive motorized recreational environment.

Access to Farish

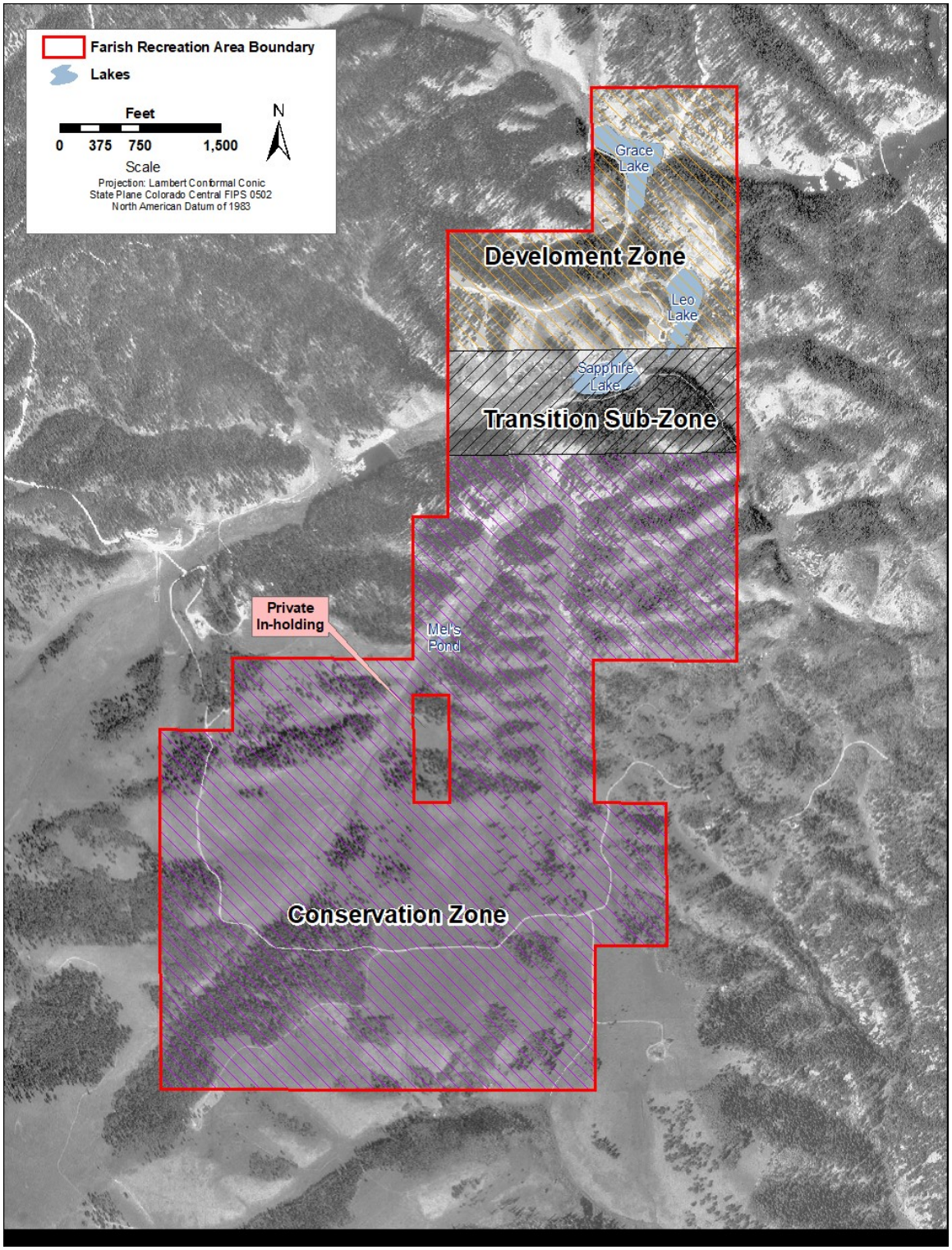
There are four access points to Farish. The Academy acquired a permanent easement through one mile of the Pike National Forest on the west boundary of Farish to make a new main entrance in 2001. The Academy is responsible for maintaining this road, but has no enforcement authority along the road. This is a public road and can be used by anyone recreating in the Pike National Forest (USAFA 2001).

The Schubarth Trail begins at Rampart Range Road and crosses through mixed national forest and private property before entering Farish at the southwest gate. Schubarth Trail bisects the southern part of Farish and continues eastward beyond the boundary as a four-wheel-drive road to Pike National Forest.

The Pike National Forest Trail 721 enters Farish on the northeast boundary near the former landfill. Use is limited to hiking, horseback riding, and mountain biking.



Existing Conditions at the Farish Recreation Area



Farish Recreation Area Zone Map

Grace Lake

Development in the Grace Lake area includes two lodges, administrative/storage/maintenance areas, an unused caretaker's residence (scheduled for demolition); and informal picnic areas.

Leo Lake

One large and three smaller picnic pavilions are on the west side of Leo Lake, along with a gravel parking area with space for about 20 cars, a volleyball area, a playground, and a camper cabin (which accommodates four people overnight). Five walk-in campsites are on the east side of the lake. The large picnic pavilion contains grills and accommodates about 40 people. Potable water is provided in large water buffaloes, and restrooms are portable, self-contained toilets. There are several bear-proof dumpsters and containers. A handicap accessible fishing pier has also been installed next to the large pavilion.

Sapphire Lake

Six campsites, two camper cabins and portable toilets are near the south shore of Sapphire Lake; two campsites are located southeast and away from the lake. There is also a log picnic pavilion that accommodates about 12 people.

Program Barn Area

A 1,500-square-foot stable with a corral (built in 1959) used to be located in a drainage area south and west of Grace Lake. Horses were removed from this stable area in 1991. The horse operation was not economically viable, and Academy resources managers were concerned about the effect of water runoff from the horse corral on the water quality of adjacent wetlands and Grace Lake.

The stable was converted to a program barn and the corral was removed. A pavilion is now located next to the program barn. An access road extends westward beyond the program barn to a camper cabin that accommodates four people.

West Gate

The main entrance and office facility is located at the west gate. A multipurpose building has been constructed south of the main entrance road. The building is often used as a training or meeting place for Academy personnel. Two duplexes are located on each side of the multipurpose building road. These duplexes are fully equipped cottages with water, electric, bathing facilities, and kitchens. Two lodging units are located in the basement of the multipurpose building. They are used as overnight lodging facilities for Farish guests.

A bathhouse is also located on the multipurpose building road. The bathhouse serves overnight camping guests at Farish. A septic system has been constructed east of the multipurpose building road, which serves the multipurpose building, six lodging units, entrance facility, and the bathhouse.

Former Landfill

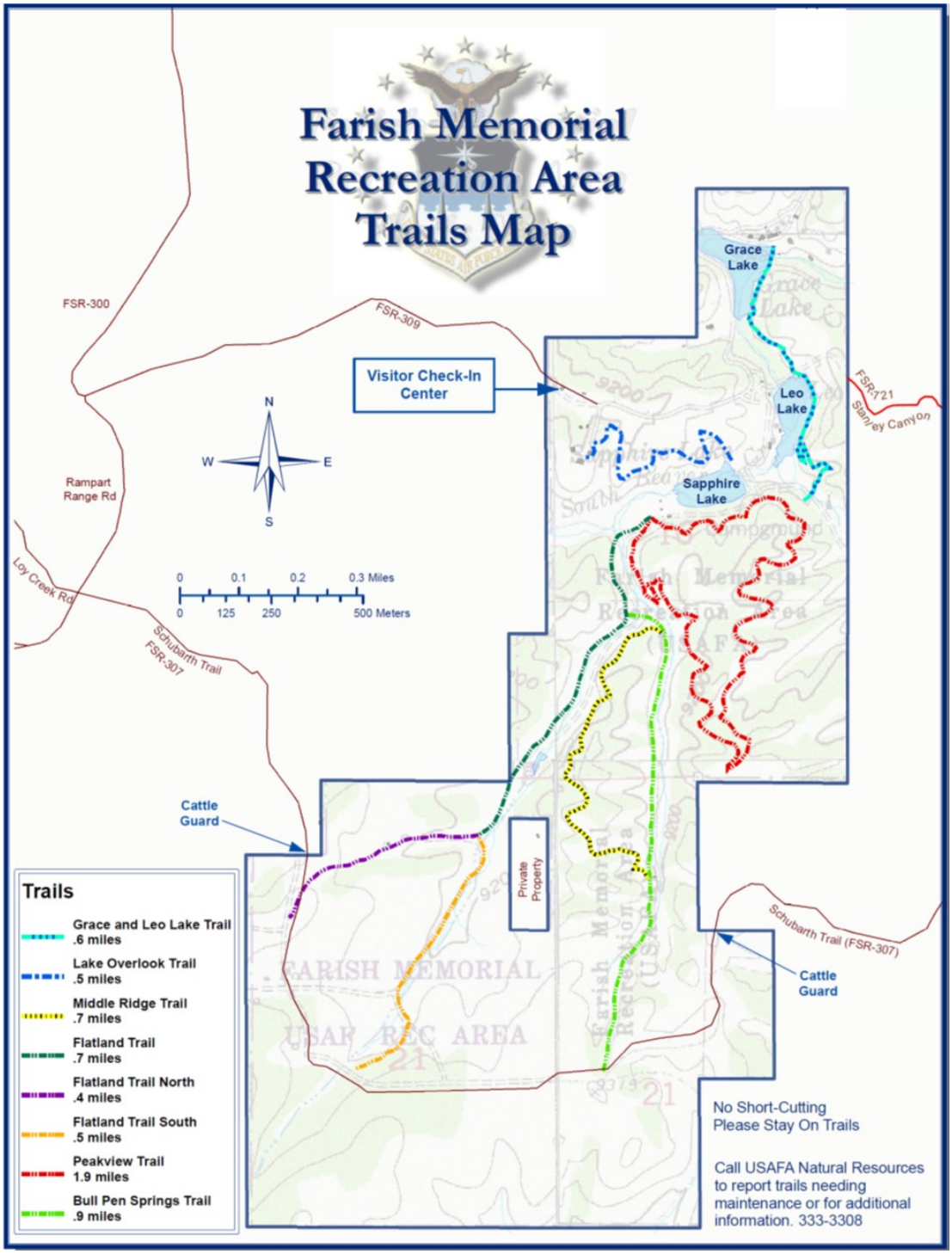
In past years, a knoll between Grace and Leo lakes was regraded and used as a disposal area for material dredged from Farish lakes. The landfill is no longer in use. Two wells were installed in 1984 to monitor groundwater in the vicinity of the landfill. The groundwater did not show significant levels of hazardous materials, so the monitoring wells were capped in 1998 (USAFA 2001). An astronomy observatory was built on the hill in 2015. Trail 721 enters Farish near the southeastern corner of the landfill (USAFA 2001).

Trails

Many trails for hiking and biking follow existing service and access roads. Over six miles of additional single-track, multi-use recreational trail was constructed in the mid-2000's to encourage more use of the the backcountry area.

Bullseye Auxiliary Airfield

The Bullseye Auxiliary Airfield occupies a 197-acre site that accommodates a 3,500-foot by 75-foot asphalt paved runway and associated support facilities. An unpaved road provides access from the nearest public road (Sanborn Road). Bullseye also contains a 1,000-foot clear zone, a 30-foot-wide parallel paved taxiway with connections at both ends and at the mid-point of the runway, and a 130-foot-by-235-foot paved aircraft parking apron with tie downs for four parked T-41 aircraft.



2.4.3 Current Major Mission Impacts on Natural Resources

Hazardous Materials and Hazardous Wastes

Air Force Academy

The operation of aircraft, vehicles, and equipment requires the use of a variety of hazardous and non-hazardous materials including fuels, solvents, lubricants, and caustics. If released to the environment, these materials have the potential to impact air, soil, and water quality. The activity at the Academy that poses the greatest potential threat to the local environment is the transfer and storage of petroleum, oils, and lubricants (POL). The Academy has several environmental programs (e.g., spill control, hazardous waste management, and stormwater pollution prevention) that have been successful in controlling hazardous materials and waste releases to the environment.

The Academy's spill plan (i.e., *Hazardous Materials Emergency Planning and Response Plan (HAZMAT) Plan*) describes preventive actions that are designed to lower the potential for hazardous material spills and prevent hazardous materials from entering the environment. The HAZMAT Plan also provides required notification procedures and details responses to releases that might occur.

In addition, the Academy has implemented a Hazmat Management System for distributing hazardous materials. The purpose of the Hazmat Management System is to minimize and organize the usage of hazardous materials, thus reducing hazardous waste generation. Furthermore, all hazardous materials used are assessed to determine whether less-toxic alternative materials could be used during the industrial process. Materials are approved by the Installation Hazmat Management Process (IHMP) Team for use at the Academy's industrial shops on an as-needed basis. Any unused portion of the material may be returned to the Hazmat where it can be made available for other users.

The *Waste Management Plan* outlines procedures for the proper accumulation, collection, transportation, and disposal of hazardous wastes. It is designed to ensure that hazardous wastes are disposed of in a legal and timely manner.

Environmental Restoration Program

Air Force Academy

The ERP was established by DOD to ensure that military installations identify and evaluate suspected problems associated with past waste disposal actions. Two former municipal landfill sites known as Environmental Restoration Program Sites 6 and 7 are located to the north and south of the airfield. Site 6 was operated as a landfill from 1972 to 1978. During this period, municipal solid waste was disposed to this landfill at a rate of approximately 40,000 cubic yards per year. Trenches approximately 40 feet wide by 500 feet long were excavated to a depth of approximately 30 feet below ground surface (BGS) where either an impenetrable layer or water was typically encountered. Waste was placed in the trenches, which were then backfilled with soil. The majority of the waste buried at Site 6 is believed to be present above the water table. During installation of monitoring well MW06-21 in the central area at Site 6 in 1999, municipal solid waste, including paper, glass, plastic, and wood fragments, was observed from a depth of approximately 6 feet BGS to a depth of approximately 22 ft. BGS. In well MW06-21, the water table was encountered at about 28 feet BGS, indicating that buried waste is not in contact with the groundwater at this location.

Site 7 was operated as a municipal waste landfill from 1960 to 1972. From 1960 to 1965, the waste consisted of nondurable trash and incinerator ash. From 1965 to 1972, the waste reportedly consisted of domestic trash, digester sludge, and operational wastes. Trenches approximately 40 feet wide by 500 feet long were excavated to a depth of approximately 30 feet BGS where either an impenetrable layer or water was encountered. Waste was placed in the trenches, which were then backfilled with soil. The majority of the waste buried at Site 7 is believed to be present above the water table. During installation of monitoring well MW07-25 in the northeastern part of Site 7, municipal solid waste, including cloth, glass, paper, plastic, and metal fragments, was observed from a depth of approximately 15 feet BGS to a depth of approximately 23 feet BGS. The water table was encountered at about 25 feet BGS, indicating that buried waste is close to, but not in direct contact with, groundwater at this location.

The Academy conducted closure and long-term monitoring of these sites under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) with oversight from the Colorado Department of Public Health and the Environment (CDPHE) and the U.S. Environmental Protection Agency (USEPA). Under the terms of the closure documents for the sites and because buried trash remains at the sites, no development or construction is allowed to occur at these locations. A full description of the sites is located in the CERCLA Administrative Record maintained by the Academy.

From time-to-time natural resources management issues have arisen regarding these two ERP sites. The natural resources staff has provided assistance in addressing erosion, revegetation, and noxious weed issues on the landfills' caps. Also, the Academy sponsored a study to determine if any adverse effects might exist to the Preble's meadow jumping mouse populations from water or forage contaminated from heavy metals. The results of that study were negative (Greystone 2003). The Academy NR Office will continue to provide advice and assistance on natural resources issues relating to these two sites.

Water Quality

Water quality changes in the surface drainages could occur during storm events. Increase in sedimentation might occur during construction activities; however, the use of BMPs to minimize loose soils from leaving the site ameliorates any potential impacts that could occur. Of greater concern is the impact of off base construction and general development to the Academy's water quality. The increase of impervious surfaces with development on lands adjacent to the Academy significantly increases runoff into the Academy's waterways. Besides a general increase in runoff, which may contribute to additional erosion, the increased water flows in some cases cause a conversion of previously intermittent streams to nearly perennial ones which also increases erosion and sedimentation. Hazardous materials are managed according to all applicable regulations and, therefore, should not affect water quality. As previously noted, the Academy has developed stormwater BMPs for Jacks Valley (URS Group 2006a), the Cadet Area (URS Group 2006b), the Community Center (URS Group 2006c), the Main Airfield (URS Group 2006d), and the base composting facility (URS Group 2002).

Noise

Noise is considered to be unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. It can be intermittent or continuous, steady or pulsating. It can be stationary or transient. Stationary sources are normally related to specific land uses, such as housing tracts or industrial plants. Transient noise sources move through the environment, either along relatively established paths (e.g., highways, railroads, and aircraft flying a specific flight track), or randomly (e.g., an aircraft flying in a block of airspace such as a Restricted Area). There is wide diversity in responses to noise that vary not only according to the type of noise and the characteristics of the sound source, but also according to the sensitivity and expectations of the receptor, the time of day, and the distance between the noise source (e.g., an aircraft) and the receptor (e.g., a person or animal). The duration of noise events and the number of times noise events occur are also important considerations in assessing noise impacts.

Current and forecast aircraft activity at the Academy is summarized in the Air Installation Compatible Use Zone (AICUZ) Study. According to the Academy Noise Study, the maximum day night levels measured during the study are below the threshold of 65 dBA established by U.S. Department of Housing and Urban Development for compatible land use.

While the noise generated from low-altitude military overflights might be initially startling, habituation to 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. 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.

Air Quality

Air quality in a given location or region is generally described by the concentrations of various measurable substances known as "criteria pollutants." Concentrations are normally expressed in units of parts per million (PPM), milligrams per cubic meter (mg/m3), or micrograms per cubic meter (µg/m3). Air quality is determined by the type and amount of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration is determined by comparison with Federal or state air quality standards. These standards represent the maximum allowable concentrations of various pollutants and are established to protect public health and welfare with a reasonable margin of safety.

Inversions occur frequently in the area of the Academy, particularly in the winter. Wind-blown dust is the primary contributor to increased particulates, and this adds to local air quality degradation. As delineated by the Pikes Peak Area Council of Governments and the Colorado Air Quality Control Commission, Colorado Springs (including the Academy) is a maintenance area for CO (resulting mainly from vehicle traffic).

According to the Academy Wildland Fire Management Plan, prescribed burning is conducted in accordance with Federal Wildland Fire Management Policy and Program Review of 1995 (as updated), the National Wildland Fire Coordinating Group (NWCG) Wildland Fire Qualification subsystem guide (PMS 310-1/NFES 1414), National Fire Protection Association (NFPA) Standard for Wildfire Control, Standard 299- Protection of Life and Property from Wildfire, and Standard 1051, AFMAN 32-7003 Environmental Conservation, AFPD 32-70 Environmental Quality, and the Colorado Smoke MOU. A Colorado prescribed fire smoke permit must be obtained through the CDPHE and El Paso County Department of Health and Environment. As currently conducted, the Academy prescribed burn program is in compliance with Federal Air Quality plans and regulations.

2.4.4 Potential Future Mission Impacts on Natural Resources

Known potential future mission impacts at the Academy would include continuation of current impacts as described above, and additional impacts due to new missions or mission components. Specifically, new construction and related activities as recommended by the General Plan would represent additional, future impacts on the environment. Ongoing or planned new development includes expansion of the cemetery, relocating the Visitor Center to the North Gate, construction of a privately- funded hotel/conference center/office complex at the North Gate, additional campsites and other facilities at Farish Recreation Area, expansion of training facilities in Jacks Valley, possible new public and private utilities, new Combat Survival Training facilities at the Kettle Lakes, and possible redevelopment of the Pine Valley housing area.

3 ENVIRONMENTAL MANAGEMENT SYSTEM

The DAF environmental program adheres to the Environmental Management System (EMS) framework and its "Plan, Do, Check, Act" cycle for ensuring mission success. Executive Order (EO) 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*; DoDI 4715.17, *Environmental Management Systems*; DAFI 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 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, 10th ABW is responsible for overseeing the Academy's security, civil engineering, communications, logistics, military and civilian personnel, financial management, services, command post, chaplaincy, equal opportunity, and the hospital, all which support the 4,100+ cadets and a total military community of approximately 12,000 personnel. The 10 ABW Commander is the approving authority for the Academy's INRMP.
AFCEC Natural Resources Media Manager/SME/Subject Matter Specialist (SMS)	The AFCEC Natural Resources Media Manager, located at the Peterson (AFB) Installation Support Team (IST) assists in forecasting natural resources requirements, completes programming, advocates for funding, assists with technical assessments and recommendations, and helps the installation execute natural resources projects effectively. The Media Manager also answers higher headquarters natural resources taskers, including data calls; and interprets and passes down policy/regulation implementation.
Installation Natural Resources Manager/POC	The Installation Natural Resources Managers (NRMs) on USAFA are USFWS personnel. The NRMs manage day-to-day activities to conserve and enhance natural habitats, protect T&E species and species of concern, monitor natural resource health, and act as the focal point for natural resources issues.
Installation Security Forces	The 10 SFS can assist the natural resources program by

	observing natural resources conditions during routine patrols, apprehending individuals violating natural resources laws, and assisting with enforcement of hunting and fishing regulations.
Installation Unit Environmental Coordinators (UECs); see AFI 32-7001 for role description	
Installation Wildland Fire Program Manager	The Installation Wildland Fire Program Manager assists in developing the Wildland Fire Management Plan, planning and writing prescribed fire plans, and managing wildland fire mitigation efforts. The Installation Wildland Fire Program Manager interacts with the AF Wildland Fire Center as needed and with the Peterson IST Natural Resources Media Manager to submit annual wildland fire project requirements.
Pest Manager	The Pest Manager develops the Pest Management Plan and coordinates with the Installation Natural Resources staff to ensure the INRMP and Pest Management Plan are compatible and complementary.
Range Operating Agency	The Chief of Airfield Management operates the USAFA airfield and Bullseye Range. This office coordinates on proposals that would impact flying operations, safety, or airfield sustainment.
Conservation Law Enforcement Officer (CLEO)	N/A. The Academy relies on assistance from Colorado Parks and Wildlife officers.
National Environmental Policy Act (NEPA)/Environmental Impact Analysis Process (EIAP) Manager	The Community Planning Function oversees the Environmental Impact Analysis Process. The Planner ensures the INRMP activities that trigger NEPA are adequately described and analyzed in order to support a Finding of No Significant Impact, unless an environmental impact statement is warranted.
NOAA/ National Marine Fisheries Service (NMFS)	N/A
US Forest Service	The USFS partners with USAFA to manage forest health on the Front Range. The USFS may provide technical advice on infestation/disease impacting the forest. Additionally, they may request access to USAFA to collect data beneficial to research and/or analysis of forest health. The AF may provide funding for the USFS to implement wildland fire mitigation.
US Fish and Wildlife Service Colorado Parks and Wildlife	The USFWS and CPW can provide technical and law enforcement assistance to the Academy. Specifically, these agencies will alert the Academy's NR Office whenever new species that have the potential of inhabiting the Academy are added to the Federal or state endangered species lists. In addition, these agencies provide support during scheduled wildlife surveys and hunts and are signatories to this INRMP. The USFWS Colorado Fish and Wildlife Conservation Office has the lead on the Cooperative Agreement that provides at least four full time equivalent (FTE) USFWS positions in

	support of the natural resources program on a fully reimbursable basis.
U.S. Department of Agriculture-Wildlife Services (USDA-WS)	The U.S. Department of Agriculture-Wildlife Services (USDA-WS) is contracted to monitor and managed nuisance wildlife that have the potential to create a wildlife aircraft strike hazard. USDA-WS personnel support activities that pertain to the Academy BASH Reduction Program and coordinate their activities with the 10ABW, Airfield Management (306 OSS/OSA), Flight Safety, and Natural Resources.
10th Force Support Squadron – 10 FSS	The 10th FSS contributes to readiness and improves productivity of the Academy, including active-duty personnel, family members, Academy civilians, and retirees of the greater community, through programs promoting fitness, esprit de corps, and quality of life. The FSS works in cooperation with the Academy's Environmental and Natural Resources programs in managing recreational facilities such as the Academy's Equestrian Center, golf course, and the Farish Recreation Area.
Contract Services – 10 CES/CEOB	The 10 CES Contract Services is responsible for oversight of grounds maintenance activities on the Academy.
Public Affairs—USAFA/PA	The 10 ABW/PA is responsible for distributing information and coordinating access for public events. Public Facilities/Recreation land use is oriented to providing recreational opportunities to assigned Academy personnel, members of reserve components and their families, active and retired military, and civil service personnel. The 10 ABW/PA serves as the point-of-contact to interface between the Superintendent and civilian groups interested in using the Academy for environmental, educational, or other purposes.
Legal—USAFA/JA	The Legal Office is responsible for ensuring that the implementation of the management objectives contained within this INRMP meet all of the Academy's and the 10 ABW's regulatory and statutory requirements that pertain to natural resources management. The Legal Office will review any future natural resources management proposals and alert the 10 ABW Commander (CC), the 10 ABW Environmental Management Office (EM), and the Chief of Airfield Management should there be any regulatory conflicts or shortfalls. In addition, the legal office will keep all Academy offices involved with natural resources issues of any new statutes or regulations that might affect natural resources management on the Academy.
Flight Safety Officer—USAFA/SE	The 10 ABW/SE, in conjunction with the Academy Chief of Airfield Management, is responsible for implementing all activities presented in this Plan that pertain to the BASH Reduction Program. In addition, the 10 ABW/SE ensures that the Bird Hazard Working Group (BHWG) conducts meetings to evaluate and refine strategies for the reduction of the BASH threat on the Academy.

5 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.

- *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 School, 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 AF 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.*

6 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.

USAFA Natural Resources records are stored in office files or on the 10 CES "O" drive and are regularly maintained in accordance with an AFRIMS-approved file plan.

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.

USAFA Natural Resources responds to all data calls and information requests through the USAFA Environmental Manager and Peterson AFB AFCEC Installation Support Team.

7 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.

Our Mission: *In support of the military education and training mission, conserve and enhance the Air Force Academy's natural resources through the application of sound science and proactive stewardship practices.*

The Natural Resources program manages the forests, rangelands, wetlands, wildlife, recreational fishing lakes, and multi-use trails on the US Air Force Academy, Farish Recreation Area, and Bullseye Auxiliary Airfield. Through a Cooperative Agreement with the US Fish and Wildlife Service, a team of USFWS biologists and foresters is responsible for managing the installation's 19,322 acres, of which more than 70% is natural open space. The staff works cooperatively with many partners, including local governments and organizations, Colorado Parks and Wildlife, US Forest Service, Colorado Natural Heritage Program, Colorado State Forest Service, and other DoD offices. The natural resources management program has received the US Fish and Wildlife Service's Military Conservation Partner Award and the Department of Defense General Thomas D. White Award.

Key management areas of emphasis include:

- Conservation of the threatened Preble's meadow jumping mouse and other rare plants, animals, and habitats
- Forest health and disease management
- Wildland fire and fuels management Noxious weed control and prevention
- Native revegetation and erosion control
- Watershed management and stream restoration
- Outdoor recreation, including hunting, fishing, and multi-use trails
- Support of the BASH program
- Environmental compliance support

7.1 Fish and Wildlife Management

Applicability Statement

This section applies to AF installations that manage fish and wildlife on AF property. This section is applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

For the purposes of this INRMP, wildlife management is defined as manipulation of the environment and wildlife populations to produce desired objectives. The primary goal of wildlife management at the Academy is to maintain game and nongame populations at levels compatible with land use objectives, habitat objectives, public safety, and military training. Management of the fish and wildlife program at the Academy is also implemented through USAF Academy Instruction 32-7001, *Natural Resources on the USAF Academy*, 30 January, 2019.

The Academy supports an active recreational fishing program at the Kettle Creek Lakes and Deadmans Lake and at Farish Recreation Area (Grace Lake, Leo Lake, and Sapphire Lake). The lakes are stocked with rainbow trout from approximately May through September. No fishing resources exist at the Bullseye Auxiliary Airfield. Receipts from the previous years' fishing permit sales are deposited in the USAF fish and wildlife reimbursable account and are used to purchase the following years' supply of hatchery-raised fish for stocking. The Academy has complied with DOD and USAF directives to provide access for handicapped fishermen both at Kettle Lake No. 3 and Leo Lake at the Farish Recreation Area. A USAFA annual ($24), one-day ($9), and second rod ($7.00) fishing permit is required and is available to active duty military, military retirees, DoD civilians, and their sponsored guests. Discounted annual permits are also available for >60% disabled veterans and Purple Heart recipients. The eligibility requirements and other regulations are outlined in USAFAI 32-7001 and on the iSportsman website (usafa.isportsman.net).

The Academy's NR Office uses guided hunting as an effective management tool for regulating the mule deer, white-tailed deer, turkey, and elk populations in balance with the habitat and the surrounding urbanized environment. Deer hunting began in 1959 but was eliminated for many years because of safety concerns. Deer hunting was re-introduced in 1988 following years with a high number of deer-automobile accidents and is conducted annually in an effort to control deer numbers within the carrying capacity of the habitat and to help prevent deer-vehicle collisions and other property damage. A few buck deer harvested in 2018-2020 tested positive for chronic wasting disease. The Academy will continue to coordinate with CPW to monitor for the prevalence of this disease within the deer population. Cow elk hunting began in 2001 in response to a rapidly growing elk population. Archery-only fall and spring turkey hunting was initiated in 2019. No hunting is permitted at the Farish Recreation Area or the Bullseye Auxiliary Airfield. The Academy coordinates with the CPW to determine how many deer, elk, and turkey licenses are available each season. The goal is to maintain the deer herd at fewer than 300 animals and the elk herd at fewer than 30 animals. A population of fewer than 200 turkey is desirable to reduce nuisance interactions with the public, especially around facilities. All hunting is open to the general public and requires a state license and base access permit (deer $15, turkey $10, elk $25).

The key to managing a rich assemblage of both game and nongame wildlife is to provide a mosaic of habitats that are structurally and biologically diverse. The Academy utilizes six basic approaches for managing fish and wildlife and their habitat.

Inventorying and Monitoring Wildlife. Wildlife inventories and monitoring, including annual ground surveys for deer, elk, turkey and other wildlife are conducted annually. The information obtained through such efforts is used to detect any long-term changes in population size or herd structure. All data is shared with the CPW for their use in managing the regional Data Analysis Unit (DAU) which includes the Academy. Inventorying and monitoring of Preble's meadow jumping mouse and other species of concern occurs annually, as discussed in the Management of Threatened and Endangered Species, Species of Concern and Habitats section.

Inventorying and Monitoring Stream Fish. Periodic electro-shocking and seining surveys of Monument Creek, West Monument Creek, Stanley Creek, and Kettle Creek are performed to assess species diversity, age-class distribution, and productivity within the watershed. Surveys conducted in 2014 and 2018 identified six fish species: white sucker (*Catostomus commersonii*), fathead minnow (*Pemphales promelas*), longnose dace (*Rhinichthys cataractae*), creek chub (*Semotilus atromaculatus*), cutthroat trout (*Onocorhynchus clarkii*), and brook trout (*Salvelinus fontinalis*). Future surveys may include other tributaries of Monument Creek once the creek habitat improves from completed channel stabilization and restoration projects.

Controlling Invasive Species. The Academy has an expansive and integrated program to inventory, monitor, and control invasive species. Invasive weed control efforts, as outlined in the Academy's Integrated Noxious Weed Management Plan (CNHP 2015), are implemented annually (see Integrated Pest Management Program section). Monitoring for potential aquatic invasive species, especially Lernea (a fish parasite) and New Zealand mud snail are ongoing. The fishing lakes are also monitored for nuisance and unwanted species such as crappie, golden shiner, and goldfish).

Restoring Degraded Areas. Degraded areas (e.g., training and recreation areas, construction sites) are restored using native species in accordance with the USAFA Erosion Control, Revegetation, and Tree Care Standards. Eroded drainageways are stabilized and restored using hard- and soft-engineering approaches depending on the degree of damage, anticipated future hydrology and hydraulics, and habitat restoration objectives.

Protecting Sensitive Areas. The Academy maintains biological diversity by protecting, to the extent practical, sensitive areas that provide unique habitat niches such as the natural areas identified by the CNHP (ESCO Associates, Inc. 1992; CHNP 2012, 2018).

Sustaining Pollinators. Pollinators such as most bees and some birds, bats, and other insects play a crucial role in flowering plant reproduction and ecosystem stability. To protect and enhance pollinator populations, the Academy conducts management (e.g., prescribed fire, noxious weed control) that promotes healthy, native plant communities; minimizes the use of herbicides and pesticides when possible; and utilizes native plants for habitat restoration and erosion control. The hops azure butterfly (*Celastrina humulus*) is a state species of special concern that has received specific inventory and monitoring attention.

Opportunities to conserve this species is high due to the habitat overlap with the protected Preble's meadow jumping mouse Conservation Zone. Abundant cover of the butterfly's wild hops (*Humulus lupulus*) host plant is found throughout the Academy's wetland and riparian habitat. Volunteers have established small native plant gardens that could benefit the monarch butterfly and other pollinators. The Cadet Beekeeping Club also maintains an apiary near the Natural Resources office.

Managing Migratory Birds. The Migratory Bird Treaty Act (MBTA) protects all migratory birds and prohibits the taking of migratory birds, their young, nests, and eggs except as permitted by the USFWS. The USFWS recommends the Academy avoid impacting birds by surveying for nesting birds in areas proposed for disturbance, such as prescribed burning or construction, and, if necessary, waiting until nesting and fledging is complete. Alternatively, the USFWS recommends conducting activities outside of nesting areas or the typical bird nesting season (March through August) to help avoid direct impacts.

Executive Order 13186 and DOD-USFWS Memorandum of Agreement: Executive Order 13186 (2001) outlines specific responsibilities of federal agencies for the protection of migratory birds. The E.O. also mandated the establishment of a memorandum of agreement (MOU) between each major federal agency and the USFWS to outline specific responsibilities for each agency. The DOD established that MOU in 2006 (DOD-USFWS 2006). The MOU outlines a number of specific actions that the DOD agrees to consider undertaking for the conservation and protection of migratory birds, consistent with mission and funding requirements. Air Force policy requires that Air Force installation conscientiously address the programs outlined in the MOU and that individual INRMPs consider implementing those programs where feasible and appropriate.

Partners in Flight Programs: It is DOD and Air Force policy to promote and support a partnership role in the protection and conservation of all migratory birds and their habitats by protecting vital habitat, enhancing biological diversity, and maintaining healthy and productive natural systems on DOD lands consistent with the military missions. Therefore, the DOD is a participant in the Partners in Flight (PIF) program, as outlined in the PIF North American Landbird Conservation Plan (Rich et al. 2004) and the DOD PIF Strategic Plan (DoD PIF 2002), and strongly supports specific conservation measures outlined in those plans and other guidance DOD PIF documents.

