U. S. AIR FORCE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

U.S. Air Force Academy

(See INRMP signature pages for plan approval date)

ABOUT THIS PLAN

This installation-specific Environmental Management Plan (EMP) is based on the U.S. Air Force's (AF) standardized Integrated Natural Resources Management Plan (INRMP) template. This INRMP has been developed in cooperation with applicable stakeholders, which may include Sikes Act cooperating agencies and/or local equivalents, to document how natural resources will be managed. Non-U.S. territories will comply with applicable Final Governing Standards (FGS). Where applicable, external resources, including Air Force Instructions (AFIs); AF Playbooks; federal, state, local, FGS, biological opinion and permit requirements, are referenced.

Certain sections of this INRMP begin with standardized, AF-wide "common text" language that address AF 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 AF-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 AF environmental Installation Support Teams (ISTs) and/or installation personnel.

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.

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DOCUMENT CONTROL

Record of Review – The INRMP is updated not less than annually, or as changes to natural resource management and conservation practices occur, including those driven by changes in applicable regulations. In accordance with (IAW) the Sikes Act and AFI 32-7064, *Natural Resources Management*, the INRMP is required to be reviewed for operation and effect not less than every five years. Annual reviews and updates are accomplished by the base Natural Resources Manager (NRM), and/or an Installation Support Team 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 NR Media Manager) conducts an annual review of the INRMP in coordination with internal stakeholders and local representatives of the United States Fish and Wildlife Service (USFWS), state fish and wildlife agency, and National Oceanic and Atmospheric Administration (NOAA) Fisheries, where applicable, and accomplishes pertinent updates. Installations will document the findings of the annual review in an Annual INRMP Review Summary. By signature to 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. Following update, the installation NRM obtains approval signatures on the updated document.

INRMP APPROVAL/SIGNATURE PAGES

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN FOR THE UNITED STATES AIR FORCE ACADEMY

This Integrated Natural Resources Management Plan (INRMP) for the United States Air Force Academy, Colorado, meets the requirements of the Sikes Act (16 U.S.C. 670a et seq.) as amended and has been prepared in accordance with regulations, standards, and procedures of the Department of Defense and the United States Air Force. To the extent resources permit, the United States Air Force Academy will implement the actions associated with this plan and will strive to meet its goals and objectives.

Statement of Operation and Effect:

By their signatures below, all parties grant their concurrence and acceptance, having reviewed this plan, and agree that its goals and objectives contribute to the regional conservation and management of wildlife, forests, rare species, aquatic and terrestrial habitats, and wildland fuel hazards; and provide outdoor recreation opportunities.

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

Date

DAN PRENZLOW
Southeast Region Manager, Colorado Parks & Wildlife

Date

SHAWN CAMPBELL, Colonel, USAF
Commander, 10th Air Base Wing
⌊

Date

EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) has been developed for the U.S. Air Force Academy (the Academy) and the Air Force Civil Engineer Center (AFCEC) in accordance with Air Force Instruction (AFI) 32-7064, Integrated Natural Resources Management; 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 the Bullseye Auxiliary Air Field (Bullseye) and the surrounding environment, and presents various management practices designed to mitigate negative impacts and enhance the positive effects of the Academy's mission on local and regional ecosystems. 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. In some cases the implementation of some of these recommendations for improvement of natural resources on the Academy will need to be accommodated for the efficiency of the mission.

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, and Colorado Natural Heritage Program.

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 to discuss the workplan for the upcoming year. Any updates or revision of the INRMP are now accomplished in a timelier manner by editing this electronic 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 would conserve and enhance the regional ecosystems in which the Academy, the Farish Recreation Area, and the Bullseye Auxiliary Airfield, are embedded.

The overriding goals of the INRMP are as follows:

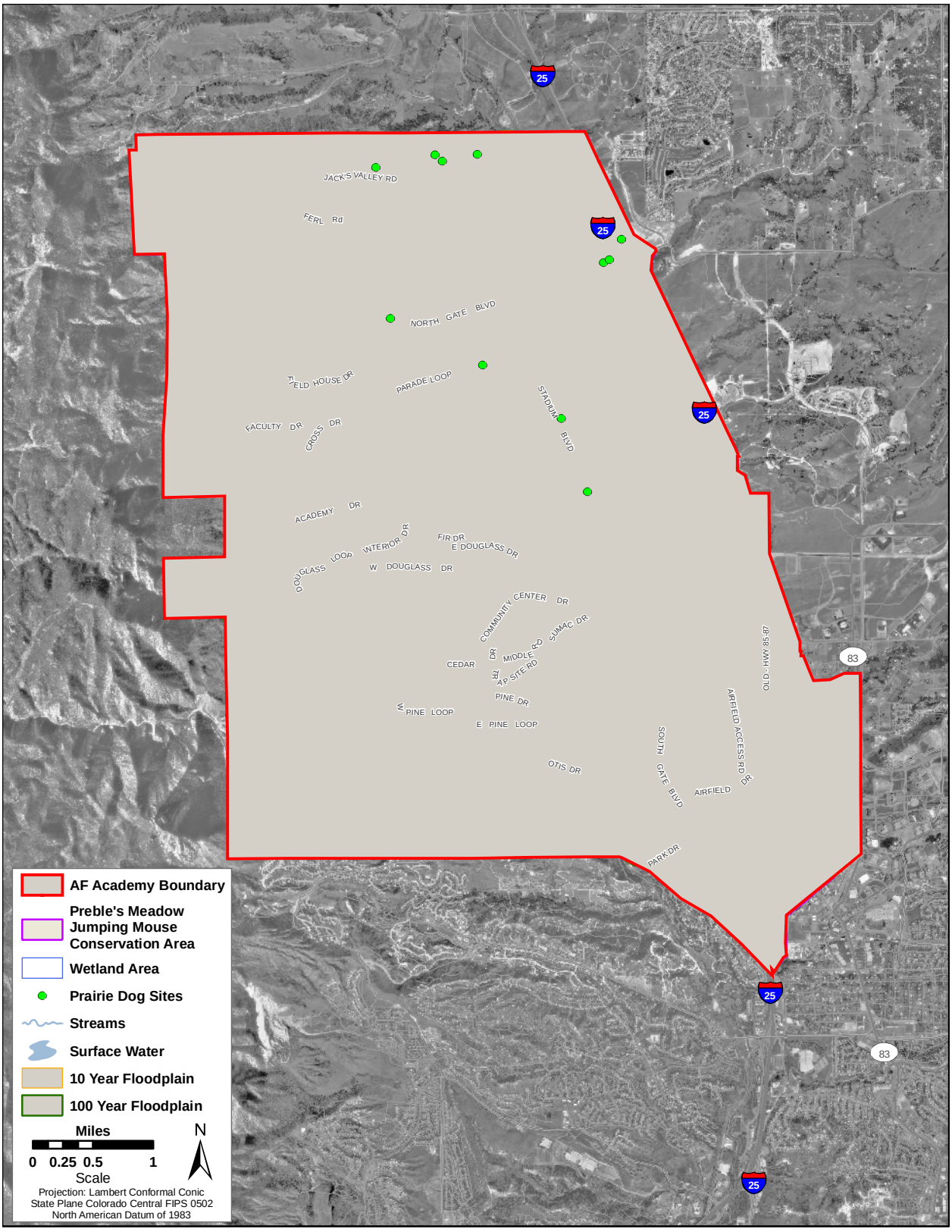
1. Manage for no net loss in the Academy's capability to support the military mission of the Academy
2. Minimize habitat fragmentation and promote the natural connectivity of habitats
3. Protect native species and discourage nonnative, invasive species
4. Protect rare and ecologically important species and unique or sensitive environments
5. Maintain or mimic natural processes
6. Protect genetic diversity

7. Conserve and enhance species, communities, and ecosystems on a regional basis
8. Monitor impacts on biodiversity
9. Provide quality, sustainable outdoor recreation opportunities.

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

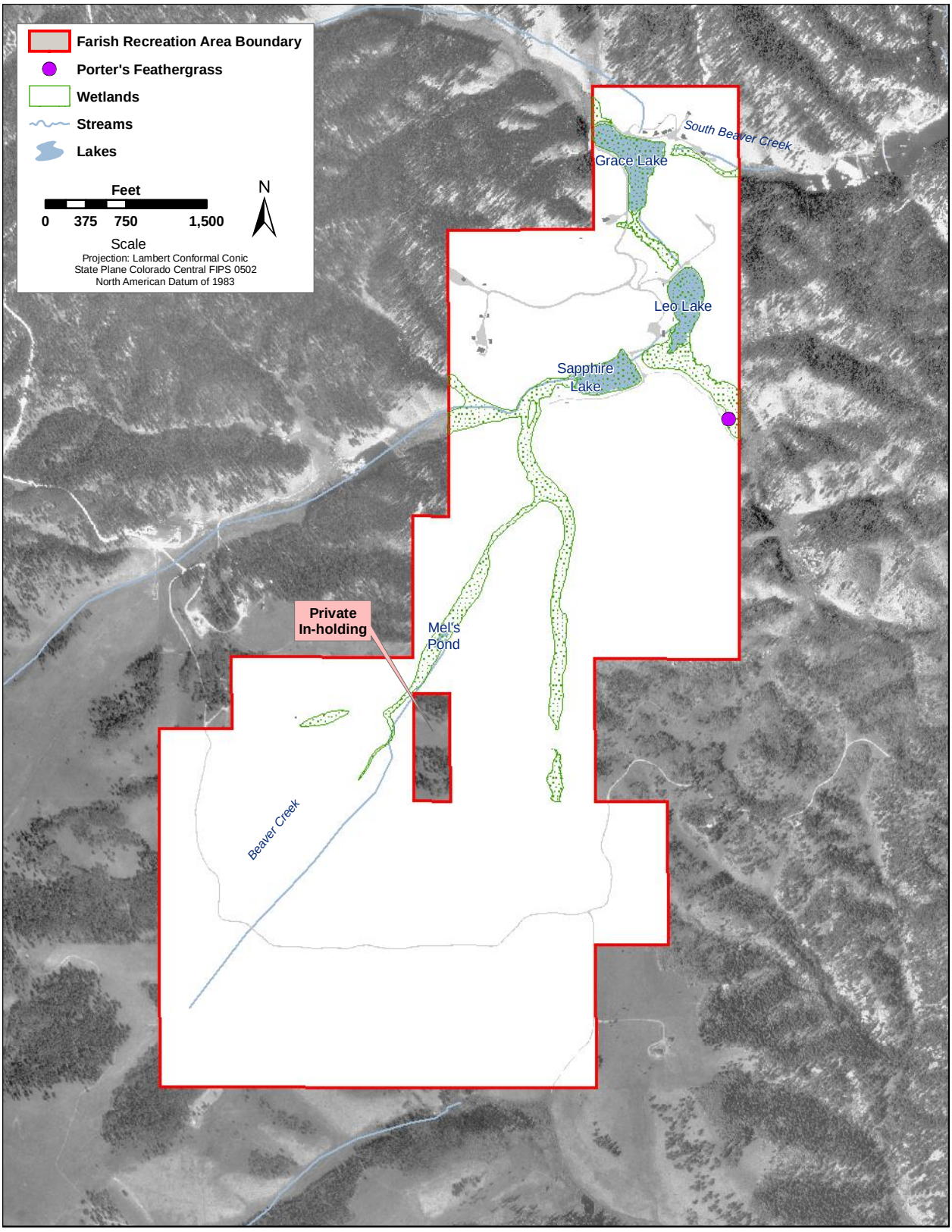
Throughout the development of this INRMP, management issues were identified in a number of natural resources subject areas. Some of these natural resources topics of concern could have an adverse impact on the Academy's mission or future planning operations. The potential negative impacts could range 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 for the base and to obtain workable and useful solutions for each topic of concern.

- 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.



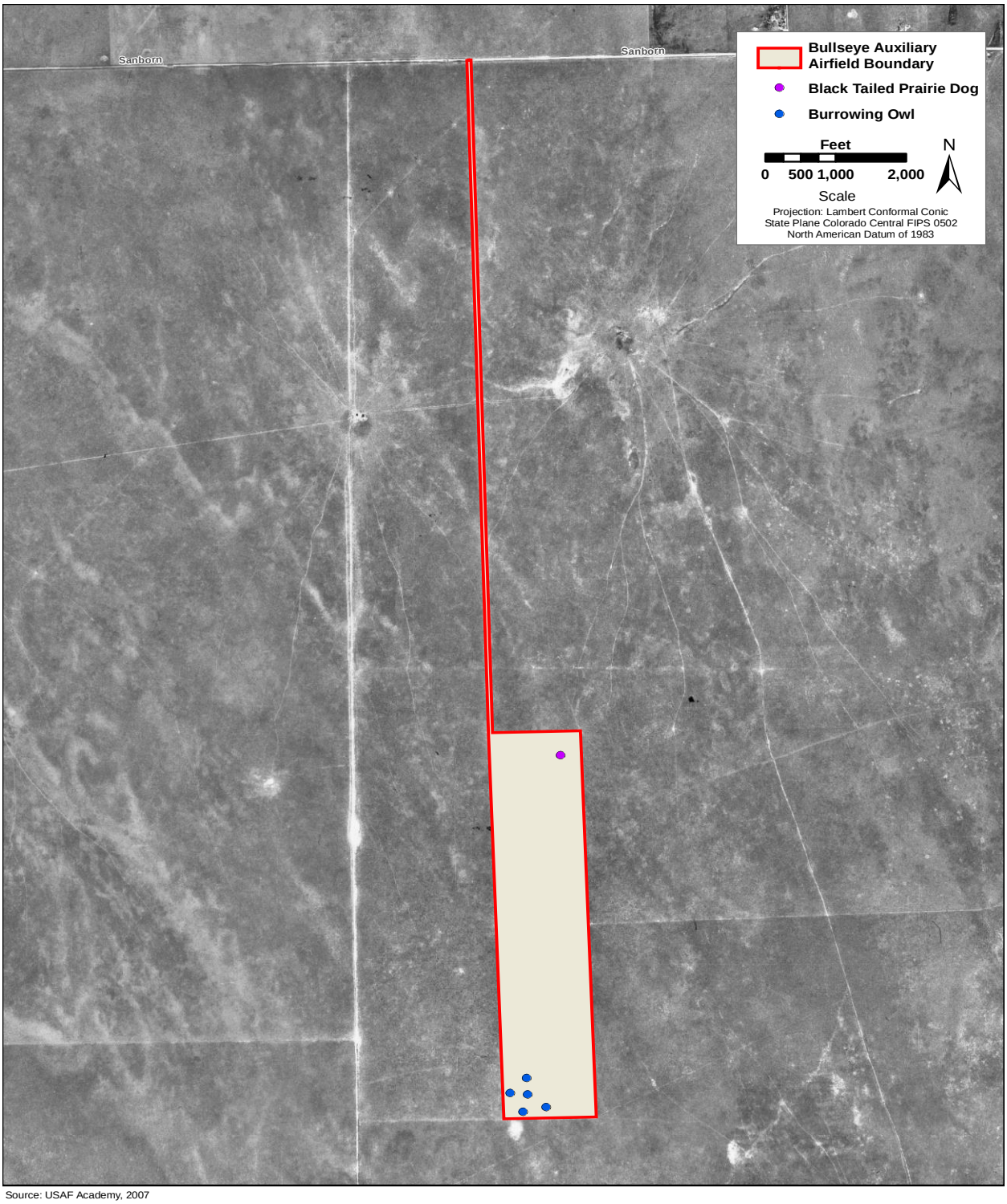
Sources: USAF Academy 2007b

Composite Natural Resources Constraints at the U.S. Air Force Academy



Source of Data: USAF Academy 2007b

Composite Natural Resources Constraints at the Farish Recreation Area



Source: USAF Academy, 2007

Composite Natural Resources Constraints at the Bullseye Auxiliary Airfield. Note: Burrowing owl and black-tailed prairie dog have not been observed at Bullseye since 2012, but they still pose a potential constraint.

1.0 OVERVIEW AND SCOPE

This INRMP was developed to provide for effective management and protection of natural resources. It summarizes the natural resources present on the installation and outlines strategies to adequately manage those resources. Natural resources are valuable assets of the United States Air Force. 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 Air Force adaptability in all environments. The Air Force has stewardship responsibility over 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 Air Force natural resources program is to sustain, restore and modernize natural infrastructure to ensure operational capability and no net loss in the capability of AF 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 base 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 Air Force Instruction (AFI) 32-7064, Integrated Natural Resources Management; 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 will be implemented to allow for the presence of mission-oriented activities, as well as environmental quality through the efficient management of natural resources.

The information presented in this INRMP is incorporated into the Academy Installation Development Plan. The Academy's comprehensive management planning process should continually incorporate the concerns presented in this INRMP so that the growth 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.

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 AFI 32-7064, Integrated Natural Resources Management, 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 AFI 32-7064. 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. Finally, AFI 32-7065 provides guidance on the preservation of cultural resources at USAF installations. 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. 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, and partners to promote environmental compliance and protection.
USAFAI 32-7001	Natural Resources on the USAF Academy, 21 July 2016
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	Specific site restoration standards included as part of the Overarching Environmental Standards
USAFA 91-212 BASH Plan	Bird-Aircraft Strike Hazard (BASH) Plan

1.4 Integration with Other Plans

AFI 32-7064, Integrated Natural Resources Management, 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, AFI 32-7064, section 3.10.3, *Integration with Other Installation Programs*, states, "Draft INRMP revisions must be coordinated through the installation chain of command and the BASH working group. Ensure that the INRMP, Integrated Cultural Resources Management Plan (ICRMP), Bird/Wildlife Air Strike Hazard (BASH) Plan, Integrated Pest Management Plan (IPMP), and Air Installation Compatible Use Zone (AICUZ) studies 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" (AFI 32-7064, 15.1.1). 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.

2.0 INSTALLATION PROFILE

Office of Primary Responsibility	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/POC	Brian Mihlbachler, Ph.D.
State and/or local regulatory POCs (For US-bases, include agency name for Sikes Act cooperating agencies)	U.S. Fish and Wildlife Service (Sikes Act) – Pam Sponholtz Colorado Division of Wildlife (State/Local)- Dan Prenzlow
Total acreage managed by installation	19,238
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
NR Program Applicability (Place a checkmark next to each program that must be implemented at the installation. Document applicability and current management practices in Section 7.0)	☑ Fish and Wildlife Management Program ☑Threatened and endangered species ☑ Invasive species ☑ Wetlands Protection Program ☑ Grounds Maintenance Contract/SOW ☑ Forest Management Program ☑ Wildland Fire Management Program ☐ Agricultural Outleasing Program ☑ Integrated Pest Management Program ☑ Bird/Wildlife Aircraft Strike Hazard (BASH) Program ☐ Coastal Zones/Marine Resources Management Program ☑ Cultural Resources Management Program

2.1 Installation Overview

2.1.1 Location and Area

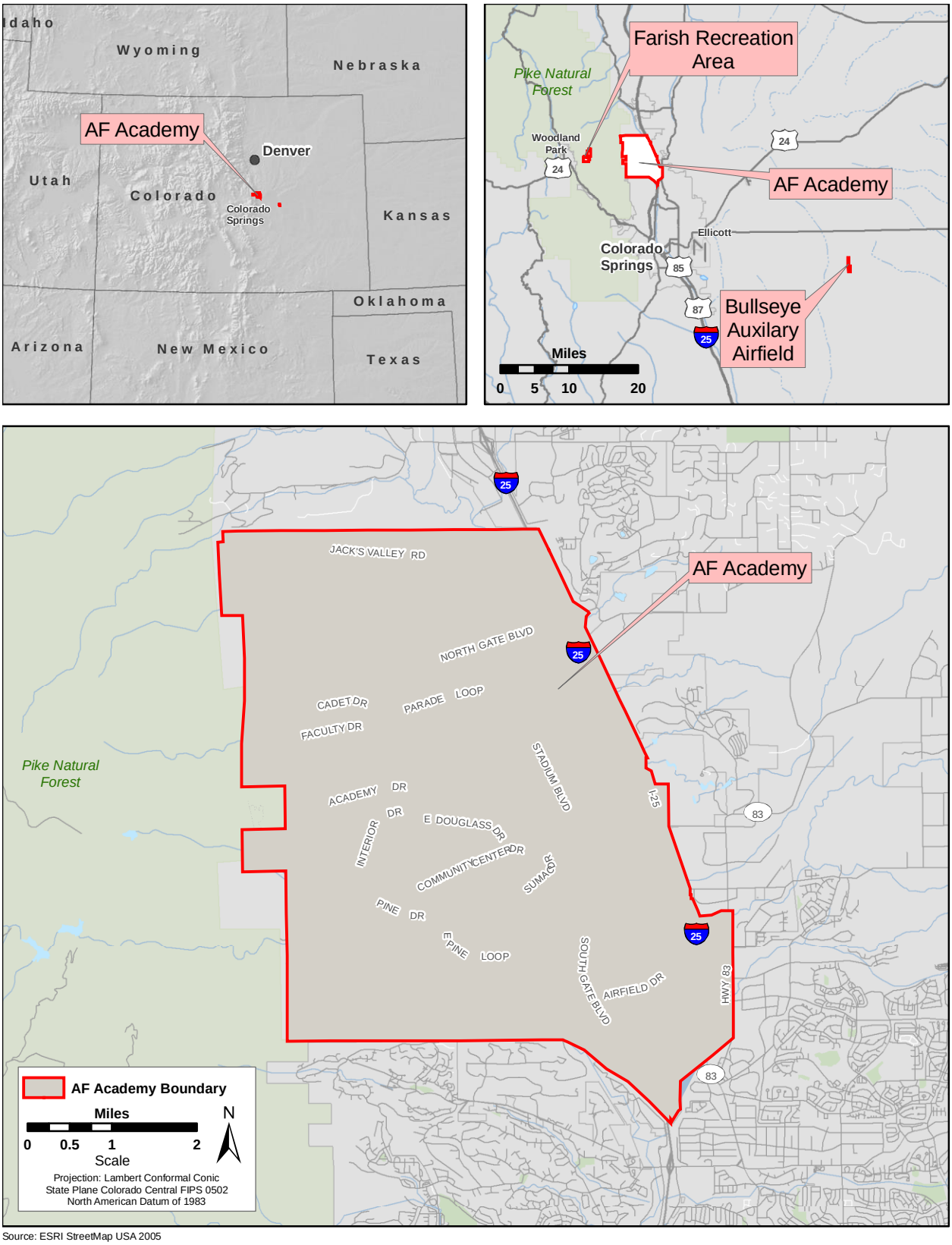
The 18,455-acre Academy is situated along the Rocky Mountain Front Range in Colorado about 6 miles north of downtown Colorado Springs and approximately 60 miles south of Denver. The Academy land covers an area that is about 5 miles wide by 7 miles long. The Rampart Range, which forms the western boundary of the Academy, is a north-south trending uplift within the Front Range that extends from Platte Canyon near Denver south to Pikes Peak.

Farish Recreation Area

The 655-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 721 through Stanley Canyon.

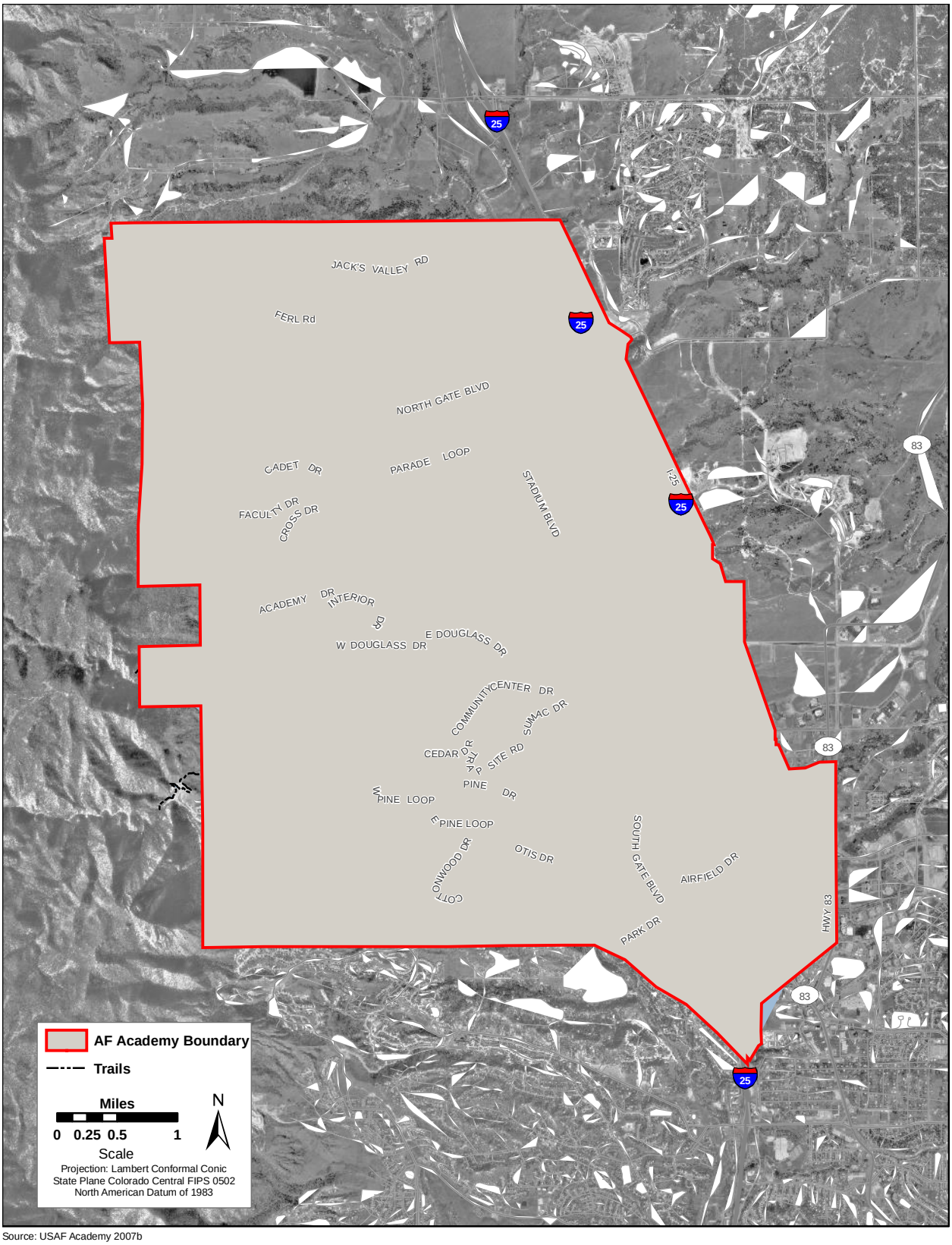
Bullseye Auxiliary Airfield

The 197-acre Bullseye Auxiliary Airfield is approximately 8 aerial miles east-southeast of Ellicott, El Paso County, Colorado.