Powerline Protection Program: Electrocution of migratory birds by contact with high voltage wires on power poles, especially large raptors such as hawks, owls and eagles, is a serious potential cause of mortality (AVPIC 2006; Edison Electric 2005). The Academy and Colorado Springs Utilities has retrofitted powerlines to mitigate possible electrocution hazards to migratory birds (EDM 2008). The Academy will continue to monitor the effectiveness of power pole retrofits to reduce bird electrocutions.

Miscellaneous Waterfowl and Shorebird Conservation Plans: Opportunities for developing waterfowl and shorebird conservation programs are outlined in various conservation plans. Examples include The North American Waterfowl Management Plan, the United States Shorebird Conservation Plan, and the North American Waterbird Conservation Plan (Kushlan, J.A. et al, 2002. The DOD and USAF support the implementation of these plans where they are consistent with the military mission and are competitive for receiving funding.

The DOD and Air Force encourage installations to support of State Wildlife Action Plans as part of a comprehensive installation natural resources program. Consequently, the Academy formally reviews Colorado's Comprehensive Wildlife Conservation Strategy and Wildlife Action Plans and consults with the Regional CPW office to determine where the Academy can assist with future wildlife conservation efforts to implement the state Plan.

7.2 Outdoor Recreation and Public Access to Natural Resources

Applicability Statement

This section applies to all AF installations that maintain an INRMP. The U.S. Air Force Academy is required to implement this element.

Program Overview/Current Management Practices

The Academy and the Farish Recreation Area provide a wide range of recreation opportunities for military personnel and their families, DOD civilian employees, and the general public. Outdoor recreation activities include hunting, fishing, hiking, jogging, cycling, horseback riding, wildlife viewing, golfing, and camping/RVing. Unfortunately, high levels of recreational use can have negative impacts on the environment so constant monitoring is necessary to ensure permanent damage to the natural and cultural resources does not occur. Off-road vehicle or all-terrain vehicle use is strictly prohibited, except in support of authorized government activities.

Detailed information for recreational access, eligibility, fees, policies, and other regulations is available on the Natural Resources website at https://usafa.isportsman.net and in USAFAI32-7001 (Natural Resources on the USAF Academy).

7.3 Conservation Law Enforcement

Applicability Statement

This section applies to all AF installations that maintain an INRMP, as all installations are required to provide a method for enforcement of conservation laws. The U.S. Air Force Academy is required to implement this element.

Program Overview/Current Management Practices

Prior to entering into the 2003 cooperative agreement with the US Fish and Wildlife Service for the operation and management of the natural resources program, the Academy had an Air Force Conservation Law Enforcement Officer (CLEO) with a state wildlife officer commission. This position generally dealt with nuisance and hazardous wildlife issues, enforcement of state game laws, and enforcement of the hunting and fishing regulations. Due to the USFWS organizational and supervisory controls required for law enforcement personnel, USFWS could not support a CLEO under the Colorado Fish and Wildlife Conservation Office agreement with the Academy.

For the incidents requiring law enforcement support (e.g., wildlife-vehicle accidents, removal of hazardous wildlife, investigation of other wildlife issues), the Academy relies on the 10th Security Forces or Colorado Parks and Wildlife, which has concurrent jurisdiction [Colorado Revised Statutes 3-3-103, (2016)] on the Academy. The Natural Resources office typically handles the routine nuisance and hazardous wildlife problems and recreation permitting issues in-house.

The most routine wildlife violations are failing to possess a valid base fishing permit, fishermen exceeding the daily creel limit, and wildlife feeding. Most of these cases are handled with a verbal warning from Natural Resources personnel, but in rare instances the 10th Security Forces may be contacted to intervene with a written violation notice or assistance to remove an offender from the installation.

A shared CLEO position between the Academy and F.E. Warren AFB is being discussed and would be manned and supervised by the USFWS National Wildlife Refuge System (Law Enforcement) program. In addition to law enforcement duties, some of the CLEO's time would be available to assist with other natural resources projects.

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

Applicability Statement

This section applies to AF installations that have threatened and endangered species on AF property. This section **IS** applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

Air Force Academy

Section 2.3.4 includes a list of the federally and state-listed species that have been documented on, may migrate through, or have historic ranges that overlap the Academy.

The goal is to manage the Academy using an ecosystem-based approach that protects rare and sensitive species. While single- species management is not promoted as a general management approach, species-specific actions are used to protect threatened, endangered, and rare species.

Presently, the threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is the only federally listed species found on the Air Force Academy. Since 2000 the base has protected the mouse and its habitat through implementation of a Biological Opinion and Conservation Agreement. Other plant, animal, and invertebrate species of state special concern have been identified through field surveys performed by the Colorado Natural Heritage Program (2012, 2018) and the Natural Resources staff. Field surveys for the eastern black rail (*Laterallus jamaicensis*) and tricolored bat (*Perimyotis subflavus*) are ongoing to assess their potential occurrence on the installation.

The Academy is a stakeholder on the Monument Creek Site Conservation Team (SCT), which advises the U.S. Fish and Wildlife Service on local conservation and recovery of the threatened Preble's meadow jumping mouse. The Academy is integral to the team's charter as it supports a significant mouse population and the most contiguous habitat within the watershed and designated recovery area. Team members representing local governments and organizations are also stakeholders in developing the Academy's management and monitoring strategies to support both the SCT, Conservation Agreement and Plan, and the USAFA mission. Projects such as updating and revising the Conservation Agreement and the Monument Creek Corridor Planning Study (in draft) also offer an opportunity for stakeholder participation.

7.5 Water Resource Protection

Applicability Statement

This section applies to AF installations that have water resources. This section **IS** applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

Air Force Academy

The Academy's land area accounts for only 12% of the Monument Creek watershed, but due to the topography and location near the geographic center of the watershed, nearly 75% of the surface drainage must pass through the installation as it flows downstream to Colorado Springs and Fountain Creek.

Watershed protection directly affects flooding, water quality, and groundwater recharge, and is critical for maintaining the high- quality riparian, wetland, and aquatic habitats. An increased volume and frequency of stormwater from off-base development, especially adjacent to the Academy's eastern border, has caused serious channel erosion and habitat loss on the majority of the Monument Creek tributaries. Projects to help mitigate this damage, both on and off-base, are identified in the Monument Creek Watershed Restoration Plan (October 2016) and the City/USAFA Monument Creek Watershed Creek Corridor Planning Study (2023). Unpaved roads, utility lines, and firebreaks constructed on the fragile soils found in many parts of the Academy and the Farish Recreation Area are also a source of erosion and sedimentation. BMPs developed for Jack's Valley, the Cadet Area, Community Center, and the Main Airfield provide engineered approaches to reduce erosion and sedimentation in those areas.

The Academy is actively coordinating and partnering with local developers and governments to identify and execute channel restoration projects on the installation to address erosion, sedimentation, habitat loss, water quality, and airfield safety. In addition, the Academy and the CNHP are investigating the use of beaver dam analogs and post-assisted logs structures to help mitigate minor channel incision, reconnect disconnected floodplain, and elevate groundwater to help restore and sustain riparian and wetland areas. Hopefully the artificial beaver dams will promote an expansion of the beaver population, which already occurs along Monument Creek and several of the larger tributaries.

7.6 Wetland Protection

Applicability Statement

This section applies to AF installations that have existing wetlands on AF property. This section **IS** applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

Air Force Academy

Wetlands

Wetlands are important natural systems because of the diverse biologic and hydrologic functions they perform. These include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, provision of wildlife habitat, unique flora and fauna niches, stormwater attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the "waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats (including wetlands). The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions.

Wetlands are affected over time by both natural and man-made processes; therefore, local changes to their boundaries are expected to occur. Pursuant to Regularity Guidance Letter (RGL) 90-06, jurisdictional determinations of wetlands are to be valid for a period that does not exceed 5 years. As noted in the Wetland Protection section of this plan, the Academy and the Farish Recreation Area were included in the 1993 NWI maps. In 2002, a non-jurisdictional wetlands delineation was completed for the Academy using aerial photographs, the NWI maps, existing data on project-specific jurisdictional delineations, and extensive field surveys and ground-truthing of site vegetation and surface hydrology indicators. The resulting wetlands data provide a good initial basis for master planning, construction planning, and environmental management. However, a formal delineation of wetland boundaries with a jurisdictional determination from the USACE is necessary for any proposed projects that could affect a wetland or water of the United States.

Wetlands are protected under EO 11990, *Protection of Wetlands* (43 Federal Register [FR] 6030), the purpose of which is to reduce adverse impacts associated with the destruction or modification of wetlands. Secretary of the Air Force Order (SAFO) 791.1 re-delegates authority for the protection of wetlands to the Assistant Secretary of the USAF (SAF/MI) and indicates that authority may be further re-delegated. The December 2000 SAF/MI memo re-delegates authority to the Major Command (MAJCOM) vice- commanders as chair of the MAJCOM Environmental Protection Committee/Environmental, Safety, Occupational Health Committee (EPC/ESOHC). The MAJCOM vice-commanders, as chair of the EPC/ESOHC, must sign a Finding of No Practicable Alternative (FONPA) before any action within a federal wetland may proceed. For the Academy, the Vice Superintendent, as chair of the ESOH Council, is the approving authority for wetlands FONPA. In preparing a FONPA, the base must consider the full range of practicable alternatives that will meet justified program requirements to ensure they are within legal authority of the USAF, meet technology standards, are cost-effective, do not result in unreasonable adverse environmental impacts, and other pertinent factors. When the practicality of alternatives has been fully assessed, only then should a statement regarding the FONPA be made into the associated FONSI or record of decision (ROD).

Floodplains

Floodplains are defined as areas adjoining inland or coastal waters that are prone to flooding. These areas must be reserved to discharge the 100-year flood without cumulatively increasing the water surface elevation more than a designated limit. When a 100-year floodplain is established, no additional obstruction (e.g., a building) should be placed in the floodplain that will increase the 100-year floodwater surface elevation. As noted in the Water Resource Protection section, the 10-year and 100-year floodplains on the Academy were mapped in 2003. Colorado State University also re-mapped the Academy's 100-year and 500- year floodplains in 2022 using updated LiDAR and updated modelling and hydrology information. Mapping of the 100-year floodplain is used to delineate the boundary of the Preble's conservation zone, defined as 300-feet from the edge of the floodplain.

EO 11988, *Floodplains Management*, requires all Federal agencies to provide leadership and take action to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of Federal lands. In addition, if action is taken that permits an encroachment within the floodplain that alters the flood hazards on a National FIRM (e.g., changes to the floodplain boundary), the Academy must submit an analysis reflecting those changes to FEMA. As part of the Monument Creek Corridor Planning Study, Fluvial Hazard Zone mapping was performed for the major sub-basins - Monument Creek, Kettle Creek, and Black Squirrel Creek, with the mapping results provided to the Colorado Water Conservation Board.

7.7 Grounds Maintenance

Applicability Statement

This section applies to AF installations that perform ground maintenance activities that could impact natural resources. This section **IS** applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

Air Force Academy

Site-adapted landscaping practices can reduce maintenance costs while also providing wildlife habitat. Planting windbreaks around buildings and parking areas, establishing wildflower areas, and reducing mowing are all ways to spend dwindling dollars more wisely, educate the public about the benefits of reduced maintenance, and become better stewards of the environment. To ensure compliance with the 1994 Memorandum on *Environmentally and Economically Beneficial Practice on Federal Landscaped Grounds*, EO 13112 (*Invasive Species*), and EO 13148 (*Greening the Government Through Leadership in Environmental Management*), native vegetation should be given priority for use in grounds landscaping.

The following are guidelines for improved area grounds management:

Use selective landscaping and vegetative management, including pruning, cutting, or planting, to provide for regeneration, shrub development, pest hazard reduction, and site stabilization.

1. Where appropriate, plant shelter belts of shrubs around the borders of parking lots and near buildings. Shrubs should be spaced about 4 to 6 feet apart. To create shelter belts, plant several rows of larger shrubs and smaller shrubs with rows about 15 feet apart.
2. To address fuel hazard defensible space concerns, avoid planting vegetation in direct proximity to buildings.
3. Native species should be used in landscape plantings whenever practicable.

The Natural Resources program is not responsible for grounds maintenance of "improved" areas, but it does coordinate with the Grounds contractor on issues related to noxious weed control, tree pests and disease control, and urban forestry.

7.8 Forest Management

Applicability Statement

This section applies to AF installations that maintain forested land on AF property. This section IS applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

The forests of the Academy and the Farish Recreational Area represent one of the most aesthetically pleasing and environmentally important components of the ecosystem. Their health and stability contribute to the overall environmental well-being of the region and play an essential role in the Academy's mission. For those reasons, the management of the Academy's forests is one of the most important and challenging responsibilities of the natural resources program.

The forests in the Front Range have been significantly altered from their natural, pre-settlement conditions, largely due to the suppression of natural fire regimes. Frequent, low-intensity fires removed dead debris from the forest floor, naturally thinned many smaller trees, and encouraged the growth of larger, widely spaced trees with an understory of grasses and small herbs. The structure of such forests is often described as "park-like." As the suppression of all forest fires became the rigid policy of American forestry management starting in the latter 19th Century, the stage was set for dramatic changes in forest structure, composition, and health. Some of the most obvious direct consequences of fire suppression have been the establishment of much more dense forest stands composed of many more trees of smaller diameter. This is discussed further in the Other Natural Resource Information section of this plan.

Although approximately 2,000 acres of forest on the Academy have been thinned in the past decade, there are still many areas in need of management to reduce overstocking and improve overall forest health. These unnaturally dense forests are seriously vulnerable to wildfires, in addition to being high-risk for bark beetle attack. Tree stress from extreme competition has been exacerbated by the recent drought and increasing mean temperatures with tree mortality increasing and an accumulation of dead and down fuels.

Major elements of the forest management program at the Academy and Farish are driven by efforts to restore forest health and minimize the risk of widespread tree mortality from bark beetles or wildfires. These include thinning programs, control of forest pests, individual tree removals, and fuel hazard reduction projects. The latter includes both prescribed fire and mechanical treatments specifically targeted to reduce heavy fuel loadings and are addressed in the Wildland Fire Management section of this plan. The forestry staff also serves in an advisory capacity for management of urban trees along roads, around structures and "improved areas", and within cantonment areas.

Regional Forest Thinning

Unfortunately, the forest thinning program is hampered by a lack of forest product markets in the local region. Trees cleared from thinned forests have almost no market value due to the great distance they have to be transported for processing. Thus, the thinning program is in no way self-supporting from the sale of timber products. Instead, the thinned trees create a significant disposal expense and liability. Bark beetles will target recently downed trees, brood, and infect standing trees if the downed material is not mitigated. Improved markets could facilitate more economical forest management at the Academy and throughout the region.

The Academy Natural Resources office has been cooperating in researching efforts to find or create markets for local timber products. This is an issue with many forest landowners and managers in the area. Two of the largest drivers for marketing timber are volume and timber quality. USAFA's forested areas are managed to provide for aesthetics and forest health with no efforts to produce merchantable timber for sale. Maintaining the aesthetics of USAFA's forests also precludes the majority of forested areas from being commercially harvested. Currently Natural Resources sells merchantable timber to the public for $40 a cord.

Air Force Academy

There are four forest types that will be managed at the Academy under this INRMP. Each has its own silvicultural strategy, as briefly described below. These include mature ponderosa pine, mixed conifer, urban, and ponderosa pine plantations.

Ponderosa Pine: Ponderosa pine stands comprise nearly 90% of the Academy's forests, or approximately 9,000 acres. Unmanaged pine stands are characterized by fairly dense stocking of predominantly ponderosa pine, with minor amounts of Douglas-fir or white fir (primarily on north slopes), Rocky Mountain juniper or pinion pine (primarily on south slopes), and a variable amount of Gambel oak. Many of the Academy's pine stands are uneven aged, comprised of trees of varying ages and sizes. There are often scattered pockets or sometimes small stands of very dense (ranging up to 200 square feet of basal area (BA) per acre) even-aged pines that are lacking in vigor due to intense competition. These even-aged pockets are usually a result of disturbance, sometimes from the death of a pocket of large overstory trees which allows more light to a relatively small area of the forest, or from a more widespread disturbance such as a damaging wildfire. Numerous trees may establish at the same time, competing fiercely for light, water and nutrients.

Mountain Pine Beetle (MPB) infestations have been largely eliminated in the previous years. Only one documented case of the MPB has been identified since 2016, this was behind this firing range on USASA's western border. Previous intensive management and the cyclic nature of the infestations account for this dramatic decline. The most common bark beetle pest now affecting the Ponderosa Pine are the Ips Beetle. The mountain pine beetle and Ips beetle are discussed in detail under Forest Insects and Diseases.

Stocking levels of most pine stands not under recent management range from 100-120 BA per acre. Historically with periodic low intensity fires, these stands would have been closer to 40-50 BA/acre. The threshold above which stand vigor suffers enough to significantly increase the risk of attack by the mountain pine beetle is approximately 90 BA/acre. Maintaining stocking levels below this level will help ensure sufficient tree health and vigor to provide some level of insurance against bark beetles. Heavier thinning to a lower stocking level will further enhance individual tree vigor and lengthen the natural resistance to beetle mortality. Nearly any reduction in basal area will reduce wildland fire fuel hazard. When attempting to balance varying objectives such as forest health, beetle resistance, aesthetic quality, wildfire hazard mitigation, and restoration to more open pre-settlement conditions, there is a continuum of residual stocking levels that could reasonably be targeted.

The general objective for forest management in pine ecosystems on the Academy is to maintain uneven aged stand conditions (consisting of a variety of tree age and size classes) through individual tree selection harvesting, reducing stocking levels to approximately 50-90 BA/acre. This may be increased in proximity to stream channels, or along roads and trails to feather the edge and soften the visual effect of harvesting. Residual basal area may also be increased on north slopes, which tend to have less competition for moisture and typically support higher stocking levels. To enhance stand diversity, healthy pinion pine should be retained if feasible. Healthy Douglas-fir and white fir may be retained in small amounts and favored more on north slopes but should be removed if in proximity to structures due to fuel hazard concerns. Treatment will work toward or maintain a healthy, uneven aged forest that includes

a strong component of large mature pines. Highest priority for removal is diseased and insect-infested trees of all sizes, followed by trees that are suppressed or low in vigor. Third priority would be trees of poor form, such as those with forked tops that could present a structural weakness as they grow.

The uneven aged pine stand is generally seen as aesthetically pleasing, with a multi-storied structure that typically includes a component of towering, yellow-barked pines, ranging up to several hundred years of age. Overstory thinnings focus on improving stand health while working toward the desired uneven aged structure. While the stand objective would be a variety of age and size classes, separation of trees through a reduction in overall basal area would limit the amount of ladder fuels and the concurrent opportunity to channel fire into the upper tree canopy. Thinning prescriptions for the Ponderosa Pine forests will concentrate on returning to "pre-settlement" conditions based on the USDA document RMS-GTR-373: Principles and Practices for the Restoration of Ponderosa Pine and Dry Mixed-Conifer Forests of the Colorado Front Range. The thinning prescription will focus on creating groups of pines and large opening ranging from .5-5 acres. This thinning prescription will reduce competition, lessen the impact of bark beetles, reduce the risk of a crown driven wildfire, and over all improve forest health.

Because the Abert's squirrel relies on a component of dense ponderosa pine as an important part of its habitat, scattered pockets of mid-canopy pines with interlocking crowns will be retained. Snag retention to meet wildlife habitat needs will be addressed in individual stand silvicultural prescriptions. Mitigation measures to address disturbance limitations and seasonal restrictions within Preble's habitat will be adhered to in any forest management activities.

Mixed Conifer: These stands consist of a mixture of Douglas-fir, ponderosa pine and white fir, with lesser amounts of limber pine, and trace amounts of pinion pine and juniper. They tend to be very dense, with interlocking crowns and heavy understory ladder fuels. The shade-tolerant Douglas-fir and white fir are prevalent in the understory. Predominant stand structure is two-storied, which is highly susceptible to crown fire and catastrophic forest fires.

There are approximately 1,000 acres of mixed conifer stands on the Academy, located primarily on the steep east and north facing slopes along the western edge of the Academy. But these mixed conifer forests are decreasing due to mortality from climate change. These mesic sites tend to be higher in elevation, naturally supporting a thicker forest than the drier and lower pine sites. They form the majestic backdrop of the Academy, rising into the foothills and merging into the adjacent Pike National Forest. Many of these stands are located in steep, rugged terrain, with huge boulders and poor access. Soils are shallow, highly erosive decomposed granite, rendering forest management extremely difficult.

With the continued drought and increasing temperatures, many mixed conifer stands are seeing a decline in forest health and experiencing increased mortality. It is expected that the range for this forest type will move up in elevation and latitude as conditions worsen with climate change.

Dwarf mistletoe infection is common in both Douglas-fir and white fir, weakening and predisposing them to bark beetles. The firs are more susceptible than ponderosa pine to root rot, which is also present on the Academy.

Where operable, mixed conifer stands will be masticated with small pockets left to provide wildlife habitat and allow for acceptable regeneration. Diseased trees will be highest priority for removal. Wherever possible, strategic fuel breaks downslope of these dense stands will be created in order to minimize the risk of wildfire entering the mixed conifer forest and running up the steep west boundary of the Academy onto the adjacent Pike National Forest.

Ponderosa Pine Plantations: Nearly 400 acres of pine plantations exist within the eastern one-third of the Academy. These plantations, ranging in age from 15 to 55 years, were established primarily as a source of landscape trees. Their provenance is from the Black Hills of South Dakota. As such, they are extremely frost hardy, but exhibit a growth habitat very different from that of native pines. They tend to have a very squat form, with a pronounced taper and a high diameter to height ratio. They will achieve diameters of 15" but will generally not exceed 25' in height. While this may produce a desirable landscape tree, it is deleterious to introduce into the ponderosa pine gene pool. In addition to being "offsite" in terms of genetic acclimatization, these plantations are also located predominantly on native grassland areas. The soils are not well-adapted to tree growth, exacerbating the poor growth habits.

In general, these trees have a fairly high incidence of insect problems, often causing deformities and top-kill, and sometimes tree death. Soils in these areas are fairly sandy, with low nutrient levels and water-holding capacity. Several plantations near the main airfield are on particularly disturbed sites, having had most of the topsoil removed during initial Academy construction. Trees over 40 years of age have only reached 5' height on some of the poorest sites. They do, however, serve the purpose of stabilizing the soil in these disturbed

areas.

Pockets of trees will be left as needed for habitat for the whitetail deer, which frequents the eastern portion of the Academy.

In some cases, some plantations or portions thereof will be targeted for conversion back to grassland prairie. Decisions on this will be largely predicated on value for wildlife habitat, tree health, site stabilization needs, and aesthetics.

Urban Forests: The urban forests mainly exist in the Ponderosa Pine forest classification and will contain all species noted in that classification including various ornamentals, this forest type can be very unique and diverse or a monoculture depending on the area. In addition to the changes presented in the Ponderosa Pine forests these areas also include the issue of the Wildland Urban Interface (WUI).

WUI presents a hazard when forest resources are in close proximity to structures, roads, and other areas of recreation frequented by USAFA residents and visitors. These hazards include not only an increased fire danger but also a risk to structures and people as trees die or are weakened. These trees are further stressed by salt applications on the roads, removal of irrigation, construction projects, degradation of habitat, and the high population density. To provide for improved urban forest health, Natural Resources will be focusing on planting trees and shrubs more suited to the urban environment. These will be mainly deciduous trees that do not produce fruit.

Reducing fuel loading, especially in Gambel Oak, is a priority in the WUI. Mastication and herbicide projects are being developed to remove the highly volatile oak surrounding developed areas with the priority being the housing and cadet areas.

Farish Recreation Area

Mortality exists in many of the forest stands at Farish, particularly in the Engelmann spruce and aspen in the developed north portion. There is historical evidence of spruce beetle mortality, although the area is fortunately not at high risk for a major spruce epidemic, as confirmed by a field visit by U.S. Forest Service entomologists. High-risk conditions for this include large (predominantly over 16" dbh) mature spruce with a substantial component of downed trees. Although not high risk now, these stands could become so in the future, especially as the plurality of spruce increases and the trees reach maturity. There is a considerable amount of spruce deadfall, but generally not of a great enough number or size to cause alarm at this time. Removal of these dead and downed trees and maintenance of good growth rates through thinning will decrease the risk of future spruce mortality and the risk of a crown driven wildfire threatening the area.

The aspen in the north is declining and experiencing high mortality due to over-maturity. This short-lived species begins to decline at 60-80 years of age. The area is succeeding naturally to a nearly pure spruce forest. The decrease of aspen is inevitable without natural disturbance to open up the site and establish a new generation.

Spruce is shallow-rooted and very prone to wind throw, while aspen is subject to considerable rot and stem breakage. This mortality and wind throw is causing significant safety concerns in the northern developed area due to the presence of campsites, roads and trails. It is also adversely impacting aesthetic quality.

The mountain pine beetle has caused considerable mortality in the ponderosa pine component in previous years. Farish is fortunate in that ponderosa pine comprises only a small percentage of the forest ecosystem, limiting the overall potential impact from this beetle. As at the Academy, the forestry staff is coordinating with the U.S. Forest Service on beetle management across boundaries, since Farish is flanked by the Pike National Forest in several areas. Intensive field surveys for beetle activity will continue, with all infested trees mapped and treated prior to beetle emergence in early summer. Assistance will be provided as feasible in surveying adjacent ownerships, with every effort made to encourage adjacent landowners to also remove infested trees.

Aside removal of all beetle-infested trees, a light sanitation salvage harvest to remove primarily dead, dying and unhealthy trees in the spruce/pine/aspen areas will improve forest health, visitor safety, and visual quality. Maintaining at least a moderate growth rate in the residual spruce will help guard against future spruce beetle infestation. Maintaining a component of ponderosa pine, Douglas-fir and limber pine will enhance stand diversity and decrease risk of future losses to the spruce beetle, as a monoculture of mature large spruce greatly increases the risk of widespread mortality. The intent of forest management would be to work toward an uneven aged forest with as much diversity as possible. Thinning intensity will be light, as opening the forest too drastically could result in considerable wind throw, especially in the spruce component. Management at this time, is important to preserve the aesthetic quality of a forested

landscape for the future while providing for forest health. Recent overstory thinnings on US Forest Service lands to the north and west of Farish assist in enhancing protection from forest pests and an overstory driven wildfire threating the area.

In implementing these forest management activities, it will be important to assure that land boundaries are adequately marked. These are missing in several areas, necessitating surveying and signing prior to any tree harvesting to prevent inadvertent trespass.

Reforestation

Reforestation techniques for USAFA grounds are currently being revised. In past years, seeds were collected from various species and locations throughout USAFA property. This seed was then sent to a U.S. Forest Service Nursery in Nebraska. The nursery would then germinate the seeds and ship the bare root seedlings back to the Academy to be planted.

Estimated survival rates are approximately 25-35% for these planted seedlings. Minimal care after the seedling has been planted, shipping stress, planting bareroot seedlings, and transplanting stress all explain the low survival rate. To improve the survival of planted seedlings, a tree nursery is being constructed in the fenced area of Natural Resources.

The nursery will include irrigated tables to place containerized seedlings collected from USAFA grounds. Moving away from the bare-root to containerized/irrigated seedlings will increase survival rate and allow planting at nearly any time of year based on need.

Besides seedling planting, natural ponderosa pine regeneration is established on the Academy through individual tree selection harvests. These individual tree selection harvest units are designed to perpetuate a forest with multiple age classes, including establishment of new regeneration.

In the southern end of Farish, several small logging units were harvested between 2000 and 2006 to naturally regenerate aspen. These ranged from approximately one-third to two acres and have resulted in as many as 12,000 new aspen per acre. Since aspen establish primarily by suckering from existing root systems, the cutting units were placed in areas where the aspen component in the forest was dying but still present. These treatments were designed to perpetuate aspen in the landscape in an effort to increase biodiversity, improve wildlife habitat, and enhance aesthetic quality. The units were fenced to prevent elk browsing, a major contributing factor to the decrease of aspen across the western landscape.

This newly established aspen will be monitored for the next several years, which will aid in the decision on when it will be appropriate to remove the fencing. New harvest areas are currently being developed in conjunction with thinning and prescribed fire efforts at Farish. These will be located outside of the developed area again, due to the temporary adverse visual impact and exclusion of forest users due to fence installation. As before, they will be located in areas where aspen is in rapid decline. Areas of healthy, thriving aspen should be avoided, as these have high value in terms of current forest diversity and aesthetic quality. Future logging areas should be accompanied by an interpretive sign explaining the project. A sign placed by the recently harvested aspen units has been well-received.

Forest Insects and Disease

Following is a brief description of the major damaging agents found in the forests of the Academy and the Farish Recreation Area. Biotic agents are living organisms, while abiotic influences are non-living substances or conditions which affect plant health.

Biotic Agents:

Mountain Pine Beetle (MPB): MPB (Dendroctonus ponderosae) infestations are starting to trend up after 5-7 years of reduced activity along the Front Range. But due to intense eradication efforts, there has only been one instance of MPB on USAFA since January of 2017.

The MPB life cycle takes place over the course of one year in this area and, except for the flight of adults to new host trees, occurs entirely under the bark of infested trees. Beetles mate under the bark in the summer and lay eggs in late summer to early fall. Larva tunnel out from the main gallery, overwinter, and pupate in late spring. The adult beetles emerge during the summer, usually in July and August. Beetles from each infested tree typically infest several additional trees. Trees larger than 5" dbh may be targeted by the MPB. In addition to girdling the tree, the MPB introduces a blue-stain fungus which clogs the tree's vascular tissue and contributes to its death.

When attacked, trees typically produce a pitch response in an effort to "pitch out" the beetle. Occasionally the beetle is caught in the resin flow or smothered by the resin underneath the bark. Reddish pitch tubes usually contain wood shavings and beetle frass

(droppings), indicating that the beetle attack was likely successful. Large white pitch tubes may indicate that the tree successfully resisted the attack. When trees are drought-stressed or very low in vigor, their pitch response and consequent resistance to beetle attack is greatly compromised. Maintaining tree vigor is essential to protecting forests from extensive tree mortality during bark beetle outbreaks.

Natural MPB predators include woodpeckers and certain beetles, but these have little impact when MPB populations are high. Extreme cold for extended periods could stem an epidemic, but this would require -30 degrees Fahrenheit temperatures for five days.

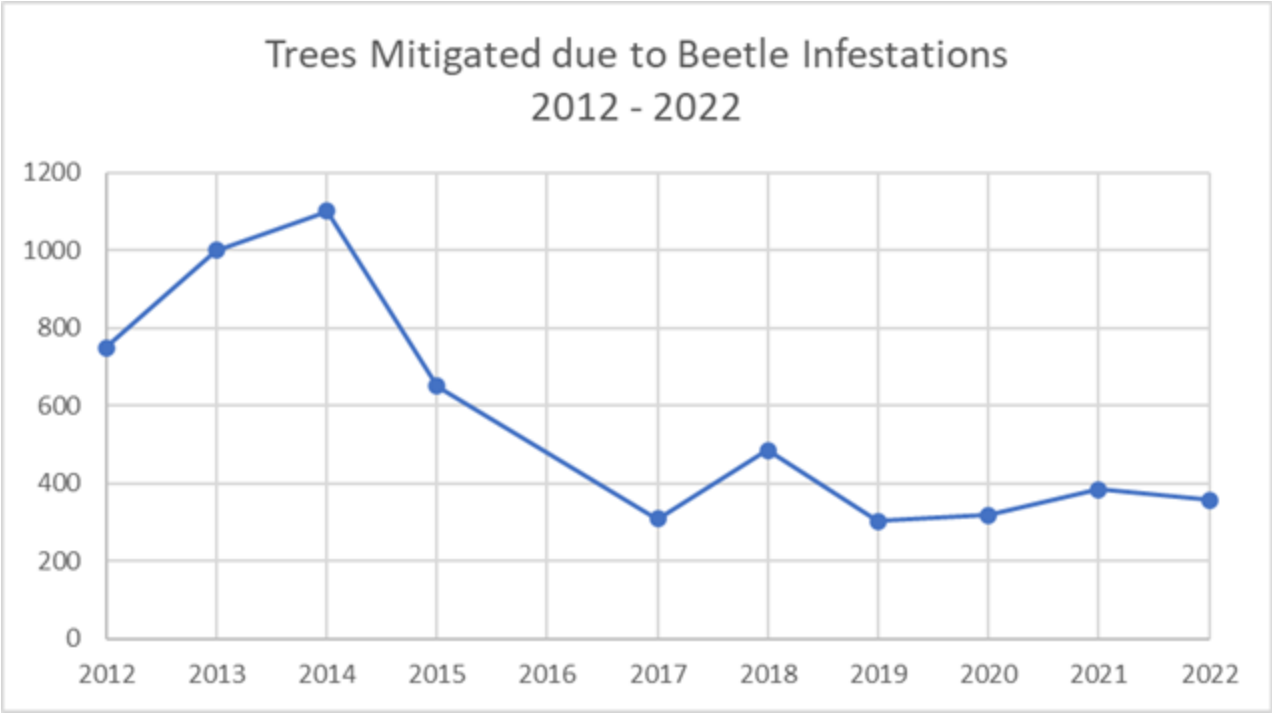
Direct control of MPB includes field surveys to locate infested trees and treatment before beetle emergence. Treatment options include felling infested trees, followed by chipping residual material and moving merchantable wood to a woodlot or debarking and bucking the bole while loping and scattering the residual material. The Academy, Pike National Forest, El Paso County and City of Colorado Springs are continually combining forces to address increasing beetle populations and battle this potentially devastating forest pest.

The long-term preventative strategy is forest thinning to enhance tree vigor which will decrease the likelihood of attack by beetles and improve the pitch response of a tree against the beetle if attacked. The Academy has been increasing forest thinning over the past several years, in an effort to improve forest health and minimize the risk of widespread tree mortality from MPB.

Although there is no remedy to save a pine once infested, preventative sprays are available which prevent beetle attack. These are impractical on a landscape basis but may be appropriate on high risk or showcase trees. These might include front-yard or high visibility trees.

Additional information on the MPB is available at: http://www.ext.colostate.edu/pubs/insect/05528.html, or http://www.barkbeetles.org/mountain/fidl2.htm.

Ips Beetle: The Ips (engraver) beetle is a bark beetle with breeding habits similar to the MPB, but with multiple generations each year. There are eleven species of Ips in Colorado, with six species targeting ponderosa pine. Adults can emerge as early as March and fly as late as November, with population peaks around mid-summer. But there is evidence of these life cycles changing with climate change in length of time the beetles are active and number of annual broods. The Ips beetle attacks a range of tree sizes. While much Ips damage is found in treetops and individual branches, one species attacks the main stem (Ips calligraphus), sometimes in conjunction with MPB. Most Ips damage is found on trees in the open or on the edge of forests, while MPB tends to attack trees in a more contiguous forest environment. Ips will also attack limbs of downed trees as small as 3" diameter.