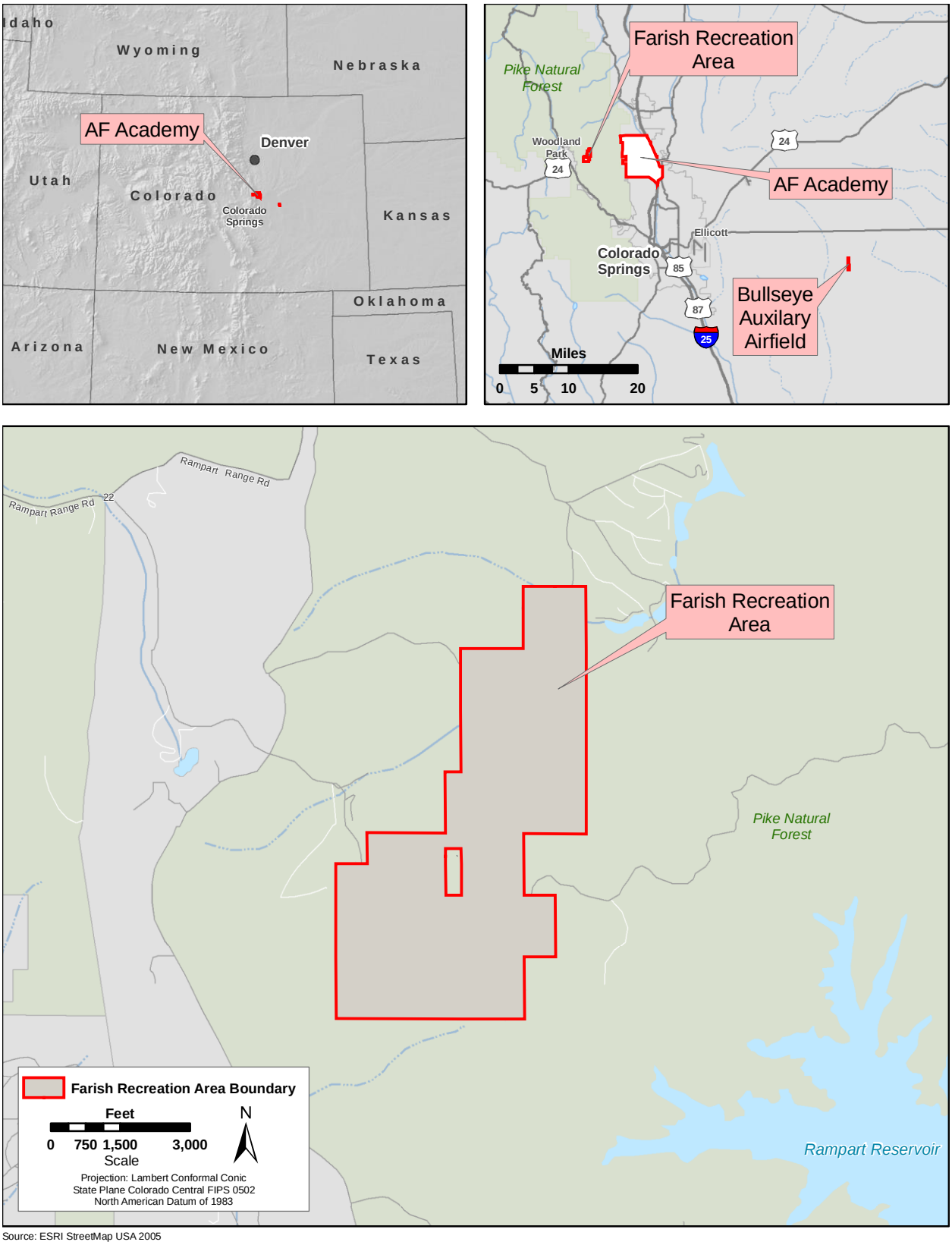
Source: ESRI StreetMap USA 2005

Academy Location and the Surrounding Region



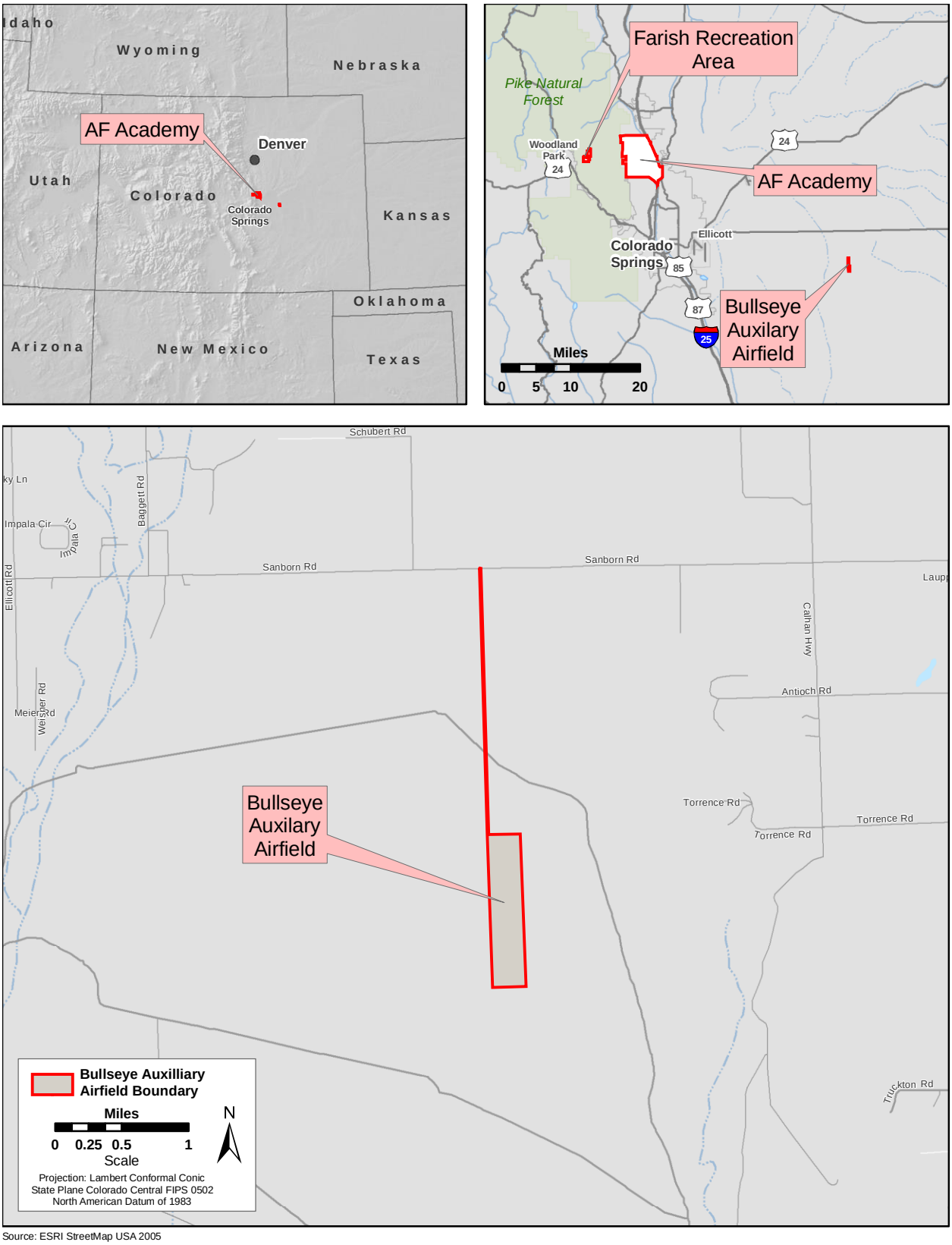
Source: USAF Academy 2007b

Network of Roads and Trails Within and Immediately Adjacent to the Academy



Source: ESRI StreetMap USA 2005

Location of the Farish Recreation Area



Source: ESRI StreetMap USA 2005

Location of the Bullseye Auxiliary Airfield

Installation/GSU Location and Area Descriptions

Base/GSU Name	Main Use/Mission	Acreage	Addressed in INRMP?	Describe NR Implications
Farish Recreation Area]	Recreation: camping, hiking, fishing	655	*yes*	No federally listed species. Forestry, trails, weed management, and recreational fisheries management are primary NR focus areas
[Bullseye Auxiliary Airfield]	Flying training	197	yes	No federally listed species. Migratory bird/BASH and other wildlife issues are primary NR concern
US Air Force Academy	Military training, education	18,455	yes	Federally threatened species present. Forestry, fish and wildlife management, range and watershed management, wildland fire management, outdoor recreation are primary NR focus areas

2.1.2 Installation History

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 (USAFA 2007a).

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 (USAFA 2007a).

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 (USAFA 2007a).

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 4,000 (USAFA 2007a).

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 (USAFA 2007a).

The Academy supports a resident population of approximately 4,135 cadets, 1,716 active-duty military residents, and 1,487 commuting civilians (IDP 2017). 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 History

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 655 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 (USAFA 2001).

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 at Farish. 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 History

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 the existing airfield while saturating the available airspace. 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 (ITC 1988).

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 to maintain the natural setting for training and enjoyment, steward its portion of the Front Range ecosystem, comply with environmental laws and regulations, and maintain healthy forest, range, and wildlife resources that provide multiple opportunities for consumptive and non-consumptive use (USAFA 2003). 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 USAFA Cadet Training Wing and the 306th Flight Training Group.

Listing of Tenants and NR Responsibility

Tenant Organization	NR Responsibility
NA	*Through a Cooperative Agreement, the U.S. Fish and Wildlife Service manages the USAFA Natural Resources Office and all natural resources on the base's property*

2.1.4 Surrounding Communities

The Academy is in El Paso County, which has a total population of 688,284. Within the county are two small towns north of the Academy, Palmer Lake (population 2,637) and Monument (population 6,556). The City of Colorado Springs, with 465,101 inhabitants, is south and southeast of the Academy. (U.S. Census Bureau data, 2016). Commercial and residential development north and east of the Academy continues to expand and has created airfield noise and airspace encroachement concerns, stormwater management problems, and wildlife habitat (including T&E species) and wetlands issues.

2.1.5 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 in the Pike National Forest and surrounding low-density private home sites and ranchettes.

Bullseye Auxiliary Airfield

The Bullseye Auxiliary Airfield is surrounded by rangeland composed of agricultural land, shortgrass prairie, and mixed grass prairie. Land ownership around Bullseye is entirely owned by the State Land Board (SLB) and most is designated as State Stewardship Trust. This designation conveys additional resource "protection" above normal SLB lands (USFWS 2008).

2.2 Physical Environment

2.2.1 Climate

The Academy receives approximately 15 inches of annual precipitation as rainfall and snow. Most occurs between April and September, with the highest precipitation taking place 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. However, wind velocities in excess of 70 miles per hour can occur, especially during the winter.

The climate and weather data below summarizes information collected by the USAFA airfield from 1967-2018.

OPERATIONAL CLIMATIC DATA SUMMARY (OCDS-II)

LOCATION ID	STATION NAME	PERIOD OF RECORD	UTC TO LST
FAA_KAFF	AIR FORCE ACADEMY, CO	Mean: 2008/01/01 - 2017/12/31 Extreme: 1967/11/27 - 2018/10/31	-7
LOCATION(DEGREES)		ELEVATION(FEET)	PREPARED BY
N 38.969 W 104.813		6572	557WW /14WS
YEAR(S)		DETAILED POR	
Period of Record (see detailed POR >>>)		1967-1970, 1977-2017	

AUTHORITATIVE CLIMATE SUMMARY - DATA QUALITY AND QUANTITY SUFFICIENT TO PRODUCE ACCURATE CLIMATOLOGICAL VALUES

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TEMPERATURE

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Temperature Extreme Maximum (°F)	73	74	78	82	93	99	100	97	91	86	79	70	100
Temperature Mean Maximum (°F)	45	45	56	60	67	81	84	81	76	64	54	44	63
Temperature Mean (°F)	27	28	36	41	50	65	67	65	59	46	36	25	46
Temperature Mean Minimum (°F)	17	19	26	32	40	50	55	53	47	35	26	16	35
Temperature Extreme Minimum (°F)	-21	-22	-8	0	18	27	39	36	21	-4	-12	-21	-22
Temperature Maximum Range (°F)	50	58	50	50	49	52	47	49	52	49	54	56	58
Days With Temperature >= 90°F	0	0	0	0	0	4	6	1	0	0	0	0	10
Days With Temperature <= 32°F	29	26	25	20	6	0	0	0	0	14	25	30	175
Days With Temperature <= 0°F	3	2	0	0	0	0	0	0	0	0	1	3	8

* = No Data T = Trace # = Occurrences rounded to 0

PRECIPITATION

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Precipitation Period Maximum (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
Precipitation Period Mean (In)	0.3	0.3	0.8	1.4	2.0	1.9	2.6	2.8	1.3	0.7	0.5	0.4	15.2
Precipitation Period Minimum (In)	0.0	0.0	0.0	0.1	0.0	0.1	0.4	0.3	0.1	0.0	0.0	0.0	7.5
Precipitation Period Daily Maximum (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
Snowfall Period Maximum (In)	13.6	23.0	23.0	22.6	14.0	0.4	0.0	0.0	8.2	21.5	21.2	15.7	90.1
Snowfall Period Mean (In)	4.9	5.3	7.1	6.8	1.4	0.0	0.0	0.0	0.5	2.5	4.5	4.8	36.8
Snowfall Period Daily Maximum (In)	7.8	16.3	9.4	14.0	10.0	0.4	0.0	0.0	5.0	12.5	10.0	14.9	16.3
Days with liquid >= Trace	8	7	7	9	9	9	9	9	7	7	5	8	94
Days with liquid >= 0.01"	2	3	4	7	11	8	13	13	6	5	2	2	76
Days with liquid >= 0.5"	0	#	#	1	1	#	2	1	1	#	0	0	7
Days with snow >= Trace	5	4	5	4	2	#	#	#	1	2	4	4	31
Days with snow >= 0.05"	4	4	5	4	1	0	0	0	#	2	4	4	28
Days with snow >= 1.5"	1	1	2	2	#	0	0	0	#	1	1	1	9

* = No Data T = Trace # = Occurrences rounded to 0

Farish Recreation Area

Farish is higher in elevation than the Academy, therefore the average temperature is expected to be lower and the amount of precipitation it receives is expected to be higher than at the Academy. Woodland Park, Colorado would likely have the most similar weather and climate as the recreation area.

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 it receives is expected to be lower than at the Academy. Ellicott, Colorado would likely have the most similar weather and climate as the airfield.

2.2.2 Landforms

Boundaries for the Academy were based on the need for airspace, land-based military training, and 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 recreation (USAFA 2003).

2.2.3 Geology and Soils

Topography and Geology at the 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 above mean sea level (AMSL) at Monument Creek near the South Gate to 7,800 feet AMSL at the base of the Rampart Range at Stanley Canyon (USAFA 2003).

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 on the Academy, 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 (USAFA 2003).

Farish Recreation Area

The topography of the Farish Recreation Area is characterized by rolling terrain associated with South Beaver Creek and several unnamed tributaries to the creek 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. Elevations in the recreation area range from approximately 9,360 feet AMSL in its southwest corner to approximately 9,040 feet AMSL 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

The topography of Bullseye Auxiliary Airfield is characterized by a gently sloping to a nearly level plain of low topographic relief. The elevation of the airfield and access road is approximately 6,000-feet.

Bullseye lies within the southern portion of the Denver Basin structural province. No bedrock is exposed at the site. Subsurface bedrock contacts are not inferred because the entire site is covered by a surficial deposit of windblown sand. This sand deposit is geographically extensive in the southeastern section of El Paso County. Presently, the sand is stabilized by vegetation. It is probable that the material was deposited during the early Holocene period (the present to 10,000 years ago) and the Pinedale Glaciation when climatic conditions were different (ITC 1988).

Soils at the Academy

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.

Following are examples of criteria that 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 (NRCS 2006).
- 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.

Soil erosion rates are generally lower in areas covered by vegetation. Erosion problems are more likely to occur on tilled firebreak areas, unimproved roads, near stream banks, and other barren areas. The soils on the Academy are susceptible to water erosion if not protected with vegetation or other cover. Most soils on the base are considered to be moderately erodible.

Most of the soils at the Academy are derived from a granitic parent material. 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 (USAFA 2003).

The NRCS identifies 26 soil mapping units on the Academy (NRCS 2008b). 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.

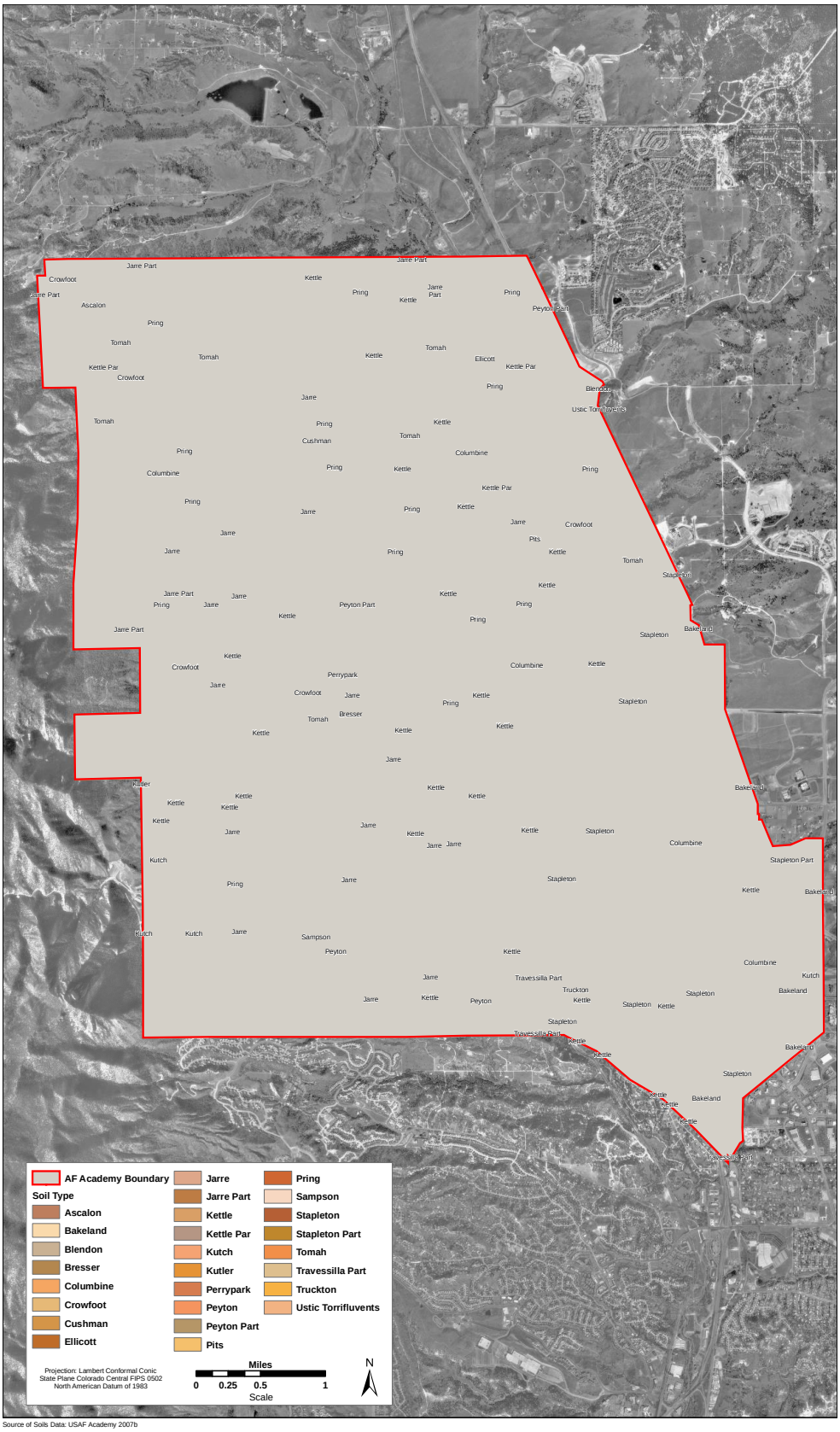
Farish Recreation Area

The soils at Farish are composed mainly of weathering 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 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 (USAFA 2001). 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 (ITC 1988).

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 (ITC 1988).



Source of Soils Data: USAF Academy 2007b

Soils Mapped on the Academy

2.2.4 Hydrology

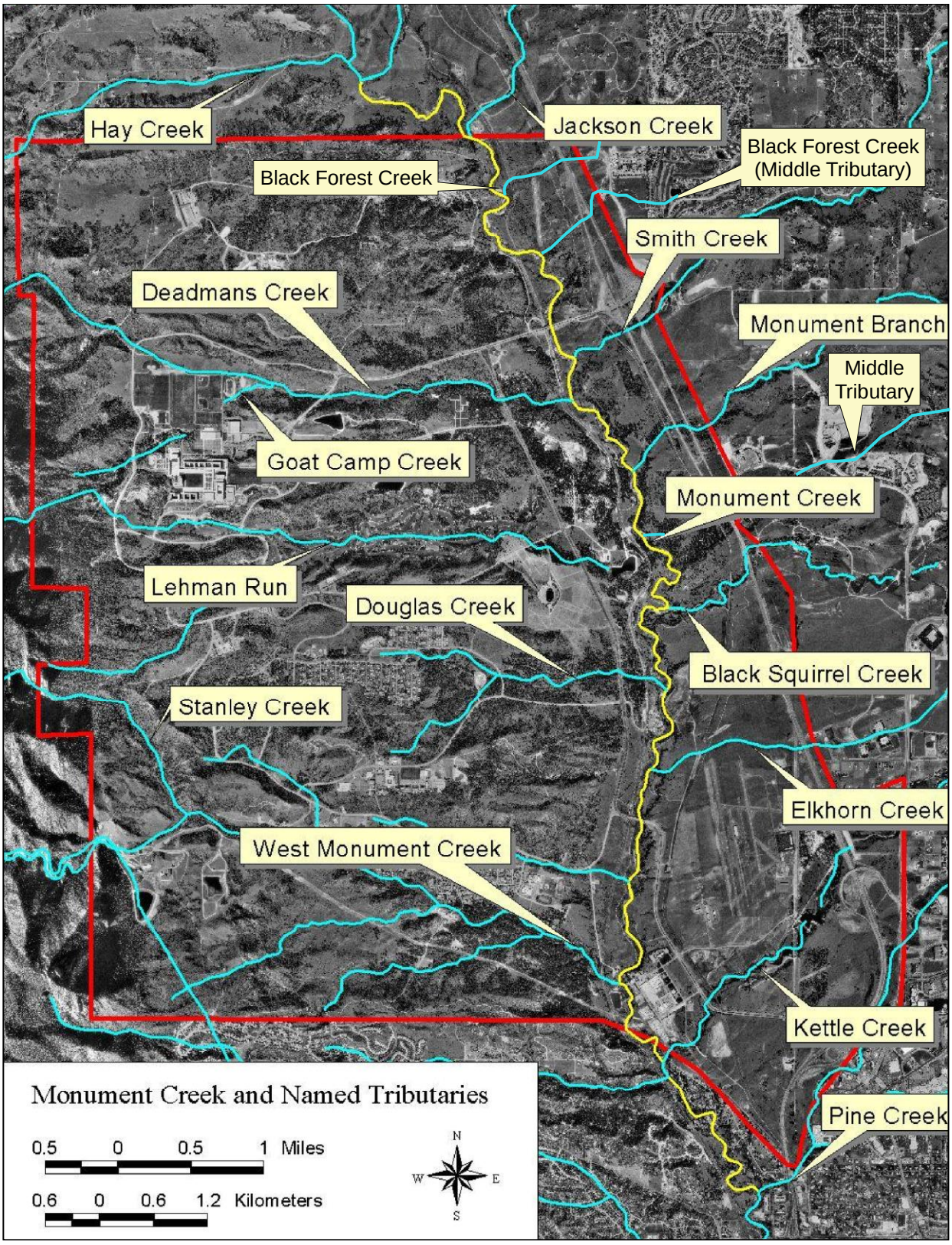
The stream corridors are among the most important natural resources features on the Academy reservation, representing areas of concentrated biodiversity and important habitats. The predominant surface water feature on the base is Monument Creek, which runs from north to south on the east side of the 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 base's southern boundary. The Academy has preserved Monument Creek, and it represents one of the best remaining plains streams in the upper Arkansas River drainage. Monument Creek serves as a refuge for several species of rare plants and for the Preble's meadow jumping mouse, a federally listed (threatened) species (USAFA 2003).

Other perennial and intermittent streams on base are considered to be in poor to good condition depending on floodplain and channel stability and riparian vegetation cover. All tributary streams flowing into Monument Creek from the east have been impacted by urban development which produces increased stormwater runoff. Erosion and sedimentation has been severe in nearly all of the eastern tributaries, and some western tributaries have been degraded by increased runoff from on-base developments. Open water on the Academy consists of five recreational lakes and four non potable reservoirs, as shown in Table: Open Water on the Academy (USAFA 2003).

Riparian vegetation at the lower elevations is 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 also function as vital links between the different plant communities described in the Vegetation section of this plan.

Table: Open Water on the Academy

Name	Surface Area (Acres)	Volume (Acre Feet)
Non Potable Reservoir No. 1	8.5	Unknown
Non Potable Reservoir No. 2	11.00	Unknown
Non Potable Reservoir No. 3	8.0	Unknown
Non Potable Reservoir No. 4	3.5	Unknown
Deadman's Lake	1.9	11.33
Ice Lake	5.5	34.07
Kettle Lake No. 1	1.8	14.14
Kettle Lake No. 2	3.3	32.31
Kettle Lake No. 3	8.5	53.7



Source: Michels et al. 2006

Monument Creek and its Tributaries

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. Except for Grace Lake, Leo Lake, Sapphire Lake, and Mel's Pond, which are all man-made, there is little perennial surface water on Farish (USAFA 2001). The surface areas of these water bodies are shown in Table: Open Water at the Farish Recreation Area.

Table 3-6. Open Water at the Farish Recreation Area

Name	Surface Area (Acres)	Volume (Acre Feet)
Grace Lake	4.3	14.96
Lake Leo	4.0	21.49
Mel's Pond	0.09	Unknown
Sapphire Lake	3.9	Unknown

Bullseye Auxiliary Airfield

There are no surface water channels or water bodies found on or in the vicinity of the Bullseye Auxiliary Airfield. This is due to the presence of the deep sandy soils which have a rapid 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.

Sedimentation due to erosion can also impact water quality. Erosion disturbs existing land plant systems, and the resulting siltation in streams can degrade benthic habitat and fish spawning grounds. In an effort to protect surface water quality, the Academy utilizes certain soil erosion/construction BMPs.

The Academy has a Stormwater Pollution Prevention Plan which 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 (URS Group 2002). The Monument Creek Watershed Restoration Master Plan (2016) also identifies on-base and off-base projects and priorities for controlling erosion and sedimentation.

Farish Recreation Area

Threats to water quality at Farish occur from erosion and sediment transport in flows after intense rainstorms and from potential POL from the maintenance facility in the floodplain of South Beaver Creek, below Grace Lake dam.

Bullseye Auxiliary Airfield

There is no surface water at the Bullseye Auxiliary Airfield; therefore, there are no water quality issues.

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 resulted in the selective fragmentation of habitat and caused habitat degradation in developed areas. To continue to provide valuable habitat for wildlife, existing large uninterrupted wildland areas must be maintained (USAFA 2003).

Because of habitat diversity and preservation, 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. For example, 247 (55%) of the 444 bird species found in Colorado occur at the Academy, and about 70 (56%) of the 125 mammal species known to occur in Colorado are found on the Academy (USAFA 2003).

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 on the base 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*).

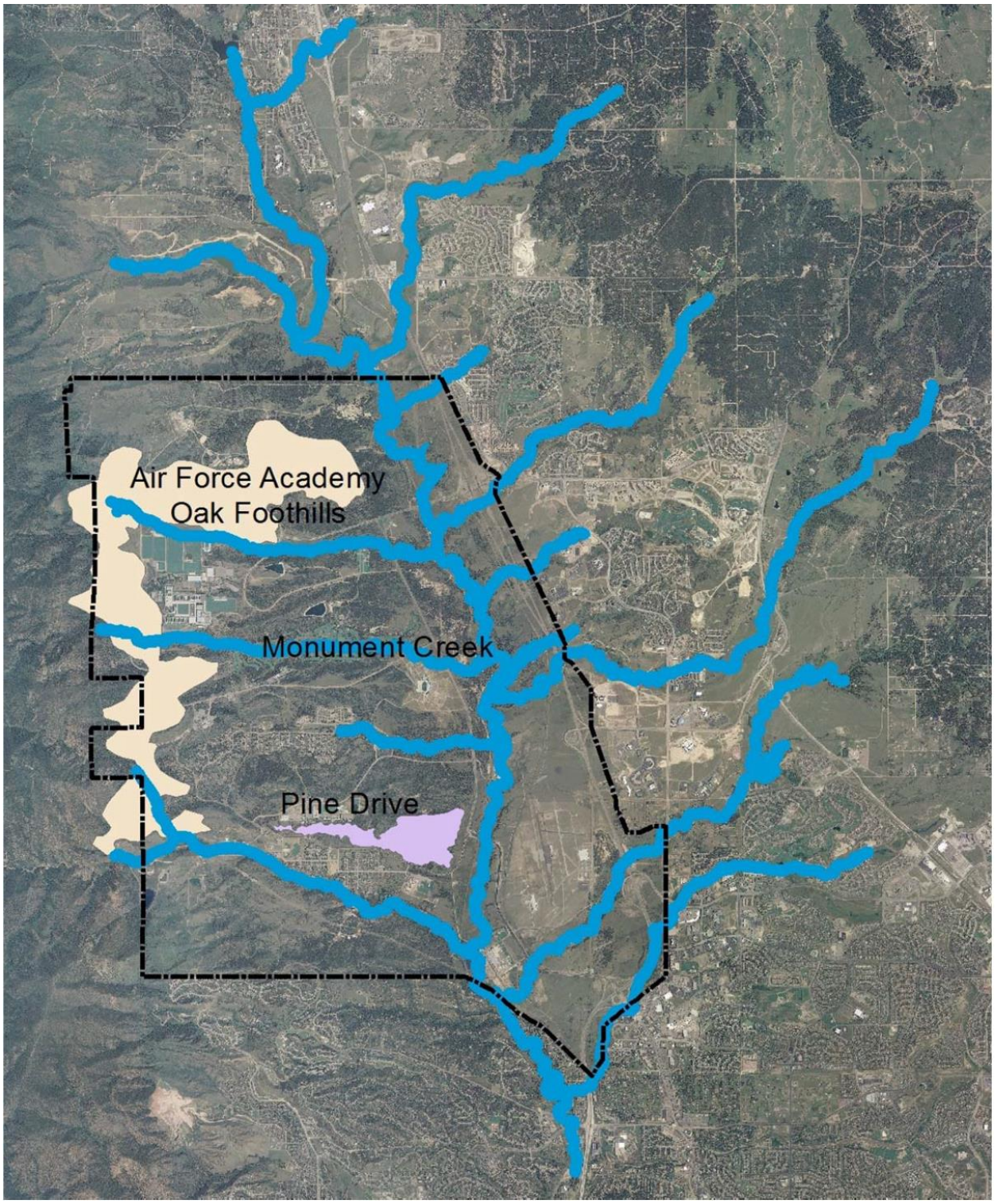
Monument Creek and its tributaries are important riparian habitats. These areas are important to wildlife, especially white-tailed deer, Preble's meadow jumping mouse, amphibians, neotropical migratory birds, and native fish species. The highest diversity of species occurs in the riparian and shrub communities. Mature ponderosa pine stands with grass understory provide habitat for Abert's squirrel (*Sciurus aberti*). Ridges and valleys that run west to east across the base are important travel corridors for wildlife (USAFA 2003).

Most south-facing slopes are important feeding and warming areas for deer and elk. The north slopes of some ridges are used as bedding and thermal cover areas. Elk are most commonly observed in the northern half of the Academy (USAFA 2003).