Ips success is highly correlated with environmental stress, particularly drought. Trees under environmental stress such as drought, road de-icer contamination, and transplant shock are high risk for Ips attack. Recently transplanted trees are especially a magnet for attack,

since they are under extreme stress after having lost the vast majority of their root system. Watering is important to lessen the chance of Ips attack. Preventative spraying is especially important for recently transplanted trees and is recommended for at least 2-3 years following transplanting.

Removal of trees harboring larval and pupal life stages of the beetle is the preferred treatment control option, although this may be difficult to effectively implement on a landscape basis since the beetles attack and leave a tree within a short time period. Infested logs can be treated with the same methods used for MPB.

Additional information on the Ips beetle is available at: http://www.ext.colostate.edu/pubs/insect/05558.html.

Spruce Beetle: The spruce beetle (Dendroctonus rufipennis) is capable of causing extensive tree mortality and changing forest stand structure by killing large mature spruce. Endemic levels of spruce beetle live in wind thrown spruce. When populations reach high levels, beetles begin to target large mature standing spruce. Most spruce beetle outbreaks originate after blowdown events.

The spruce beetle includes the same life stages as the MPB but requires two years in this area to mature. Approximately two years after attack, adults emerge from overwintering sites and attack new trees. The first sign of infestation is small pitch masses on the tree trunk with reddish-brown boring dust near these entrance holes, in bark crevices, and on the nearby ground. The foliage of infested trees does not usually turn off-color until the summer following the attack and can sometimes remain green for several years.

When spruce beetle populations are low, as at Farish, silvicultural treatments designed to enhance forest health and maintain a good growth rate should decrease long-term stand susceptibility to the beetle. Encouraging stand diversity whenever possible should also decrease beetle risk, since a high plurality of spruce in a stand is a contributing risk factor. The chance for beetle populations to grow as a result of thinning can be minimized if stump heights are kept below 18 inches, and slash (treetops and limbs) are either chipped or spread out and exposed to sunlight. Excessive thinning should be avoided, as spruce is relatively shallow-rooted and prone to wind throw. Additional information on the spruce beetle is available at:
http://www.na.fs.fed.us/spfo/pubs/fidls/sprucebeetle/sprucebeetle.htm.

Dwarf Mistletoe: Dwarf mistletoe (Arceuthobium spp.) is a parasitic plant that spreads by forcibly ejected seeds. It robs host trees of water and nutrients, resulting in decreased tree vigor and growth. It causes swollen distorted branches, sometime called "witch's brooms". Mistletoe can severely weaken trees, often predisposing them to other damaging agents such as bark beetles. It can also cause premature death, especially in smaller trees.

Mistletoe seeds are ejected in late summer. They can travel up to 60' and are also sometimes dispersed by birds or animals. Their sticky surface adheres easily in the branches and trunks of surrounding trees. If seeds reach a susceptible tree, the parasite produces root-like structures called sinkers which become embedded in the wood. Mistletoe is host-specific. Ponderosa mistletoe will only infect ponderosa pine. Hosts on the Academy include ponderosa pine, Douglas-fir and white fir.

Control measures include removing infected trees or pruning infected limbs if the infection has not yet reached the main tree stem. In a lightly infected area, thinning which discriminates against infected trees may limit spread, although subsequent monitoring is important, as mistletoe shoots take several years to appear after infecting a new branch. Creating buffer zones between infected and uninfected areas is also an option to contain mistletoe to an area but is not failsafe.

Additional information on dwarf mistletoe is available at: http://www.ext.colostate.edu/pubs/garden/02925.html.

Shoestring root rot: Shoestring root rot (Armillaria spp.) is a fungus that infects tree roots, spreading primarily through root-to-root contact in the soil. It can live in stumps and dead roots for years. Its progression depends largely on tree size and vigor. It is most pathogenic on slow-growing trees.

Symptoms include thin, yellowing foliage and slowing shoot growth. Fruiting mushrooms may be evident in the autumn around the base of the tree. Thick white mycelial fans under the bark and thin black "shoestring" rhizomorphs on the roots are diagnostic. Many infected trees will lose significant root mass and eventually blow over.

There is no practical control method. Forest thinning to promote tree vigor is a good long-term strategy. Conversion to a more resistant tree is an option when root rot is well established and widespread.

Additional information on shoestring root rot can be found at: http://www.forestpests.org/southern/shoestringrot.html.

Oak borer: The flat-headed oak borer (Agriius spp.) caused widespread dieback recently in Gambel oak along the Front Range. While this insect is not usually very aggressive, the prolonged drought stressed these oaks sufficiently to succumb to the beetle in large numbers. While many of these oak clumps have resprouted from the base or had prolific epicormic sprouting from the main trunk, many tops are dead. The amount of dead woody material across the landscape from this mass dieback has greatly added to the wildland fire fuel hazard and detracted from aesthetic quality.

Although there is no treatment on a landscape basis, mortality and dieback from the oak borer should continue to diminish as drought conditions diminish.

Additional information on the oak borer can be found at: http://www.ext.colostate.edu/ptlk/1477.html.

Pine tip moth: The southwestern pine tip moth (Rhyacionia neomexicana) has been active recently in young ponderosa pine on the Academy. The larvae mine into the new, expanding shoots, often killing the buds and seriously reducing terminal growth. Trees less than 8' in height are most susceptible.

Pitch tents, frass, and silk webbing may be seen in May and June, but damage is seldom easily noticed until midsummer, when infested shoots turn reddish brown. Injured needles stop growing and rapidly fade to yellowish brown. If the attack is severe enough, the entire shoot may stop growing and wither.

Although damage in established pines from the pine tip moth is usually not serious, it does tend to promote a bushier appearance. A damaged terminal leader will often be replaced by several lateral shoots, leading to a multiple top. Repeated attacks can cause serious deformities. Mortality is sometimes seen in young pine seedlings.

The best long-term strategy against this insect is to maintain good tree growth through thinning. Direct control is possible through chemical insecticides. Although not practical on a landscape level, these may be useful for small plantations or residential plantings. The pine tip moth also has abundant natural predators, such as ants, spiders and wasps. Additional information on the pine tip moth can be found at: http://www.na.fs.fed.us/spfo/pubs/fidls/sw_pinetip/fidl-swp.htm.

Red ray rot: Dichomitus squalens is a fungus that causes red ray rot, sometimes known as red rot. The hosts include ponderosa and pinyon pine. It produces a flat, annual fruiting body on the underside of dead branches which is white when fresh then fades to yellow. It can be difficult to detect in living trees as the only outward sign is the fruiting body and appears after approximately four years from the original infection. The spores are spread by wind where they germinate in the bark cervices. Trees must be removed as no other treatment for red ray rot is established. This fungus is rare in Colorado but has been identified in the Senior Officers Quarters in Douglass Valley Housing. Monitoring for that area will include red ray rot.

Additional information can be found at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5336984.pdf

Twig Beetles: Twig beetles (Pityophthorus spp. and Pityogenes spp.) are poorly known native insects that attack conifers. They target many forest grown and ornamental conifers, including pines, true firs, Douglas-fir, and spruce but pine trees are the most commonly affected. While the twig beetles do not usually cause morality in the tree, it can kill limbs and further stress the tree leaving it open in other pests and damage. Recent droughts, increasing temperatures, urban stress, and cold stress have increased the vulnerability to twig beetles and its effects can be seen in these particularly stressed areas. The forested areas near Pine Valley Housing and 10th Civil Engineering have been particularly affected by the twig beetles.

Additional information can be found at: http://wci.colostate.edu/Assets/pdf/TwigBeetle.pdf

Other forest insects and diseases: There are a wide variety of other insects and diseases that cause damage to trees on the Academy and Farish. At endemic levels, damage may not be obvious. When environmental stresses such as drought increase, trees become more susceptible to insects and diseases. The fir engraver beetle (Scolytus ventralis) has left pockets of dead white fir and Douglas-fir. The Douglas-fir tussock moth (Orgyia pseudotsugata) and western spruce budworm (Choristoneura occidentalis) are a potential threat to Douglas-fir, white fir and spruce, although they have not been active in recent years on the Academy or Farish. There have been significant outbreaks with extensive mortality from these insects on Pike National Forest land west of the Academy.

Abiotic Agents:

Chemicals: Changes in a plant's environment through the introduction of chemicals can adversely affect its health. Salt damage from de-icing compounds (primarily magnesium chloride) applied to roads, parking lots and sidewalks have had a major impact on roadside trees. This chemical is also used for dust abatement in the summer. Ponderosa pine has a moderate tolerance to salt injury, while Douglas-fir has only a slight tolerance. Trees are affected both by direct spray from chemical-laden snow, in addition to drainage ditches that channel chemical runoff well off the road. This damage is indicated by black stripes on the needles of affected trees (see photo).

Additional precipitation could help leach out the salt and assuage the injury, but high rates of tree mortality and adverse impacts on tree vigor and growth will likely continue until moisture patterns return to normal. Numerous research studies on the effects of magnesium chloride and other de-icing salts on vegetation and aquatic ecosystems are ongoing. These may lead to recommendations of alternate methods of de-icing that may be less detrimental to natural systems.

Areas irrigated with recycled water tend to have a high nitrogen content, which can also be very detrimental to a tree's health. While nitrogen is vital to trees at normal levels, an excess can upset intricate balances with other elements, altering foliar chemistry substantially and leading to tree decline. Also, because these areas are often watered to maintain a thriving grass component, the amount of water received is well above the needs of the relatively xeric ponderosa pine. This exacerbates the nitrogen excess problem and is an ongoing management challenge in areas such as the Academy Cemetery and Golf Course.
https://extension.colostate.edu/docs/pubs/garden/07425.pdf

Drought stress: Although the pronounced drought of the early-mid 2000s has ameliorated somewhat, trees are still under lingering drought stress. Root systems have atrophied considerably, rendering trees much more prone to wind throw. A major wind events in November 2005 and the winter of 2017/18 blew down or snapped off approximately 300 trees on the Academy in each instance. It is

likely that long-term effects of the drought will be continue for the near future, with increased mortality due to high winds, bark beetles, and chemical poisoning.

Root damage: Construction activity (e.g., trenching) can result in the destruction of a tree's root system. Removal of an excessive amount of roots reduces a tree's ability to absorb oxygen, water, and nutrients, and could weaken or kill trees. Tree roots generally extend out from 2-3 times the height of the tree, affording a generous area for damage. In addition, affected trees could be more susceptible to being toppled by high winds, creating a hazard in housing or recreation areas. Overburden, adding more soil above the root system, prevents effective oxygen exchange with lethal results. This might result from sedimentation due to change in water runoff paths or from redistribution of soil associated with construction activities. Parking or driving vehicles over a tree's root system over extended periods of time results in compaction of the soil around the roots. This could also be lethal.

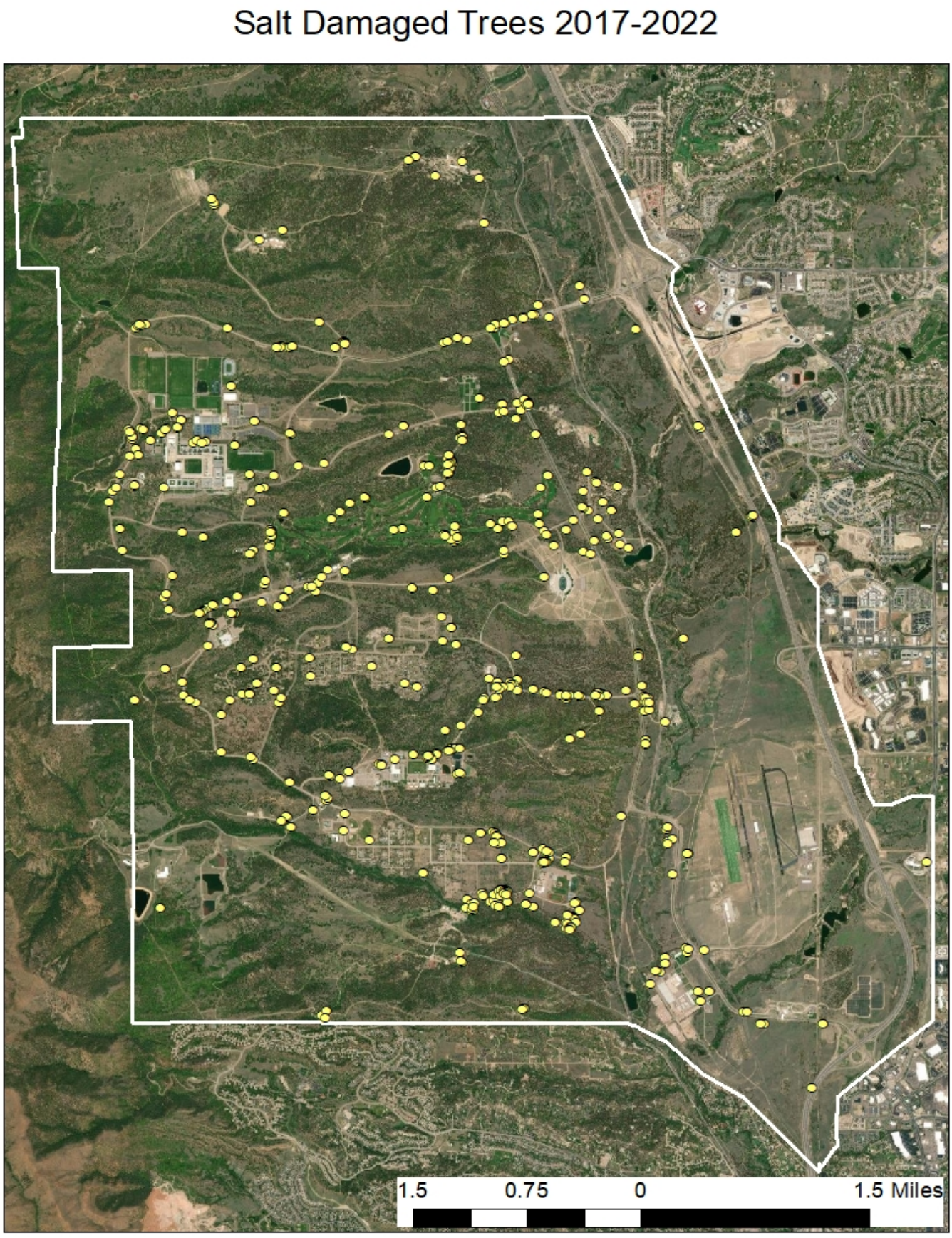
Natural needle cast: Healthy trees can have an overall brown appearance when they shed large numbers of old needles. This shedding occurs in the autumn and may be more pronounced in stressed trees or in dry years. In ponderosa pine, needles tend to shed after 3 to 4 years of age. This is a natural process and not indicative of any pathogen.

Cold stress: Cold stress is evident when there is an abrupt change in temperature without trees having a chance to hardening their needles. Pines normally are hardy in colder climates but with a drastic and quick drop in temperatures, they are unable to properly prepare themselves for the climate. The Front Range experienced these conditions in the Fall of 2019. Many Ponderosa Pine can be seen with needles browning out from the tips. This is a similar indicator for salt infection. The difference is the cold stressed needles will not have the black banding or die in a spiral pattern up the bole. These damaged needles will likely drop off during the growing season and will be replaced with new, healthy needles, unlike with salt damage. By the spring, the damage should be hardly noticeable. There are no management options for this damage other than monitoring and removing the tree when necessary.

Climate Change: Climate change is quickly becoming one of the major agents of change on USAFA's forested areas. The effects of climate change on the front range can be seen in the extended drought mentioned before, increasing temperatures, change in the annual precipitation routine, and the increased frequency of major weather events. Recent high wind events have leveled hundreds of trees, including a record setting 100+ MPH recorded wind in 2021 at USAFA's airfield. Mortality in many mixed conifer stands is increasing due to decreased moisture and increasing temperatures. Colorado Springs set a record for days without measurable snow in 2021. Natural Resources is planning for these effects by conducting overstory thinnings in applicable forested areas to improve forest health, reducing fuel loads along our western border and near sensitive areas, removing stressed and beetle infested trees, encouraging proper reforestation, and continuing an aggressive monitoring program to identify issues.

Urban Stress: Overstocking, road salt applications, irrigating with contaminated water, human damage (such as cutting into the bark or stacking cut wood next to a tree), construction projects, and poor soil health all encompass issues that stress trees in the urban areas. The mortality of conifers in the urban areas is increasing as they are much more susceptible to this stress. Due to the nature and

location of these trees, there are no feasible treatment methods to reduce this damage.



7.9 Wildland Fire Management

Applicability Statement

This section applies to AF 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 the U.S. Air Force Academy.

Program Overview/Current Management Practices

Active suppression of wildland fires is the most critical wildland fire management objective at the Academy. Academy Fire and Emergency Services assumes primary responsibility for these operations, while the Natural Resources department assists with firefighting duties and serves in a resource advisory capacity. Due to the close intermingling of the wildland environment and human infrastructure and populace, fire cannot be restored to its natural role on the Academy at this time, except under carefully planned scenarios.

The 2018 Academy Wildland Fire Management Plan (WFMP) serves as an associated plan to the INRMP (See Chapter 15.0 Associated Plans, Tab 1). This comprehensive plan outlines fire program responsibilities, staffing, Mutual Aid Agreements, communications and other topics related to wildland fire, including fire suppression, prescribed fire and fuel hazard mitigation. To avoid repetition, activities related to fire suppression are not incorporated into the INRMP.

The Natural Resources department is responsible for evaluating resources damage from fires, and for preparing resources damage assessments and overseeing restoration projects when necessary.

Aside from direct suppression of wildfires, the next most important objective is to minimize the risk of and damage from catastrophic wildfires by reducing unnaturally high vegetation fuel loads. A discussion of fire ecology and the need to mitigate existing fuel loadings can be found in the Other Natural Resource Information section of this plan. Fuel hazard reduction can be achieved through prescribed burning or through mechanical treatments.

Prescribed burns are fires which are intentionally set under carefully planned conditions to accomplish specific management objectives. While prescribed burning can be an effective and relatively inexpensive tool for mitigating wildland fire fuel hazard, it can also dispose of logging residue, rejuvenate herbaceous vegetation, remove undesirable vegetation, help control insect and disease infections, enhance wildlife habitat and preserve landscape diversity.

Prescribed fire has been used as a management tool on the Academy since 1992. The majority of areas burned have been in the grass/shrub fuel type, with the remainder consisting of understory burning in conifer forests. Most burns have been carried out in the spring or autumn.

Due to the prolonged drought, however, recent application of prescribed fire has been limited to slash pile burns. Dry fuel conditions and relatively high wildfire risk have diminished the opportunity to implement broadcast burns across more expansive areas. In addition, urban interface concerns greatly limit the applicability of prescribed fire on the Academy. The risk of an escaped burn is accentuated by the close proximity to infrastructure and neighborhoods, both on and near the Academy. In addition to the actual calculated risk, the public perception of prescribed fire and its inherent risks further complicate its use as a management tool.

Smoke emissions pose another considerable limitation on the ability to utilize prescribed fire, especially within the urban interface. The Academy is a signatory to the Colorado Smoke Management Memorandum of Understanding (MOU). This MOU describes the procedures that must be followed to minimize impacts of smoke on the environment and residents, and to meet all state and county ambient air quality standards. Often a broadcast burn covering a sizable area might have to be parceled into smaller pieces and burned separately in order to address smoke emission issues.

While still a viable alternative at the Academy, prescribed fire may be a more realistic tool at Farish. Urban interface and smoke emission issues are considerably diminished due to an increased distance from an urban populace. Fuel hazard concerns across the Farish landscape are generally lower than at the Academy, with its drier pine forests, thicker grass understories, and more dissected and steep terrain. Numerous opportunities exist to enhance vegetative health and diversity through prescribed fire.

Areas are prioritized for prescribed burning by the importance of the project in meeting the resources objectives listed above. Many areas are not available due to terrain features or vegetation features that make it infeasible to ignite for safety reasons. Although up to 500 acres on the Academy and Farish will be allowed annually under this INRMP, that acreage will rarely be met due to these restrictions.

If feasible, initial prescribed burning to maintain and enhance grasslands is recommended twice in the first 5-year period, decreasing to a burn frequency of every 5 to 7 years during the winter or early spring to reduce the accumulated litter layer and control understory competition. Site preparation burns for either tree planting, direct seeding, or seed tree areas should be accomplished in the early fall, prior to natural seed catch, if possible. Slash pile burns will generally be carried out in the winter or early spring months, with adequate snow cover on the ground to facilitate containment. Forest understory burns should take place in early spring in areas of high public visibility, to enable a rapid green-up following the fire. Burning 1-3 years after a thinning could also alleviate smoke management and fuel loading issues for prescribed fire operations in the forest understory.

The first step in planning a prescribed fire is to prepare a comprehensive burn plan. This plan details specific objectives, location, burn prescription, weather parameters, staffing and equipment, ignition plan, mop-up and monitoring procedures, and public notification requirements. It addresses smoke management, including calculations of emissions from the burn and identification of sensitive receptors such as towns, highways, airports, and hospitals, to predict favorable burn conditions that likely will minimize smoke impacts. The burn plan is prepared by the Natural Resources department and the Wildland Fire Support Module then reviewed by the USFWS and Academy Fire and Emergency Management Services before approval by the Base Fire Marshal. A burn plan template has been developed and adopted by several Federal agencies, including the USFWS and USDA Forest Service. The Academy WFMP describes the prescribed burn planning process and template in further detail.

Implementation of the burn program involves Natural Resources, the Academy Fire Department, Wildland Fire Support Module, and several off-base cooperators. The DOD Front Range Eco-Regional MOU promotes personnel and equipment-sharing among DOD installations, from F.E. Warren AFB in Wyoming to the U.S. Army Piñon Canyon Maneuver Site in southeast Colorado. Other agencies such as the USFWS assist as available in the burn program.

As an alternative to prescribed fire, mechanical fuel reduction treatments are very effective in reducing fuel loadings and restoring forests to a more natural and open condition. Forest thinning and mastication projects to reduce overall tree stocking densities has been practiced for several decades at the Academy. In the 1990s, an average of 40 acres was thinned annually. Since 2002, the amount of forest thinning has quadrupled to as many as 200 acres annually. This increase was due largely to a greatly heightened awareness of the elevated fuel hazard following a series of Front Range wildfires in 2000 and 2002. Appendices D-1 and D-2 depict potential forest thinning areas on the Academy and Farish. Logging slash (treetops and limbs) can be chipped or masticated (ground into larger chunks) and spread across the ground to significantly reduce fuel hazard, as the smaller slash pieces pose a much lesser hazard than raw slash. Slash may also be chipped and removed from site, although economics of doing so will be very limiting until markets develop. Other mechanical treatments include defensible space enhancement of forests in proximity to buildings to establish crown separation between trees, and to reduce small trees and brush serving as ladder fuels. Reduction of Gambel oak along roads and trails enhances their utilization as fuelbreaks. For the past several years mechanical treatment (e.g., hydro-axe, chain saws, and roller chopper) of Gambel oak has been carried out in dense oak concentrations to break up fuel continuity and reduce potential fire intensity. The appendix titled Forestry Management Treatments shows areas on the Academy suitable for fuel hazard mitigation through removal of Gambel oak. Firefighter safety is improved as a result of these treatments.

Future treatments will be necessary to maintain overall forest health. Thinned areas will likely need pretreatment in 15-20 years. Fuel mitigation treatments will require retreatment every 5-10 years, depending on vegetative growth.

Note that this section focuses on forestry treatments specifically for defensible space and fuel hazard reduction objectives. Forest thinning to promote forest health and address insect and disease concerns is addressed under the Forestry Management section of this plan.

Community Wildfire Protection Plans (CWPP) have been developed for several communities in the areas surrounding the Academy and Farish. Natural Resources is working with surrounding communities who do not have plans in place to obtain these CWPPs and defensible space plans. These plans address wildfire safety issues, and outline fuel hazard mitigation measures on private land. Natural Resources managers should coordinate with these communities whenever possible, in an effort to prioritize fuel hazard reduction work that complements projects occurring on adjacent lands.

Whether through prescribed fire or mechanical treatments, intervention is critical to restore today's forests to a more open and fire-adapted condition. Without fuel hazard mitigation, our forests will continue to be at high risk for a catastrophic wildfire. Because the forested landscape forms the fabric of the Academy, the risk of a wildfire transcends a forest ecosystem health issue, to a real and present safety concern to the infrastructure and populace of the entire Academy.

7.10 Agricultural Outleasing

Applicability Statement

This section applies to AF installations that lease eligible AF land for agricultural purposes. This section **IS** applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

The lands now occupied by the USAF Academy were used for a variety of agricultural purposes dating to the latter 19th Century. Dairy farming, grazing, and crop cultivation were actively practiced in Pine, Douglass, and Jacks Valley. Those activities ceased with the establishment of the Academy in the mid-1950s, with the exception of a horse grazing program begun in 1959 on 737 acres in Pine Valley that supported a horse stable facility run by the Force Support Squadron (FSS). A hay leasing program at the Farish Recreation Area was tried in the late 1980s but was discontinued when it did not prove financially viable. Prior to its acquisition by the USAF in 1988, the land occupied by the Bullseye Auxiliary Airfield was used for cattle grazing, but no grazing has occurred there since USAF leased the land.

Currently, the Academy stables accommodate approximately 100 horses, 30 to 35 of which are government-owned; the remainder are privately owned by eligible users who pay to board their horses. In the past, overgrazing of the Academy's horse pastures was common which, in turn, promoted noxious weed infestation and soil erosion. In 1990 a comprehensive Grazing Management Plan was developed for the Academy by the NRCS. That plan presented a number of recommendations for improving the range conditions on the Academy horse pastures. A key feature of the plan involved constructing additional fences so that five separate pastures could be used on a rotational basis, thus allowing individual pastures to rest and recover before returning to grazing. The plan also called for developing watering sources in each of the five pastures. Although the fencing plan was implemented, water sources were never developed, and the rotational grazing plan was not fully implemented. Consequently, overgrazing due to poor animal distribution still continues in some of the pastures. Other recommendations of the 1990 plan have been implemented, such as using weed free hay in the stables, and excluding horses from watering in West Monument Creek. The recommendation to fully compost the stable's manure was not implemented because the base lacks an adequate composting facility. The heavy surface disposal of manure in the pastures has sometimes resulted in burning or smothering vegetation. Using vegetation transects, photo documentation, and grazing exclosures, the condition of the pastures is periodically monitored to prevent resource damage from over-grazing, noxious weeds, or the proliferation of trails.

7.11 Integrated Pest Management Program

Applicability Statement

This section applies to AF installations that perform pest management activities in support of natural resources management, e.g., invasive species, forest pests, etc. This section IS applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

Integrated Pest Management (IPM) is "a planned program, incorporating continuous monitoring, education, record keeping, and communication, to prevent pests and disease vectors from causing unacceptable damage to operation, people, property, materiel, or the environment. IPM uses targets, sustainable (effective, economical, environmentally sound) methods including education, habitat modification, biological, genetic, cultural, mechanical, physical, and regulatory controls and where necessary, the judicious application of least-hazardous pesticides."

Pest species are typically organisms that, for one reason or another (e.g., removal of natural controls, enhancement of habitats), have negative impacts on natural ecosystems or on human health. Pest management programs at the Academy have the potential to affect natural resources. Presently, pesticides, herbicides, rodenticides, and insecticides are used to control indigenous pest populations. These chemicals are inherently toxic to most biological systems and, as such, often have no natural degradation pathways and can persist for long periods in the environment. The presence of such compounds can degrade the quality of soil, surface water, and groundwater. Wildlife and plant life could be detrimentally affected by any inadvertent contact with pest management chemicals.

Health-related pest species at the Academy include rock squirrels, black widow spiders, wasps and bees, deer mice, and mosquitoes. General household pests include miller moths, spiders, and cockroaches. Nuisance or hazardous wildlife include bear, coyote, fox, mice, pocket gopher, prairie dog, raccoon, skunk, rattlesnake, tree squirrel, mountain lion, and bats (USAFA 2020).

The 10 CES Pest Management Coordinator implements an integrated pest management program that is based on non-chemical measures and the judicious use of pesticides in controlling most household pests on the base. All pesticides used on the Academy must be on the Armed Forces Pest Management Board's Standard Pesticide List. The Pest Management Program incorporates the provisions of DOD Instruction (DODI) 4150.7, DOD Pest Management Program. The instruction states that it is DOD policy to establish and maintain safe, effective, and environmentally sound integrated pest management programs to prevent or control pests and disease vectors that might adversely impact readiness or military operations by affecting the health of personnel or damaging structures, material, or property. Integrated pest management should use mechanical, physical, cultural, biological, and educational methods to maintain pests at populations low enough to prevent undesirable damage or annoyance. In addition, application of the least toxic chemical should be used as a last resort.

IPM has been implemented at the Academy through the IPM Plan. The Plan identifies where pest control or pest management operations are conducted, which pests are controlled or have potential for causing pest problems, and areas of responsibility. The plan discusses the following priorities of pest control operations; therefore, information will not be duplicated in this plan.

- Disease vectors and public health pests: mosquitoes, fleas, fire ants, ticks, black widow spiders, scorpions, skunks, raccoons, bats, mice, rattlesnakes, prairie dogs, and rock squirrels
- Quarantine and regulated pests: insects the USDA have prohibited from entering certain geographic areas Stored food product pests: beetles, moths, and rodents
- Pests of real property: birds, gophers, mice, prairie dogs, and subterranean termites
- Other undesirable vegetation: weeds along fence lines, road shoulders, and paved surfaces pests
- Animal pests: mice, stray dogs and cats, and regulated wildlife species Household and nuisance pests: ants, cockroaches, spiders.

Wetlands, birds, mammals, amphibians, reptiles, and insects can be negatively affected by pesticide use. For example, neotropical migratory birds, which pass through or nest on the Academy, feed primarily on insects and fish. Pesticides that are sprayed to kill insects can accumulate in the tissues of higher mammals that eat the insects and fish. This process is called bioaccumulation and can eventually cause the death of the bio-accumulator. For this reason, non-chemical means of control for insects will be used if possible. However, when chemical treatments are necessary the Academy complies with the requirements of AFI 32-71053, *Air Force Pest Management Program,* and the goals and management requirements of this INRMP. The guidelines for pest management operations are provided below:

- Use mechanical or biological control methods whenever feasible and economical. Only apply pesticides when no biological or mechanical control method can be found, or such controls are prohibitively expensive.
- By law, all pesticides must be applied according to label specifications. Never exceed the manufacturer's recommended dosage for pesticides, apply only to the target pests identified on the label, wear required safety clothing, and apply the lowest labeled pesticide rate that adequately controls pests. Lower rates reduce the total amount of chemical in the environment. Rotate pesticides among chemical families to minimize pest resistance. IPM does not rely on continuous use of a single pesticide or pesticide family.
- Apply all chemicals according to manufacturer's instructions and away from drainages.
- Only certified pesticide applicators are authorized to purchase and spray pesticides. All applicators must become certified and should remain current in new developments in pest management.
- Use rapidly degrading pesticides, which are less likely to contaminate soil and groundwater.
- Pesticides should be applied at a time when they will be most effective against the pest. Pest cycles are influenced by temperature and moisture conditions. In many cases, pests under dormant or stressed conditions might not be susceptible to pesticide treatments. Avoid pesticide applications during adverse weather, especially windy, wet conditions. Do not apply volatile chemicals under high-temperature conditions.
- Keeping accurate records of all agricultural chemicals applied on the site will help the Academy make informed management decisions. By law, records of all restricted use pesticides must be maintained by operators for at least 2 years. Records of non-restricted chemicals can be maintained on the same form as the required records with minimal additional effort. This information has further value for use with crop and pest modeling programs and economic analyses.
- Avoid spraying pesticides within riparian zones.
- No pesticides are applied directly to sensitive areas (for example, critical habitat to endangered, threatened, or rare flora or fauna species; unique geological and other natural features; wetlands; ponds; standing water; or other water areas) unless use in such an area is specifically approved on the label.

Aquatic Invasives Management

Unwanted fish species, invasive aquatic organisms, and fish diseases can severely impact the quality of a lake or stream for fishing. Unfortunately, all of these problems have been introduced to the lakes by fishermen, fish hatcheries, and from upstream ponds. Nuisance fish such as goldfish, koi, European rudd, and crappie occur in most of the lakes. Fishermen are encouraged to dispose of these fish in the available trash containers. The Academy stocks only whirling disease-free trout, but the parasite that causes this disease does occur in the lakes. Most stocked trout are not in the lakes long enough to contract and display the symptoms of whirling disease.

Anchor worm (*Lernea*), another fish parasite, is prevalent in the lakes. This disease is caused by an external parasite that penetrates the fish's skin, often at the base of a fin. The head develops into an "anchor" that holds the parasite in place, then the female produces egg sacs that can look like small worms. The site of attachment usually develops into a bumpy sore which can cover the body of a severely infected fish. The cause of an anchor worm outbreak is unknown, but it is likely that a combination of environmental and biological factors, such as higher water temperature and fish density, help promote the parasite. There is no practical method for treating the fish or controlling the parasite.

To prevent the spread of aquatic invasives, people are encouraged to:

- Don't dump bait fish or aquarium fish in the lakes
- Don't transfer fish between the lakes
- Clean all fishing tackle and gear
- Disinfect waders and float tubes with a 10% bleach solution

The fishing lakes and non-potable reservoirs are also treated with bio-enzymes, algaecides, and aquatic herbicides to control algae and weeds. Sterile, hybrid Asian grass carp are also stocked to help control aquatic weeds.

Non-native, Invasive Plants

Invasive species are alien species (not native to the ecosystem) whose introduction does or is likely to cause economic or environmental harm or harm to human health. At the Academy, invasive species management is an important component of the habitat and rangeland management program. The Federal Noxious Weed Act and EO 13112, Invasive Species, requires Federal agencies to control noxious and invasive species on Federal lands. The Federal Noxious Weed Act, enacted January 3, 1975, established a federal program to control the introduction and spread of foreign noxious weeds into the United States. Amendments in 1990 established management programs for undesirable plants (including noxious weeds) on Federal lands. EO 13112 requires that Federal agencies prevent the introduction of invasive species, detect and control populations of invasive species, and restore native species and habitat conditions in ecosystems that have been invaded. The Colorado Noxious Weed Act (Title 35, Article 5.5) places all Colorado lands under the jurisdiction of local governments that have been delegated the responsibility and power to assure the management of state and locally designated noxious weeds.

Non-native, invasive plant species have the potential to be a major influence on ecosystem integrity. Non-native species, as the name indicates, are species from other regions of the world which have been artificially introduced to the region, primarily through human activities. Invasive species are those that, whether native or non-native, tend to become established in disturbed systems and competitively exclude native species. These aggressive species typically occur on disturbed sites where past or current land uses have resulted in disturbed soils and loss of native vegetative cover. Invasive, non-native species have also been intentionally introduced for erosion control, landscaping, or wildlife food plots.

List A weeds species are designated by the state for eradication on all lands. List B species are designated for control to stop the continued spread of these weeds. List C species are weeds recommended for control. Watchlist species are non-native weeds whose impacts and distribution within the state are not yet well understood.

List A, B, C, and Watchlist invasive weeds occur on the Academy and Farish; no invasive weeds occur at the Bullseye Auxiliary Airfield. The Integrated Noxious Weed Management Plan (CNHP 2015) outlines priorities, strategies, and procedures for the control and monitoring of noxious weeds.