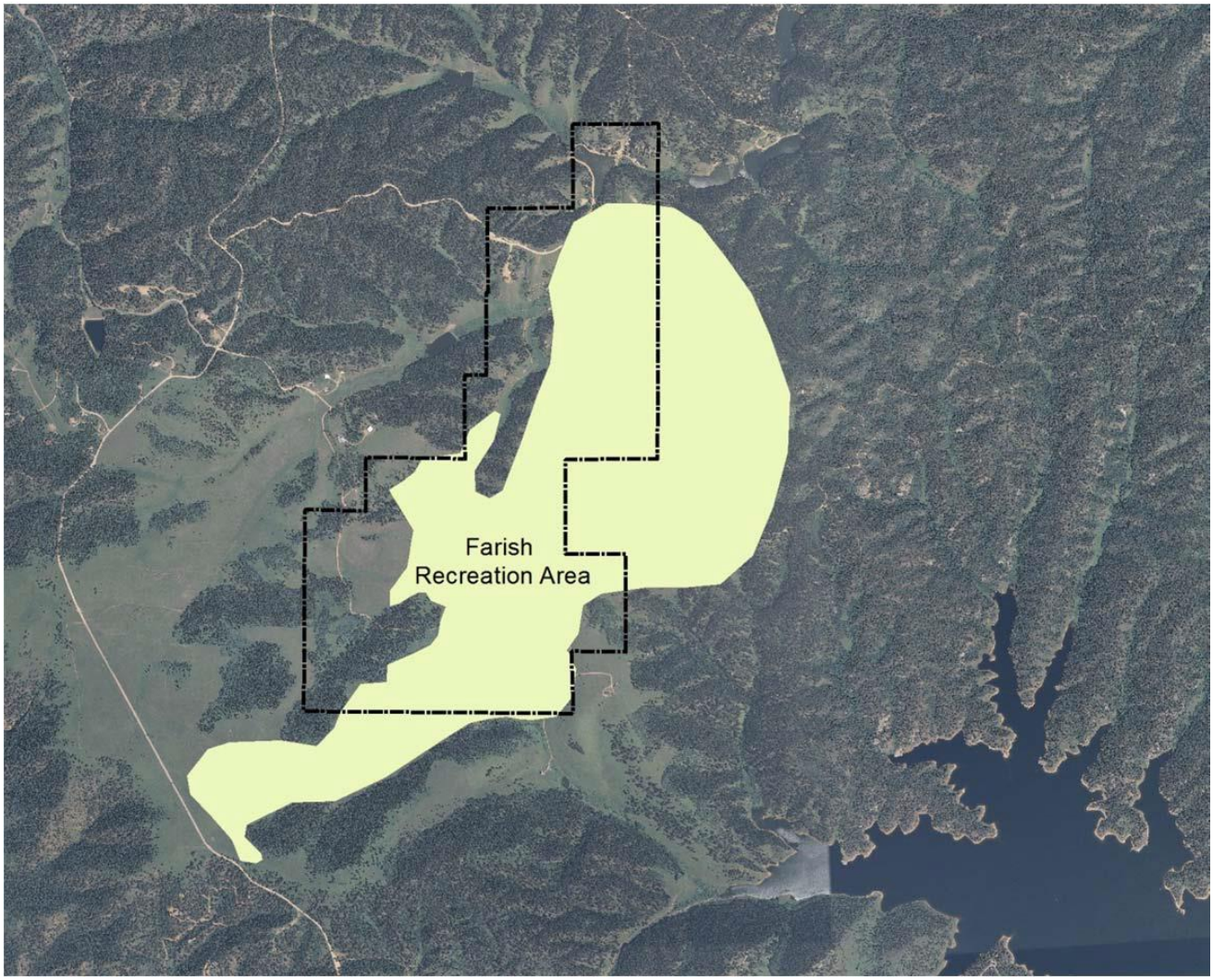
Potential Natural Areas and Species of Concern

Through annual vegetation and noxious weed surveys, wildlife monitoring activities, and a 2012 biological inventory (CNHP 2012), 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 these surveys is cataloged in the Colorado Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS) for future use in conservation planning and management.

As specified in AFI 32-7064, paragraph 16.4, special natural areas that contain natural resources warranting special protection efforts may, where consistent with the military mission, be designated in the INRMP as Special Natural Areas. The INRMP will identify applicable access, land-use restrictions, and management approaches for each designated area.



Potential Conservation Areas on the Academy (CNHP 2012)



Potential Conservation Area on Farish Recreation Area (CNHP 2012)

2.3.2 Vegetation

The following sections describe the vegetative environment on the Academy. In general, mountain and foothill areas support different vegetative species, and various plant and tree communities are found within each..

2.3.2.1 Historic Vegetative Cover

The vegetation of the Academy belongs to the Southern Rocky Mountain Floristic Region, and is represented by montane and foothills zones (Ripley 1994). Plant communities of coniferous forest, shrubland, grassland, and riparian zone dominated the historic landscape and still persist today. Grazing, mining, agriculture, fire suppression, and logging activities in the area as early as the 1860's, however, did significantly alter plant cover and diversity, and likely contributed to current management issues such as noxious weed invasion, soil erosion, and stream instability.

2.3.2.2 Current Vegetative Cover

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 that the different plant communities create in relationship to one another, is a critical aspect of the biodiversity found at the Academy (USAFA 2003).

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 (USAFA 2003).

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. Three factors that have contributed to these changes include a shift toward a more mesic climate, overgrazing by livestock, and fire suppression (USAFA 2003).

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

Vegetation Zones on the Academy

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 five 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:

a. A 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.
b. Tallgrass prairie species merging with ponderosa pine and Gambel's 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.
c. 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*).

Urban Habitats

The Cadet Area, housing areas, the Community Center, the median strip on South-Gate, Stadium, and North-Gate Boulevards, elementary schools, and the 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, and the remainder of the Academy primarily contain native shrub and tree canopies, but also include bluegrass groundcover (USAFA 2003).

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 more moist 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 (USAFA 2001). 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 short grass prairie is dominated by blue grama (*Bouteloua gracilis*). The agricultural land produces hay crops. 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*) (ITC 1988).

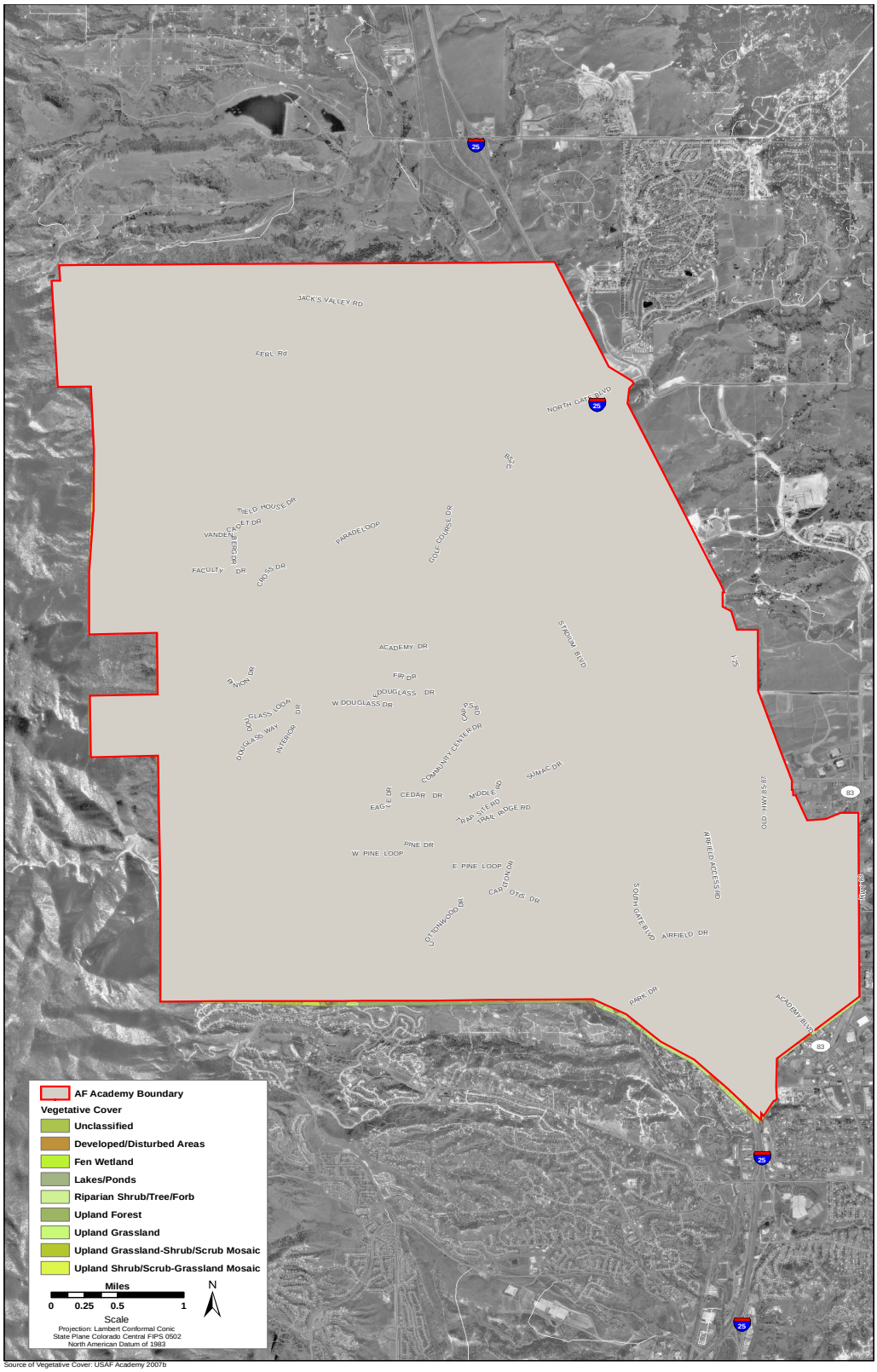
Species of forbs observed include greenthread (*Thelesperma megapotamicum*), annual buckwheat (*Eriogorum annum*), penstemon (*Penstemon* sp.), trailing fleabane (*Erigeron flagellaris*), goosefoot (*Chenopodium sp.*), and stickseed (*Lappula redowskii*) (ITC 1988).

Species of shrubs observed include fringed sage (*Artemisia frigida*), spreading eriogonium (*Eriogonum effusum*), calylophus (*Calylophus sp.*), and prickly pear (*Opuntia polyacantha*) (ITC 1988).

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. 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 (Neely et al. 2006).

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.



Vegetative Cover on the Academy

2.3.2.3 Turf and Landscaped Areas

Turf and landscaped areas on the Academy include 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 wide variety of deciduous and coniferous trees and shrubs are used for screening and general base aesthetics. The base is currently working toward reducing its irrigation requirements by removing turf areas and replacing with more drought tolerant, low maintenance landscaping.

2.3.3 Fish and Wildlife

Examples of birds in this area include the red-tailed hawk (*Buteo jamaicensis*), wild turkey, prairie falcon (*Falco mexicanus*), scrub jay (*Aphelocoma coerulescens*), and spotted towhee (*Pipilo erythrophthalmus*).

The shorthorned lizard (*Phrynosoma douglassi*), bullsnake (*Pituophis melanoleucus*), and Western rattlesnake (*Crotalus viridis*) also occur in these areas.

Mammals in the grasslands community include coyote, red fox, Gunnison's prairie dog (*Cynomys gunnisoni*), spotted ground squirrel (*Spermophilus spilosoma*), northern pocket gopher (*Thomomys talpoides*), and Western harvest mouse (*Reithrodontomys megalotis*).

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*).

Mammals common to the riparian communities are white-tailed deer, beaver (*Castor canadensis*), several bat species, muskrat (*Ondatra zibethica*), gray fox (*Urocyron cinereoargenteus*), cottontail rabbit, and raccoon (*Procyon lotor*), meadow vole (*Microtus pennsylvanicus*), Montane shrew (*Sorex monticolus*), and Preble's meadow jumping mouse .

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*).

Chorus frog (*Pseudacris triseriata*), northern leopard frog (*Lithobates pipiens*), and other amphibians live in the riparian areas.

Aquatic Habitats. The Academy's coldwater perennial streams (West Monument and Stanley Creek) support reproducing populations of brook trout (*Salvelinus fontinalis*). Nine species of native nongame fish occur in the warmer waters 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 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*).

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

Black bears have been a nuisance in housing areas and at other facilities, but the problem has been successfully managed with the provision of bear-proof dumpsters. Sightings of mountain lions have been infrequent, and no human-lion encounters have resulted in injury. Smaller mammals such as coyote (*Canis latrans*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), and raccoon (*Procyon lotor*) are frequent visitors in the Academy housing areas and at other facilities.

The health of fish and wildlife habitat on the Academy is, in large part, dependent on the interactions with areas surrounding the Academy. Ensuring connectivity of the landscape is vital to the functionality of the Academy's fish and wildlife habitat. Wildlife and fisheries habitat management goals are presented in the Goals and Objectives section of this plan, as well as management actions planned to meet these objectives.

Farish Recreation Area

Wildlife species found on Farish are similar to the wildlife found on the Academy. Common species include mule deer, elk, and black bear. Bear sightings have become more frequent and a potential problem in the camping areas.

No game hunting is allowed on Farish. Game poaching is a concern because of the public access to many backcountry areas. Frequent and heavy elk use, particularly during the winter, is evident from the browse damage on the aspen trees and the lack of young aspen sprouts.

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

Bullseye Auxiliary Airfield

Wildlife species found on Bullseye are typical of the short-grass prairie. Some of the more common species of wildlife include pronghorn (*Antilocapra americana*), black-tailed prairie dog (*Cynomys ludovicianus*), coyote, red-tailed hawk (*Buteo jamaicensis*), vesper sparrow (*Pooecetes gramineus*), and horned lark (*Eremophila alpestris*). The uniformity of the vegetation and terrain and the absence of habitat features such as large trees, rock outcrops, and water account for the relatively low diversity and abundance of wildlife on Bullseye (ITC 1988), however, BASH incidents have been on the rise.

2.3.4 Threatened and Endangered Species and Species of Concern

Birds of Conservation Concern

The U.S. Fish and Wildlife Service has identified birds of conservation concern for the region occupied by the Academy (USFWS 2008, https://www.fws.gov/mountain-prairie/migbirds/prioritySpecies.php). Table: Birds of Conservation Concern Occurring on the Academy shows the bird species of USFWS conservation concern and indicates which of those species have been reported from the Academy according to Defusco and Cassel (1988).

Potential Birds of Conservation Concern on the Academy

USFWS Regional Birds of Conservation Concern	Reported on USAFA Defusco and Cassel (1988).
Ferruginous Hawk	**X**
Golden Eagle	**X**
Bald Eagle	**X**
Peregrine Falcon	**X**
Mountain Plover	**X**
Long-billed Curlew	**X**
Buff-breasted Sandpiper	
Upland Sandpiper	**X**
Marbled Godwit	**X**
Flammulated Owl	
Western Burrowing Owl	**X**
Sprague's Pipit	
Cassin's Sparrow	
Grasshopper Sparrow	**X**
Henslow's Sparrow	
Band-Tail Pigeon	
Hudsonian Godwit	
Sandhill Crane	
Tumpeter Swan	
Cinnamon Teal	**X**

Species of Special Concern and Habitats at the Academy

In 2012, the Colorado Natural Heritage Program (CNHP 2012) updated the survey information for rare species or species of special concern on the Academy and Farish Recreation Area. Field surveys by Ellington et al. (1996) 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 (*Celastrina humulus*), southern Rocky Mountain cinquefoil (*Potentilla ambigens*), New Mexico cliff fern (*Woodsia neomexicana*), cedar waxwing (*Bombycilla cedrorum*), gray catbird (*Dumatella carolinesis*), and northern leopard frog (*Lithiobates pipiens*).

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 extinct. Such species are threatened or endangered for a variety of reasons, mainly due to specialized habitat needs or habitat destruction. 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 on the habitat of a listed species is strictly prohibited.

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 (USAFA 2003), a 2012 Biological Inventory (CNHP 2012) and annual Preble's meadow jumping mouse surveys since 1997 (Schorr 2001 and Schorr 2003). 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 also identified several new rare plant sites while conducting noxious weed monitoring and inventories (Anderson et al. 2003).

Preble's Meadow Jumping Mouse

The federally-threatened Preble's meadow jumping mouse is the only breeding, resident species on the Academy that is protected under the ESA. The Academy supports a significant mouse population and the greatest extent of contiguous suitable habitat in the Arkansas River Basin, therefore the bases's management and oversight is critical for the long-term conservation and recovery of the species. A Conservation Zone, which includes both riparian and adjacent upland mouse habitat, covers approximately 3,300 acres of USAFA. The Conservation Zone is based on a delineation of habitat within 300-feet of the upper edge of a 100-year floodplain.