Prior to 1999, noxious weed control on the Academy and Farish involved hand-pulling, seed head harvesting and limited herbicide spraying. The first major non-chemical efforts to control invasive and non-native species at the Academy began in 1999 through a cooperative effort with the Texas Agricultural Experiment Station, the DOD, the "Pulling Together Initiative," and several other regional military installations (Fort Carson Military Reservation, Rocky Flats Environmental Technology Site, and Buckley AFB, Colorado, and Francis E. Warren AFB, Wyoming) to introduce biological weed control agents. Although some success was noted, the biological weed control and monitoring program was discontinued in 2014 after it was determined that several weed species (e.g., knapweeds, yellow toadflax, thistles) were not sufficiently controlled by the biological agents to warrant a reduction in herbicide control, which was a primary objective of the project. However, field surveys suggest the previously released bio- agents have established populations that will continue to provide some level of biological control.

The CNHP has conducted multiple surveys of the Academy and Farish for noxious weeds to provide a basis for developing an Integrated Noxious Weed Management plan (CNHP 2015). Currently over 25 species (see Table) are actively monitored and managed, and the Noxious Weed Management Plan is updated periodically to incorporate management goals and objectives for newly identified weed species.

In 2005, the CNHP established an annual monitoring program for multiple noxious weeds at the Academy and Farish that employ permanent monitoring plots, field surveys, and photo-plot monitoring to assess the effectiveness of the weed control program. Monitoring has identified weed control successes and failures depending on the species and environmental factors (i.e., land disturbance, rainfall, establishment of biological controls). Weed management priorities have been established for the Academy and Farish that are based primarily on four factors: (1) current status on State and County noxious weed lists, (2) current prevalence at the Academy or Farish and cost effectiveness of management, (3) potential invasiveness, and (4) the threat posed to significant natural resources. For example, myrtle spurge and orange hawkweed are given a high priority for management due to their status as List A species.

Noxious Weeds found on the U.S. Air Force Academy and/or Farish Recreation Area

Scientific Name	Common Name	Colorado Weed List Status
Acroptilon repens	Russian knapweed	List B
Alliaria petiolata	garlic mustard	List B
Cardaria draba	hoary cress	List B
Carduus nutans	musk thistle	List B
Centaurea diffusa	diffuse knapweed	List B
Centaurea maculosa	spotted knapweed	List B
Centaurea diffusa x maculosa	diffuse / spotted knapweed hybrid	List B
Cirsium arvense	Canada thistle	List B
Cirsium vulgare	bull thistle	List B
Convolvulus arvensis	field bindweed	List C
Cynoglossum officinale	houndstongue	List B
Dipsacus fullonum	common teasel	List B
Elaeagnus angustifolia	Russian olive	List B
Euphorbia esula	leafy spurge	List B
Euphorbia myrsinites	myrtle spurge	List A
Galium verum	yellow spring bedstraw	n/a
Hesperis matronalis	Dames rocket	List B
Hieracium aurantiacum	orange hawkweed	List A
Hypericum perforatum	common St. Johnswort	List C
Lepidium latifolium	perennial pepperweed	List B
Leucanthemum vulgare	oxeye daisy	List B
Linaria dalmatica	Dalmatian toadflax	List B
Linarian vulgaris	Yellow toadflax	List B
Lonicera tatarica	Tatarian honeysuckle	List B
Onopordum acanthium	Scotch thistle	List B
Saponaria officinalis	bouncingbet	List B
Tamarix ramosissima	salt cedar	List B
Tanacetum vulgare	common tansy	List B
Tripleurospermum perforatum	scentless chamomile	List B
Verbascum thapsus	Common mullein	List C

List A – must be eradicated statewide; List B – must be eradicated contained, or suppressed, depending on location to stop spread; List C – control recommended by state and may be required by locally.

7.12 Bird/Wildlife Aircraft Strike Hazard (BASH)

Applicability Statement

This section applies to AF installations that maintain a BASH program to prevent and reduce wildlife-related hazards to aircraft operations. This section **IS** applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

Airfield management encounters a number of natural resources issues affecting the safe and efficient operation of the Academy's airspace at USAFA and Bullseye. This section will focus specifically on actions required to ensure compliance with airfield safety requirements with the least environmental impacts.

Natural Resources coordinates closely with Airfield Management on wildlife and other BASH-related issues through the Bird- Hazard Working Group and quarterly Airfield Operations Board meetings. Natural Resources also reviews the BASH plan on an annual basis. In 2018, USDA-Wildlife Services began staffing a wildlife biologist at the airfield to conduct bird and other wildlife surveys; conduct hazing, trapping, depredation actions; and to develop a Wildlife Hazard Assessment and Management Plan. Natural Resources coordinates with the USDA biologist to obtain the required migratory bird permits (depredation, salvage, Eagle depredation) and to review proposed wildlife or habitat management actions. The USDA-WS biologist provides monthly reports to Natural Resources, assists with preparing the annual MBTA permit reports, participates in the annual INRMP Sikes Act review, and provides the USDA Form 37 to support depredation permit requests to USFWS.

Natural Resources and USDA-WS advocate for using all available habitat management and non-lethal hazing/harassment techniques to control or reduce wildlife hazards. Conducting wildlife trapping and relocation or taking lethal control measures is considered as a last resort.

The most problematic wildlife species in the airfield environment include mule deer, white-tailed deer, horned lark, ducks and Canada geese, various hawks, common raven, and other grassland birds.

7.13 Coastal Zone and Marine Resources Management

Applicability Statement

This section applies to AF installations that are located along coasts and/or within coastal management zones. This section **IS NOT** applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

N/A.

7.14 Cultural Resources Protection

Applicability Statement

This section applies to AF installations that have cultural resources that may be impacted by natural resource management activities. This section **IS** applicable to the U.S. Air Force Academy.

Program Overview/Current Management Practices

Air Force Academy

From the late 1990s most of the main block of USAFA land has been inventoried for cultural resources (CR) listed in or potentially eligible for the National Register of Historic Places (NRHP). This was done under requirements of the National Historic Preservation Act of 1966 (NHPA, as amended). These CR are primarily archeological sites and historic buildings/structures although a limited ethno-botanical field survey also took place (results published in 2017) involving federally recognized tribes (NHPA stakeholders) interested in native plant communities for their tradition use, etc. The USAFA Integrated Cultural Resources Management Plan (ICRMP) is updated annually, and it has more information on the above and following information. The inventory of CR for any military installation is a dynamic and continual series of studies, updating and adding to existing CR records. Generally, this is justified under NHPA Sec. 110 (now 54 U.S.C. 306101-306114) or project-driven under Sec. 106 (for info see https://www.achp.gov). Since approximately 2018 USAFA has begun re-inventorying much of its lands, and buildings/structures, by use of contracted-to-consultant CR field studies either AFCEC-funded or as part of USAFA community planners' "area district plans" (ADPs or DPs; note these are *not* NRHP districts but rather strategic planning "district" areas under USAFA's Installation Development Plan). The NHPA-related management of USAFA's CR also is influenced by a 1998-2003 interest in making the entire USAFA a NHRP district. On files at the Colorado State Historic Preservation Officer (SHPO) and USAFA, this is recorded as the "USAFA Campus District, 5EP.595". It represents recognition that USAFA from its origins in 1954 was viewed as a comprehensively planned/designed landscape with points of concentrated "built environment" (i.e., buildings such as the campus area) in a natural setting with such concentrations setting within and separated by visually striking natural areas. The 5EP.595 district is considered a static matter today in that USAFA leadership if not higher levels of AF in 2003 declined to follow through to have the proposed district listed in the NRHP. However, from that time to the present, SHPO staff informally advocate that USAFA CR staff acknowledge this once proposed NRHP district in that it reminds all concerned parties of USAFA's unique landscape design origins, etc. and this 1998-2003 era documentation influences how CR sites are evaluated for significance. Also, in 2004 the heart of USAFA's campus did become listed in the NRHP as a National Historic Landmark (NHL). Generally, the heavily developed Cadet Area NHL does not have bearing on USAFA's NR management. Natural resource management activities that may cause ground disturbance are coordinated through the EIAP process which includes the planning process of NHPA, Section 106, which typically involves consultation to the SHPO and 30+ tribes. A number of tribes consulted by USAFA generally attach cultural or religious importance to the site known as Cathedral Rock, a sandstone hoodoo formation all in the Jacks Valley training area. The USAFA CR Manager works closely with the USAFA NR Manager to ensure good coordination on all NHPA matters where USAFA's NR program activities have known or potential overlap. For example, NR and CR have worked to facilitate a request by the Elmorh Iris Society to harvest iris cultivars (non-native strains) from a historic site in order to grow them on and preserve and propagate the strains, potentially saving them from extinction. Further, it is possible that one of USAFA's tribal stakeholders could request to collect medicinal or spiritual plants from USAFA, which also require close cooperation to permit the collection and safeguard the plant population from over-exploitation. Other CR-related federal laws have potential applicability for USAFA but, to date, have not required specific coordination: the Archaeological Resources Protection Act of 1979 (ARPA; as amended) and the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA, not amended as of Feb 2021). For example, if USAFA NR staff became aware of unlawful collecting of archeological materials at USAFA, the response in coordination with the CR Manager and others would require consideration of ARPA applicability. Likewise, attention under NAGPRA might apply in terms of human remains or other NAGPRA-defined materials becoming identified on USAFA lands. To date no American Indian human remains or other NAGPRA materials have been discovered at USAFA. Known historic pioneer human remains at USAFA are those of five individuals whose graves were re-located in the 1960s to the NRHP-listed Capps-Burgess historic cabin site.

Farish Recreation Area

Completion of baseline information about cultural resources at Farish was completed in 1994 during an archeological inventory conducted by the University of Colorado at Colorado Springs. From that study there are eight archeological sites recorded at Farish, and all are considered not eligible for the NRHP. Also, Farish also has three structures that are eligible for the NRHP, and they are associated with a 1990s (or such time origin) proposed potential NRHP district focused on Farish's buildings/structures. In 2021 an AFCEC-funded consultant updated the historic (built environment) CR of Farish. In future years a comprehensive updating-type archeological survey is anticipated. Farish is federal land which means that ARPA and NAGPRA would have applicability.

B*ullseye Auxiliary Airfield*

A cultural resources field reconnaissance was conducted at Bullseye during October 1987 and a 100% survey was conducted during November 1987. A total of 188 acres was inventoried during the site survey. Although no evidence of cultural resources was observed on the proposed airfield site, several insignificant resources were located along 2 miles of disturbed access road. Two small prehistoric sites, three prehistoric isolated finds, and one historic site were reported. Generally, all USAFA CR management at this airfield is prompted by USAFA undertakings subject to compliance under NHPA Sec.106. This is state of Colorado land leased by USAFA. Thus, ARPA and NAGPRA are inapplicable although other CR-type state laws could be applicable.

Paleobotanical (Paleontological) Site – Air Force Academy

In the early 1990s, research teams from Fort Hays State University, Kansas, identified and examined areas of USAFA exhibiting fossilized plants from the Late Cretaceous-Paleocene era (about 60 million years ago). The assemblage of fossilized plants includes at least six different types of ferns, and several types of broad-leaved plants that resemble present-day figs, magnolias, water lilies, and palms (Thomasson 1994). The location of the site remains confidential to ensure protection of the resource. Other than the broad applicability of the Antiquities Act of 1906, and an interpretable reference under the Archeological and Historic Preservation Act of 1974 (AHPA), this paleontological site is not subject to specific protection under CR or paleontological federal laws, including that the Paleontological Resources Preservation Act of 2009 does not apply to military lands such as at USAFA. Section 3 of AHPA is pertinent potentially where paleontological sites equate "significant scientific data" and AHPA can be cited to support the Department of Interior's involvement to help preserve such a site. Regardless, theft of federal property (18 U.S.C Sec. 641) possibly would be applicable to unlawful removal of materials from this site. This site has never been evaluated formally for its paleontological significance, but existing documentation indicates it is a locality with significant specimens and research potential. While not promoted at present, future evaluation and/or collection of materials from the site might be conducted by a reputable museum, university, etc. under an Antiquities Act permit coordinated to the Department of the Interior and, most likely, requiring approval at levels higher than USAFA such as by the Assistant Secretary of the Air Force for Installations, Environment, and Energy (SAF/IE).

7.15 Public Outreach

Applicability Statement

This section applies to all AF installations that maintain an INRMP. The U.S. Air Force Academy is required to implement this element.

Program Overview/Current Management Practices

The Air Force Academy's primary means of distributing information about the natural resources program is through the iSportsman website (usafa.isportsman.net). Other sources of information include the FSS Outdoor Recreation Center, Farish Recreation Area, and kiosks at the fishing lakes and trailheads. Basewide email is periodically used to distribute information on nuisance or hazardous wildlife, ongoing programs, etc.

The Natural Resources office leads events such as Arbor Day recognition, a FireWise community open house, and an annual Creek Week trash cleanup. Several school or scout volunteer projects are often completed each year.

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 the Academy.

Program Overview/Current Management Practices

A threats and stressors assessment for species-at-risk and ecological systems found on the Academy, Fort Carson, and Pinon Canyon Manuever Site was prepared by CNHP and CEMML scientists (Grunau et al, 2017), with a focus on climate vulnerability and climate change. The objectives of the study were to:

1. Analyze vulnerability of species and ecosystems to stressors at local and regional scales
2. Identify potential species declines that could adversely affect future training operations
3. Incorporate spatial data to evaluate possible distribution shifts and other species/ecosystems responses in relation to destabilizing events
4. Develop recommendations to scale down the ecosystem management concept and help halt species declines both on and off installations.
5. Document our process and lessons learned to facilitate similar analyses by other installations for their species and ecological systems.

Exerpts from the 2017 report are provided below as an introduction to the climate vulverability and risk to the Academy and its natural resources, with a focus on the Preble's meadow jumping mouse which is identified as extremely vulnerable to climate change.

The Academy represents a significant proportion of the remaining distribution of Preble's. Given this species' restriction to riparian habitats, there is potential for increasing drought to have a strong influence on future natural resource management and expenditures as changes in precipitation patterns and stream hydrology impact riparian habitats. Thus, potential future issues related to water management and climate change are of particular concern.

Because projected warmer and drier conditions are expected to decrease the quality and quantity of riparian habitats, Preble's is especially vulnerable (USFWS 2018). Although many models project a slight increase in precipitation (averaging 5% increase or less annually) for the Preble's range by mid-century, a simultaneous temperature increase of 4°F or more means that no areas in the current range will receive sufficient compensatory precipitation to maintain current runoff patterns. Reduced summer flows are predicted to result in more frequent drought stress for riparian habitats, with a resulting loss or contraction of the habitat, including the lower elevational limits of Preble's. These conditions are not limited to transition streams on the Front Range. A statewide climate change vulnerability assessment for Colorado shows that predicted temperature and precipitation are outside of historic means for wetland and riparian habitats across all elevational gradients (Decker and Fink 2014).

In 2021, the Center for Environmental Management of Military Lands (CEMML) also prepared a climate change assessment for the U.S. Air Force Academy, Bullseye Auxiliary Airfield, and Farish Recreation Area (CEMML 2021). A detailed analysis of the potential climate-related impacts on various resources is summarized in a final report available upon request through the USAFA Natural Resources office.

Natural Resources is also cooperating with USAFA/A4 to incorporate the Department of the Air Force Climate Action Plan in to the USAFA Sustainability Strategic Plan.

7.17 Geographic Information Systems (GIS)

Applicability Statement

This section applies to all AF installations that maintain an INRMP, since all geospatial information must be maintained within the AF GeoBase system. The U.S. Air Force Academy is required to implement this element.

Program Overview/Current Management Practices

GIS is a computer system for capturing, storing, checking, integrating, manipulating, analyzing, and displaying data related to positions on the Earth's surface. GIS is used to create and manipulate maps. These are represented as several different layers where each layer contains data on a particular kind of feature (e.g., soils, wetlands, roads). Each feature is linked to a position on the graphical image of a map. The data layers are organized to create maps and to perform statistical analysis.

The Academy utilizes GIS for complex analyses such as project siting, constraints analysis, training operations planning, and environmental and risk assessments. The Academy's GeoDatabase and Natural Resources field data supports resource planning and management activities that require the ability to analyze, display, and distribute spatial data and information. The Natural Resources GIS database also supports the Environmental program, cadet activities, and military training.

8 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.

Goal 1: Maintain an INRMP that sustains the military training mission and protects and enhances biological diversity and ecological integrity using the principles of ecosystem management.

Objective 1.1: Maintain a cooperative and supportive relationship with Sikes Act partners (USFWS, CPW) to maximize the effectiveness of the USAFA Natural Resources Management Program.

Project 1.1.1: Annually review INRMP accomplishments with USFWS and CPW and, as mutually agreed to; revise the methods, objectives, projects, budget, and timeline to address changing conditions.

Project 1.1.2: Annually coordinate with CPW on opportunities to assist with accomplishing State Wildlife Action Plan objectives, conduct wildlife inventories or studies, or perform monitoring.

Objective 1.2: Maintain a cooperative and supportive relationship with various USAFA organizations to integrate natural resource management with sustainment of the training landscape and mission-related activities.

Project 1.2.1: Coordinate with and advise the 10 ABW, Davis Airfield, and Cadet Training Wing on natural resources issues through participation in the Jacks Valley Working Group, ESOH Council, 10 ABW briefings, EIAP meetings, Bird Hazard Working Group, and other organizational meetings.

Project 1.2.2: As necessary, prepare after-action reports of training and other activities that negatively affect natural resources, and provide recommendations and practical remedial SOPs for future actions.

Objective 1.3: Maintain accurate and up-to-date environmental and biological databases to support natural resource management decisions and environmental analysis.

Project 1.3.1: Incorporate current and historical natural resource databases and geo-referenced data layers into GeoBase to help measure and monitor resource condition and trend.

Project 1.3.2: As necessary, obtain aerial photography and geo-referenced data layers for areas outside the installation to assess regional and ecosystem-wide resource management issues.

Objective 1.4 Inform the military and general public of ongoing activities to implement the INRMP and sustain USAFA's natural resources.

Project 1.4.1: Maintain an easily accessible, DoD-compliant Natural Resources public website (usafa.iSportsman.net) with information covering program activities, rules and regulations, maps, photographs, and outdoor recreation opportunities.

Project 1.4.2: Periodically provide briefings, news articles, email, website updates, etc. that address natural resource management activities and concerns.

Objective 1.5: Comply with natural resource and environmental laws and regulations.

Project 1.5.1: Closely coordinate any wildlife compliance or resource damage issues with 10th Security Forces, USFWS, and CPW.

Project 1.5.2: Maintain the Natural Resource Manager's qualifications through the attendance of national, regional, and state conferences and other professional development training opportunities as funding allows.

Project 1.5.3: Obtain necessary permits, including Clean Water Act 404, Migratory Bird depredation and salvage, Eagle Depredation, wildland fire burning permits, roadkill wildlife possession, etc.

Project 1.5.4: Pursue a Conservation Law Enforcement Officer (CLEO) position staffed through the U. S. Fish and Wildlife Service National Wildlife Refuge System (Law Enforcement)

Objective 1.6: Manage USAFA's natural resources in a regional context by sustaining natural ecological and biological processes (e.g., natural hydrologic patterns, seasonal fire dynamics, native plant competition, predator-prey interaction, host-pollinator interaction). Participate in strategic landscape planning efforts, to exchange scientific knowledge and to manage for desired ecological conditions in a regional context. Develop partnerships with other agencies to monitor effectiveness of various treatments, and to maximize effectiveness of forest restoration and management across the Front Range landscape. Apply adaptive management in response to increasing knowledge and understanding of ecosystem functions and response.

Project 1.6.1 Through implementation of other INRMP Goals, quantify and mitigate environmental stressors (e.g., climate change, invasive species, altered hydrology and fire regimes, wildlife and forest diseases and pests, overpopulation) that affect biological diversity and ecological integrity.

Project 1.6.2: Through various media, continue to educate base residents, personnel, visitors, and commanders of the economic and ecological benefits of managing natural landscapes using the principles of ecosystem management.

Project 1.6.3: Participate on collaborative teams dedicated to exploring complex and pressing natural resource issues.

Project 1.6.4: Actively partner with the Pike National Forest to address regional forest health issues and maximize the effectiveness of forest management across boundaries.

Project 1.6.5: Participate in the U.S. Forest Service (USFS) Forest Health Protection (FHP) program to secure funds for forest insect and disease protection. Host an annual biological site visit with the FHP staff to review previous year accomplishments and discuss new proposals. Submit Form FS 3400-2 to be considered for funding annually by the deadline (~October 1).

Project 1.6.6: Work closely with the USFS FHP staff to identify unknown insect and disease agents. Submit samples and request field visits as needed to collaborate on findings and articulate management needs.

Project 1.6.7: Cooperate with the USFS, USDA Animal and Plant Health Inspection Service (APHIS) and other agencies to monitor for insect and disease issues. Place traps, etc., in suitable locations, and monitor as needed. Participate in regional workshops and other forums to maintain currency on forest health issues.

Goal 2: Sustain fish and wildlife populations, manage wildlife-human interaction concerns, and protect and conserve threatened, endangered and sensitive species and their habitats.

Objective 2.1: Prevent and control wildlife-related health and safety risks and wildlife diseases.

Project 2.1.1: Publicize wildlife viewing opportunities and proper ways to observe and interact with wildlife through various media. Provide "Living with Wildlife" brochures to educate the public on how to minimize wildlife-human conflicts.

Project 2.1.2: Monitor the deer and elk population for the prevalence of chronic wasting disease.

Project 2.1.3: Coordinate with CPW, USAFA Pest Management, Public Health, and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.

Project 2.1.4: Coordinate with Civil Engineering, Forces Support Squadron, and the base housing contractor to provide animal-resistant trash receptacles to protect wildlife and reduce potentially hazardous wildlife-human interaction.

Objective 2.2: Avoid or minimize impacts on birds protected by the Migratory Bird Treaty Act (MBTA) or Bald and Golden Eagle Protection Act.

Project 2.2.1: Coordinate project schedules in advance with proponents to ensure projects don't impact nesting birds or as necessary; perform field surveys for nesting birds prior to site disturbance planned during the typical March-August nesting season. Obtain eagle or migratory bird permits when impacts cannot be avoided by adjusting the project scheduling.

Project 2.2.2: Annually obtain migratory bird salvage and depredation permits to collect dead birds, control nuisance species (e.g., double-crested cormorant), and mitigate any airfield BASH concerns.

Project 2.2.3: Interact at least quarterly with Airfield Management, Flight Safety, USDA-Wildlife Services, and the Bird Hazard Working Group to develop procedures and management actions to reduce the Bird-Aircraft Strike Hazard (BASH) through habitat and wildlife control actions. Assist the Airfield staff with identifying bird mortalities, harassing wildlife from the airfield environment, and reviewing the BASH Plan.

Project 2.2.4: Perform informal and formal bird surveys in aquatic and terrestrial habitats and add observations to the Cornell Lab of Ornithology eBird database.

Project 2.2.5: Provide logistical support for the annual maintenance and monitoring of 150+ blue bird nest boxes on USAFA by CPW volunteers.

Project 2.2.6: Monitor above-ground utilities for potential bird electrocution hazards and mitigate as necessary. Project 2.2.7: Maintain a geo-referenced database (GeoBase) of active and inactive nesting sites.

Objective 2.3: Implement a hunting program to help achieve wildlife population and habitat management objectives and reduce wildlife-human conflicts.

Project 2.3.1: Annually coordinate with CPW to perform a base-wide count of deer, elk, turkey, and other non-game wildlife of interest.

Project 2.3.2: Based on population estimates, annually coordinate with CPW on the number of deer, elk, and turkey licenses to be issued for the following hunting season to help maintain a target population of approximately 250 deer and 30 elk.

Project 2.3.3: Sustain a flock of approximately 150 Merriam's turkey to prevent bird-human conflicts. Provide a fall and spring archery-only hunting opportunity in coordination with CPW.

Objective 2.4: Maintain the diversity and abundance of native fish in Monument Creek and its tributaries.

Project 2.4.1: Conduct electrofishing surveys within the perennial streams every 3-years to help assess aquatic and biotic health and integrity.

Project 2.4.2: Protect and encourage beaver (and their dams) to help maintain stream base flow, mitigate stormwater impacts, and provide deep water habitat for sustaining native fish populations. Only remove beavers and dams that are negatively affecting stormwater management (e.g., plugging culverts) or the diversion of water to the fishing lakes.

Objective 2.5: Monitor the diversity and populations of other non-game wildlife.

Project 2.5.1: Through field observations and reports, maintain a species list of rare sightings and wildlife known to inhabit or frequent the installation.

Project 2.5.2: Assist with Department of Biology and cadet independent study wildlife projects, such as track counts, coyote howling surveys, and maintaining motion-detector game cameras.

2.5.3: Perform surveys for eastern black rail to assess their occurrence on the Air Force Academy.

2.5.4: Perform echo-location acoustic monitoring and mist-netting surveys to assess the occurrence of bat species on Academy properties.

Objective 2.6: Control free-roaming, stray, and feral pets.

Project 2.6.1: Coordinate with 10th Security Forces, Pest Management, or Base Housing to identify, capture, and transfer nuisance pets and feral animals to the Pikes Peak Humane Society.

Objective 2.7: Maintain and comply with the Preble's meadow jumping mouse (Preble's) Biological Opinion.

Project 2.7.1: Annually conduct Preble's population and habitat assessments and provide monitoring data and reports to USFWS.

Project 2.7.2: Implement habitat and stream restoration projects in degraded Preble's meadow jumping mouse habitat.

Project 2.7.3: As warranted, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any change in habitat suitability.

Project 2.7.4: Participate in the implementation of a USFWS Preble's meadow jumping mouse recovery plan through the Fountain Creek HUC Site Conservation Team.

Objective 2.8: Identify and monitor important natural habitats and other species of conservation concern.

Project 2.8.1: In coordination with CPW, USFWS, and CNHP, annually review a list of special status species known or likely to occur on USAFA.

Project 2.8.2: Maintain a geo-spatial database of populations and habitats of special status species.

Project 2.8.3: Conduct field surveys every 5-years to evaluate the occurrence, abundance, threats, and management needs of special status species.

Project 2.8.4: Conduct field surveys every 5-years to evaluate the condition, trend, threats, and management needs of ecologically important habitats, including the CNHP-designated Potential Conservation Areas, Natural Areas, and rare plant communities.

Goal 3: Sustain proper functioning of watersheds, wetlands, and floodplains.

Objective 3.1: Improve local and regional management of stormwater and urban runoff to prevent watershed degradation.

Project 3.1.1: Coordinate with the Civil Engineering Heavy Equipment Shop to develop road grading and culvert maintenance standards and practices similar to those used by the US Forest Service, and construct stormwater infrastructure that minimizes vegetation damage and can sustainably collect and release water without causing erosion.

Project 3.1.2: In coordination with Civil Engineering, opportunistically relocate above- and below-ground utilities out of wetlands and floodplains as part of planned construction projects.

Project 3.1.3: Through the Community Planner and various public forums, continue to document and communicate to City and County governments and developers the adverse impact that an altered rate and volume of off-base stormwater is having on USAFA natural resources, infrastructure, and aesthetics.

Project 3.1.4: Continue to advocate with the City and Country for improvements in stormwater and urban runoff planning and regulations to protect the USAFA watershed.

Project 3.1.5: In partnership with local government and developers, implement watershed protection and restoration projects to mitigate impacts on USAFA and downstream areas.

Objective 3.2: Sustain adequate vegetation cover to protect the watershed against excessive runoff and soil erosion.

Project 3.2.1: Prevent activities which unnecessarily damage the vegetation cover, including unauthorized or undesirable ORV use, creation of social trails, excessive training or construction disturbance, and unnecessary mowing.

Project 3.2.2: Use native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.

Project 3.2.3: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all authorized soil-disturbing projects utilize appropriate erosion control techniques and materials to prevent soil loss and promote revegetation.

Objective 3.3: Maintain functional wetlands and floodplains that support biological diversity and are hydrologically sustainable.

Project 3.3.1: Annually assess the condition of wetland, stream channel, and floodplain areas and identify any factors causing a departure from a stable Proper Functioning Condition.

Project 3.3.2: As necessary and feasible, implement channel restoration and stabilization projects to prevent or mitigate any causal factors posing a threat or creating system instability, with emphasis on sustaining or restoring habitat for the Preble's meadow jumping mouse and other wetland/riparian species. Projects must be designed to withstand the altered rate, volume, and frequency of discharge resulting from any increase in urban runoff. When feasible, drainage and habitat restoration projects should also be designed to remove or mitigate barriers to native fish passage.

Project 3.3.3: As necessary, update the wetland and floodplain inventory and mapping in GeoBase.

Project 3.3.4: Construct beaver dam analogs (BDA's) to provide aquatic habitat, sustain and stabilize creek channels and floodplains, and enhance riparian and wetland habitats. Monitor the long-term benefit of BDA's for creating habitat and species diversity. Assess the use of BDA's alone or in combination with more aggressive channel stabilization approaches to achieve effective and rapid wetland and riparian habitat restoration.

Goal 4: Sustain healthy rangelands, forests and urban trees.

Objective 4.1: Control the encroachment and expansion of state-listed noxious weeds and other undesirable horticultural plant materials.

Project 4.1.1: Conduct a base-wide noxious weed inventory every 5-years to update the weed database and promote early detection/rapid response control measures.

Project 4.1.2: Conduct annual weed monitoring to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.

Project 4.1.3: As appropriate, update the Integrated Noxious Weed Management Plan to include new species, management priorities, monitoring protocols, and control techniques.

Project 4.1.4: Coordinate with adjacent landowners and local governments to identify and control noxious weeds that could invade USAFA.

Project 4.1.5: Utilize an integrated management approach (chemical, biological, mechanical, cultural practices) to control noxious weeds.

Objective 4.2: Promote sustainable range management in the Pine Valley horse pastures.

Project 4.2.1: Revise and implement a horse grazing management plan to sustain or improve range condition and trend.

Project 4.2.2: In coordination with FSS, frequently inspect the fences, gates and watering sources to better control grazing use and access.

Project 4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.

Project 4.2.4: Coordinate annually with FSS on manure disposal practices and approved locations to prevent inadvertent impacts to native vegetation or waterways.

Objective 4.3: Manage USAFA forests in a regional context by restoring and sustaining natural ecological and biological processes. Identify environmental stressors (i.e., forest insects and diseases, abiotic factors, overstocking), and design projects to enhance health and resiliency of the forested landscape.

Project 4.3.1: Inventory all treatment units before operations begin. Incorporate data into Academy GeoBase.

Project 4.3.2: Perform forest health surveys on all of USAFA's forested acres annually to evaluate insect and disease issues (i.e., bark beetles, dwarf mistletoe infection), and to identify management needs. Specifically resurvey areas pruned for mistletoe to detect new infections and identify for retreatment as necessary to ensure treatment effectiveness.

Project 4.3.3: Perform 150 acres of forest management annually to enhance forest health and to restore forests to a more open, natural condition, reminiscent of forests found under a historic fire regime. Management options include forest thinning, timber stand improvement, and sanitation pruning. Focus on uncharacteristically dense mature stands for forest thinning; younger stands or areas in need of sanitation treatments for timber stand improvement, and mistletoe-infected areas for pruning.

Objective 4.4: Aggressively manage bark beetle infestations to prevent extensive mortality.

Project 4.4.1: Place high priority on locating infested trees (through field surveys in 4.3.2) and treating promptly (de- barking, chipping, hauling to a "safe" place; wrapping in plastic) to eradicate developing insect broods, especially when populations are high. Tree removal due to beetle attack varies but is expected to range from 300 to 1,000 annually, with an average of 700 per year.

Project 4.4.2: Identify high risk or high-profile trees for spraying to prevent bark beetle attack. Base spray program on existing beetle populations and stressors affecting trees (i.e., root damage, drought, etc.). Minimize pesticide use as much as possible. Avoid riparian areas and stipulate strict usage parameters (wind speed, etc.). Track pesticide usage and report to Pest Management.

Project 4.4.3: Coordinate with the Academy Biology faculty to develop the senior capstone courses.

Project 4.4.4: Perform field inventory for beetle-infested trees on privatized land on the USAFA and arrange for prompt removal of infested trees via contract logger, since brood trees threaten surrounding USAFA forest. Coordinate with Embassy Tree and Grounds Maintenance on field survey and tree removal activities, to ensure residents are apprised.

Objective 4.5: Maintain forest stand database, to accurately reflect current conditions and improve the quality of management planning and accomplishment reporting.

Project 4.5.1: Update forest stand boundaries on the USAFA and Farish, based on treatment units and new forest boundaries. The forested component represents approximately 14,000 acres, including stands with at least 20 square feet of basal area per acre.

Objective 4.6: Manage campgrounds, parking areas and managed trails for potentially hazardous trees, to help ensure recreationist safety.

Project 4.6.1: Perform annual sweeps of all managed trails at the USAFA and Farish to identify potentially hazardous trees. Project 4.6.2: Arrange for felling of potentially hazardous trees identified in Project 4.7.1 via contract logger.

Project 4.6.3: Perform annual hazard tree inventory on all trees within Peregrine Pines Family Campground, Farish camping areas, and major trailheads. Delineate inventory areas based on potential tree strike distance to targets (concentrated use areas, parking spots, etc.). Utilize the USFS Hazard Tree Rating system for this inventory, to quantitatively document and track tree health conditions. GPS tree locations and maintain data in GeoBase.

Project 4.6.4: Perform subsequent annual field checks of trees rated as potentially hazardous (classes 4 to 6 in the USFS Hazard Tree Rating System) in the baseline campground inventory, in addition to any that have been obviously damaged since the baseline survey (i.e., lightning strike).

Project 4.6.5: Promptly remove trees identified as imminently hazardous (class 6 or possibly class 4) within Project 4.6.4.

Project 4.6.6: Conduct a hazard tree survey after every major environmental event that would threaten the health of USAFA's forested areas. This would include wind events, heavy snow, wildfire, etc. Remove all trees that are the responsibility of Natural Resources and facilitate removal of others with Civil Engineering and Grounds Maintenance.

Objective 4.7: Maintain an active reforestation program.

Project 4.7.1: Maintain Natural Resources' seedling nursery. Keep stocked with a minimum of 300 seedlings procured from densely stocked forested areas. Ponderosa Pine will be the preferred species for transplanting and nursery care.

Project 4.7.2: Plant 300 seedlings in recreation and areas of concern throughout USAFA.

Project 4.7.3: Perform seedling survival surveys at years 1, 3 and 5 following planting. Schedule replanting as necessary.

Project 4.7.4: In the event of a major wildfire, mobilize seedling transplanting program to relocate appropriate species from densely forested areas.

Objective 4.8: Regenerate aspen at Farish Recreation Area to enhance biological diversity, wildlife habitat, aesthetic quality and overall ecosystem health.

Project 4.8.1: Select two areas of declining aspen in which to focus regeneration efforts. Delineate two small (one-to-two acre) clearcut harvest units to encourage re-sprouting. .