The Preble's meadow jumping mouse (PMJM), is a small golden 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 largest and most stable populations occurring in the Monument Creek watershed on the Academy (Siemers et al. 2003).

Preble's Meadow Jumping Mouse

Initially found on the Academy in 1994 by the CNHP, the PMJM was listed as threatened by the USFWS in May 1998. Following listing, the Academy entered formal consultation with the USFWS on the PMJM, as required by Section 7 of the ESA. In April 2000 the USFWS rendered a "no jeopardy" Biological Opinion for the Academy's proposed actions in the PMJM habitat. The USFWS declined to designate Critical Habitat for the PMJM on the Academy at that time. Conditions of the "no jeopardy" Biological Opinion included the development of a conservation agreement which the Academy and USFWS signed in June 2000. Since initiation, the Academy has adhered to the terms and conditions of the PMJM conservation agreement and has renewed it every 5-years.

Potential Threatened and Endangered Species

Other threatened or endangered candidate or listed species, and Colorado species of concern that occur on the Academy as migrants, or have potential to occur on the Academy, include the Mexican spotted owl (*Strix occidentalis lucida*), Arkansas darter (*Etheostoma cragini*), and the orchid Ute ladies' tresses (*Spiranthes diluvialis*) (USAFA 2003).

Other Animal Species of Special Concern

The 2012 Biological Inventory (CNHP, 2012) of the Academy observed Gunnison's prairie dog (*Cynomys gunnisoni*), Hops Azure (*Celastrina humulus*), Northern Leopard Frog (*Lithobates pipiens*), and Ovenbird (*Seiurus aurocapillus*).

An updated list of Federal and State of Colorado threatened, endangered, special concern, and candidate species that occur or could occur in El Paso County is based on information from USFWS, CPW, and CNHP. (Table: Federal and State-Listed Species Found in El Paso County).

Farish Recreation Area

No plant or animal species listed as threatened or endangered have been identified on Farish.

Bullseye Auxiliary Airfield

No plant or animal species listed as threatened or endangered have been identified at Bullseye

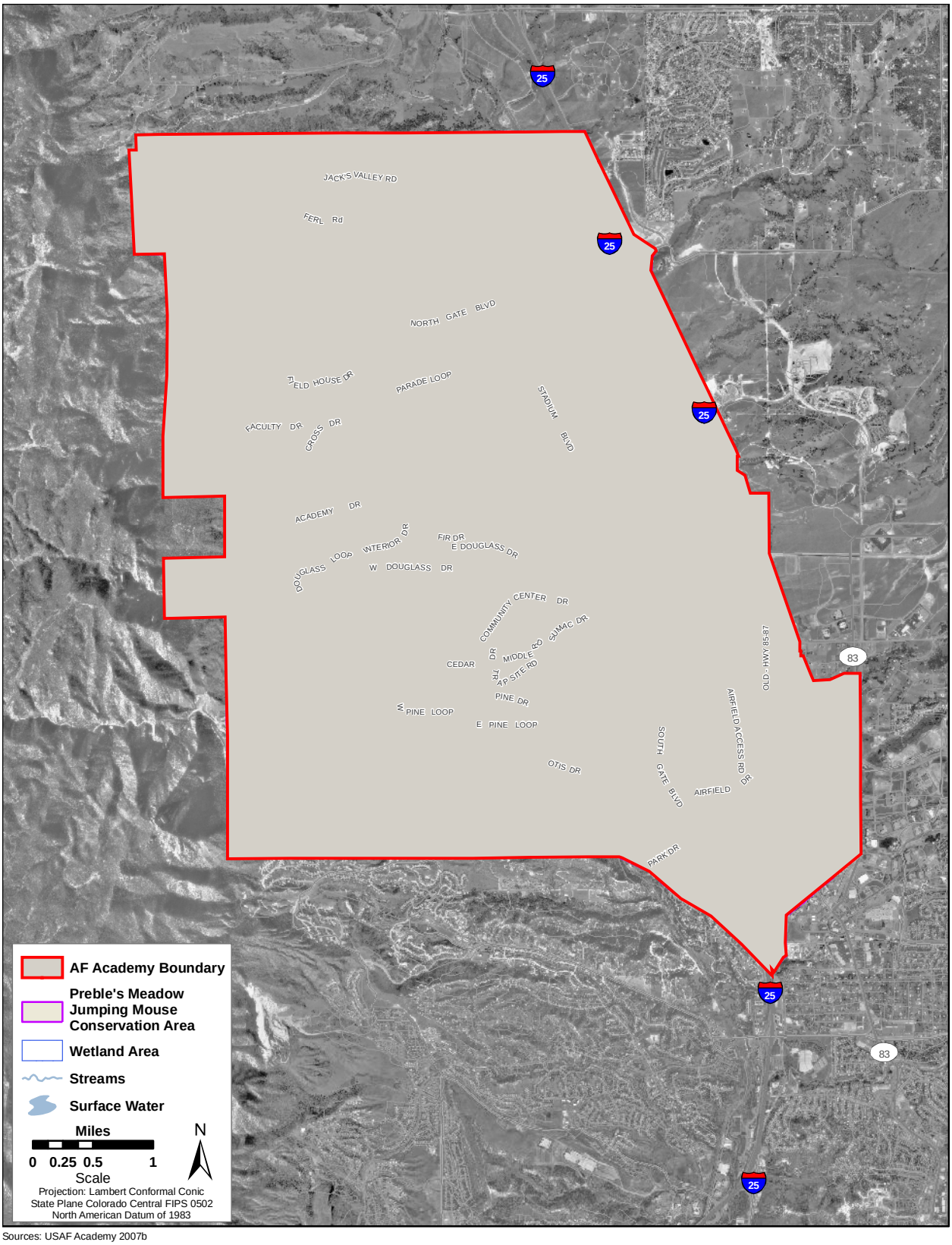
Table: Federal and State-Listed Species Found in El Paso County

Species		Status *	
Common Name	**Scientific Name**	**Federal**	**Colorado**
Fish			
Arkansas darter	***Etheostoma cragini***	**C**	**T**
Greenback cutthroat trout	***Oncorhynchus clarki stomias***	**T**	**T**
Plants			
American currant	***Ribes americanum***	**C**	**-**
Rocky Mountain blazing star	***Liatris ligulistylis***	**-**	**SC**
Slender moonwort	***Botrychium lineare***	**-**	**SC**
Streaked ragweed	***Ambrosia lineris***	**-**	**SC**
Ute ladies'-tresses orchid	***Spiranthes diluvialis***	**T**	**SC**
Plains Ironwood	***Vernonia marginata***		**SC**
Frostweed	***Crocanthemum bicknellii***		**SC**
Southern rocky Mountain Cinquefoil	***Potentilla ambigens***		**SC**
Porter's Feathergrass	***Ptilagrostis porterii***		**SC**
Birds			
American Peregrine falcon	***Falco peregrinus anatum***	**-**	**SC**
Burrowing Owl	***Athene cunicularia***	**-**	**SC**
Mexican spotted owl	***Strix occidentalis lucida***	**T**	**T**
Mountain plover	***Charadrius montanus***	**-**	**SC**
Mammals			
Black-footed ferret	***Mustela nigripes***	**E**	**E**
Preble's meadow jumping mouse	***Zapus hudsonius preblei***	**T**	**T**

Sources: USFWS 2007, CDOW 2007, and CNHP 2007

***Notes:**

T - Threatened
E - Endangered
C - Candidate
SC - State Special Concern (not a statutory category)



Sources: USAF Academy 2007b

Preble's Meadow Jumping Mouse Conservation Area

2.3.5 Wetlands and Floodplains

Wetlands on the Academy

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.

Previously, the Academy's wetland data consisted of 1993 National Wetland Inventory (NWI) maps that were produced by the USFWS. In 2002, 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. The purpose of conducting a wetland survey was to provide a database that could facilitate initial master planning, construction planning, and environmental management. A jurisdiction determination from USACE was not obtained for the wetlands delineated in the study. A formal delineation of wetland boundaries is still necessary for any 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 313 wetlands and other waters of the United States identified on base, 90 areas are in riverine systems and 223 areas are within the palustrine system. 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 (USAFA 2003).

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 (USAFA 2003).

Farish Recreation Area

The USFWS NWI mapping was completed for Farish in February 1994. NWI maps delineated 37.8 acres of wetland habitat as (1) palustrine persistent emergent wetlands, temporarily flooded and (2) palustrine, forested, broad-leaved deciduous wetlands (USAFA 2001).

Bullseye Auxiliary Airfield

The Bullseye Auxiliary Airfield has not been formally surveyed for wetlands but it is unlikely that any occur there based on the vegetation and the lack of surface hydrologic features.

Floodplains at the Academy

Floodplains at the Academy are found along the riparian areas and are most prevalent along Monument Creek and its tributaries. The Academy's 10-year and 100-year floodplains were mapped in 2003 (URS Group 2003a and URS Group 2003b).

Farish Recreation Area

The potential for hazardous flooding of the South Beaver Creek at Farish was evaluated in 1997 in conjunction with an assessment of dam safety for the three lakes of the area (BRW, Inc. 1997). 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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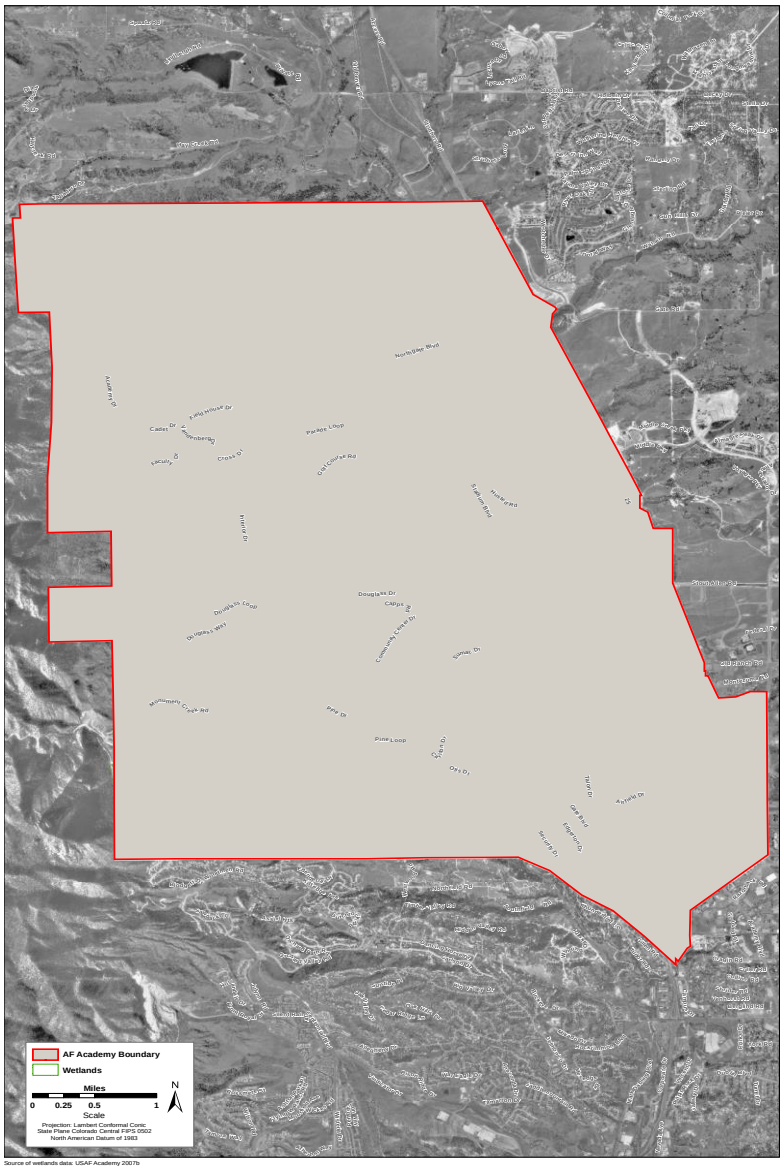
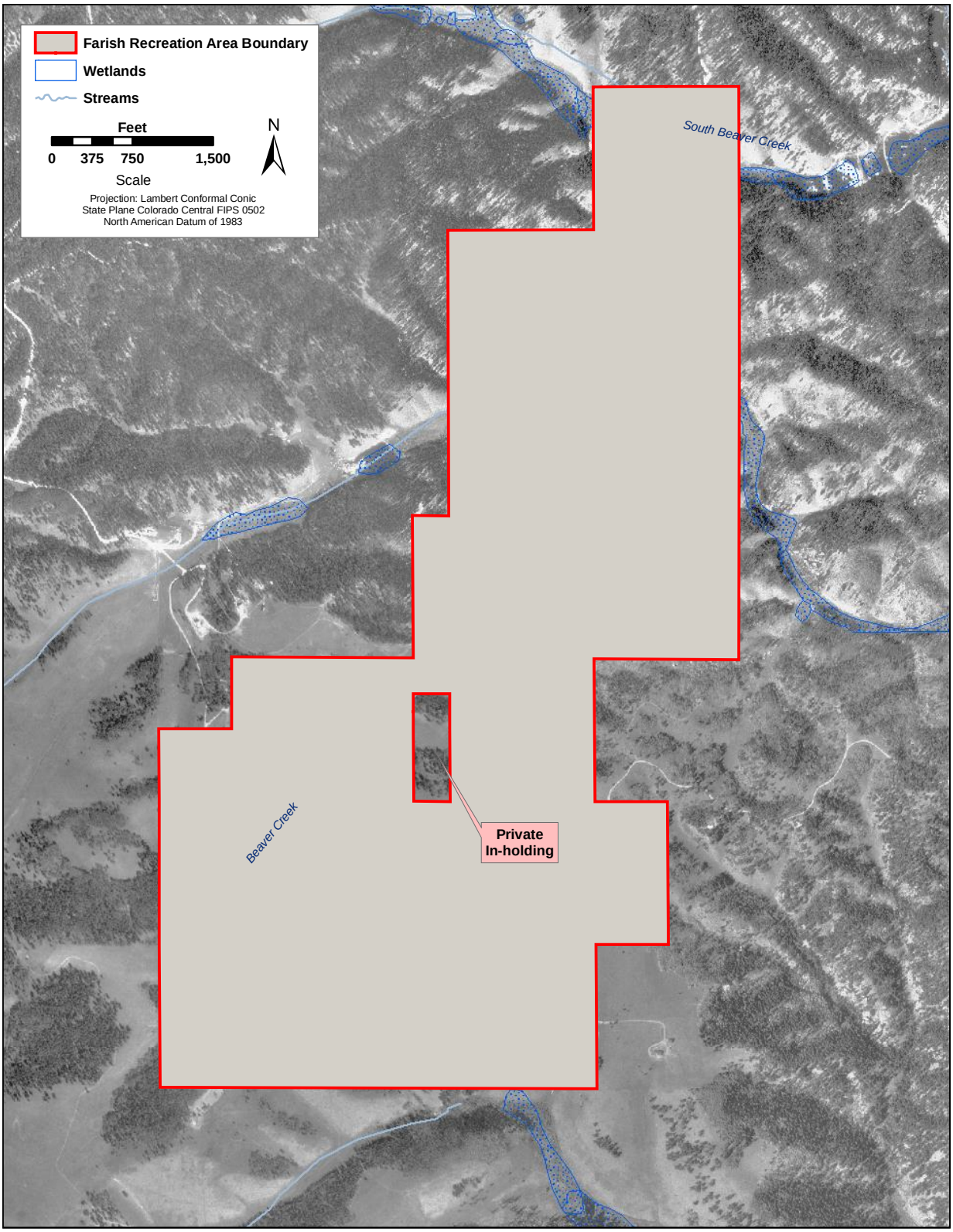


Wetlands Located on the Academy



Source of wetlands data: USAF Academy 2007b

Wetlands on the Farish Recreation Area Based on NWI Maps

2.3.6 Other Natural Resource Information

Landscape Fire Ecology

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 amount 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.