Project 4.8.2: Complete fuels management project to mitigate the residual debris. Coordinate with the Wildland Support Module to design a pile or broadcast burn.

Project 4.8.3: Perform biyearly field surveys in existing aspen regeneration harvest units to determine timing to remove fencing, and in newly created units to monitor regeneration success. Survey all fences yearly for repair needs.

Project 4.8.4: Develop prescribed fire burn plan and burn slash piles from Project 4.8.2.

Project 4.8.5: Partner with the U.S. Forest Service and other land management agencies to evaluate regional decline of aspen and discuss/adopt future management strategies.

Objective 4.9: Contribute to a better regional understanding of silvics and control strategies for Gambel oak with respect to minimizing wildfire risk.

Project 4.9.1: Establish monitoring plots on four different oak clearing sites, to represent treatment at various times of the year. Design studies plan to capture growth response and effectiveness of treatment based various treatment methods. Incorporate "before" and "after" photos into data collection procedures. Utilize Cadet assistance as study project if possible.

Project 4.9.2: Revisit oak study sites in years 1, 3, 5, 7 and 9 to quantitatively and photographically document growth response.

Project 4.9.3: Collaborate with the USAF Wildland Fire Center and regional stakeholders on oak management, identifying and employing adaptive management strategies as appropriate.

Objective 4.10: Maintain a forest product sales program.

Project 4.10.1: Manage Natural Resource woodlot for firewood sales. Submit sales receipts per USAF protocol. Project 4.10.2: Explore possibility of selling seedlings from nursery and mulch from chipping operations.

Objective 4.11: Document all forestry activities photographically and geospatially. This will monitor long-term effectiveness of management activities, and accurately record specific project locations.

Project 4.11.1: Take pre-treatment photos of all forest thinning areas, ranging across a variety of stand conditions and representing a density of at least one photo per five acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage.

Project 4.11.2: Document other forestry activities to include planting, pruning, beetle-infested tree treatment, etc. with anecdotal photos. Catalog by activity and month/year completed.

Project 4.11.3: GPS all harvest unit boundaries, and planting areas of at least one acre in size. Include contractor name and project dates in attribute data. To the extent feasible, digitize all beetle-infested trees removed to help track trends and focus subsequent field surveys.

Project 4.11.4: Track all accomplishments in GIS. Coordinate with the USAFA Geo Integration Office (GIO) to assimilate pertinent forestry data into the USAFA GeoBase. Specifically, this will include updated forest stand inventory data, annual forest thinning accomplishments, and bark beetle tree mortality data.

Objective 4.12: Protect trees in an urban setting by providing training and technical advice to the Grounds Maintenance staff and project planners. Participate in landscape design planning, to enhance the health of the USAFA's urban forests.

Project 4.12.1: Establish an approved plant list to be utilized for all landscape design projects. Emphasize native species, but also incorporate other proven species well adapted to the USAFA environment, to enhance biodiversity and hedge against single-species insect and disease losses.

Project 4.12.2: Review proposed landscape plans as time allows. Emphasize the need for xeriscaping and commensurate irrigation needs by planting zone.

Project 4.12.3: As requested, host urban tree care workshops for Grounds Maintenance, other landscaping staff and quality control inspectors. Address post-planting tree care, watering regimes, pruning, etc.

Project 4.12.4: Utilize annual tree board meeting to address issues with tree care and forest health. Address trenching, grading, pruning and long-term landscape care as needed. Assist USAFA tree management partners with tree health issues as requested.

Project 4.12.5: Chair an urban forest council with representatives from Natural Resources, Grounds Maintenance, Embassy Tree, and the CE service contractor.

Project 4.12.6: Complete two field surveys documenting tree health issues in private areas. Submit report to appreciate agency (Embassy Tree).

Project 4.12.7: Coordinate with Grounds Maintenance to develop a plan to maintain and effectively utilize urban tree inventory data.

Project 4.12.8: Complete annual Tree City USA application in December and Arbor Day proclamation in February. Host Arbor Day ceremony annually in April.

Project 4.12.9: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all projects adhere to tree care specifications to help ensure health and longevity of newly planted landscapes, and minimize damage to trees from construction work.

Objective 4.13: Ensure that trees to do not pose a safety issue to airfield operations.

Project 4.13.1: Coordinate with Airfield Operations to ensure that trees are removed from airfield clear zones. Project 4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.

Project 4.13.3: Assess potential for transplant trees to be removed during clearing operations and arrange for sale or use of said trees on base if suitable.

Goal 5: Minimize the risk of catastrophic wildfire on USAFA and Farish and increase use of prescribed fire as a management tool.

Objective 5.1: Revise and implement the USAFA and Farish Wildland Fire Management Plan (WFMP).

Project 5.1.1: Coordinate with the Wildland Fire Center (WFC) to revise the WFMP.

Project 5.1.2: Implement the WFMP, and review progress annually with the Sikes Act Cooperators and the WFC.

Objective 5.2: Maintain currency of required documents enabling the USFWS-staffed Natural Resources office to participate in wildland fire operations.

Project 5.2.1: Annually update the Wildland Fire Management Annual Operating Plan (AOP). Objective 5.3: Decrease risk of fast-spreading wildfire by creating and enhancing strategic fuelbreaks.

Project 5.3.1: Complete fuels reduction projects on a minimum of two units annually. Efforts and acreage here will vary due to the fuel loading and accessibility of the units. Masticate brush or pile for subsequent prescribed burning.

Project 5.3.2: Coordinate with the WFC to burn piles created from brush clearing.

Project 5.3.3: Maintain strategic shaded fuel breaks by limbing trees and reducing fuel loadings. These lines will be primarily located along the north, south, and western Academy boundaries.

Objective 5.4: Enhance defensible space around buildings and other infrastructure, to increase the ability to protect these resources in the event of a wildfire.

Project 5.4.1: Complete fuels reduction projects to protect a minimum of five site annually. A site may consist of a building, utility site, etc. Clearing distance will depend on fuel type, density and terrain.

Project 5.4.2: Facilitate fuel hazard assessments of homes within privatized housing areas, using USAFA firefighters to complete surveys.

Project 5.4.3: Determine sources for funding fuel hazard reduction projects within privatized housing areas, including the possibility of amending the housing lease to clarify respective responsibilities.

Objective 5.5: Increase the use of prescribed fire for fuels management and habitat improvement.

Project 5.5.1: Complete two prescribed fire operations annually. This could include pile burns, timber understory, grass, or any other broadcast burn.

Project 5.5.1.1: Complete pre and post fuels effect monitoring for these burns based on objectives set forth in the burn plan.

Project 5.5.1.2: Establish return fire intervals for subsequent operations every 7-12 years.

Project 5.5.2: Complete prescribed burn operations to mitigate debris resulting from aspen harvest units at Farish (Project 4.8.1).

Project 5.5.3.1: Coordinate with the Wildland Support Module to develop Rx burn plan and implement fire operations. Project 5.5.4: Assess the need for and benefits of additional prescribed fire, and update INRMP accordingly.

Objective 5.6: Document all fuel mitigation and prescribed burn activities photographically and spatially. This will monitor long- term effectiveness of management activities, and accurately record specific project locations.

Project 5.6.1: Take pre-treatment photos of all projects, ranging across a variety of conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage.

Project 5.6.2: GPS all fuels treatment project boundaries. Include contractor name (if applicable) and project dates (to include month and year) in attribute data. Add to applicable GeoBase layers.

Objective 5.7: Provide education on the need for fuel hazard mitigation, including defensible space concepts, fire prevention and wildfire preparation.

Project 5.7.1: Play an active role in regional fire and forest management groups, examples including Society of American Foresters, Fire Adapted Colorado, and The Pikes Peak Area Council of Governments. Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.

Project 5.7.2: Host an educational booth at the annual USAFA Fire Open House in August.

Goal 6: Provide quality, sustainable outdoor recreational opportunities and experiences.

Objective 6.1: Provide a recreational fishing program for USAFA-eligible anglers.

Project 6.1.1: Require a reasonable fee for annual, one-day, and second rod permits to generate income for a self- supporting program of stocking hatchery-reared fish. Provide discounted fishing permits for Purple Heart recipients or disabled veterans (DAV) with a greater than 60% disability rating. Coordinate with Airfield Management to provide handicapped access though Gate K-1 with the proper credentials.

Project 6.1.2: Periodically conduct angler interviews and collect creel information to track angler success and satisfaction with the fishing program and recreational experience.

Project 6.1.3: Improve and maintain safe, pedestrian-friendly fishing access on shoreline trails and piers.

Project 6.1.4: Seasonally monitor aquatic weed and algal growth in the fishing lakes and treat with approved algaecides or sterile grass carp. As necessary, maintain multiple age classes of grass carp to promote effective biological weed control.

Project 6.1.5: Monitor for fish diseases and parasites and take appropriate management actions. Stock whirling disease-free fish in accordance with CPW regulations.

Project 6.1.6: Opportunistically control any undesirable fish species without having a detrimental impact on the stocked fish population.

Project 6.1.7: Monitor for invasive aquatic species and take appropriate management actions.

Project 6.1.8: Maintain and improve water diversion structures to better capture and regulate water flow and minimize sediment transport to the lakes.

Objective 6.2: Maintain a network of sustainable, naturally surfaced trails that support hiking, running, mountain biking, and equestrian use.

Project 6.2.1: Annually repair and maintain the 22+ mile trail network using the techniques and guidelines outlined in the Trails Management Plan and Maintenance Standards, and those recommended by the International Mountain Biking Association (IMBA) and other trail organizations.

Project 6.2.2: Coordinate with the Cadet Mountain Biking Club/Team, IMBA, Medicine Wheel Trail Advocates, and other trail groups to design and construct trail re-routes, technical features, and skills/challenge courses that enhance the user experience, improve trail sustainability, and protect the environment.

Project 6.2.3: Partner with Medicine Wheel Trail Advocates and/or IMBA to provide volunteers, or train new USAFA volunteers, for trail construction and maintenance.

Project 6.2.4: Coordinate with the Force Support Squadron (FSS) to designate sustainable horse trails in the Pine Valley area and work to limit the proliferation of unsustainable "social" trails.

Project 6.2.5: Coordinate with El Paso County and the City of Colorado Springs concerning public access and the maintenance of the New Santa Fe Trail and LaForet Trail.

Project 6.2.6: Expand and upgrade the trail signage and provide user-friendly trail maps and information kiosks to improve the user experience.

Project 6.2.7: Provide picnic tables, animal-resistant trash containers, and restroom facilities at high volume trailheads and parking areas to enhance the user experience and reduce littering and environmental damage.

Project 6.2.8: Coordinate with the US Forest Service, Pikes Peak Ranger District, to regulate and maintain the trail access between the USAFA and USFS property.

Objective 6.3: Coordinate with HQ USAFA/A3O to maintain an enjoyable and environmentally sustainable camping area for non- profit organizations.

Project 6.3.1: In coordination with USAFA/A3O, update the user requirements and regulations for the B-52 camping area.

Project 6.3.2: Monitor the camping area to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.

Objective 6.4: Restrict off-road vehicle (ORV) use, with the exception of GOV-owned ORV's used for security patrols, military exercises, and other official business.

Project 6.4.1: Provide training to 10th Security Forces, 10 Civil Engineering Squadron, and the Jacks Valley Training Area Superintendent concerning the proper use of ORV's to minimize environmental impacts.

Project 6.4.2: As necessary, map and close undesirable ORV trails using signage, fencing, barriers, revegetation, and erosion control features.

9 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

Through a Sikes Act Cooperative Agreement with the Air Force, the Natural Resources program is staffed with permanent, full- time US Fish and Wildlife Service personnel from the Colorado Fish and Wildlife Conservation Office (COFWCO). The staff includes a Natural Resource Manager, Fish and Wildlife Biologist, Forester, and Forestry Technician. Volunteers, seasonal USFWS employees, and Student Conservation Association interns are used periodically to accomplish various projects.

This INRMP reflects the commitment set forth by the Academy to conserve, protect, and enhance the natural resources present on the installation from 2023 through 2027. An ecosystem approach was used to develop the management measures for each resource area. Implementation of the management measures will maintain and conserve the ecological integrity of the base and its biological communities. Implementation of the INRMP supports the military training mission and helps sustain the land- based resources that will be necessary for realistic future training activities.

This INRMP is a "living" document that is based on several short-, medium-, and long-term planning goals. Short-range goals include activities that are planned to occur in 0 to 5 years, while medium-range goals include activities in a 6- to 10-year period. Long-range goals are usually scheduled beyond 10 years. A majority of the goals and objectives discussed in this INRMP are based on short-term natural resources management goals. Because an INRMP is a "living" document, goals can be revised over time to reflect evolving environmental conditions and mission demands. In addition, medium- and long-range planning goals could eventually become short-range activities that also require implementation.

The tasks proposed in this INRMP are aggressive and might not be accomplished within the established timelines due to a number of factors (e.g., budget and manpower constraints). However, their importance to the proper management of the Academy's natural resources cannot be understated. Therefore, the management actions identified in the Annual Work Plans may be modified as part of the annual review by the INRMP Working Group to ensure that these tasks are continually emphasized and accomplished when practicable.

Funding sources are identified in AFMAN 32-7003. While some of the actions described in this INRMP could potentially be funded under "Environmental Compliance" in addition to "Conservation Resources Management" such as Legacy funds, the most probable funding sources for the majority of the actions are O&M Funds and Reimbursable Conservation Program (RCP) funds. While the above provides a brief summary of budget priorities and funding sources, it is the responsibility of the base's Natural Resources Manager to carefully examine and adhere to the referenced AFMAN, and any subsequent supplements or revisions, in preparing each year's budget for implementation of the actions identified in this INRMP.

9.2 Monitoring INRMP Implementation

USAFA Natural Resources, embedded within 10 CES, is the primary organization responsible for implementation of the INRMP. Other organizations frequently coordinated with include the Force Support Squadron, 306th Flight Safety and Airfield Management, 10th Security Forces Squadron, USAFA Public Affairs, Cadet Training Wing, USAFA Department of Biology, Colorado Parks and Wildlife, US Fish and Wildlife Service, Colorado State Forest Service, and the U.S. Forest Service. Annual review of the INRMP and Work Plans provide an opportunity for these organizations to comment on the state of USAFA's resource management and recommend areas for improvement.

9.3 Annual INRMP Review and Update Requirements

To ensure that this INRMP properly addresses all aspects of the natural and cultural resources present on the 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 Commander, 10th Air Base Wing. Similarly, all changes to be incorporated into this Plan must be approved by Commander, 10th Air Base Wing. This INRMP must also be approved by the USFWS and the CPW.

This INRMP is effective for 5-years from the date of approval; however, the Operational Component Plans must be updated annually during preparation of the Academy environmental budgets.

This Plan should be reviewed annually to assess the suggested management practices in terms of their appropriateness for current conditions at the Academy. In addition, the plan should be updated whenever there is a modification to the Academy's mission, or when there is a substantial change to the Academy's natural or cultural resources.

Development and implementation of an INRMP is the basic requirement for the establishment of the Academy's natural resources program. The INRMP must be developed in cooperation with the CPW and the USFWS, and the Academy's ESOC Council. The INRMP must be reviewed and revised as specified in AFMAN 32-7003 and implemented using funds obtained through the USAF budgeting process.

See Appendix J for documentation of the changes made to the INRMP following the annual reviews with CPW and USFWS.

10 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.

Annual Work Plans

FY23 Tasks

Project/Work Plan	Funding Source	Priority Level
1.1.1: Review INRMP accomplishments with USFWS and CPW and, as mutually agreed to; revise the methods, objectives, projects, budget, and timeline to address changing conditions.	In House	High
1.1.2: Coordinate with CPW on opportunities to assist with accomplishing State Wildlife Action Plan objectives, conduct wildlife inventories or studies, or perform monitoring	In House	Medium
1.2.1: Coordinate with and advise the 10 ABW, Davis Airfield, and Cadet Training Wing on natural resources issues through participation in the Jacks Valley Working Group, ESOH Council, 10 ABW briefings, EIAP meetings, Bird Hazard Working Group, and other organizational meetings.	In House	Medium
1.2.2: As necessary, prepare after-action reports of training and other activities that negatively affect natural resources, and provide recommendations and practical remedial SOPs for future actions.	In House	Low
1.3.1: Incorporate current and historical natural resource databases and geo-referenced data layers into GeoBase to measure and monitor resource condition and trend.	In House	Low
1.3.2: As necessary, obtain aerial photography and geo-referenced data layers for areas outside the installation to help assess regional and ecosystem-wide resource management issues.	In House	Low
1.4.1: Develop an easily accessible,		

DoD-compliant Natural Resources public website with information covering program activities, rules and regulations, maps, photographs, and outdoor recreation opportunities.	In House, PA	Medium
1.4.2: Periodically provide briefings, news articles, email, website updates, etc. that address natural resource management activities and concerns	In House	Low
1.5.1: Closely coordinate any compliance or resource damage issues with 10th Security Forces, USFWS, and CPW.	In House	Medium
1.5.2: Maintain Natural Resource Manager's qualifications through the attendance of national, regional, and state conferences and other professional development training opportunities as funding allows.	USFWS Coop Agreement	Low
1.5.3: Obtain necessary permits, including Clean Water Act 404, Migratory Bird depredation and salvage, Bald and Golden Eagle Protection Act, wildland fire, roadkill wildlife possession, etc.	In House	Medium
1.5.4: Pursue a Conservation Law Enforcement Officer (CLEO) position staffed through the U. S. Fish and Wildlife Service National Wildlife Refuge System (Law Enforcement)	AFCEC	Medium
1.6.1: Through implementation of other INRMP Goals, quantify and mitigate environmental stressors (e.g., climate change, invasive species, altered hydrology and fire regimes, wildlife and forest diseases and pests, overpopulation) that affect biological diversity and ecological integrity.	In House, multiple EQ	Medium
1.6.2: Through various media, continue to educate base residents, personnel, visitors, and commanders of the economic and ecological benefits of managing natural landscapes using the principles of ecosystem management.	In House	Low
1.6.3: Participate on collaborative teams dedicated to exploring complex and pressing natural resource issues, especially affecting the USAFA and Farish.	In House	Low

1.6.4: Actively partner with the Pike National Forest as an adjacent landowner to the USAFA and Farish, to address regional forest health issues and maximize effectiveness of forest management across boundaries.	In House	Medium
1.6.5: Participate in the U.S. Forest Service (USFS) Forest Health Protection (FHP) program to secure funds for forest insect and disease protection. Host an annual biological site visit with the FHP staff in September to review previous year accomplishments and discuss the proposal for the following year. Submit Form FS 3400-2 to be considered for funding annually by the deadline (~Oct. 1).	In House	Medium
1.6.6: Work closely with the USFS FHP staff to identify unknown insect and disease agents. Submit samples and request field visits as needed to collaborate on findings and articulate management needs.	In House	Medium
1.6.7: Cooperate with the USFS, USDA Animal and Plant Health Inspection Service (APHIS) and other agencies to monitor for insect and disease issues. Place traps, etc. in suitable locations, and monitor as needed. Participate in regional workshops and other forums to maintain currency on forest health issues.	In House	Medium
2.1.1: Publicize wildlife viewing opportunities and proper ways to observe and interact with wildlife through various media. Provide "Living with Wildlife" brochures to educate the public on how to minimize wildlife-human conflicts.	In House	Low
2.1.2: Monitor the deer and elk population for the prevalence of chronic wasting disease.	In House	Medium
2.1.3: Coordinate with CPW, USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.	In House	Medium
2.1.4: Coordinate with Civil Engineering, Forces Support Squadron, and the base housing		

contractor to provide animal-resistant trash receptacles to protect wildlife and reduce potentially hazardous wildlife-human interaction.	In House	Medium
2.2.1: Coordinate project schedules in advance with proponents to ensure projects don't impact nesting birds or as necessary, perform field surveys for nesting birds prior to site disturbance planned during the typical March-August nesting season. Obtain a migratory bird or Bald and Golden Eagle Protection Act permit when impacts cannot be avoided by adjusting the project scheduling.	In House	Medium
2.2.2: Obtain migratory bird salvage and depredation and Bald and Golden Eagle Protection Act permits to collect dead birds, control nuisance species (e.g., double-crested cormorant), and mitigate any airfield BASH concerns.	In House	Medium
2.2.3: Interact at least quarterly with Airfield Management, Flight Safety, USDA, and the Bird Hazard Working Group to develop procedures and management actions to reduce the Bird-Aircraft Strike Hazard (BASH) through habitat and wildlife control actions. Assist the Airfield staff with identifying bird mortalities, harassing wildlife from the airfield environment, and reviewing the BASH Plan.	In House	Medium
2.2.4: Perform informal and formal bird surveys in aquatic and terrestrial habitats and add observations to the Cornell Lab of Ornithology eBird database.	In House	Low
2.2.5: Provide logistical support for the maintenance and monitoring of 150+ blue bird nest boxes on USAFA by CPW volunteers.	In House	Low
2.2.6: Monitor above-ground utilities for potential bird electrocution hazards and mitigate as necessary.	In House	Low
2.2.7: Maintain a geo-referenced database (GeoBase) of active and inactive nesting sites.	In House	Low
2.3.1: Coordinate with CPW to perform a base-wide count of deer, elk, turkey, and other non-game		

wildlife of interest.	In House	Low
2.3.2: Based on population estimates, coordinate with CPW on the number of deer and elk licenses to be issued to help maintain a target population of approximately 250 deer and 30 elk.	In House	Low
2.3.3: Sustain a flock of approximately 150 Merriam's turkey to prevent bird-human conflicts. Provide fall and spring archery-only hunting opportunities.	In House	Low
2.3.4: Continue to discuss with CPW ways to reduce the "trophy" nature of the buck deer hunting.	In House	Low
2.4.2: Protect and encourage beaver (and their dams) to help maintain stream base flow, mitigate stormwater impacts, and provide deeper water habitat for sustaining native fish populations. Only remove beavers and dams that are negatively affecting stormwater management (e.g., plugging culverts) or the diversion of water to the fishing lakes.	In House	Low
2.5.1: Through field observations and reports, maintain a species list of rare sightings and wildlife known to inhabit or frequent the installation.	In House	Low
2.5.2: Assist with Department of Biology and cadet independent study wildlife projects, such as track counts, coyote howling surveys, and maintaining motion-detector game cameras.	In House	Low
2.5.3: Perform surveys for eastern black rail to assess their occurrence on the Air Force Academy	In House	High
2.5.4: Perform echo-location acoustic monitoring and/or mist-netting surveys to assess the occurrence of bat species on Academy property	In House/NABat/AFCEC , EQ	High
2.6.1: Coordinate with 10th Security Forces, Pest Management, or Base Housing to identify, capture, and transfer nuisance pets and feral animals to the Pikes Peak Humane Society.	In House	Low
2.7.1: Conduct Preble's population		

and habitat assessments and provide monitoring data and reports to USFWS.	EQ XQPZA53237119	High
2.7.2: Implement habitat and stream restoration projects in degraded Preble's meadow jumping mouse habitat.	In House, EQ XQPZA53237118	High
2.7.3: As necessary, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any change in habitat suitability and non-habitat areas.	In House	Medium
2.7.4: Participate in the implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan and associated Site Conservation Team.	In House	Medium
2.8.1: In coordination with CPW, USFWS, and CNHP, review a list of special status species that are known or likely to occur on USAFA.	In House	Medium
2.8.2: Maintain a geo-spatial database of populations and habitats of special status species.	In House	Medium
2.8.3: Conduct field surveys to evaluate the occurrence, abundance, threats, and management needs of special status species.	In House	Medium
2.8.4: Conduct field surveys to evaluate the condition, trend, threats, and management needs of ecologically important habitats, including the CNHP-designated Potential Conservation Areas, Natural Areas, and rare plant communities.	In House	Low
3.1.1: Coordinate with the Civil Engineering Heavy Equipment Shop to develop road grading and culvert maintenance standards and practices similar to those used by the US Forest Service, and construct stormwater infrastructure that minimizes vegetation damage and can sustainably collect and release water without causing erosion.	In House	Low
3.1.2: In coordination with Civil Engineering, opportunistically relocate above- and below-ground utilities out of wetlands and floodplains as part of		

planned construction projects.	In House	Low
3.1.3: Through the Community Planner and various public forums, continue to document and communicate to City and County governments and developers the adverse impact that an altered rate and volume of off-base stormwater is having on USAFA natural resources, infrastructure, and aesthetics.	In House	Medium
3.1.4: Continue to advocate for improvements in stormwater and urban runoff planning and regulation to protect the USAFA watershed.	In House	Low
3.1.5: In partnership with local government and developers, implement watershed protection and restoration projects to mitigate impacts on USAFA and downstream areas.	In House, EQ XQPZA53237118	High
3.2.1: Prevent activities which unnecessarily damage the vegetation cover, including unauthorized or undesirable ORV use, creation of social trails, excessive training or construction disturbance, and unnecessary mowing.	In House	Low
3.2.2: Use native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.	In House	Medium
3.2.3: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all authorized soil-disturbing projects utilize appropriate erosion control techniques and materials to prevent soil loss and promote revegetation.	In House	Medium
3.3.1: Assess the condition of wetland, stream channel, and floodplain areas and identify any factors causing a departure from a stable Proper Functioning Condition.	In House	Medium
3.3.2: As necessary and feasible, implement drainage projects to prevent or mitigate any causal factors posing a threat or creating system instability, with emphasis on sustaining or restoring habitat for the		

Preble's meadow jumping mouse and other wetland/riparian species. Projects must be designed to withstand the altered rate, volume, frequency, and discharge hydrograph resulting from any increase in local and regional stormwater and urban runoff. When feasible, drainage and habitat restoration projects should also be designed to remove or mitigate barriers to native fish passage.	In House, EQ XQPZA53237118	High
3.3.3: As necessary, update the wetland and floodplain inventory and mapping in GeoBase.	In House	Low
4.1.2: Conduct annual weed monitoring and 5-year base-wide surveys to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.	EQ XQPZA53236121	High
4.1.3: Update the Integrated Noxious Weed Management Plan to include new species, management priorities, monitoring protocols, and control techniques.	In House	Low
4.1.4: Coordinate with adjacent landowners and local governments to identify and control noxious weeds that could invade USAFA.	In House	Low
4.1.5: Utilize an integrated management approach (chemical, biological, mechanical, cultural practices) to control noxious weeds.	In House, EQ XQPZA53236121	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.	In House, 10 FSS	Low
4.2.2: In coordination with FSS, frequently inspect the fences, gates and watering sources to better control grazing use and access.	In House, 10 FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.	In House, 10 FSS	Low
4.2.4: Coordinate with FSS on manure disposal practices and approved locations to prevent inadvertent impacts to native vegetation or		

waterways.	In House, 10 FSS	Low
4.3.1: Inventory 400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy database.	In House, EQ XQPZA53236119	Medium
4.3.2: Perform forest health walkthrough surveys on 14,000 acres annually to evaluate insect and disease issues (i.e. bark beetles, dwarf mistletoe infection), and to identify management needs. Resurvey areas pruned for mistletoe to detect new infections and ensure treatment effectiveness.	In House, EQ XQPZA53236119, USFS 2N funds	High
4.3.3: Perform 150 acres of forest management annually to enhance forest health and to restore forests to a more open, natural condition, reminiscent of forests found under a historic fire regime. Management options include forest thinning, timber stand improvement, and sanitation pruning.	EQ XQPZA53236119, USFS 2N funds	Medium
4.4.1: Locate infested trees (through field surveys in Project 4.3.2) and treat promptly (de-barking, chipping, hauling to a "safe" place; wrapping in plastic) to eradicate developing insect broods, especially when populations are high. Tree removal due to beetle attack varies but is expected to range from 300 to 1,000 annually, with an average of 700 per year.	In House, EQ XQPZA53236119, USFS 2N funds	High
4.4.2: Identify high risk or high-profile trees for spraying to prevent bark beetle attack. Base spray program on existing beetle populations and stressor affecting trees (i.e., root damage, drought, etc.). Track pesticide usage and report to Pest Management. An estimated 400 trees per year will be sprayed.	EQ XQPZA53236119	High
4.4.3: Coordinate with the Academy Biology faculty to develop projects that would benefit Natural Resources and educate cadets on land management.	In House	Low
4.4.4: Perform field inventory for beetle-infested trees on privatized land on the USAFA and arrange for		

prompt removal of infested trees via contract. Coordinate with Forest City on field survey and tree removal activities.	In House, EQ XQPZA53236119, USFS 2N funds	Medium
4.5.1: Re-delineate forest stand boundaries on the USAFA and Farish, due to availability of improved digital orthophotos, changed forest conditions and higher stand definition standards. The forested component represents approximately 14,000 acres, including stands with at least 20 square feet of basal area per acre.	In House, EQ XQPZA53236119	Low
4.6.1: Perform annual sweep of all managed trails at the USAFA and Farish to identify potentially hazardous trees.	In House	Medium
4.6.2: Arrange for felling of potentially hazardous trees identified (in Project 4.6.1) via contract logger. An annual estimated 200 trees will be cut.	EQ XQPZA53236119	Medium
4.6.3: Accomplish a hazard tree inventory on all trees within Peregrine Pines Family Campground, Farish camping areas, and major trailheads. Delineate inventory areas based on potential tree strike distance to targets (concentrated use areas, parking spots, etc.). Utilize the USFS Hazard Tree Rating system to quantitatively document and track tree health conditions.	In House	Medium
4.7.1 Complete Urban Forest Management review to update tree planting list, tree management recommendations, soil property study,	EQ XQPZA53236119	High
4.7.4: Stock Natural Resources seedlings nursery with 450 seedlings	In House	Low
4.7.6: Perform seedling survival surveys for areas planted in 20218 and 2022. Schedule replanting as necessary.	In House	Low
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing.	In House	High
4.8.5: Partner with the U.S. Forest Service and other land management		

agencies to evaluate regional decline of aspen and discuss/adopt future management strategies.	In House	Low
4.9.2: Revisit previous overstory thinning and mastication sites to quantitatively and photographically document growth response.	In House	Medium
4.9.3: Collaborate with the USAF Wildland Fire Center and regional stakeholders on oak management, identifying and employing adaptive management strategies as appropriate.	In House, WFC	Low
4.10.1: Manage Natural Resource woodlot for firewood sales. Submit sales receipts per USAF protocol.	In House	Low
4.10.2: Under conducive moisture conditions, thin existing pine plantations by selling transplant trees as a forest product. Submit sales receipts per USAF protocol.	In House	Low
4.11.1: Take pre-treatment photos of all mature forest thinning areas, ranging across a variety of stand conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage	In House	Medium
4.11.2: Document other forestry activities to include planting, pruning, beetle-infested tree treatment, etc. with anecdotal photos. Catalog by activity and month/year completed.	In House	Low
4.11.3: GPS all harvest unit boundaries, and planting areas of at least one acre in size. Include contractor name and project dates in attribute data. To the extent feasible, digitize all beetle-infested trees removed to help track trends and focus subsequent field surveys.	In House	High
4.11.4: Track all accomplishments in GIS. Coordinate with the USAFA Geo Integration Office (GIO) to assimilate pertinent forestry data into the USAFA GeoBase. Specifically, this will include		

updated forest stand inventory data, annual forest thinning accomplishments, and bark beetle tree mortality data.	In House, GIO	Low
4.12.2: Review proposed landscape plans as time allows. Emphasize the need for xeriscaping and commensurate irrigation needs by planting zone.	In House	Low
4.12.3: Host annual USAFA Tree Board Meeting	In House,	Medium
4.12.6: Collect urban tree inventory data on stressed trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.	EQ XQPZA53236119	Low
4.12.7: Coordinate with Grounds Maintenance to effectively utilize urban tree inventory data.	In House	Low
4.12.8: Complete annual Tree City USA application in December and Arbor Day proclamation. Host Arbor Day ceremony annually in April.	In House	Medium
4.12.9: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all projects adhere to tree care specifications to help ensure health and longevity of newly planted landscapes, and minimize damage to trees from construction work.	In House	Low
4.13.1: Coordinate with Airfield Operations to ensure that trees are removed from airfield clear zones.	In House, EQ XQPZA53236119, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.	EQ XQPZA53236119, 306/OSS	Medium
4.13.3: Assess potential for transplant trees to be removed during clearing operations and arrange for sale or use of said trees on base if suitable.	In House	Low
5.1.2: Implement the WFMP, and review progress annually with the Sikes Act Cooperators and the WFC.	In House, WFC EQ AFCE190105	Medium
5.2.2: Update the Wildland Fire Management Annual Operating Plan (AOP).	In House	Medium

5.3.1: Clear 70 acres annually of areas of high fuel loading for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.	WFC, EQ AFCE190105	High
5.3.3: Limb conifers retained within shaded fuelbreak areas to a height of approximately six feet. An estimated 300 trees will be limbed annually.	WFC, EQ AFCE190105	Low
5.4.1: Clear brush and lower tree limbs and rake woody and leafy debris from close proximity to five sites annually. A site may consist of a building, utility site, etc. Clearing distance will depend on fuel type, density and terrain.	WFC, EQ AFCE190105	Low
5.4.2: Reassess the Douglass and Pine Valley housing areas with fuel hazard assessments of homes, coordinating with USAFA firefighters to identify hazards and prioritize treatments.	In House, WFC, EQ AFCE190105 10CES/CEF	Low
5.5.1: Secure a smoke permit and perform a prescribed broadcast burn as weather and conditions allow.	In House, WFC EQ AFCE190105, 10CES/CEF	High
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.	In House	Low
5.5.3: Assess the need for and benefits of additional prescribed fire, and update INRMP accordingly.	In House, WFC EQ AFCE190105	Low
5.6.1: Take pre-treatment photos of all projects, ranging across a variety of conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage.	In House	Low
5.6.2: GPS all fuels treatment project boundaries. Include contractor name (if applicable) and project dates (to include month and year) in attribute data. Add to applicable GeoBase layers.	In House	Low
5.7.1: Play an active role in the Colorado Springs Wildfire Mitigation Committee and the Pikes Peak Area		

Council of Governments Joint Land Use Study. Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.	In House	Medium
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.	In House	Low
6.1.1: Require a reasonable fee for annual, one-day, and second rod permits to generate income for a self-supporting program of stocking hatchery-reared fish. Provide discounted fishing permits for disabled veterans (DAV) and Purple Heart recipients. Coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.	In House, 57X F&W Reimbursable Account	Low
6.1.2: Periodically conduct angler interviews and collect creel information to track angler success and satisfaction with the fishing program and recreational experience.	In House	Low
6.1.3: Improve and maintain safe, pedestrian-friendly fishing access on shoreline trails and piers.	In House	Low
6.1.4: Seasonally monitor aquatic weed and algal growth in the fishing lakes and treat with approved algaecides or sterile grass carp. As necessary, maintain multiple age classes of grass carp to promote effective biological weed control.	In House	Low
6.1.5: Monitor for fish diseases and parasites and take appropriate management actions. Stock whirling disease-free fish in accordance with CPW regulations.	In House	Low
6.1.6: Opportunistically control any undesirable fish species without having a detrimental impact on the stocked fish population.	In House	Low
6.1.7: Monitor for invasive aquatic species and take appropriate management actions.	In House	Medium
6.1.8: Maintain and improve water diversion structures to better capture and regulate water flow and minimize		

sediment transport to the lakes.	In House	Low
6.2.1: Repair and maintain the 22+ mile trail network using the techniques and guidelines outlined in the Trails Management Plan and Maintenance Standards, and those recommended by the International Mountain Biking Association (IMBA) and other trail organizations. Re-route trails as necessary to promote long-term sustainability and reduce annual maintenance needs.	In House, EQ XQPZA53236119	Medium
6.2.2: Coordinate with the Cadet Mountain Biking Club/Team, IMBA, Medicine Wheel Trail Advocates, and other trail groups to design and construct trail re-routes, technical features, and skills/challenge courses that enhance the user experience, improve trail sustainability, and protect the environment.	In House	Low
6.2.3: Partner with Medicine Wheel Trail Advocates and/or IMBA to provide volunteers, or train new volunteers, for trail construction and maintenance.	In House	Low
6.2.4: Coordinate with the Force Support Squadron (FSS) to designate sustainable horse trails in the Pine Valley area and work to limit the proliferation of unsustainable "social" trails.	In House, 10 FSS	Low
6.2.5: Coordinate with El Paso County and the City of Colorado Springs concerning public access and the maintenance of the New Santa Fe Trail and LaForet Trail.	In House	Low
6.2.6: Expand and upgrade the trail signage and provide user-friendly trail maps and information kiosks to improve the user experience.	In House, EQ XQPZA53236119	Low
6.2.7: Provide picnic tables, animal-resistant trash containers, and restroom facilities at high volume trailheads and parking areas to enhance the user experience and reduce littering and environmental damage.	In House	Low
6.2.8: Coordinate with the US Forest Service, Pikes Peak Ranger District, to		

regulate and maintain the trail access between the USAFA and USFS property.	In House	Low
6.3.1: Coordinate with USAFA/A3O to update the user requirements and regulations for the B-52 camping area.	In House, USAFA A3O	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.	In House, USAFA A3O	Low
6.4.1: Provide training to 10th Security Forces, 10 Civil Engineering Squadron, and the Jacks Valley Training Area Superintendent concerning the proper use of ORV's to minimize environmental impacts. Brief the proper operation and authorized use of ORV's at the annual 10 CES Facility Manager training.	In House	Low
6.4.2: As necessary, close and restore undesirable ORV trails using signage, fencing, barriers, revegetation, and erosion control features.	In House	Low

FY24 Tasks

Project/Work Plan	**Funding Source**	**Priority Level**
1.1.1: Review INRMP accomplishments with USFWS and CPW and, as mutually agreed to; revise the methods, objectives, projects, budget, and timeline to address changing conditions.	In House	High
1.1.2: Coordinate with CPW on opportunities to assist with accomplishing State Wildlife Action Plan objectives, conduct wildlife inventories or studies, or perform monitoring	In House	Medium
1.2.1: Coordinate with and advise the 10 ABW, Davis Airfield, and Cadet Training Wing on natural resources issues through participation in the Jacks Valley Working Group, ESOH Council, 10 ABW briefings, EIAP meetings, Bird Hazard Working Group, and other organizational meetings.	In House	Medium
1.2.2: As necessary, prepare after-action reports of training and other		

activities that negatively affect natural resources, and provide recommendations and practical remedial SOPs for future actions.	In House	Low
1.3.1: Incorporate current and historical natural resource databases and geo-referenced data layers into GeoBase to measure and monitor resource condition and trend.	In House	Low
1.3.2: As necessary, obtain aerial photography and geo-referenced data layers for areas outside the installation to help assess regional and ecosystem-wide resource management issues.	In House	Low
1.4.1: Develop an easily accessible, DoD-compliant Natural Resources public website with information covering program activities, rules and regulations, maps, photographs, and outdoor recreation opportunities.	In House, PA	Medium
1.4.2: Periodically provide briefings, news articles, email, website updates, etc. that address natural resource management activities and concerns	In House	Low
1.5.1: Closely coordinate any compliance or resource damage issues with 10th Security Forces, USFWS, and CPW.	In House	Medium
1.5.2: Maintain Natural Resource Manager's qualifications through the attendance of national, regional, and state conferences and other professional development training opportunities as funding allows.	USFWS Coop Agreement	Low
1.5.3: Obtain necessary permits, including Clean Water Act 404, Migratory Bird depredation and salvage, Bald and Golden Eagle Protection Act, wildland fire, roadkill wildlife possession, etc.	In House	Medium
1.5.4: Pursue a Conservation Law Enforcement Officer (CLEO) position staffed through the U. S. Fish and Wildlife Service National Wildlife Refuge System (Law Enforcement)	AFCEC	Medium
1.6.1: Through implementation of other INRMP Goals, quantify and mitigate environmental stressors (e.g.,		

climate change, invasive species, altered hydrology and fire regimes, wildlife and forest diseases and pests, overpopulation) that affect biological diversity and ecological integrity.	In House, multiple EQ	Medium
1.6.2: Through various media, continue to educate base residents, personnel, visitors, and commanders of the economic and ecological benefits of managing natural landscapes using the principles of ecosystem management.	In House	Low
1.6.3: Participate on collaborative teams dedicated to exploring complex and pressing natural resource issues, especially affecting the USAFA and Farish.	In House	Low
1.6.4: Actively partner with the Pike National Forest as an adjacent landowner to the USAFA and Farish, to address regional forest health issues and maximize effectiveness of forest management across boundaries.	In House	Medium
1.6.5: Participate in the U.S. Forest Service (USFS) Forest Health Protection (FHP) program to secure funds for forest insect and disease protection. Host an annual biological site visit with the FHP staff in September to review previous year accomplishments and discuss the proposal for the following year. Submit Form FS 3400-2 to be considered for funding annually by the deadline (~Oct. 1).	In House	Medium
1.6.6: Work closely with the USFS FHP staff to identify unknown insect and disease agents. Submit samples and request field visits as needed to collaborate on findings and articulate management needs.	In House	Medium
1.6.7: Cooperate with the USFS, USDA Animal and Plant Health Inspection Service (APHIS) and other agencies to monitor for insect and disease issues. Place traps, etc. in suitable locations, and monitor as needed. Participate in regional workshops and other forums to maintain currency on forest health issues.	In House	Medium
2.1.1: Publicize wildlife viewing		

opportunities and proper ways to observe and interact with wildlife through various media. Provide "Living with Wildlife" brochures to educate the public on how to minimize wildlife-human conflicts.	In House	Low
2.1.2: Monitor the deer and elk population for the prevalence of chronic wasting disease.	In House	Medium
2.1.3: Coordinate with CPW, USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.	In House	Medium
2.1.4: Coordinate with Civil Engineering, Forces Support Squadron, and the base housing contractor to provide animal-resistant trash receptacles to protect wildlife and reduce potentially hazardous wildlife-human interaction.	In House	Medium
2.2.1: Coordinate project schedules in advance with proponents to ensure projects don't impact nesting birds or as necessary, perform field surveys for nesting birds prior to site disturbance planned during the typical March-August nesting season. Obtain a migratory bird or Bald and Golden Eagle Protection Act permit when impacts cannot be avoided by adjusting the project scheduling.	In House	Medium
2.2.2: Obtain migratory bird salvage and depredation and Bald and Golden Eagle Protection Act permits to collect dead birds, control nuisance species (e.g., double-crested cormorant), and mitigate any airfield BASH concerns.	In House	Medium
2.2.3: Interact at least quarterly with Airfield Management, Flight Safety, USDA, and the Bird Hazard Working Group to develop procedures and management actions to reduce the Bird-Aircraft Strike Hazard (BASH) through habitat and wildlife control actions. Assist the Airfield staff with identifying bird mortalities, harassing wildlife from the airfield environment, and reviewing the BASH Plan.	In House	Medium
2.2.4: Perform informal and formal bird surveys in aquatic and terrestrial		

habitats and add observations to the Cornell Lab of Ornithology eBird database.	In House	Low
2.2.5: Provide logistical support for the maintenance and monitoring of 150+ blue bird nest boxes on USAFA by CPW volunteers.	In House	Low
2.2.6: Monitor above-ground utilities for potential bird electrocution hazards and mitigate as necessary.	In House	Low
2.2.7: Maintain a geo-referenced database (GeoBase) of active and inactive nesting sites.	In House	Low
2.3.1: Coordinate with CPW to perform a base-wide count of deer, elk, turkey, and other non-game wildlife of interest.	In House	Low
2.3.2: Based on population estimates, coordinate with CPW on the number of deer and elk licenses to be issued to help maintain a target population of approximately 250 deer and 30 elk.	In House	Low
2.3.3: Sustain a flock of approximately 150 Merriam's turkey to prevent bird-human conflicts. Provide fall and spring archery-only hunting opportunities.	In House	Low
2.3.4: Continue to discuss with CPW ways to reduce the "trophy" nature of the buck deer hunting.	In House	Low
2.4.1: Conduct electrofishing survey to assess native fish populations and aquatic and biotic health and integrity.	In House, EQ XQPZA53246119	Medium
2.4.2: Protect and encourage beaver (and their dams) to help maintain stream base flow, mitigate stormwater impacts, and provide deeper water habitat for sustaining native fish populations. Only remove beavers and dams that are negatively affecting stormwater management (e.g., plugging culverts) or the diversion of water to the fishing lakes.	In House	Low
2.5.1: Through field observations and reports, maintain a species list of rare sightings and wildlife known to inhabit or frequent the installation.	In House	Low
2.5.2: Assist with Department of		

Biology and cadet independent study wildlife projects, such as track counts, coyote howling surveys, and maintaining motion-detector game cameras.	In House	Low
2.5.3: Perform surveys for eastern black rail to assess their occurrence on the Air Force Academy	In House	High
2.5.4: Perform echo-location acoustic monitoring and/or mist-netting surveys to assess the occurrence of bat species on Academy property	In House/NABat/AFCEC , EQ	High
2.6.1: Coordinate with 10th Security Forces, Pest Management, or Base Housing to identify, capture, and transfer nuisance pets and feral animals to the Pikes Peak Humane Society.	In House	Low
2.7.1: Conduct Preble's population and habitat assessments and provide monitoring data and reports to USFWS.	EQ XQPZA53247119	High
2.7.2: Implement habitat and stream restoration projects in degraded Preble's meadow jumping mouse habitat.	In House, EQ XQPZA53247118	High
2.7.3: As necessary, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any change in habitat suitability and non-habitat areas.	In House	Medium
2.7.4: Participate in the implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan and associated Site Conservation Team.	In House	Medium
2.8.1: In coordination with CPW, USFWS, and CNHP, review a list of special status species that are known or likely to occur on USAFA.	In House	Medium
2.8.2: Maintain a geo-spatial database of populations and habitats of special status species.	In House	Medium
2.8.3: Conduct field surveys to evaluate the occurrence, abundance, threats, and management needs of special status species.	In House	Medium

2.8.4: Conduct field surveys to evaluate the condition, trend, threats, and management needs of ecologically important habitats, including the CNHP-designated Potential Conservation Areas, Natural Areas, and rare plant communities.	In House	Low
3.1.1: Coordinate with the Civil Engineering Heavy Equipment Shop to develop road grading and culvert maintenance standards and practices similar to those used by the US Forest Service, and construct stormwater infrastructure that minimizes vegetation damage and can sustainably collect and release water without causing erosion.	In House	Low
3.1.2: In coordination with Civil Engineering, opportunistically relocate above- and below-ground utilities out of wetlands and floodplains as part of planned construction projects.	In House	Low
3.1.3: Through the Community Planner and various public forums, continue to document and communicate to City and County governments and developers the adverse impact that an altered rate and volume of off-base stormwater is having on USAFA natural resources, infrastructure, and aesthetics.	In House	Medium
3.1.4: Continue to advocate for improvements in stormwater and urban runoff planning and regulation to protect the USAFA watershed.	In House	Low
3.1.5: In partnership with local government and developers, implement watershed protection and restoration projects to mitigate impacts on USAFA and downstream areas.	In House, EQ XQPZA53247118	High
3.2.1: Prevent activities which unnecessarily damage the vegetation cover, including unauthorized or undesirable ORV use, creation of social trails, excessive training or construction disturbance, and unnecessary mowing.	In House	Low
3.2.2: Use native plants and seed mixes and rangeland seeding techniques for all revegetation and		

restoration projects in non-improved areas.	In House	Medium
3.2.3: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all authorized soil-disturbing projects utilize appropriate erosion control techniques and materials to prevent soil loss and promote revegetation.	In House	Medium
3.3.1: Assess the condition of wetland, stream channel, and floodplain areas and identify any factors causing a departure from a stable Proper Functioning Condition.	In House	Medium
3.3.2: As necessary and feasible, implement drainage projects to prevent or mitigate any causal factors posing a threat or creating system instability, with emphasis on sustaining or restoring habitat for the Preble's meadow jumping mouse and other wetland/riparian species. Projects must be designed to withstand the altered rate, volume, frequency, and discharge hydrograph resulting from any increase in local and regional stormwater and urban runoff. When feasible, drainage and habitat restoration projects should also be designed to remove or mitigate barriers to native fish passage.	In House, EQ XQPZA53247118	High
3.3.3: As necessary, update the wetland and floodplain inventory and mapping in GeoBase.	In House	Low
4.1.2: Conduct annual weed monitoring and 5-year base-wide surveys to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.	EQ XQPZA53246121	High
4.1.3: Update the Integrated Noxious Weed Management Plan to include new species, management priorities, monitoring protocols, and control techniques.	In House	Low
4.1.4: Coordinate with adjacent landowners and local governments to identify and control noxious weeds that could invade USAFA.	In House	Low

4.1.5: Utilize an integrated management approach (chemical, biological, mechanical, cultural practices) to control noxious weeds.	In House, EQ XQPZA53246121	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.	In House, 10 FSS	Low
4.2.2: In coordination with FSS, frequently inspect the fences, gates and watering sources to better control grazing use and access.	In House, 10 FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.	In House, 10 FSS	Low
4.2.4: Coordinate with FSS on manure disposal practices and approved locations to prevent inadvertent impacts to native vegetation or waterways.	In House, 10 FSS	Low
4.3.1: Inventory 400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy database.	In House, EQ XQPZA53246119	Medium
4.3.2: Perform forest health walkthrough surveys on 14,000 acres annually to evaluate insect and disease issues (i.e. bark beetles, dwarf mistletoe infection), and to identify management needs. Resurvey areas pruned for mistletoe to detect new infections and ensure treatment effectiveness.	In House, EQ XQPZA53246119, USFS 2N funds	High
4.3.3: Perform 150 acres of forest management annually to enhance forest health and to restore forests to a more open, natural condition, reminiscent of forests found under a historic fire regime. Management options include forest thinning, timber stand improvement, and sanitation pruning.	EQ XQPZA53246119, USFS 2N funds	Medium
4.4.1: Locate infested trees (through field surveys in Project 4.3.2) and treat promptly (de-barking, chipping, hauling to a "safe" place; wrapping in plastic) to eradicate developing insect broods, especially when populations are high. Tree removal due to beetle		

attack varies but is expected to range from 300 to 1,000 annually, with an average of 700 per year.	In House, EQ XQPZA53246119, USFS 2N funds	High
4.4.2: Identify high risk or high-profile trees for spraying to prevent bark beetle attack. Base spray program on existing beetle populations and stressor affecting trees (i.e., root damage, drought, etc.). Track pesticide usage and report to Pest Management. An estimated 400 trees per year will be sprayed.	EQ XQPZA53246119	High
4.4.3: Coordinate with the Academy Biology faculty to develop projects that would benefit Natural Resources and educate cadets on land management.	In House	Low
4.4.4: Perform field inventory for beetle-infested trees on privatized land on the USAFA and arrange for prompt removal of infested trees via contract. Coordinate with Forest City on field survey and tree removal activities.	In House, EQ XQPZA53246119, USFS 2N funds	Medium
4.5.1: Re-delineate forest stand boundaries on the USAFA and Farish, due to availability of improved digital orthophotos, changed forest conditions and higher stand definition standards. The forested component represents approximately 14,000 acres, including stands with at least 20 square feet of basal area per acre.	In House, EQ XQPZA53246119	Low
4.6.1: Perform annual sweep of all managed trails at the USAFA and Farish to identify potentially hazardous trees.	In House	Medium
4.6.2: Arrange for felling of potentially hazardous trees identified (in Project 4.6.1) via contract logger. An annual estimated 200 trees will be cut.	EQ XQPZA53246119	Medium
4.6.3: Accomplish a hazard tree inventory on all trees within Peregrine Pines Family Campground, Farish camping areas, and major trailheads. Delineate inventory areas based on potential tree strike distance to targets (concentrated use areas, parking spots, etc.). Utilize the USFS Hazard Tree Rating system to quantitatively document and track tree health		

conditions.	In House	Medium
4.7.1 Complete Urban Forest Management review to update tree planting list, tree management recommendations, soil property study,	EQ XQPZA53246119	High
4.7.4: Stock Natural Resources seedlings nursery with 450 seedlings	In House	Low
4.7.6: Perform seedling survival surveys for areas planted in 20218 and 2022. Schedule replanting as necessary.	In House	Low
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing.	In House	High
4.8.5: Partner with the U.S. Forest Service and other land management agencies to evaluate regional decline of aspen and discuss/adopt future management strategies.	In House	Low
4.9.2: Revisit previous overstory thinning and mastication sites to quantitatively and photographically document growth response.	In House	Medium
4.9.3: Collaborate with the USAF Wildland Fire Center and regional stakeholders on oak management, identifying and employing adaptive management strategies as appropriate.	In House, WFC	Low
4.10.1: Manage Natural Resource woodlot for firewood sales. Submit sales receipts per USAF protocol.	In House	Low
4.10.2: Under conducive moisture conditions, thin existing pine plantations by selling transplant trees as a forest product. Submit sales receipts per USAF protocol.	In House	Low
4.11.1: Take pre-treatment photos of all mature forest thinning areas, ranging across a variety of stand conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years		

after treatment. Establish digital catalog for storage	In House	Medium
4.11.2: Document other forestry activities to include planting, pruning, beetle-infested tree treatment, etc. with anecdotal photos. Catalog by activity and month/year completed.	In House	Low
4.11.3: GPS all harvest unit boundaries, and planting areas of at least one acre in size. Include contractor name and project dates in attribute data. To the extent feasible, digitize all beetle-infested trees removed to help track trends and focus subsequent field surveys.	In House	High
4.11.4: Track all accomplishments in GIS. Coordinate with the USAFA Geo Integration Office (GIO) to assimilate pertinent forestry data into the USAFA GeoBase. Specifically, this will include updated forest stand inventory data, annual forest thinning accomplishments, and bark beetle tree mortality data.	In House, GIO	Low
4.12.2: Review proposed landscape plans as time allows. Emphasize the need for xeriscaping and commensurate irrigation needs by planting zone.	In House	Low
4.12.3: Host annual USAFA Tree Board Meeting	In House,	Medium
4.12.6: Collect urban tree inventory data on stressed trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.	EQ XQPZA53246119	Low
4.12.7: Coordinate with Grounds Maintenance to effectively utilize urban tree inventory data.	In House	Low
4.12.8: Complete annual Tree City USA application in December and Arbor Day proclamation. Host Arbor Day ceremony annually in April.	In House	Medium
4.12.9: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all projects adhere to tree care specifications to help ensure health and longevity of newly planted		

landscapes, and minimize damage to trees from construction work.	In House	Low
4.13.1: Coordinate with Airfield Operations to ensure that trees are removed from airfield clear zones.	In House, EQ XQPZA53246119, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.	EQ XQPZA53246119, 306/OSS	Medium
4.13.3: Assess potential for transplant trees to be removed during clearing operations and arrange for sale or use of said trees on base if suitable.	In House	Low
5.1.2: Implement the WFMP, and review progress annually with the Sikes Act Cooperators and the WFC.	In House, WFC EQ AFCE190105	Medium
5.2.2: Update the Wildland Fire Management Annual Operating Plan (AOP).	In House	Medium
5.3.1: Clear 70 acres annually of areas of high fuel loading for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.	WFC, EQ AFCE190105	High
5.3.3: Limb conifers retained within shaded fuelbreak areas to a height of approximately six feet. An estimated 300 trees will be limbed annually.	WFC, EQ AFCE190105	Low
5.4.1: Clear brush and lower tree limbs and rake woody and leafy debris from close proximity to five sites annually. A site may consist of a building, utility site, etc. Clearing distance will depend on fuel type, density and terrain.	WFC, EQ AFCE190105	Low
5.4.2: Reassess the Douglass and Pine Valley housing areas with fuel hazard assessments of homes, coordinating with USAFA firefighters to identify hazards and prioritize treatments.	In House, WFC, EQ AFCE190105 10CES/CEF	Low
5.5.1: Secure a smoke permit and perform a prescribed broadcast burn as weather and conditions allow.	In House, WFC EQ AFCE190105, 10CES/CEF	High
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.	In House	Low
5.5.3: Assess the need for and benefits of additional prescribed fire,		

and update INRMP accordingly.	In House, WFC EQ AFCE190105	Low
5.6.1: Take pre-treatment photos of all projects, ranging across a variety of conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage.	In House	Low
5.6.2: GPS all fuels treatment project boundaries. Include contractor name (if applicable) and project dates (to include month and year) in attribute data. Add to applicable GeoBase layers.	In House	Low
5.7.1: Play an active role in the Colorado Springs Wildfire Mitigation Committee and the Pikes Peak Area Council of Governments Joint Land Use Study. Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.	In House	Medium
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.	In House	Low
6.1.1: Require a reasonable fee for annual, one-day, and second rod permits to generate income for a self-supporting program of stocking hatchery-reared fish. Provide discounted fishing permits for disabled veterans (DAV) and Purple Heart recipients. Coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.	In House, 57X F&W Reimbursable Account	Low
6.1.2: Periodically conduct angler interviews and collect creel information to track angler success and satisfaction with the fishing program and recreational experience.	In House	Low
6.1.3: Improve and maintain safe, pedestrian-friendly fishing access on shoreline trails and piers.	In House	Low
6.1.4: Seasonally monitor aquatic weed and algal growth in the fishing lakes and treat with approved		

algaecides or sterile grass carp. As necessary, maintain multiple age classes of grass carp to promote effective biological weed control.	In House	Low
6.1.5: Monitor for fish diseases and parasites and take appropriate management actions. Stock whirling disease-free fish in accordance with CPW regulations.	In House	Low
6.1.6: Opportunistically control any undesirable fish species without having a detrimental impact on the stocked fish population.	In House	Low
6.1.7: Monitor for invasive aquatic species and take appropriate management actions.	In House	Medium
6.1.8: Maintain and improve water diversion structures to better capture and regulate water flow and minimize sediment transport to the lakes.	In House	Low
6.2.1: Repair and maintain the 22+ mile trail network using the techniques and guidelines outlined in the Trails Management Plan and Maintenance Standards, and those recommended by the International Mountain Biking Association (IMBA) and other trail organizations. Re-route trails as necessary to promote long-term sustainability and reduce annual maintenance needs.	In House, EQ XQPZA53246119	Medium
6.2.2: Coordinate with the Cadet Mountain Biking Club/Team, IMBA, Medicine Wheel Trail Advocates, and other trail groups to design and construct trail re-routes, technical features, and skills/challenge courses that enhance the user experience, improve trail sustainability, and protect the environment.	In House	Low
6.2.3: Partner with Medicine Wheel Trail Advocates and/or IMBA to provide volunteers, or train new volunteers, for trail construction and maintenance.	In House	Low
6.2.4: Coordinate with the Force Support Squadron (FSS) to designate sustainable horse trails in the Pine Valley area and work to limit the proliferation of unsustainable "social"		

trails.	In House, 10 FSS	Low
6.2.5: Coordinate with El Paso County and the City of Colorado Springs concerning public access and the maintenance of the New Santa Fe Trail and LaForet Trail.	In House	Low
6.2.6: Expand and upgrade the trail signage and provide user-friendly trail maps and information kiosks to improve the user experience.	In House, EQ XQPZA53246119	Low
6.2.7: Provide picnic tables, animal-resistant trash containers, and restroom facilities at high volume trailheads and parking areas to enhance the user experience and reduce littering and environmental damage.	In House	Low
6.2.8: Coordinate with the US Forest Service, Pikes Peak Ranger District, to regulate and maintain the trail access between the USAFA and USFS property.	In House	Low
6.3.1: Coordinate with USAFA/A3O to update the user requirements and regulations for the B-52 camping area.	In House, USAFA A3O	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.	In House, USAFA A3O	Low
6.4.1: Provide training to 10th Security Forces, 10 Civil Engineering Squadron, and the Jacks Valley Training Area Superintendent concerning the proper use of ORV's to minimize environmental impacts. Brief the proper operation and authorized use of ORV's at the annual 10 CES Facility Manager training.	In House	Low
6.4.2: As necessary, close and restore undesirable ORV trails using signage, fencing, barriers, revegetation, and erosion control features.	In House	Low

FY25 Tasks

Project/Work Plan	**Funding Source**	**Priority Level**
1.1.1: Review INRMP accomplishments with USFWS and CPW and, as mutually agreed to;		

revise the methods, objectives, projects, budget, and timeline to address changing conditions.	In House	High
1.1.2: Coordinate with CPW on opportunities to assist with accomplishing State Wildlife Action Plan objectives, conduct wildlife inventories or studies, or perform monitoring	In House	Medium
1.2.1: Coordinate with and advise the 10 ABW, Davis Airfield, and Cadet Training Wing on natural resources issues through participation in the Jacks Valley Working Group, ESOH Council, 10 ABW briefings, EIAP meetings, Bird Hazard Working Group, and other organizational meetings.	In House	Medium
1.2.2: As necessary, prepare after-action reports of training and other activities that negatively affect natural resources, and provide recommendations and practical remedial SOPs for future actions.	In House	Low
1.3.1: Incorporate current and historical natural resource databases and geo-referenced data layers into GeoBase to measure and monitor resource condition and trend.	In House	Low
1.3.2: As necessary, obtain aerial photography and geo-referenced data layers for areas outside the installation to help assess regional and ecosystem-wide resource management issues.	In House	Low
1.4.1: Develop an easily accessible, DoD-compliant Natural Resources public website with information covering program activities, rules and regulations, maps, photographs, and outdoor recreation opportunities.	In House, PA	Medium
1.4.2: Periodically provide briefings, news articles, email, website updates, etc. that address natural resource management activities and concerns	In House	Low
1.5.1: Closely coordinate any compliance or resource damage issues with 10th Security Forces, USFWS, and CPW.	In House	Medium
1.5.2: Maintain Natural Resource		

Manager's qualifications through the attendance of national, regional, and state conferences and other professional development training opportunities as funding allows.	USFWS Coop Agreement	Low
1.5.3: Obtain necessary permits, including Clean Water Act 404, Migratory Bird depredation and salvage, Bald and Golden Eagle Protection Act, wildland fire, roadkill wildlife possession, etc.	In House	Medium
1.5.4: Pursue a Conservation Law Enforcement Officer (CLEO) position staffed through the U. S. Fish and Wildlife Service National Wildlife Refuge System (Law Enforcement)	AFCEC	Medium
1.6.1: Through implementation of other INRMP Goals, quantify and mitigate environmental stressors (e.g., climate change, invasive species, altered hydrology and fire regimes, wildlife and forest diseases and pests, overpopulation) that affect biological diversity and ecological integrity.	In House, multiple EQ	Medium
1.6.2: Through various media, continue to educate base residents, personnel, visitors, and commanders of the economic and ecological benefits of managing natural landscapes using the principles of ecosystem management.	In House	Low
1.6.3: Participate on collaborative teams dedicated to exploring complex and pressing natural resource issues, especially affecting the USAFA and Farish.	In House	Low
1.6.4: Actively partner with the Pike National Forest as an adjacent landowner to the USAFA and Farish, to address regional forest health issues and maximize effectiveness of forest management across boundaries.	In House	Medium
1.6.5: Participate in the U.S. Forest Service (USFS) Forest Health Protection (FHP) program to secure funds for forest insect and disease protection. Host an annual biological site visit with the FHP staff in September to review previous year accomplishments and discuss the proposal for the following year.		

Submit Form FS 3400-2 to be considered for funding annually by the deadline (~Oct. 1).	In House	Medium
1.6.6: Work closely with the USFS FHP staff to identify unknown insect and disease agents. Submit samples and request field visits as needed to collaborate on findings and articulate management needs.	In House	Medium
1.6.7: Cooperate with the USFS, USDA Animal and Plant Health Inspection Service (APHIS) and other agencies to monitor for insect and disease issues. Place traps, etc. in suitable locations, and monitor as needed. Participate in regional workshops and other forums to maintain currency on forest health issues.	In House	Medium
2.1.1: Publicize wildlife viewing opportunities and proper ways to observe and interact with wildlife through various media. Provide "Living with Wildlife" brochures to educate the public on how to minimize wildlife-human conflicts.	In House	Low
2.1.2: Monitor the deer and elk population for the prevalence of chronic wasting disease.	In House	Medium
2.1.3: Coordinate with CPW, USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.	In House	Medium
2.1.4: Coordinate with Civil Engineering, Forces Support Squadron, and the base housing contractor to provide animal-resistant trash receptacles to protect wildlife and reduce potentially hazardous wildlife-human interaction.	In House	Medium
2.2.1: Coordinate project schedules in advance with proponents to ensure projects don't impact nesting birds or as necessary, perform field surveys for nesting birds prior to site disturbance planned during the typical March-August nesting season. Obtain a migratory bird or Bald and Golden Eagle Protection Act permit when impacts cannot be avoided by adjusting the project scheduling.	In House	Medium

2.2.2: Obtain migratory bird salvage and depredation and Bald and Golden Eagle Protection Act permits to collect dead birds, control nuisance species (e.g., double-crested cormorant), and mitigate any airfield BASH concerns.	In House	Medium
2.2.3: Interact at least quarterly with Airfield Management, Flight Safety, USDA, and the Bird Hazard Working Group to develop procedures and management actions to reduce the Bird-Aircraft Strike Hazard (BASH) through habitat and wildlife control actions. Assist the Airfield staff with identifying bird mortalities, harassing wildlife from the airfield environment, and reviewing the BASH Plan.	In House	Medium
2.2.4: Perform informal and formal bird surveys in aquatic and terrestrial habitats and add observations to the Cornell Lab of Ornithology eBird database.	In House	Low
2.2.5: Provide logistical support for the maintenance and monitoring of 150+ blue bird nest boxes on USAFA by CPW volunteers.	In House	Low
2.2.6: Monitor above-ground utilities for potential bird electrocution hazards and mitigate as necessary.	In House	Low
2.2.7: Maintain a geo-referenced database (GeoBase) of active and inactive nesting sites.	In House	Low
2.3.1: Coordinate with CPW to perform a base-wide count of deer, elk, turkey, and other non-game wildlife of interest.	In House	Low
2.3.2: Based on population estimates, coordinate with CPW on the number of deer and elk licenses to be issued to help maintain a target population of approximately 250 deer and 30 elk.	In House	Low
2.3.3: Sustain a flock of approximately 150 Merriam's turkey to prevent bird-human conflicts. Provide fall and spring archery-only hunting opportunities.	In House	Low
2.3.4: Continue to discuss with CPW ways to reduce the "trophy" nature of the buck deer hunting.	In House	Low

2.4.2: Protect and encourage beaver (and their dams) to help maintain stream base flow, mitigate stormwater impacts, and provide deeper water habitat for sustaining native fish populations. Only remove beavers and dams that are negatively affecting stormwater management (e.g., plugging culverts) or the diversion of water to the fishing lakes.	In House	Low
2.5.1: Through field observations and reports, maintain a species list of rare sightings and wildlife known to inhabit or frequent the installation.	In House	Low
2.5.2: Assist with Department of Biology and cadet independent study wildlife projects, such as track counts, coyote howling surveys, and maintaining motion-detector game cameras.	In House	Low
2.5.3: Perform surveys for eastern black rail to assess their occurrence on the Air Force Academy	In House	High
2.5.4: Perform echo-location acoustic monitoring and/or mist-netting surveys to assess the occurrence of bat species on Academy property	In House/NABat/AFCEC , EQ	High
2.6.1: Coordinate with 10th Security Forces, Pest Management, or Base Housing to identify, capture, and transfer nuisance pets and feral animals to the Pikes Peak Humane Society.	In House	Low
2.7.1: Conduct Preble's population and habitat assessments and provide monitoring data and reports to USFWS.	EQ XQPZA53257119	High
2.7.2: Implement habitat and stream restoration projects in degraded Preble's meadow jumping mouse habitat.	In House, EQ XQPZA53257118	High
2.7.3: As necessary, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any change in habitat suitability and non-habitat areas.	In House	Medium
2.7.4: Participate in the implementation of a USFWS Preble's Meadow Jumping Mouse Recovery		

Plan and associated Site Conservation Team.	In House	Medium
2.8.1: In coordination with CPW, USFWS, and CNHP, review a list of special status species that are known or likely to occur on USAFA.	In House	Medium
2.8.2: Maintain a geo-spatial database of populations and habitats of special status species.	In House	Medium
2.8.3: Conduct field surveys to evaluate the occurrence, abundance, threats, and management needs of special status species.	In House	Medium
2.8.4: Conduct field surveys to evaluate the condition, trend, threats, and management needs of ecologically important habitats, including the CNHP-designated Potential Conservation Areas, Natural Areas, and rare plant communities.	In House	Low
3.1.1: Coordinate with the Civil Engineering Heavy Equipment Shop to develop road grading and culvert maintenance standards and practices similar to those used by the US Forest Service, and construct stormwater infrastructure that minimizes vegetation damage and can sustainably collect and release water without causing erosion.	In House	Low
3.1.2: In coordination with Civil Engineering, opportunistically relocate above- and below-ground utilities out of wetlands and floodplains as part of planned construction projects.	In House	Low
3.1.3: Through the Community Planner and various public forums, continue to document and communicate to City and County governments and developers the adverse impact that an altered rate and volume of off-base stormwater is having on USAFA natural resources, infrastructure, and aesthetics.	In House	Medium
3.1.4: Continue to advocate for improvements in stormwater and urban runoff planning and regulation to protect the USAFA watershed.	In House	Low
3.1.5: In partnership with local		

government and developers, implement watershed protection and restoration projects to mitigate impacts on USAFA and downstream areas.	In House, EQ XQPZA53257118	High
3.2.1: Prevent activities which unnecessarily damage the vegetation cover, including unauthorized or undesirable ORV use, creation of social trails, excessive training or construction disturbance, and unnecessary mowing.	In House	Low
3.2.2: Use native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.	In House	Medium
3.2.3: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all authorized soil-disturbing projects utilize appropriate erosion control techniques and materials to prevent soil loss and promote revegetation.	In House	Medium
3.3.1: Assess the condition of wetland, stream channel, and floodplain areas and identify any factors causing a departure from a stable Proper Functioning Condition.	In House	Medium
3.3.2: As necessary and feasible, implement drainage projects to prevent or mitigate any causal factors posing a threat or creating system instability, with emphasis on sustaining or restoring habitat for the Preble's meadow jumping mouse and other wetland/riparian species. Projects must be designed to withstand the altered rate, volume, frequency, and discharge hydrograph resulting from any increase in local and regional stormwater and urban runoff. When feasible, drainage and habitat restoration projects should also be designed to remove or mitigate barriers to native fish passage.	In House, EQ XQPZA53257118	High
3.3.3: As necessary, update the wetland and floodplain inventory and mapping in GeoBase.	In House	Low
4.1.2: Conduct annual weed		

monitoring and 5-year base-wide surveys to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.	EQ XQPZA53256121	High
4.1.3: Update the Integrated Noxious Weed Management Plan to include new species, management priorities, monitoring protocols, and control techniques.	In House	Low
4.1.4: Coordinate with adjacent landowners and local governments to identify and control noxious weeds that could invade USAFA.	In House	Low
4.1.5: Utilize an integrated management approach (chemical, biological, mechanical, cultural practices) to control noxious weeds.	In House, EQ XQPZA53256121	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.	In House, 10 FSS	Low
4.2.2: In coordination with FSS, frequently inspect the fences, gates and watering sources to better control grazing use and access.	In House, 10 FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.	In House, 10 FSS	Low
4.2.4: Coordinate with FSS on manure disposal practices and approved locations to prevent inadvertent impacts to native vegetation or waterways.	In House, 10 FSS	Low
4.3.1: Inventory 400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy database.	In House, EQ XQPZA53256119	Medium
4.3.2: Perform forest health walkthrough surveys on 14,000 acres annually to evaluate insect and disease issues (i.e. bark beetles, dwarf mistletoe infection), and to identify management needs. Resurvey areas pruned for mistletoe to detect new infections and ensure treatment effectiveness.	In House, EQ XQPZA53256119, USFS 2N funds	High