The Front Range suffered numerous other damaging wildfires in 2000 and 2002. While drought conditions have alleviated somewhat over the past two years, the prolonged drought starting in late 1999 has drastically weakened the Academy's forests. Another calamitous fire is a real possibility across the entire Front Range and beyond.

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 at the 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 (USAFA 2003).

1. **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

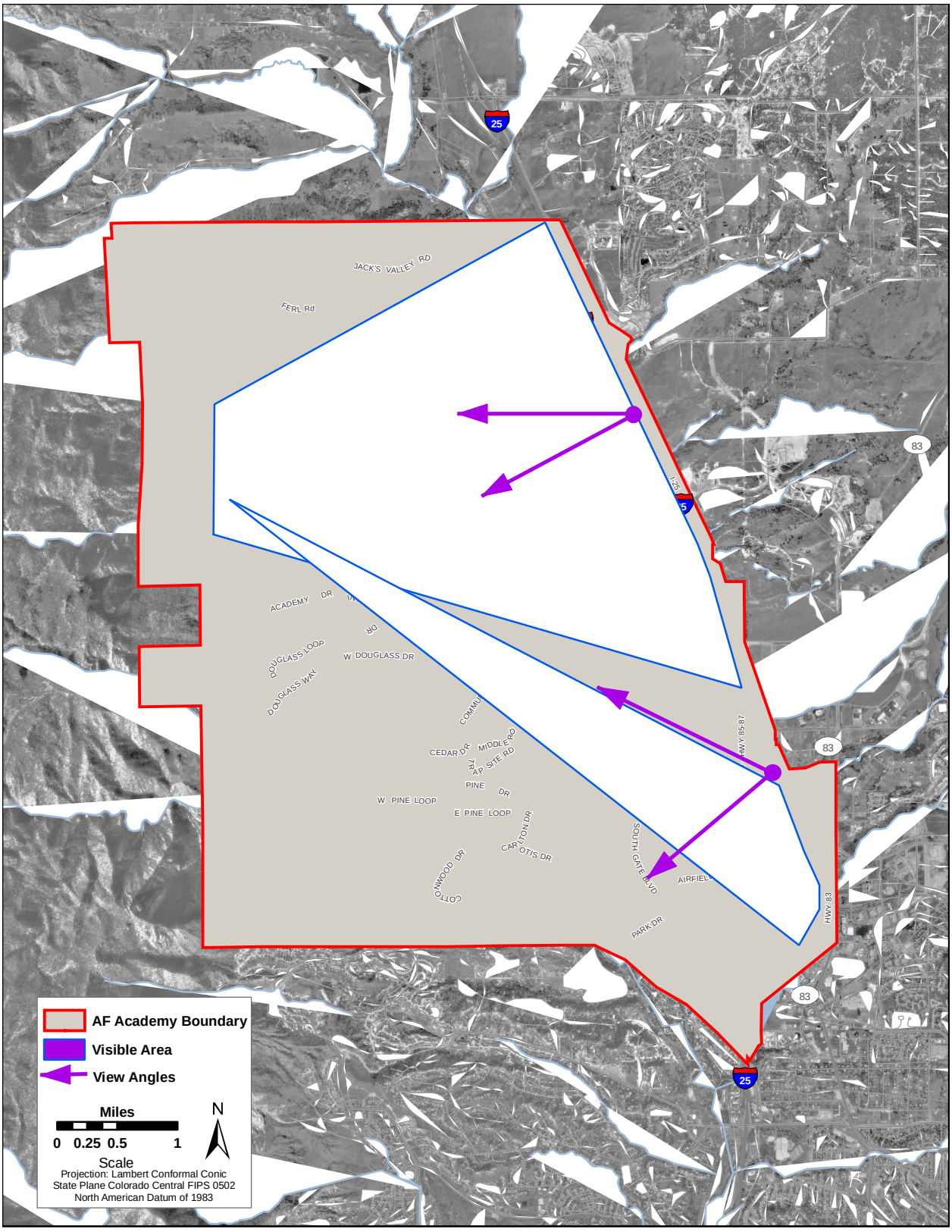
while traveling through the Academy on I-25; and they preserve the scenic, natural approach to the city of Colorado Springs from the north.

2. **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.
3. **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.
4. **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.
5. **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 (USAFA 2003).

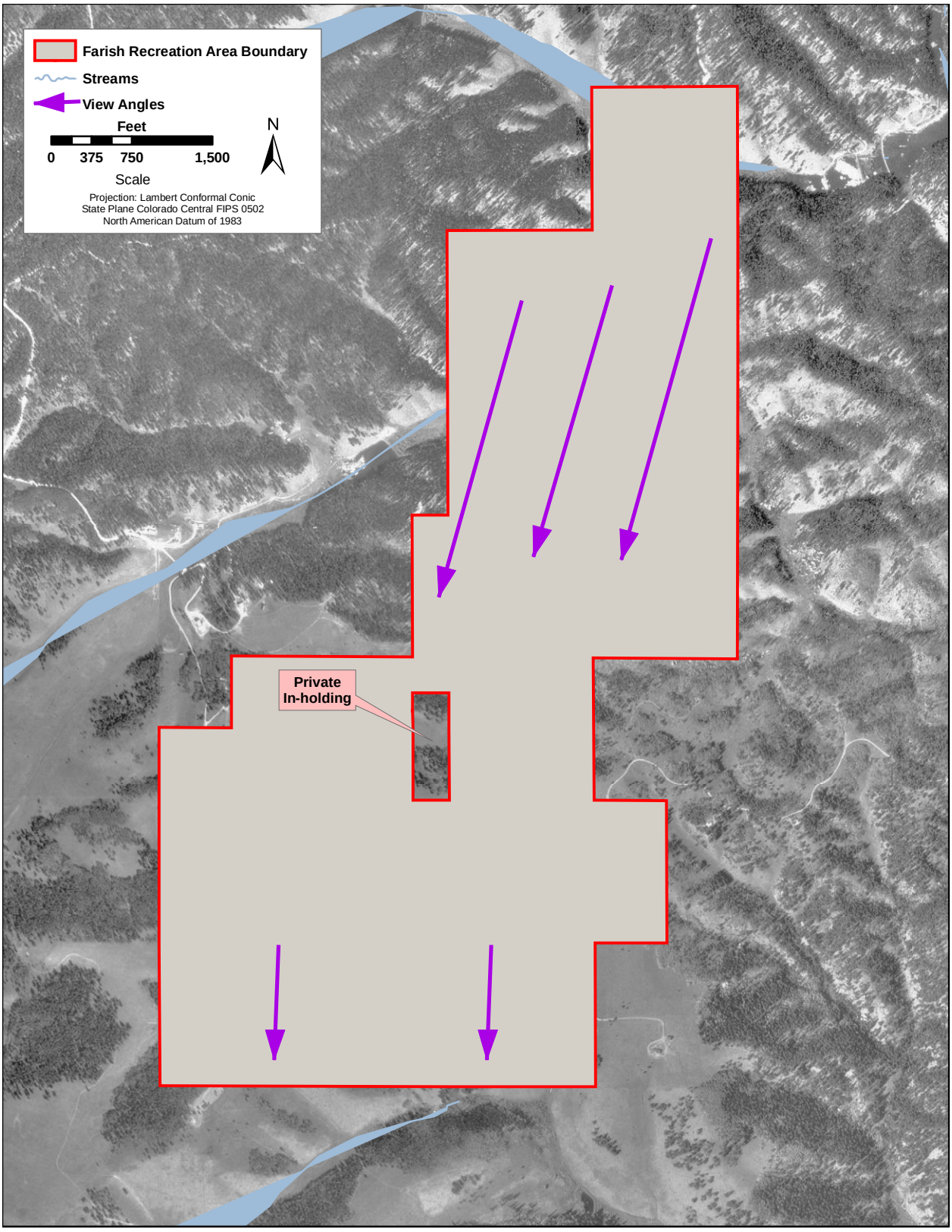
Farish Recreation Area

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.



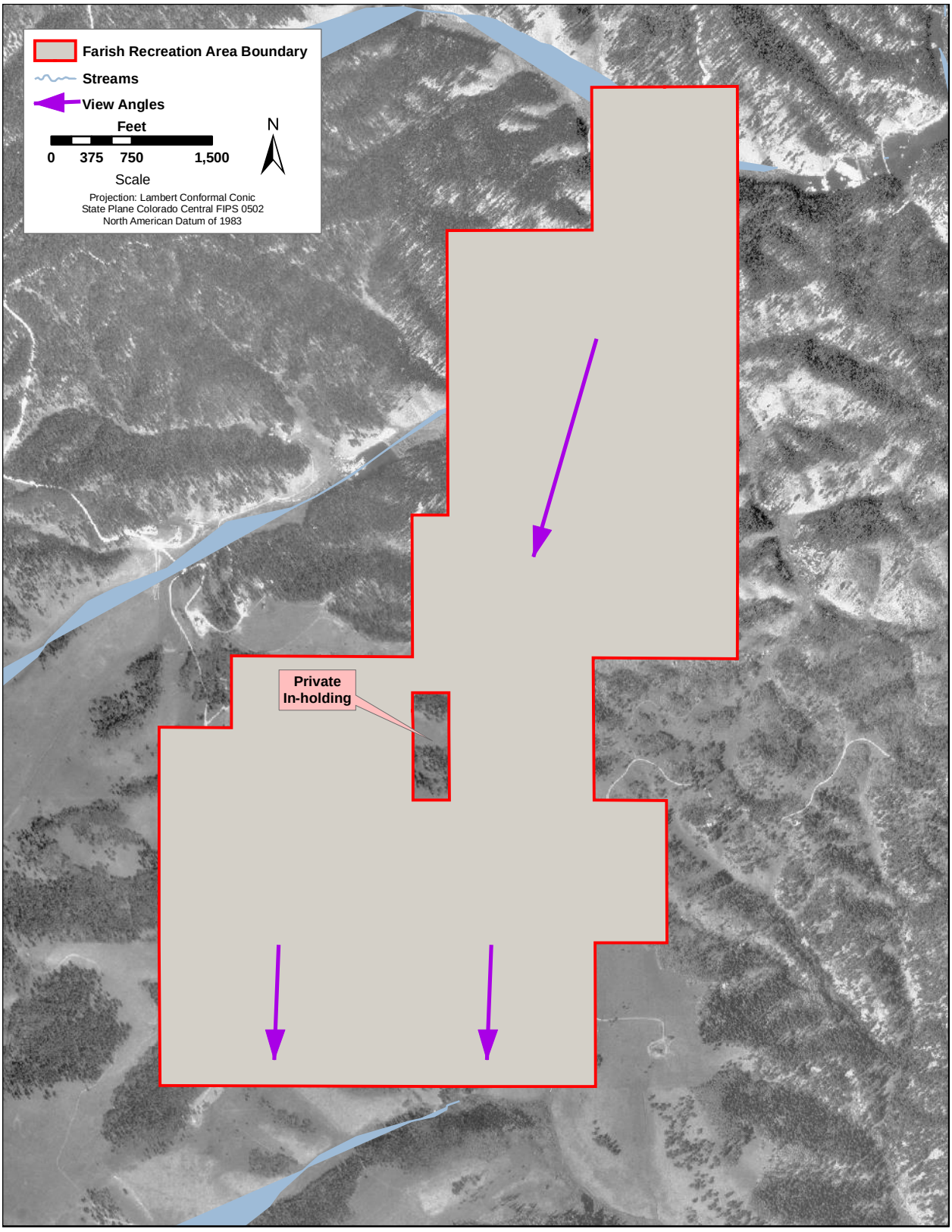
Source of View Data: USAF Academy 2007b

Views to the Academy from I-25



Source of wetlands data: USAF Academy 2007b

Views from the Academy



Source of wetlands data: USAF Academy 2007b

Views from the Farish Recreation Area

2.4 Mission Impacts on 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 near 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 unsafe. Training area may be impacted if erosion continues at the current rate.

2.4.2 Land Use

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 recreation (USAFA 2003).

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 (USAFA 2003).

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 (USAFA 2003).

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:

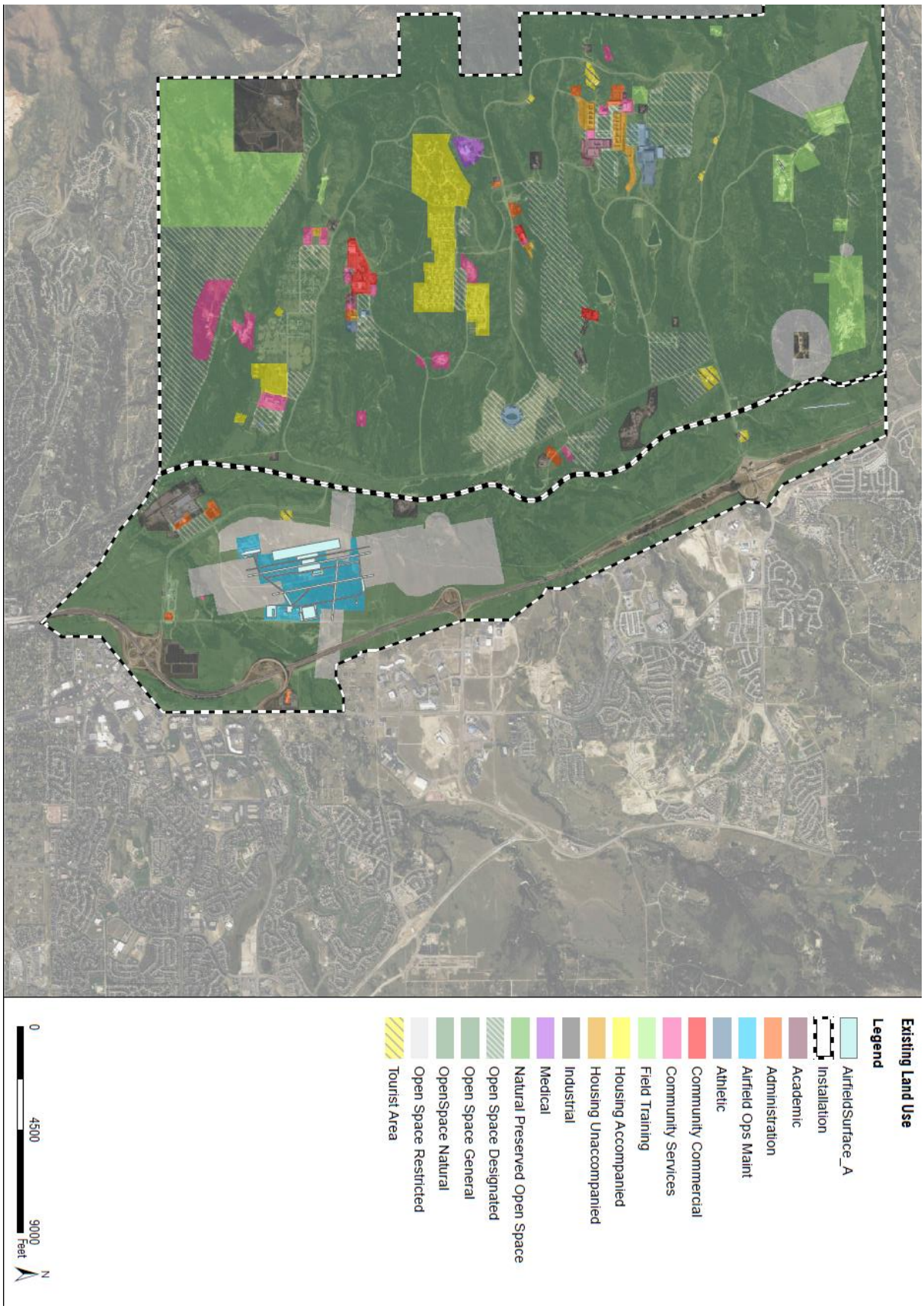
- Preserve views and thereby maintain the majestic quality of the site
- Restrict development in environmentally sensitive areas (e.g., wetlands)
- Separate and buffer subareas and functions
- Provide recreational opportunities.