4.3.3: Perform 150 acres of forest management annually to enhance forest health and to restore forests to a more open, natural condition, reminiscent of forests found under a historic fire regime. Management options include forest thinning, timber stand improvement, and sanitation pruning.	EQ XQPZA53256119, USFS 2N funds	Medium
4.4.1: Locate infested trees (through field surveys in Project 4.3.2) and treat promptly (de-barking, chipping, hauling to a "safe" place; wrapping in plastic) to eradicate developing insect broods, especially when populations are high. Tree removal due to beetle attack varies but is expected to range from 300 to 1,000 annually, with an average of 700 per year.	In House, EQ XQPZA53256119, USFS 2N funds	High
4.4.2: Identify high risk or high-profile trees for spraying to prevent bark beetle attack. Base spray program on existing beetle populations and stressor affecting trees (i.e., root damage, drought, etc.). Track pesticide usage and report to Pest Management. An estimated 400 trees per year will be sprayed.	EQ XQPZA53256119	High
4.4.3: Coordinate with the Academy Biology faculty to develop projects that would benefit Natural Resources and educate cadets on land management.	In House	Low
4.4.4: Perform field inventory for beetle-infested trees on privatized land on the USAFA and arrange for prompt removal of infested trees via contract. Coordinate with Forest City on field survey and tree removal activities.	In House, EQ XQPZA53256119, USFS 2N funds	Medium
4.5.1: Re-delineate forest stand boundaries on the USAFA and Farish, due to availability of improved digital orthophotos, changed forest conditions and higher stand definition standards. The forested component represents approximately 14,000 acres, including stands with at least 20 square feet of basal area per acre.	In House, EQ XQPZA53256119	Low
4.6.1: Perform annual sweep of all managed trails at the USAFA and		

Farish to identify potentially hazardous trees.	In House	Medium
4.6.2: Arrange for felling of potentially hazardous trees identified (in Project 4.6.1) via contract logger. An annual estimated 200 trees will be cut.	EQ XQPZA53256119	Medium
4.6.3: Accomplish a hazard tree inventory on all trees within Peregrine Pines Family Campground, Farish camping areas, and major trailheads. Delineate inventory areas based on potential tree strike distance to targets (concentrated use areas, parking spots, etc.). Utilize the USFS Hazard Tree Rating system to quantitatively document and track tree health conditions.	In House	Medium
4.7.1 Complete Urban Forest Management review to update tree planting list, tree management recommendations, soil property study,	EQ XQPZA53256119	High
4.7.4: Stock Natural Resources seedlings nursery with 450 seedlings	In House	Low
4.7.6: Perform seedling survival surveys for areas planted in 20218 and 2022. Schedule replanting as necessary.	In House	Low
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing.	In House	High
4.8.5: Partner with the U.S. Forest Service and other land management agencies to evaluate regional decline of aspen and discuss/adopt future management strategies.	In House	Low
4.9.2: Revisit previous overstory thinning and mastication sites to quantitatively and photographically document growth response.	In House	Medium
4.9.3: Collaborate with the USAF Wildland Fire Center and regional stakeholders on oak management, identifying and employing adaptive management strategies as appropriate.	In House, WFC	Low
4.10.1: Manage Natural Resource		

woodlot for firewood sales. Submit sales receipts per USAF protocol.	In House	Low
4.10.2: Under conducive moisture conditions, thin existing pine plantations by selling transplant trees as a forest product. Submit sales receipts per USAF protocol.	In House	Low
4.11.1: Take pre-treatment photos of all mature forest thinning areas, ranging across a variety of stand conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage	In House	Medium
4.11.2: Document other forestry activities to include planting, pruning, beetle-infested tree treatment, etc. with anecdotal photos. Catalog by activity and month/year completed.	In House	Low
4.11.3: GPS all harvest unit boundaries, and planting areas of at least one acre in size. Include contractor name and project dates in attribute data. To the extent feasible, digitize all beetle-infested trees removed to help track trends and focus subsequent field surveys.	In House	High
4.11.4: Track all accomplishments in GIS. Coordinate with the USAFA Geo Integration Office (GIO) to assimilate pertinent forestry data into the USAFA GeoBase. Specifically, this will include updated forest stand inventory data, annual forest thinning accomplishments, and bark beetle tree mortality data.	In House, GIO	Low
4.12.2: Review proposed landscape plans as time allows. Emphasize the need for xeriscaping and commensurate irrigation needs by planting zone.	In House	Low
4.12.3: Host annual USAFA Tree Board Meeting	In House,	Medium
4.12.6: Collect urban tree inventory data on stressed trees to be utilized by the Grounds Maintenance staff to		

prioritize tree care needs and to monitor tree health issues.	EQ XQPZA53256119	Low
4.12.7: Coordinate with Grounds Maintenance to effectively utilize urban tree inventory data.	In House	Low
4.12.8: Complete annual Tree City USA application in December and Arbor Day proclamation. Host Arbor Day ceremony annually in April.	In House	Medium
4.12.9: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all projects adhere to tree care specifications to help ensure health and longevity of newly planted landscapes, and minimize damage to trees from construction work.	In House	Low
4.13.1: Coordinate with Airfield Operations to ensure that trees are removed from airfield clear zones.	In House, EQ XQPZA53256119, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.	EQ XQPZA53256119, 306/OSS	Medium
4.13.3: Assess potential for transplant trees to be removed during clearing operations and arrange for sale or use of said trees on base if suitable.	In House	Low
5.1.2: Implement the WFMP, and review progress annually with the Sikes Act Cooperators and the WFC.	In House, WFC EQ AFCE190105	Medium
5.2.2: Update the Wildland Fire Management Annual Operating Plan (AOP).	In House	Medium
5.3.1: Clear 70 acres annually of areas of high fuel loading for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.	WFC, EQ AFCE190105	High
5.3.3: Limb conifers retained within shaded fuelbreak areas to a height of approximately six feet. An estimated 300 trees will be limbed annually.	WFC, EQ AFCE190105	Low
5.4.1: Clear brush and lower tree limbs and rake woody and leafy debris from close proximity to five sites annually. A site may consist of a building, utility site, etc. Clearing		

distance will depend on fuel type, density and terrain.	WFC, EQ AFCE190105	Low
5.4.2: Reassess the Douglass and Pine Valley housing areas with fuel hazard assessments of homes, coordinating with USAFA firefighters to identify hazards and prioritize treatments.	In House, WFC, EQ AFCE190105 10CES/CEF	Low
5.5.1: Secure a smoke permit and perform a prescribed broadcast burn as weather and conditions allow.	In House, WFC EQ AFCE190105, 10CES/CEF	High
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.	In House	Low
5.5.3: Assess the need for and benefits of additional prescribed fire, and update INRMP accordingly.	In House, WFC EQ AFCE190105	Low
5.6.1: Take pre-treatment photos of all projects, ranging across a variety of conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage.	In House	Low
5.6.2: GPS all fuels treatment project boundaries. Include contractor name (if applicable) and project dates (to include month and year) in attribute data. Add to applicable GeoBase layers.	In House	Low
5.7.1: Play an active role in the Colorado Springs Wildfire Mitigation Committee and the Pikes Peak Area Council of Governments Joint Land Use Study. Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.	In House	Medium
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.	In House	Low
6.1.1: Require a reasonable fee for annual, one-day, and second rod permits to generate income for a self-supporting program of stocking hatchery-reared fish. Provide discounted fishing permits for		

disabled veterans (DAV) and Purple Heart recipients. Coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.	In House, 57X F&W Reimbursable Account	Low
6.1.2: Periodically conduct angler interviews and collect creel information to track angler success and satisfaction with the fishing program and recreational experience.	In House	Low
6.1.3: Improve and maintain safe, pedestrian-friendly fishing access on shoreline trails and piers.	In House	Low
6.1.4: Seasonally monitor aquatic weed and algal growth in the fishing lakes and treat with approved algaecides or sterile grass carp. As necessary, maintain multiple age classes of grass carp to promote effective biological weed control.	In House	Low
6.1.5: Monitor for fish diseases and parasites and take appropriate management actions. Stock whirling disease-free fish in accordance with CPW regulations.	In House	Low
6.1.6: Opportunistically control any undesirable fish species without having a detrimental impact on the stocked fish population.	In House	Low
6.1.7: Monitor for invasive aquatic species and take appropriate management actions.	In House	Medium
6.1.8: Maintain and improve water diversion structures to better capture and regulate water flow and minimize sediment transport to the lakes.	In House	Low
6.2.1: Repair and maintain the 22+ mile trail network using the techniques and guidelines outlined in the Trails Management Plan and Maintenance Standards, and those recommended by the International Mountain Biking Association (IMBA) and other trail organizations. Re-route trails as necessary to promote long-term sustainability and reduce annual maintenance needs.	In House, EQ XQPZA53256119	Medium
6.2.2: Coordinate with the Cadet Mountain Biking Club/Team, IMBA,		

Medicine Wheel Trail Advocates, and other trail groups to design and construct trail re-routes, technical features, and skills/challenge courses that enhance the user experience, improve trail sustainability, and protect the environment.	In House	Low
6.2.3: Partner with Medicine Wheel Trail Advocates and/or IMBA to provide volunteers, or train new volunteers, for trail construction and maintenance.	In House	Low
6.2.4: Coordinate with the Force Support Squadron (FSS) to designate sustainable horse trails in the Pine Valley area and work to limit the proliferation of unsustainable "social" trails.	In House, 10 FSS	Low
6.2.5: Coordinate with El Paso County and the City of Colorado Springs concerning public access and the maintenance of the New Santa Fe Trail and LaForet Trail.	In House	Low
6.2.6: Expand and upgrade the trail signage and provide user-friendly trail maps and information kiosks to improve the user experience.	In House, EQ XQPZA53256119	Low
6.2.7: Provide picnic tables, animal-resistant trash containers, and restroom facilities at high volume trailheads and parking areas to enhance the user experience and reduce littering and environmental damage.	In House	Low
6.2.8: Coordinate with the US Forest Service, Pikes Peak Ranger District, to regulate and maintain the trail access between the USAFA and USFS property.	In House	Low
6.3.1: Coordinate with USAFA/A3O to update the user requirements and regulations for the B-52 camping area.	In House, USAFA A3O	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.	In House, USAFA A3O	Low
6.4.1: Provide training to 10th Security Forces, 10 Civil Engineering Squadron, and the Jacks Valley Training Area		

Superintendent concerning the proper use of ORV's to minimize environmental impacts. Brief the proper operation and authorized use of ORV's at the annual 10 CES Facility Manager training.	In House	Low
6.4.2: As necessary, close and restore undesirable ORV trails using signage, fencing, barriers, revegetation, and erosion control features.	In House	Low

FY26 Tasks

Project/Work Plan	**Funding Source**	**Priority Level**
1.1.1: Review INRMP accomplishments with USFWS and CPW and, as mutually agreed to; revise the methods, objectives, projects, budget, and timeline to address changing conditions.	In House	High
1.1.2: Coordinate with CPW on opportunities to assist with accomplishing State Wildlife Action Plan objectives, conduct wildlife inventories or studies, or perform monitoring	In House	Medium
1.2.1: Coordinate with and advise the 10 ABW, Davis Airfield, and Cadet Training Wing on natural resources issues through participation in the Jacks Valley Working Group, ESOH Council, 10 ABW briefings, EIAP meetings, Bird Hazard Working Group, and other organizational meetings.	In House	Medium
1.2.2: As necessary, prepare after-action reports of training and other activities that negatively affect natural resources, and provide recommendations and practical remedial SOPs for future actions.	In House	Low
1.3.1: Incorporate current and historical natural resource databases and geo-referenced data layers into GeoBase to measure and monitor resource condition and trend.	In House	Low
1.3.2: As necessary, obtain aerial photography and geo-referenced data layers for areas outside the installation to help assess regional and ecosystem-wide resource		

management issues.	In House	Low
1.4.1: Develop an easily accessible, DoD-compliant Natural Resources public website with information covering program activities, rules and regulations, maps, photographs, and outdoor recreation opportunities.	In House, PA	Medium
1.4.2: Periodically provide briefings, news articles, email, website updates, etc. that address natural resource management activities and concerns	In House	Low
1.5.1: Closely coordinate any compliance or resource damage issues with 10th Security Forces, USFWS, and CPW.	In House	Medium
1.5.2: Maintain Natural Resource Manager's qualifications through the attendance of national, regional, and state conferences and other professional development training opportunities as funding allows.	USFWS Coop Agreement	Low
1.5.3: Obtain necessary permits, including Clean Water Act 404, Migratory Bird depredation and salvage, Bald and Golden Eagle Protection Act, wildland fire, roadkill wildlife possession, etc.	In House	Medium
1.5.4: Pursue a Conservation Law Enforcement Officer (CLEO) position staffed through the U. S. Fish and Wildlife Service National Wildlife Refuge System (Law Enforcement)	AFCEC	Medium
1.6.1: Through implementation of other INRMP Goals, quantify and mitigate environmental stressors (e.g., climate change, invasive species, altered hydrology and fire regimes, wildlife and forest diseases and pests, overpopulation) that affect biological diversity and ecological integrity.	In House, multiple EQ	Medium
1.6.2: Through various media, continue to educate base residents, personnel, visitors, and commanders of the economic and ecological benefits of managing natural landscapes using the principles of ecosystem management.	In House	Low
1.6.3: Participate on collaborative teams dedicated to exploring complex		

and pressing natural resource issues, especially affecting the USAFA and Farish.	In House	Low
1.6.4: Actively partner with the Pike National Forest as an adjacent landowner to the USAFA and Farish, to address regional forest health issues and maximize effectiveness of forest management across boundaries.	In House	Medium
1.6.5: Participate in the U.S. Forest Service (USFS) Forest Health Protection (FHP) program to secure funds for forest insect and disease protection. Host an annual biological site visit with the FHP staff in September to review previous year accomplishments and discuss the proposal for the following year. Submit Form FS 3400-2 to be considered for funding annually by the deadline (~Oct. 1).	In House	Medium
1.6.6: Work closely with the USFS FHP staff to identify unknown insect and disease agents. Submit samples and request field visits as needed to collaborate on findings and articulate management needs.	In House	Medium
1.6.7: Cooperate with the USFS, USDA Animal and Plant Health Inspection Service (APHIS) and other agencies to monitor for insect and disease issues. Place traps, etc. in suitable locations, and monitor as needed. Participate in regional workshops and other forums to maintain currency on forest health issues.	In House	Medium
2.1.1: Publicize wildlife viewing opportunities and proper ways to observe and interact with wildlife through various media. Provide "Living with Wildlife" brochures to educate the public on how to minimize wildlife-human conflicts.	In House	Low
2.1.2: Monitor the deer and elk population for the prevalence of chronic wasting disease.	In House	Medium
2.1.3: Coordinate with CPW, USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.	In House	Medium

2.1.4: Coordinate with Civil Engineering, Forces Support Squadron, and the base housing contractor to provide animal-resistant trash receptacles to protect wildlife and reduce potentially hazardous wildlife-human interaction.	In House	Medium
2.2.1: Coordinate project schedules in advance with proponents to ensure projects don't impact nesting birds or as necessary, perform field surveys for nesting birds prior to site disturbance planned during the typical March-August nesting season. Obtain a migratory bird or Bald and Golden Eagle Protection Act permit when impacts cannot be avoided by adjusting the project scheduling.	In House	Medium
2.2.2: Obtain migratory bird salvage and depredation and Bald and Golden Eagle Protection Act permits to collect dead birds, control nuisance species (e.g., double-crested cormorant), and mitigate any airfield BASH concerns.	In House	Medium
2.2.3: Interact at least quarterly with Airfield Management, Flight Safety, USDA, and the Bird Hazard Working Group to develop procedures and management actions to reduce the Bird-Aircraft Strike Hazard (BASH) through habitat and wildlife control actions. Assist the Airfield staff with identifying bird mortalities, harassing wildlife from the airfield environment, and reviewing the BASH Plan.	In House	Medium
2.2.4: Perform informal and formal bird surveys in aquatic and terrestrial habitats and add observations to the Cornell Lab of Ornithology eBird database.	In House	Low
2.2.5: Provide logistical support for the maintenance and monitoring of 150+ blue bird nest boxes on USAFA by CPW volunteers.	In House	Low
2.2.6: Monitor above-ground utilities for potential bird electrocution hazards and mitigate as necessary.	In House	Low
2.2.7: Maintain a geo-referenced database (GeoBase) of active and inactive nesting sites.	In House	Low

2.3.1: Coordinate with CPW to perform a base-wide count of deer, elk, turkey, and other non-game wildlife of interest.	In House	Low
2.3.2: Based on population estimates, coordinate with CPW on the number of deer and elk licenses to be issued to help maintain a target population of approximately 250 deer and 30 elk.	In House	Low
2.3.3: Sustain a flock of approximately 150 Merriam's turkey to prevent bird-human conflicts. Provide fall and spring archery-only hunting opportunities.	In House	Low
2.3.4: Continue to discuss with CPW ways to reduce the "trophy" nature of the buck deer hunting.	In House	Low
2.4.2: Protect and encourage beaver (and their dams) to help maintain stream base flow, mitigate stormwater impacts, and provide deeper water habitat for sustaining native fish populations. Only remove beavers and dams that are negatively affecting stormwater management (e.g., plugging culverts) or the diversion of water to the fishing lakes.	In House	Low
2.5.1: Through field observations and reports, maintain a species list of rare sightings and wildlife known to inhabit or frequent the installation.	In House	Low
2.5.2: Assist with Department of Biology and cadet independent study wildlife projects, such as track counts, coyote howling surveys, and maintaining motion-detector game cameras.	In House	Low
2.5.3: Perform surveys for eastern black rail to assess their occurrence on the Air Force Academy	In House	High
2.5.4: Perform echo-location acoustic monitoring and/or mist-netting surveys to assess the occurrence of bat species on Academy property	In House/NABat/AFCEC , EQ	High
2.6.1: Coordinate with 10th Security Forces, Pest Management, or Base Housing to identify, capture, and transfer nuisance pets and feral animals to the Pikes Peak Humane		

Society.	In House	Low
2.7.1: Conduct Preble's population and habitat assessments and provide monitoring data and reports to USFWS.	EQ XQPZA53267119	High
2.7.2: Implement habitat and stream restoration projects in degraded Preble's meadow jumping mouse habitat.	In House, EQ XQPZA53267118	High
2.7.3: As necessary, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any change in habitat suitability and non-habitat areas.	In House	Medium
2.7.4: Participate in the implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan and associated Site Conservation Team.	In House	Medium
2.8.1: In coordination with CPW, USFWS, and CNHP, review a list of special status species that are known or likely to occur on USAFA.	In House	Medium
2.8.2: Maintain a geo-spatial database of populations and habitats of special status species.	In House	Medium
2.8.3: Conduct field surveys to evaluate the occurrence, abundance, threats, and management needs of special status species.	In House	Medium
2.8.4: Conduct field surveys to evaluate the condition, trend, threats, and management needs of ecologically important habitats, including the CNHP-designated Potential Conservation Areas, Natural Areas, and rare plant communities.	In House	Low
3.1.1: Coordinate with the Civil Engineering Heavy Equipment Shop to develop road grading and culvert maintenance standards and practices similar to those used by the US Forest Service, and construct stormwater infrastructure that minimizes vegetation damage and can sustainably collect and release water without causing erosion.	In House	Low
3.1.2: In coordination with Civil		

Engineering, opportunistically relocate above- and below-ground utilities out of wetlands and floodplains as part of planned construction projects.	In House	Low
3.1.3: Through the Community Planner and various public forums, continue to document and communicate to City and County governments and developers the adverse impact that an altered rate and volume of off-base stormwater is having on USAFA natural resources, infrastructure, and aesthetics.	In House	Medium
3.1.4: Continue to advocate for improvements in stormwater and urban runoff planning and regulation to protect the USAFA watershed.	In House	Low
3.1.5: In partnership with local government and developers, implement watershed protection and restoration projects to mitigate impacts on USAFA and downstream areas.	In House, EQ XQPZA53267118	High
3.2.1: Prevent activities which unnecessarily damage the vegetation cover, including unauthorized or undesirable ORV use, creation of social trails, excessive training or construction disturbance, and unnecessary mowing.	In House	Low
3.2.2: Use native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.	In House	Medium
3.2.3: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all authorized soil-disturbing projects utilize appropriate erosion control techniques and materials to prevent soil loss and promote revegetation.	In House	Medium
3.3.1: Assess the condition of wetland, stream channel, and floodplain areas and identify any factors causing a departure from a stable Proper Functioning Condition.	In House	Medium
3.3.2: As necessary and feasible, implement drainage projects to prevent or mitigate any causal factors		

posing a threat or creating system instability, with emphasis on sustaining or restoring habitat for the Preble's meadow jumping mouse and other wetland/riparian species. Projects must be designed to withstand the altered rate, volume, frequency, and discharge hydrograph resulting from any increase in local and regional stormwater and urban runoff. When feasible, drainage and habitat restoration projects should also be designed to remove or mitigate barriers to native fish passage.	In House, EQ XQPZA53267118	High
3.3.3: As necessary, update the wetland and floodplain inventory and mapping in GeoBase.	In House	Low
4.1.2: Conduct annual weed monitoring and 5-year base-wide surveys to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.	EQ XQPZA53266121	High
4.1.3: Update the Integrated Noxious Weed Management Plan to include new species, management priorities, monitoring protocols, and control techniques.	In House	Low
4.1.4: Coordinate with adjacent landowners and local governments to identify and control noxious weeds that could invade USAFA.	In House	Low
4.1.5: Utilize an integrated management approach (chemical, biological, mechanical, cultural practices) to control noxious weeds.	In House, EQ XQPZA53266121	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.	In House, 10 FSS	Low
4.2.2: In coordination with FSS, frequently inspect the fences, gates and watering sources to better control grazing use and access.	In House, 10 FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.	In House, 10 FSS	Low
4.2.4: Coordinate with FSS on manure		

disposal practices and approved locations to prevent inadvertent impacts to native vegetation or waterways.	In House, 10 FSS	Low
4.3.1: Inventory 400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy database.	In House, EQ XQPZA53266119	Medium
4.3.2: Perform forest health walkthrough surveys on 14,000 acres annually to evaluate insect and disease issues (i.e. bark beetles, dwarf mistletoe infection), and to identify management needs. Resurvey areas pruned for mistletoe to detect new infections and ensure treatment effectiveness.	In House, EQ XQPZA53266119, USFS 2N funds	High
4.3.3: Perform 150 acres of forest management annually to enhance forest health and to restore forests to a more open, natural condition, reminiscent of forests found under a historic fire regime. Management options include forest thinning, timber stand improvement, and sanitation pruning.	EQ XQPZA53266119, USFS 2N funds	Medium
4.4.1: Locate infested trees (through field surveys in Project 4.3.2) and treat promptly (de-barking, chipping, hauling to a "safe" place; wrapping in plastic) to eradicate developing insect broods, especially when populations are high. Tree removal due to beetle attack varies but is expected to range from 300 to 1,000 annually, with an average of 700 per year.	In House, EQ XQPZA53266119, USFS 2N funds	High
4.4.2: Identify high risk or high-profile trees for spraying to prevent bark beetle attack. Base spray program on existing beetle populations and stressor affecting trees (i.e., root damage, drought, etc.). Track pesticide usage and report to Pest Management. An estimated 400 trees per year will be sprayed.	EQ XQPZA53266119	High
4.4.3: Coordinate with the Academy Biology faculty to develop projects that would benefit Natural Resources and educate cadets on land management.	In House	Low

4.4.4: Perform field inventory for beetle-infested trees on privatized land on the USAFA and arrange for prompt removal of infested trees via contract. Coordinate with Forest City on field survey and tree removal activities.	In House, EQ XQPZA53266119, USFS 2N funds	Medium
4.5.1: Re-delineate forest stand boundaries on the USAFA and Farish, due to availability of improved digital orthophotos, changed forest conditions and higher stand definition standards. The forested component represents approximately 14,000 acres, including stands with at least 20 square feet of basal area per acre.	In House, EQ XQPZA53266119	Low
4.6.1: Perform annual sweep of all managed trails at the USAFA and Farish to identify potentially hazardous trees.	In House	Medium
4.6.2: Arrange for felling of potentially hazardous trees identified (in Project 4.6.1) via contract logger. An annual estimated 200 trees will be cut.	EQ XQPZA53266119	Medium
4.6.3: Accomplish a hazard tree inventory on all trees within Peregrine Pines Family Campground, Farish camping areas, and major trailheads. Delineate inventory areas based on potential tree strike distance to targets (concentrated use areas, parking spots, etc.). Utilize the USFS Hazard Tree Rating system to quantitatively document and track tree health conditions.	In House	Medium
4.7.1 Complete Urban Forest Management review to update tree planting list, tree management recommendations, soil property study,	EQ XQPZA53266119	High
4.7.4: Stock Natural Resources seedlings nursery with 450 seedlings	In House	Low
4.7.6: Perform seedling survival surveys for areas planted in 20218 and 2022. Schedule replanting as necessary.	In House	Low
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing.	In House	High

4.8.5: Partner with the U.S. Forest Service and other land management agencies to evaluate regional decline of aspen and discuss/adopt future management strategies.	In House	Low
4.9.2: Revisit previous overstory thinning and mastication sites to quantitatively and photographically document growth response.	In House	Medium
4.9.3: Collaborate with the USAF Wildland Fire Center and regional stakeholders on oak management, identifying and employing adaptive management strategies as appropriate.	In House, WFC	Low
4.10.1: Manage Natural Resource woodlot for firewood sales. Submit sales receipts per USAF protocol.	In House	Low
4.10.2: Under conducive moisture conditions, thin existing pine plantations by selling transplant trees as a forest product. Submit sales receipts per USAF protocol.	In House	Low
4.11.1: Take pre-treatment photos of all mature forest thinning areas, ranging across a variety of stand conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage	In House	Medium
4.11.2: Document other forestry activities to include planting, pruning, beetle-infested tree treatment, etc. with anecdotal photos. Catalog by activity and month/year completed.	In House	Low
4.11.3: GPS all harvest unit boundaries, and planting areas of at least one acre in size. Include contractor name and project dates in attribute data. To the extent feasible, digitize all beetle-infested trees removed to help track trends and focus subsequent field surveys.	In House	High
4.11.4: Track all accomplishments in GIS. Coordinate with the USAFA Geo Integration Office (GIO) to assimilate		

pertinent forestry data into the USAFA GeoBase. Specifically, this will include updated forest stand inventory data, annual forest thinning accomplishments, and bark beetle tree mortality data.	In House, GIO	Low
4.12.2: Review proposed landscape plans as time allows. Emphasize the need for xeriscaping and commensurate irrigation needs by planting zone.	In House	Low
4.12.3: Host annual USAFA Tree Board Meeting	In House,	Medium
4.12.6: Collect urban tree inventory data on stressed trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.	EQ XQPZA53266119	Low
4.12.7: Coordinate with Grounds Maintenance to effectively utilize urban tree inventory data.	In House	Low
4.12.8: Complete annual Tree City USA application in December and Arbor Day proclamation. Host Arbor Day ceremony annually in April.	In House	Medium
4.12.9: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all projects adhere to tree care specifications to help ensure health and longevity of newly planted landscapes, and minimize damage to trees from construction work.	In House	Low
4.13.1: Coordinate with Airfield Operations to ensure that trees are removed from airfield clear zones.	In House, EQ XQPZA53266119, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.	EQ XQPZA53266119, 306/OSS	Medium
4.13.3: Assess potential for transplant trees to be removed during clearing operations and arrange for sale or use of said trees on base if suitable.	In House	Low
5.1.2: Implement the WFMP, and review progress annually with the Sikes Act Cooperators and the WFC.	In House, WFC EQ AFCE190105	Medium
5.2.2: Update the Wildland Fire Management Annual Operating Plan		

(AOP).	In House	Medium
5.3.1: Clear 70 acres annually of areas of high fuel loading for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.	WFC, EQ AFCE190105	High
5.3.3: Limb conifers retained within shaded fuelbreak areas to a height of approximately six feet. An estimated 300 trees will be limbed annually.	WFC, EQ AFCE190105	Low
5.4.1: Clear brush and lower tree limbs and rake woody and leafy debris from close proximity to five sites annually. A site may consist of a building, utility site, etc. Clearing distance will depend on fuel type, density and terrain.	WFC, EQ AFCE190105	Low
5.4.2: Reassess the Douglass and Pine Valley housing areas with fuel hazard assessments of homes, coordinating with USAFA firefighters to identify hazards and prioritize treatments.	In House, WFC, EQ AFCE190105 10CES/CEF	Low
5.5.1: Secure a smoke permit and perform a prescribed broadcast burn as weather and conditions allow.	In House, WFC EQ AFCE190105, 10CES/CEF	High
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.	In House	Low
5.5.3: Assess the need for and benefits of additional prescribed fire, and update INRMP accordingly.	In House, WFC EQ AFCE190105	Low
5.6.1: Take pre-treatment photos of all projects, ranging across a variety of conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage.	In House	Low
5.6.2: GPS all fuels treatment project boundaries. Include contractor name (if applicable) and project dates (to include month and year) in attribute data. Add to applicable GeoBase layers.	In House	Low
5.7.1: Play an active role in the		

Colorado Springs Wildfire Mitigation Committee and the Pikes Peak Area Council of Governments Joint Land Use Study. Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.	In House	Medium
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.	In House	Low
6.1.1: Require a reasonable fee for annual, one-day, and second rod permits to generate income for a self-supporting program of stocking hatchery-reared fish. Provide discounted fishing permits for disabled veterans (DAV) and Purple Heart recipients. Coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.	In House, 57X F&W Reimbursable Account	Low
6.1.2: Periodically conduct angler interviews and collect creel information to track angler success and satisfaction with the fishing program and recreational experience.	In House	Low
6.1.3: Improve and maintain safe, pedestrian-friendly fishing access on shoreline trails and piers.	In House	Low
6.1.4: Seasonally monitor aquatic weed and algal growth in the fishing lakes and treat with approved algaecides or sterile grass carp. As necessary, maintain multiple age classes of grass carp to promote effective biological weed control.	In House	Low
6.1.5: Monitor for fish diseases and parasites and take appropriate management actions. Stock whirling disease-free fish in accordance with CPW regulations.	In House	Low
6.1.6: Opportunistically control any undesirable fish species without having a detrimental impact on the stocked fish population.	In House	Low
6.1.7: Monitor for invasive aquatic species and take appropriate management actions.	In House	Medium
6.1.8: Maintain and improve water		

diversion structures to better capture and regulate water flow and minimize sediment transport to the lakes.	In House	Low
6.2.1: Repair and maintain the 22+ mile trail network using the techniques and guidelines outlined in the Trails Management Plan and Maintenance Standards, and those recommended by the International Mountain Biking Association (IMBA) and other trail organizations. Re-route trails as necessary to promote long-term sustainability and reduce annual maintenance needs.	In House, EQ XQPZA53266119	Medium
6.2.2: Coordinate with the Cadet Mountain Biking Club/Team, IMBA, Medicine Wheel Trail Advocates, and other trail groups to design and construct trail re-routes, technical features, and skills/challenge courses that enhance the user experience, improve trail sustainability, and protect the environment.	In House	Low
6.2.3: Partner with Medicine Wheel Trail Advocates and/or IMBA to provide volunteers, or train new volunteers, for trail construction and maintenance.	In House	Low
6.2.4: Coordinate with the Force Support Squadron (FSS) to designate sustainable horse trails in the Pine Valley area and work to limit the proliferation of unsustainable "social" trails.	In House, 10 FSS	Low
6.2.5: Coordinate with El Paso County and the City of Colorado Springs concerning public access and the maintenance of the New Santa Fe Trail and LaForet Trail.	In House	Low
6.2.6: Expand and upgrade the trail signage and provide user-friendly trail maps and information kiosks to improve the user experience.	In House, EQ XQPZA53266119	Low
6.2.7: Provide picnic tables, animal-resistant trash containers, and restroom facilities at high volume trailheads and parking areas to enhance the user experience and reduce littering and environmental damage.	In House	Low

6.2.8: Coordinate with the US Forest Service, Pikes Peak Ranger District, to regulate and maintain the trail access between the USAFA and USFS property.	In House	Low
6.3.1: Coordinate with USAFA/A3O to update the user requirements and regulations for the B-52 camping area.	In House, USAFA A3O	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.	In House, USAFA A3O	Low
6.4.1: Provide training to 10th Security Forces, 10 Civil Engineering Squadron, and the Jacks Valley Training Area Superintendent concerning the proper use of ORV's to minimize environmental impacts. Brief the proper operation and authorized use of ORV's at the annual 10 CES Facility Manager training.	In House	Low
6.4.2: As necessary, close and restore undesirable ORV trails using signage, fencing, barriers, revegetation, and erosion control features.	In House	Low

FY27 Tasks

Project/Work Plan	**Funding Source**	**Priority Level**
1.1.1: Review INRMP accomplishments with USFWS and CPW and, as mutually agreed to; revise the methods, objectives, projects, budget, and timeline to address changing conditions.	In House	High
1.1.2: Coordinate with CPW on opportunities to assist with accomplishing State Wildlife Action Plan objectives, conduct wildlife inventories or studies, or perform monitoring	In House	Medium
1.2.1: Coordinate with and advise the 10 ABW, Davis Airfield, and Cadet Training Wing on natural resources issues through participation in the Jacks Valley Working Group, ESOH Council, 10 ABW briefings, EIAP		

meetings, Bird Hazard Working Group, and other organizational meetings.	In House	Medium
1.2.2: As necessary, prepare after-action reports of training and other activities that negatively affect natural resources, and provide recommendations and practical remedial SOPs for future actions.	In House	Low
1.3.1: Incorporate current and historical natural resource databases and geo-referenced data layers into GeoBase to measure and monitor resource condition and trend.	In House	Low
1.3.2: As necessary, obtain aerial photography and geo-referenced data layers for areas outside the installation to help assess regional and ecosystem-wide resource management issues.	In House	Low
1.4.1: Develop an easily accessible, DoD-compliant Natural Resources public website with information covering program activities, rules and regulations, maps, photographs, and outdoor recreation opportunities.	In House, PA	Medium
1.4.2: Periodically provide briefings, news articles, email, website updates, etc. that address natural resource management activities and concerns	In House	Low
1.5.1: Closely coordinate any compliance or resource damage issues with 10th Security Forces, USFWS, and CPW.	In House	Medium
1.5.2: Maintain Natural Resource Manager's qualifications through the attendance of national, regional, and state conferences and other professional development training opportunities as funding allows.	USFWS Coop Agreement	Low
1.5.3: Obtain necessary permits, including Clean Water Act 404, Migratory Bird depredation and salvage, Bald and Golden Eagle Protection Act, wildland fire, roadkill wildlife possession, etc.	In House	Medium
1.5.4: Pursue a Conservation Law Enforcement Officer (CLEO) position staffed through the U. S. Fish and Wildlife Service National Wildlife		

Refuge System (Law Enforcement)	AFCEC	Medium
1.6.1: Through implementation of other INRMP Goals, quantify and mitigate environmental stressors (e.g., climate change, invasive species, altered hydrology and fire regimes, wildlife and forest diseases and pests, overpopulation) that affect biological diversity and ecological integrity.	In House, multiple EQ	Medium
1.6.2: Through various media, continue to educate base residents, personnel, visitors, and commanders of the economic and ecological benefits of managing natural landscapes using the principles of ecosystem management.	In House	Low
1.6.3: Participate on collaborative teams dedicated to exploring complex and pressing natural resource issues, especially affecting the USAFA and Farish.	In House	Low
1.6.4: Actively partner with the Pike National Forest as an adjacent landowner to the USAFA and Farish, to address regional forest health issues and maximize effectiveness of forest management across boundaries.	In House	Medium
1.6.5: Participate in the U.S. Forest Service (USFS) Forest Health Protection (FHP) program to secure funds for forest insect and disease protection. Host an annual biological site visit with the FHP staff in September to review previous year accomplishments and discuss the proposal for the following year. Submit Form FS 3400-2 to be considered for funding annually by the deadline (~Oct. 1).	In House	Medium
1.6.6: Work closely with the USFS FHP staff to identify unknown insect and disease agents. Submit samples and request field visits as needed to collaborate on findings and articulate management needs.	In House	Medium
1.6.7: Cooperate with the USFS, USDA Animal and Plant Health Inspection Service (APHIS) and other agencies to monitor for insect and disease issues. Place traps, etc. in suitable locations, and monitor as needed. Participate in		

regional workshops and other forums to maintain currency on forest health issues.	In House	Medium
2.1.1: Publicize wildlife viewing opportunities and proper ways to observe and interact with wildlife through various media. Provide "Living with Wildlife" brochures to educate the public on how to minimize wildlife-human conflicts.	In House	Low
2.1.2: Monitor the deer and elk population for the prevalence of chronic wasting disease.	In House	Medium
2.1.3: Coordinate with CPW, USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.	In House	Medium
2.1.4: Coordinate with Civil Engineering, Forces Support Squadron, and the base housing contractor to provide animal-resistant trash receptacles to protect wildlife and reduce potentially hazardous wildlife-human interaction.	In House	Medium
2.2.1: Coordinate project schedules in advance with proponents to ensure projects don't impact nesting birds or as necessary, perform field surveys for nesting birds prior to site disturbance planned during the typical March-August nesting season. Obtain a migratory bird or Bald and Golden Eagle Protection Act permit when impacts cannot be avoided by adjusting the project scheduling.	In House	Medium
2.2.2: Obtain migratory bird salvage and depredation and Bald and Golden Eagle Protection Act permits to collect dead birds, control nuisance species (e.g., double-crested cormorant), and mitigate any airfield BASH concerns.	In House	Medium
2.2.3: Interact at least quarterly with Airfield Management, Flight Safety, USDA, and the Bird Hazard Working Group to develop procedures and management actions to reduce the Bird-Aircraft Strike Hazard (BASH) through habitat and wildlife control actions. Assist the Airfield staff with identifying bird mortalities, harassing		

wildlife from the airfield environment, and reviewing the BASH Plan.	In House	Medium
2.2.4: Perform informal and formal bird surveys in aquatic and terrestrial habitats and add observations to the Cornell Lab of Ornithology eBird database.	In House	Low
2.2.5: Provide logistical support for the maintenance and monitoring of 150+ blue bird nest boxes on USAFA by CPW volunteers.	In House	Low
2.2.6: Monitor above-ground utilities for potential bird electrocution hazards and mitigate as necessary.	In House	Low
2.2.7: Maintain a geo-referenced database (GeoBase) of active and inactive nesting sites.	In House	Low
2.3.1: Coordinate with CPW to perform a base-wide count of deer, elk, turkey, and other non-game wildlife of interest.	In House	Low
2.3.2: Based on population estimates, coordinate with CPW on the number of deer and elk licenses to be issued to help maintain a target population of approximately 250 deer and 30 elk.	In House	Low
2.3.3: Sustain a flock of approximately 150 Merriam's turkey to prevent bird-human conflicts. Provide fall and spring archery-only hunting opportunities.	In House	Low
2.3.4: Continue to discuss with CPW ways to reduce the "trophy" nature of the buck deer hunting.	In House	Low
2.4.1: Conduct electrofishing survey to assess native fish populations and aquatic and biotic health and integrity.	In House, EQ XQPZA53276119	Medium
2.4.2: Protect and encourage beaver (and their dams) to help maintain stream base flow, mitigate stormwater impacts, and provide deeper water habitat for sustaining native fish populations. Only remove beavers and dams that are negatively affecting stormwater management (e.g., plugging culverts) or the diversion of water to the fishing lakes.	In House	Low
2.5.1: Through field observations and		

reports, maintain a species list of rare sightings and wildlife known to inhabit or frequent the installation.	In House	Low
2.5.2: Assist with Department of Biology and cadet independent study wildlife projects, such as track counts, coyote howling surveys, and maintaining motion-detector game cameras.	In House	Low
2.5.3: Perform surveys for eastern black rail to assess their occurrence on the Air Force Academy	In House	High
2.5.4: Perform echo-location acoustic monitoring and/or mist-netting surveys to assess the occurrence of bat species on Academy property	In House/NABat/AFCEC , EQ	High
2.6.1: Coordinate with 10th Security Forces, Pest Management, or Base Housing to identify, capture, and transfer nuisance pets and feral animals to the Pikes Peak Humane Society.	In House	Low
2.7.1: Conduct Preble's population and habitat assessments and provide monitoring data and reports to USFWS.	EQ XQPZA53277119	High
2.7.2: Implement habitat and stream restoration projects in degraded Preble's meadow jumping mouse habitat.	In House, EQ XQPZA53277118	High
2.7.3: As necessary, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any change in habitat suitability and non-habitat areas.	In House	Medium
2.7.4: Participate in the implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan and associated Site Conservation Team.	In House	Medium
2.8.1: In coordination with CPW, USFWS, and CNHP, review a list of special status species that are known or likely to occur on USAFA.	In House	Medium
2.8.2: Maintain a geo-spatial database of populations and habitats of special status species.	In House	Medium

2.8.3: Conduct field surveys to evaluate the occurrence, abundance, threats, and management needs of special status species.	In House	Medium
2.8.4: Conduct field surveys to evaluate the condition, trend, threats, and management needs of ecologically important habitats, including the CNHP-designated Potential Conservation Areas, Natural Areas, and rare plant communities.	In House	Low
3.1.1: Coordinate with the Civil Engineering Heavy Equipment Shop to develop road grading and culvert maintenance standards and practices similar to those used by the US Forest Service, and construct stormwater infrastructure that minimizes vegetation damage and can sustainably collect and release water without causing erosion.	In House	Low
3.1.2: In coordination with Civil Engineering, opportunistically relocate above- and below-ground utilities out of wetlands and floodplains as part of planned construction projects.	In House	Low
3.1.3: Through the Community Planner and various public forums, continue to document and communicate to City and County governments and developers the adverse impact that an altered rate and volume of off-base stormwater is having on USAFA natural resources, infrastructure, and aesthetics.	In House	Medium
3.1.4: Continue to advocate for improvements in stormwater and urban runoff planning and regulation to protect the USAFA watershed.	In House	Low
3.1.5: In partnership with local government and developers, implement watershed protection and restoration projects to mitigate impacts on USAFA and downstream areas.	In House, EQ XQPZA53277118	High
3.2.1: Prevent activities which unnecessarily damage the vegetation cover, including unauthorized or undesirable ORV use, creation of social trails, excessive training or construction disturbance, and		

unnecessary mowing.	In House	Low
3.2.2: Use native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.	In House	Medium
3.2.3: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all authorized soil-disturbing projects utilize appropriate erosion control techniques and materials to prevent soil loss and promote revegetation.	In House	Medium
3.3.1: Assess the condition of wetland, stream channel, and floodplain areas and identify any factors causing a departure from a stable Proper Functioning Condition.	In House	Medium
3.3.2: As necessary and feasible, implement drainage projects to prevent or mitigate any causal factors posing a threat or creating system instability, with emphasis on sustaining or restoring habitat for the Preble's meadow jumping mouse and other wetland/riparian species. Projects must be designed to withstand the altered rate, volume, frequency, and discharge hydrograph resulting from any increase in local and regional stormwater and urban runoff. When feasible, drainage and habitat restoration projects should also be designed to remove or mitigate barriers to native fish passage.	In House, EQ XQPZA53277118	High
3.3.3: As necessary, update the wetland and floodplain inventory and mapping in GeoBase.	In House	Low
4.1.2: Conduct annual weed monitoring and 5-year base-wide surveys to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.	EQ XQPZA53276121	High
4.1.3: Update the Integrated Noxious Weed Management Plan to include new species, management priorities, monitoring protocols, and control techniques.	In House	Low

4.1.4: Coordinate with adjacent landowners and local governments to identify and control noxious weeds that could invade USAFA.	In House	Low
4.1.5: Utilize an integrated management approach (chemical, biological, mechanical, cultural practices) to control noxious weeds.	In House, EQ XQPZA53276121	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.	In House, 10 FSS	Low
4.2.2: In coordination with FSS, frequently inspect the fences, gates and watering sources to better control grazing use and access.	In House, 10 FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.	In House, 10 FSS	Low
4.2.4: Coordinate with FSS on manure disposal practices and approved locations to prevent inadvertent impacts to native vegetation or waterways.	In House, 10 FSS	Low
4.3.1: Inventory 400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy database.	In House, EQ XQPZA53276119	Medium
4.3.2: Perform forest health walkthrough surveys on 14,000 acres annually to evaluate insect and disease issues (i.e. bark beetles, dwarf mistletoe infection), and to identify management needs. Resurvey areas pruned for mistletoe to detect new infections and ensure treatment effectiveness.	In House, EQ XQPZA53276119, USFS 2N funds	High
4.3.3: Perform 150 acres of forest management annually to enhance forest health and to restore forests to a more open, natural condition, reminiscent of forests found under a historic fire regime. Management options include forest thinning, timber stand improvement, and sanitation pruning.	EQ XQPZA53276119, USFS 2N funds	Medium
4.4.1: Locate infested trees (through field surveys in Project 4.3.2) and treat		

promptly (de-barking, chipping, hauling to a "safe" place; wrapping in plastic) to eradicate developing insect broods, especially when populations are high. Tree removal due to beetle attack varies but is expected to range from 300 to 1,000 annually, with an average of 700 per year.	In House, EQ XQPZA53276119, USFS 2N funds	High
4.4.2: Identify high risk or high-profile trees for spraying to prevent bark beetle attack. Base spray program on existing beetle populations and stressor affecting trees (i.e., root damage, drought, etc.). Track pesticide usage and report to Pest Management. An estimated 400 trees per year will be sprayed.	EQ XQPZA53276119	High
4.4.3: Coordinate with the Academy Biology faculty to develop projects that would benefit Natural Resources and educate cadets on land management.	In House	Low
4.4.4: Perform field inventory for beetle-infested trees on privatized land on the USAFA and arrange for prompt removal of infested trees via contract. Coordinate with Forest City on field survey and tree removal activities.	In House, EQ XQPZA53276119, USFS 2N funds	Medium
4.5.1: Re-delineate forest stand boundaries on the USAFA and Farish, due to availability of improved digital orthophotos, changed forest conditions and higher stand definition standards. The forested component represents approximately 14,000 acres, including stands with at least 20 square feet of basal area per acre.	In House, EQ XQPZA53276119	Low
4.6.1: Perform annual sweep of all managed trails at the USAFA and Farish to identify potentially hazardous trees.	In House	Medium
4.6.2: Arrange for felling of potentially hazardous trees identified (in Project 4.6.1) via contract logger. An annual estimated 200 trees will be cut.	EQ XQPZA53276119	Medium
4.6.3: Accomplish a hazard tree inventory on all trees within Peregrine Pines Family Campground, Farish camping areas, and major trailheads. Delineate inventory areas based on		

potential tree strike distance to targets (concentrated use areas, parking spots, etc.). Utilize the USFS Hazard Tree Rating system to quantitatively document and track tree health conditions.	In House	Medium
4.7.1 Complete Urban Forest Management review to update tree planting list, tree management recommendations, soil property study,	EQ XQPZA53276119	High
4.7.4: Stock Natural Resources seedlings nursery with 450 seedlings	In House	Low
4.7.6: Perform seedling survival surveys for areas planted in 20218 and 2022. Schedule replanting as necessary.	In House	Low
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing.	In House	High
4.8.5: Partner with the U.S. Forest Service and other land management agencies to evaluate regional decline of aspen and discuss/adopt future management strategies.	In House	Low
4.9.2: Revisit previous overstory thinning and mastication sites to quantitatively and photographically document growth response.	In House	Medium
4.9.3: Collaborate with the USAF Wildland Fire Center and regional stakeholders on oak management, identifying and employing adaptive management strategies as appropriate.	In House, WFC	Low
4.10.1: Manage Natural Resource woodlot for firewood sales. Submit sales receipts per USAF protocol.	In House	Low
4.10.2: Under conducive moisture conditions, thin existing pine plantations by selling transplant trees as a forest product. Submit sales receipts per USAF protocol.	In House	Low
4.11.1: Take pre-treatment photos of all mature forest thinning areas, ranging across a variety of stand conditions and representing a density		

of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage	In House	Medium
4.11.2: Document other forestry activities to include planting, pruning, beetle-infested tree treatment, etc. with anecdotal photos. Catalog by activity and month/year completed.	In House	Low
4.11.3: GPS all harvest unit boundaries, and planting areas of at least one acre in size. Include contractor name and project dates in attribute data. To the extent feasible, digitize all beetle-infested trees removed to help track trends and focus subsequent field surveys.	In House	High
4.11.4: Track all accomplishments in GIS. Coordinate with the USAFA Geo Integration Office (GIO) to assimilate pertinent forestry data into the USAFA GeoBase. Specifically, this will include updated forest stand inventory data, annual forest thinning accomplishments, and bark beetle tree mortality data.	In House, GIO	Low
4.12.2: Review proposed landscape plans as time allows. Emphasize the need for xeriscaping and commensurate irrigation needs by planting zone.	In House	Low
4.12.3: Host annual USAFA Tree Board Meeting	In House,	Medium
4.12.6: Collect urban tree inventory data on stressed trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.	EQ XQPZA53276119	Low
4.12.7: Coordinate with Grounds Maintenance to effectively utilize urban tree inventory data.	In House	Low
4.12.8: Complete annual Tree City USA application in December and Arbor Day proclamation. Host Arbor Day ceremony annually in April.	In House	Medium
4.12.9: In accordance with the base's		

Erosion Control, Revegetation, and Tree Care Standards, ensure all projects adhere to tree care specifications to help ensure health and longevity of newly planted landscapes, and minimize damage to trees from construction work.	In House	Low
4.13.1: Coordinate with Airfield Operations to ensure that trees are removed from airfield clear zones.	In House, EQ XQPZA53276119, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.	EQ XQPZA53276119, 306/OSS	Medium
4.13.3: Assess potential for transplant trees to be removed during clearing operations and arrange for sale or use of said trees on base if suitable.	In House	Low
5.1.2: Implement the WFMP, and review progress annually with the Sikes Act Cooperators and the WFC.	In House, WFC EQ AFCE190105	Medium
5.2.2: Update the Wildland Fire Management Annual Operating Plan (AOP).	In House	Medium
5.3.1: Clear 70 acres annually of areas of high fuel loading for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.	WFC, EQ AFCE190105	High
5.3.3: Limb conifers retained within shaded fuelbreak areas to a height of approximately six feet. An estimated 300 trees will be limbed annually.	WFC, EQ AFCE190105	Low
5.4.1: Clear brush and lower tree limbs and rake woody and leafy debris from close proximity to five sites annually. A site may consist of a building, utility site, etc. Clearing distance will depend on fuel type, density and terrain.	WFC, EQ AFCE190105	Low
5.4.2: Reassess the Douglass and Pine Valley housing areas with fuel hazard assessments of homes, coordinating with USAFA firefighters to identify hazards and prioritize treatments.	In House, WFC, EQ AFCE190105 10CES/CEF	Low
5.5.1: Secure a smoke permit and perform a prescribed broadcast burn as weather and conditions allow.	In House, WFC EQ AFCE190105, 10CES/CEF	High
5.5.1.1: Install monitoring plots to		

evaluate results of this burn; assess at the end of the growing season.	In House	Low
5.5.3: Assess the need for and benefits of additional prescribed fire, and update INRMP accordingly.	In House, WFC EQ AFCE190105	Low
5.6.1: Take pre-treatment photos of all projects, ranging across a variety of conditions and representing a density of at least one photo per three acres. GPS and annotate photo points. Take post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage.	In House	Low
5.6.2: GPS all fuels treatment project boundaries. Include contractor name (if applicable) and project dates (to include month and year) in attribute data. Add to applicable GeoBase layers.	In House	Low
5.7.1: Play an active role in the Colorado Springs Wildfire Mitigation Committee and the Pikes Peak Area Council of Governments Joint Land Use Study. Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.	In House	Medium
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.	In House	Low
6.1.1: Require a reasonable fee for annual, one-day, and second rod permits to generate income for a self-supporting program of stocking hatchery-reared fish. Provide discounted fishing permits for disabled veterans (DAV) and Purple Heart recipients. Coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.	In House, 57X F&W Reimbursable Account	Low
6.1.2: Periodically conduct angler interviews and collect creel information to track angler success and satisfaction with the fishing program and recreational experience.	In House	Low
6.1.3: Improve and maintain safe, pedestrian-friendly fishing access on		

shoreline trails and piers.	In House	Low
6.1.4: Seasonally monitor aquatic weed and algal growth in the fishing lakes and treat with approved algaecides or sterile grass carp. As necessary, maintain multiple age classes of grass carp to promote effective biological weed control.	In House	Low
6.1.5: Monitor for fish diseases and parasites and take appropriate management actions. Stock whirling disease-free fish in accordance with CPW regulations.	In House	Low
6.1.6: Opportunistically control any undesirable fish species without having a detrimental impact on the stocked fish population.	In House	Low
6.1.7: Monitor for invasive aquatic species and take appropriate management actions.	In House	Medium
6.1.8: Maintain and improve water diversion structures to better capture and regulate water flow and minimize sediment transport to the lakes.	In House	Low
6.2.1: Repair and maintain the 22+ mile trail network using the techniques and guidelines outlined in the Trails Management Plan and Maintenance Standards, and those recommended by the International Mountain Biking Association (IMBA) and other trail organizations. Re-route trails as necessary to promote long-term sustainability and reduce annual maintenance needs.	In House, EQ XQPZA53276119	Medium
6.2.2: Coordinate with the Cadet Mountain Biking Club/Team, IMBA, Medicine Wheel Trail Advocates, and other trail groups to design and construct trail re-routes, technical features, and skills/challenge courses that enhance the user experience, improve trail sustainability, and protect the environment.	In House	Low
6.2.3: Partner with Medicine Wheel Trail Advocates and/or IMBA to provide volunteers, or train new volunteers, for trail construction and maintenance.	In House	Low

6.2.4: Coordinate with the Force Support Squadron (FSS) to designate sustainable horse trails in the Pine Valley area and work to limit the proliferation of unsustainable "social" trails.	In House, 10 FSS	Low
6.2.5: Coordinate with El Paso County and the City of Colorado Springs concerning public access and the maintenance of the New Santa Fe Trail and LaForet Trail.	In House	Low
6.2.6: Expand and upgrade the trail signage and provide user-friendly trail maps and information kiosks to improve the user experience.	In House, EQ XQPZA53276119	Low
6.2.7: Provide picnic tables, animal-resistant trash containers, and restroom facilities at high volume trailheads and parking areas to enhance the user experience and reduce littering and environmental damage.	In House	Low
6.2.8: Coordinate with the US Forest Service, Pikes Peak Ranger District, to regulate and maintain the trail access between the USAFA and USFS property.	In House	Low
6.3.1: Coordinate with USAFA/A3O to update the user requirements and regulations for the B-52 camping area.	In House, USAFA A3O	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.	In House, USAFA A3O	Low
6.4.1: Provide training to 10th Security Forces, 10 Civil Engineering Squadron, and the Jacks Valley Training Area Superintendent concerning the proper use of ORV's to minimize environmental impacts. Brief the proper operation and authorized use of ORV's at the annual 10 CES Facility Manager training.	In House	Low
6.4.2: As necessary, close and restore undesirable ORV trails using signage, fencing, barriers, revegetation, and erosion control features.	In House	Low

11 REFERENCES

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)*

Avian Power Line Interaction Committee. 2006. Suggested practices for avian protection on power lines: State of the art in 2006. Final Project Report CEC-500-2006-022.

The Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service (USFWS). 2005. Avian protection plan (APP) guidelines.

Carver, B.D. 2019. Bat (Chiroptera) surveys for Midwest AFCEC installations. Tennessee Tech University, Final Report, Agreement W9126G-18-2-0057

Center for Environmental Management of Military Lands (CEMML). 2020. Vegetation classification and mapping, United States Air Force Academy.

Center for Environmental Management of Military Lands (CEMML). 2021. Climate Change Assessments for Integrated Natural Resource Management Plans: U.S. Air Force Academy, Bullseye Auxiliary Airfield, and Farish Recreation Area.

Colorado Natural Heritage Program. 2005-2020. US Air Force Academy annual noxious weed monitoring reports.

Colorado Natural Heritage Program. 2015. US Air Force Academy Integrated Noxious Weed Management Plan.

Colorado Natural Heritage Program. 2012, 2018. US Air Force Academy Biological Inventory.

DeFusco, Russell P. and J. Frank Cassel. 1988. Check-list of the birds of the United States Air Force Academy, Colorado. Department of Biology, USAF Academy, CO

EDM International, Inc. 2008. Re-evaluation of power lines for avian electrocution risk at the U.S. Air Force Academy. 4001 Automation Way, Fort Collins, CO.

Ellington, A.R, S.M. Kettler, S.C. Spackman, C.A. Pague, and J.G. Corn. 1996. Significant natural heritage resources of the United States Air Force Academy and their conservation. Colorado Natural Heritage Program, Colorado State University, Fort Collins, CO.

ESCO Associates, Inc. 1992. Natural areas inventory, U.S. Air Force Academy, El Paso County, CO, final report. Unpublished report to The Nature Conservancy of Colorado, Boulder, CO.

Grunau, L., K. Decker, M. Fink, B. Kuhn, R. Schorr, J. Sovell, R. Cook, and D. Jones2. 2017. Threats and Stressors to SAR and Ecological Systems, Practical Implications, and Management Strategies for Installations in Colorado and the Western U.S.

Kushlan, J. A., M. J. Steinkamp, K. C. Parsons, J. Capp, M A. Cruz, M. Coulter, I. Davidson, L. Davidson, L. Dickson, N. Edelson, R. Elliot, R. M. Erwin, S. Hatch, S. Kress, R. Milko, S. Miller, K. Mills, R. Paul, R. Phillips, J E. Saliva, Sydeman, J. Trapp, J. Wheeler, and K. Wohl. 2002. Waterbird conservation for the Americas: The North American waterbird conservation plan, Version 1. Waterbird conservation for the Americas, Washington, DC.

Langlois, Christopher T. and Elizabeth L. Munson. 1991. Guide to the mammals of the United States Air Force Academy, Colorado. Department of Biology, USAF Academy, CO.

Monument Creek Watershed Restoration Master Plan. 2016. Fountain Creek Watershed Flood Control and Greenway District.

NaBat National Data Processing Lab, 2022. Bat acoustic survey results, US Air Force Academy.

Natural Resources Conservation Service (NRCS). 2006. Soil survey geographic (SSURGO) database for El Paso County, Colorado. Available at: *http://SoilDataMart.nrcs.usda.gov*.

Neely, B. S. Kettler, J. Horsman, C. Pague, R. Rondeau, R. Smith, L. Grunau. P Comer, G. Belew, F. Pusateri, B. Rosenlund, D. Runner, K. Sochi, J. Sovell, D. Anderson, T. Jackson, and M. Klavetter. 2006. Central shortgrass prairie ecoregional assessment and partnership initiative. The Nature Conservancy of Colorado and the Shortgrass Prairie Partnership, Boulder, CO.

Norat, E., S. Gray, and C. Wolfenbarger. 2021. US Air Force Academy Biology Department Bio481 bat acoustic sampling.

Rich, T. D., C. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Ingio-Elias, J. A. Kennedy, A. M. Martell, A. O. Panjabi, P. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, T. C. Will. 2004. Partners in flight North American landbird conservation plan. Cornell Lab of Ornithology. Itacha, NY.

Ripley, J. Douglas. 1994. Vegetation of the United States Air Force Academy and the adjacent regions of the Pike National Forest, El Paso County, Colorado. Department of Biology, USAF Academy, CO.

Schorr, Robert A. 2001-2020. Meadow jumping mice (*Zapus hudsonius preblei*) on the U.S. Air Force Academy, El Paso County, Colorado. Colorado Natural Heritage Program, Colorado State University, Fort Collins, CO.

Siemers, Jeremy L., Robert A. Schorr, and Aaron C. Rinker. 2003. Distributional survey of rare small mammals (Orders Insectivora, Chiroptera, and Rodentia) in Colorado: Year one. Colorado Natural Heritage Program, Colorado State University, Fort Collins, CO.

Thomasson, Joseph R. 1994. Late Cretaceous-Paleocene fossil plants from Scotty's palms local flora, U.S. Air Force Academy, Colorado. *In*: J. Douglas Ripley. Vegetation of the United States Air Force Academy and the adjacent regions of the Pike National Forest, El Paso County, Colorado. Department of Biology, USAF Academy, CO.

URS Group, Inc. 2002. Wetlands delineation, U.S. Air Force Academy.

URS Group, Inc. 2002. Surface water management plan for the United States Air Force Academy composting facility. URS, Group, Inc., Colorado Springs, CO.

URS Group, Inc. 2003a. USAF Academy floodplains revision (Phase 1: Monument, Kettle, and Deadman's Creeks, and Lehman Run). URS Group, Inc., Colorado Springs, CO.

URS Group, Inc. 2003b. USAF Academy floodplains revision (Phase 2: Goat Camp and Stanley Canyon Creeks, and eastern tributaries). URS Group, Inc., Colorado Springs, CO.

URS Group, Inc. 2006a. USAF Academy, Jacks Valley stormwater best management practices. Recommendation study. URS Group, Inc., Colorado Springs, CO.

URS Group, Inc. 2006b. USAF Academy, Cadet Area stormwater best management practices. Recommendation study. URS Group, Inc., Colorado Springs, CO

URS Group, Inc. 2006c. USAF Academy, Community Center stormwater best management practices. Recommendation study. URS Group, Inc., Colorado Springs, CO.

URS Group, Inc. 2006d. USAF Academy, main airfield best management practices. Findings and recommendations study. URS Group, Inc. Colorado Springs, CO.

U.S. Army Corps of Engineers (USACE). 1987. Wetlands delineation manual. Technical Report Y-87-1. USACE Environmental Laboratory, Vicksburg, MS.

U.S. Air Force Academy. 2020. Pest management plan for the U.S. Air Force Academy. USAF Academy, CO.

U.S. Air Force Academy. 2020. Bird/wildlife aircraft strike hazard (BASH) plan.

U.S. Fish and Wildlife Service. 2018. Recovery Plan, Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*).

12 ACRONYMS

Standard Acronyms *(Applicable to all USAF installations)*

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

ABW 10th Air Base Wing

AFCEC Air Force Civil Engineer Center

BASH	Bird/Wildlife Aircraft Strike Hazard
CDPHE	Colorado Department of Public Health and Environment
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
FEMA	Federal Emergency Management Agency
FEP	Facility Excellence Plan
ICRMP	Integrated Cultural Resources Management Plan
NEPA	National Environmental Policy Act
REPI	Readiness Environmental Protection Initiative
USACE	US Army Corps of Engineers
USAF	US Air Force
USAFA	US Air Force Academy
USEPA	US Environmental Protection Agency

13 DEFINITIONS

Standard Definitions *(Applicable to all USAF installations)*

- Natural Resources Playbook – Definitions Section

- **Multiple-Use and Sustained Yield Management** – The care and use of natural resources so as to best serve the present and future needs of the United States and its people without impairing the productivity of the land and water.
- **Recreation Carrying Capacity** – The level of recreational use that an area can sustain without damage to the environment.
- **Rotation Age** – The planned number of years between the regeneration of a forest stand and its final cutting at a specified stage of maturity.
- **Special Natural Area** – Areas on bases that contain natural resources that warrant special protection efforts. Special Natural Areas can include botanical areas, ecological reserves, geological areas, riparian zones, scenic areas, and zoological reserves. A Special Natural Area designation in an INRMP is a temporary status that is applicable for the period covered by the INRMP, and can be rescinded by order of the Base or Wing Commander. Such areas will be reassessed if the military mission requirements of the base change, during any base realignment or closure action involving the property, or if the property becomes excess and requires disposal.
- **Urban Wildlife** – Wildlife that habitually live or periodically survive in an urban environment on improved or semi-improved grounds.
- **Watchable Wildlife Areas** – Areas identified under the Watchable Wildlife Program as suitable for passive recreational uses such as bird watching, nature study, and other non-consumptive uses of wildlife resources.
- **Wildlife-Carrying Capacity** – The maximum density of wildlife that a particular area or habitat can carry on a sustained basis without deterioration of the habitat.

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. 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 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.
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.
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 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.
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.

B WILDLAND FIRE MANAGEMENT PLAN

Available upon request to USAFA Natural Resources, (719) 333-3308

C BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD (BASH) PLAN

Available upon request to USAFA Natural Resources, (719) 333-3308

D GOLF ENVIRONMENTAL MANAGEMENT (GEM) PLAN

Available upon request to USAFA Natural Resources, (719) 333-3308

E INTEGRATED CULTURAL RESOURCES MANAGEMENT PLAN (ICRMP)

Available upon request to USAFA Natural Resources, (719) 333-3308

F INTEGRATED PEST MANAGEMENT PLAN (IPMP)

Available upon request to USAFA Natural Resources, (719) 333-3308

G INTEGRATED NOXIOUS WEED MANAGEMENT PLAN

Available upon request to USAFA Natural Resources, (719) 333-3308

H TRAILS MANAGEMENT PLAN AND MAINTENANCE STANDARDS

Available upon request to USAFA Natural Resources, (719) 333-3308

I CONSERVATION AND MANAGEMENT PLAN FOR PREBLE'S MEADOW JUMPING MOUSE ON USAFA

Available upon request to USAFA Natural Resources, (719) 333-3308

J INRMP UPDATE REPORT

January 2020

Section 7.1 The increased fishing permit fees to be implemented in January 2020 was added. Section 7.1 The new archery-only turkey hunting program instituted in 2019 was added.

Section 7.8 Updated timber market development efforts. Section 7.8 New thinning prescription was added.

Section 7.8 Updated Pine Plantation and WUI management strategy. Section 7.8 Cold Stress damage added.

Section 7.9 Projects and partnership with the Wildland Fire Support Module added.

Section 7.11 The observation of a new noxious weed, orange hawkweed, at Farish Recreation Area was added. Section 7.12 The involvement of USDA-Wildlife Services in the airfield's BASH program was added.

Section 8.0 The Management Goals and Objectives were updated to reflect any changes and additions in the text of the plan. Section 10.0 The Annual Work Plans were updated through FY24.

January 2021

The organization and content of the INRMP was substantially updated to comply with the new T-EMP format. Information was added, deleted, or moved to a different section to improve clarity and accuracy.

Section 2.3.2.2 Information from the CSU/CEMML vegetation classification and mapping project was added. Section 2.3.2.3 The required Future Vegetation Cover supplement was added.

Section 2.3.4 Information on monarch butterfly and Eastern black rail was added. Section 7 The required Natural Resources Program Review supplement was added. Section 7.11 The noxious weed list was updated.

Section 7.16 The required Climate Change Vulnerability supplement was added. Section 10 The FY25 Annual Work Plan was added.

Section 11 References throughout the INRMP were updated. Section 12 Acronyms throughout the INRMP were updated. **January 2022**

Section 2.3.4 Added information on the Monument Creek Preble's Site Conservation Team. Section 7.16 Updated information from the CEMML Climate Change Assessment report.

Section 7.8 Updated beetle and pest infestations. Added climate change and urban stress damaging agents. Section 10 Added the FY 26 Annual Work Plan

Added Project 4.3.1. Inventory treatment units before forestry operations begin. Added Project 4.3.2. Annually perform forest health surveys.

Added Project 4.5.1. Update forest stand boundaries based on treatment units and new forest boundaries. Added Project 4.6.6. Conduct hazard tree surveys after each major environmental event.

Added Project 4.7.1. Maintain a tree seedling nursery.

January 2023

Extensive updates, revisions, and corrections throughout the INRMP in preparation for a major 5-year review and signature by the Academy, Colorado Parks and Wildlife, and U.S. Fish and Wildlife Service. No significant changes in Plan goals or objectives. Substantive updates are highlighted in the Executive Summary of the 2023-2028 INRMP.

K CLIMATE CHANGE ASSESSMENT FOR U.S. AIR FORCE ACADEMY, BULLSEYE AUXILIARY AIRFIELD, AND FARISH RECREATION AREA

2021 report available from the USAFA Natural Resources office, (719) 333-3308.

L WILDLAND FIRE MANAGEMENT ANNUAL OPERATING PROCEDURE

Available from the USAFA Natural Resources office. (719) 333-3308.