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.


Existing Land Use
Legend
AirfieldSurface_A
Installation
Academic
Administration
Airfield Ops Maint
Athletic
Community Commercial
Community Services
Field Training
Housing Accompanied
Housing Unaccompanied
Industrial
Medical
Natural Preserved Open Space
Open Space Designated
Open Space General
OpenSpace Natural
Open Space Restricted
Tourist Area
0
4500
9000
Feet
N

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 (USAFA 2001).

There is one 10-acre inholding in the south-central part of Farish. Access to the inholding is from the southwest gate (USAFA 2001).

Management Zones

Three Management Zones have been designated at Farish (USAFA 2001):

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.

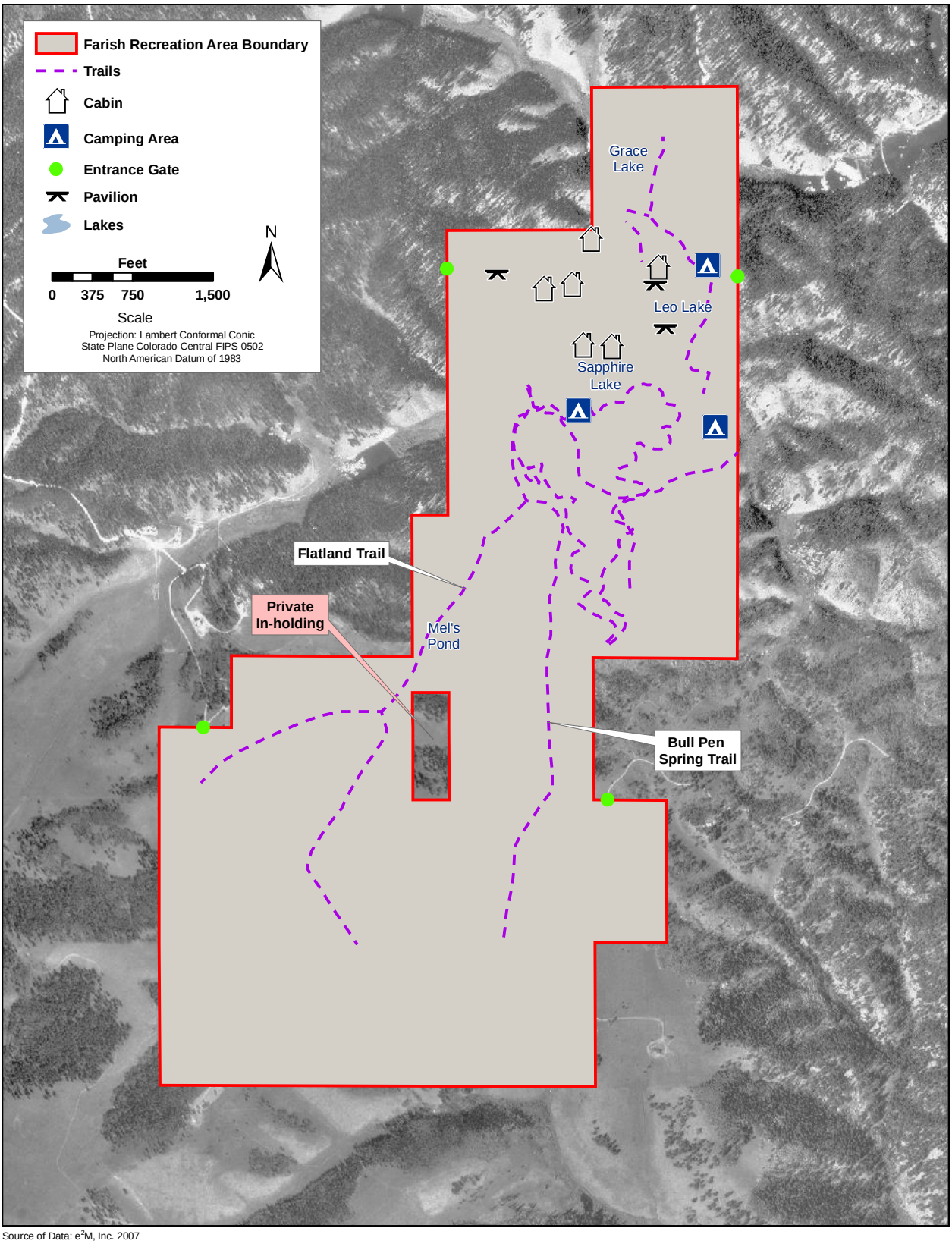
3. **Transition Sub-Zone:** The Transition Sub-Zone serves as a buffer between the Conservation Zone and the Development Zone and offers less developed recreational activities. The Transition Sub-Zone feathers the level of development in each zone from more developed in the Development Zone to less developed 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).

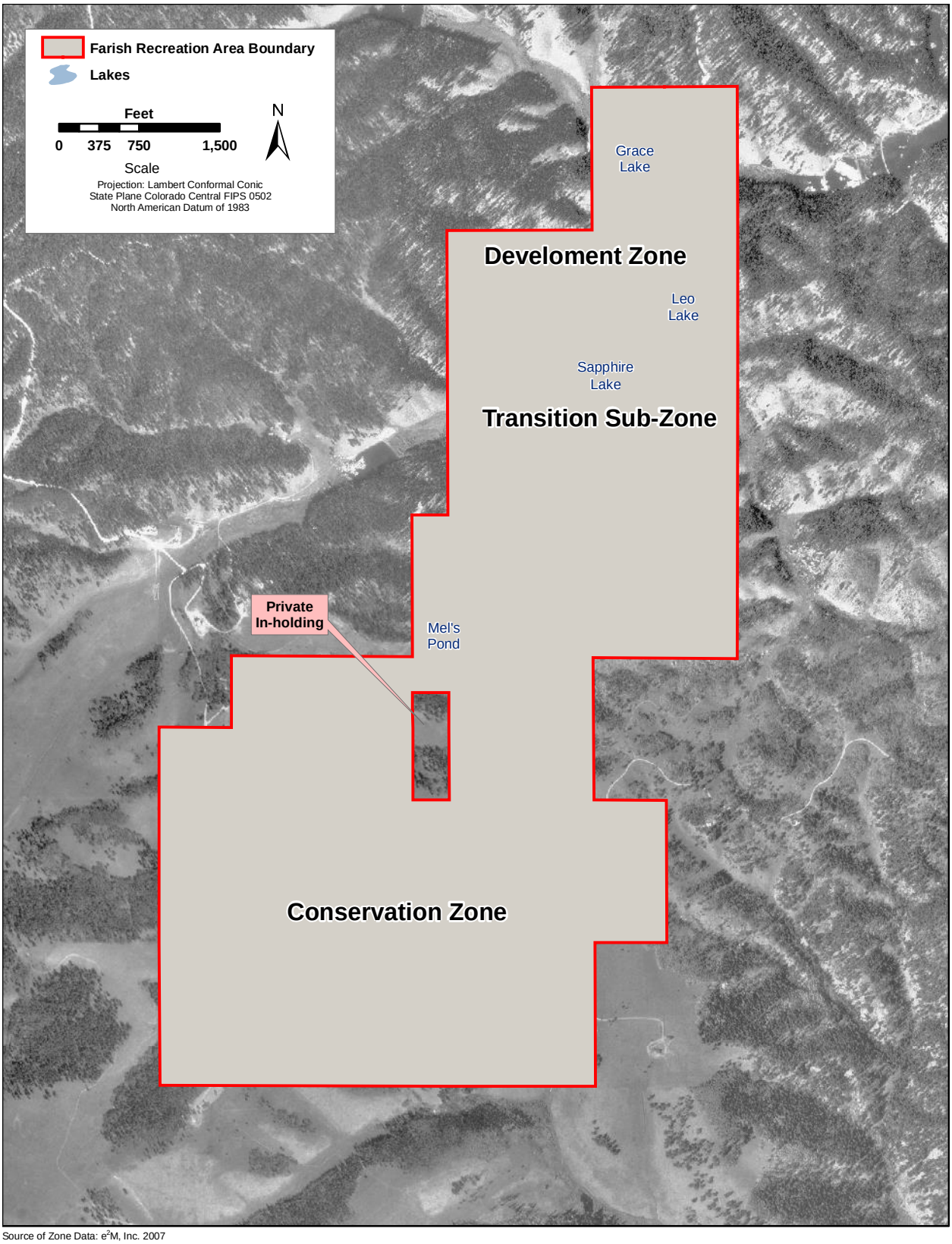
Schubarth Trail begins at Rampart Range Road and crosses through mixed national forest and private property before entering Farish at the southwest gate. Schubarth Trail bisects the southern part of Farish and continues eastward beyond the boundary as a four-wheel-drive road to Pike National Forest (USAFA 2001).

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 (USAFA 2001).



Source of Data: e²M, Inc. 2007

Existing Conditions at the Farish Recreation Area



Source of Zone Data: e^{2}M, Inc. 2007

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.

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 (USAFA 2001).

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. The road ends at three north-facing slopes that are used in winter for sledding and tubing.

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 (USAFA 2001).

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 (USAFA 2001).

Matrimony Point which is also referred to as Wedding Ridge is located south of the multipurpose building road. This point has spectacular views of Pikes Peak and is a popular spot for weddings (USAFA 2001).

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).

The landfill is referred to as Cadet Hill. The area is often used as an overnight camp for military training. Cadet Hill has vehicle access by going across the Leo Lake Dam and then going up a steep grade to the top of the hill. Cadet Hill is a large flat area that serves as a great overnight group camp. An astronomy observatory was built on the hill in 2015. Trail 721 enters Farish near the southeastern corner of the landfill (USAFA 2001).

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. The pavilion and the camper cabin have electric service.

The three smaller picnic pavilions accommodate about eight people each. 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 (USAFA 2001).

Sapphire Lake

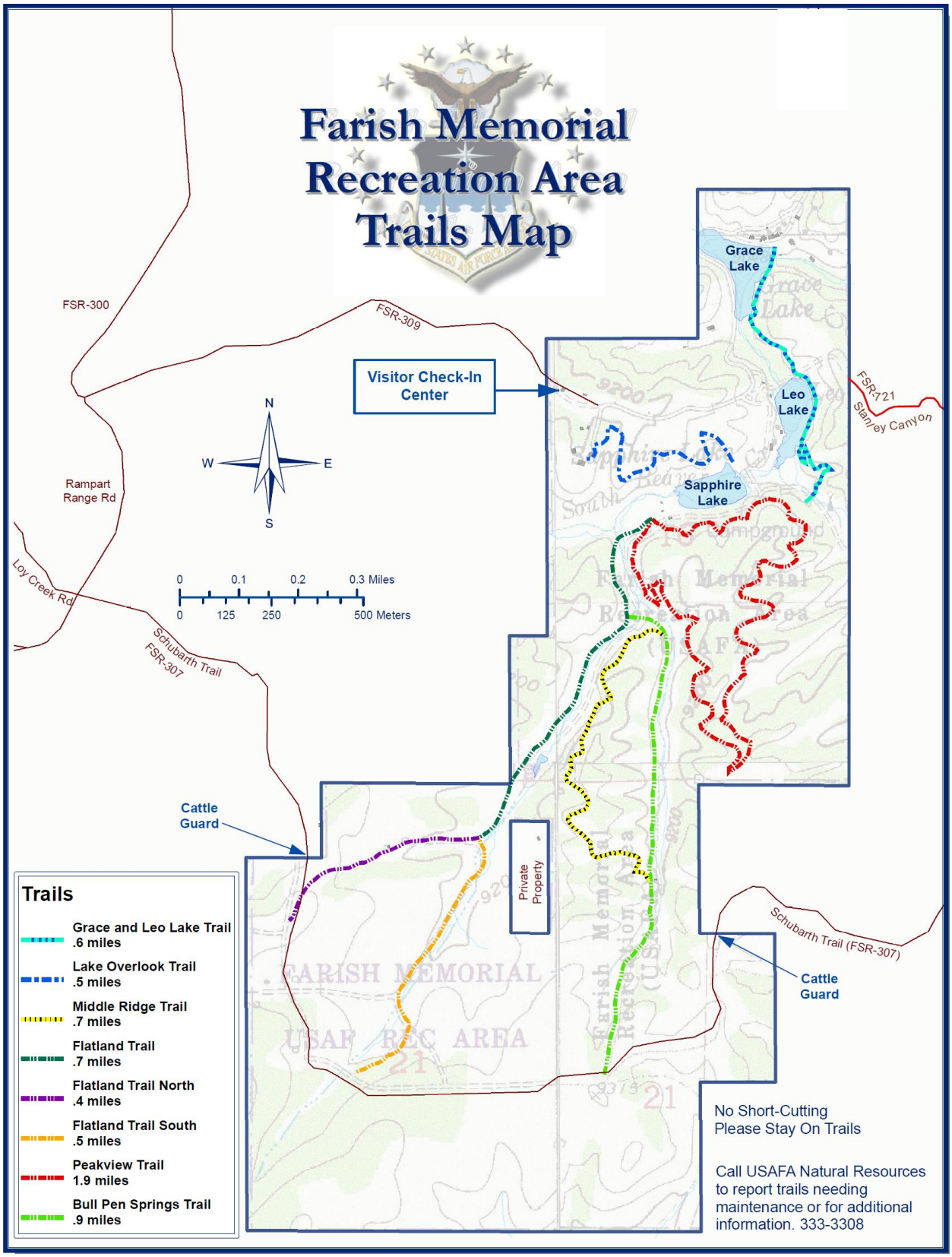
Six campsites, two camper cabins and portable toilets are near the south shore of Sapphire Lake; two campsites are located southeast and away from the lake. There is also a log picnic pavilion that accommodates about 12 people (USAFA 2001).

Trails

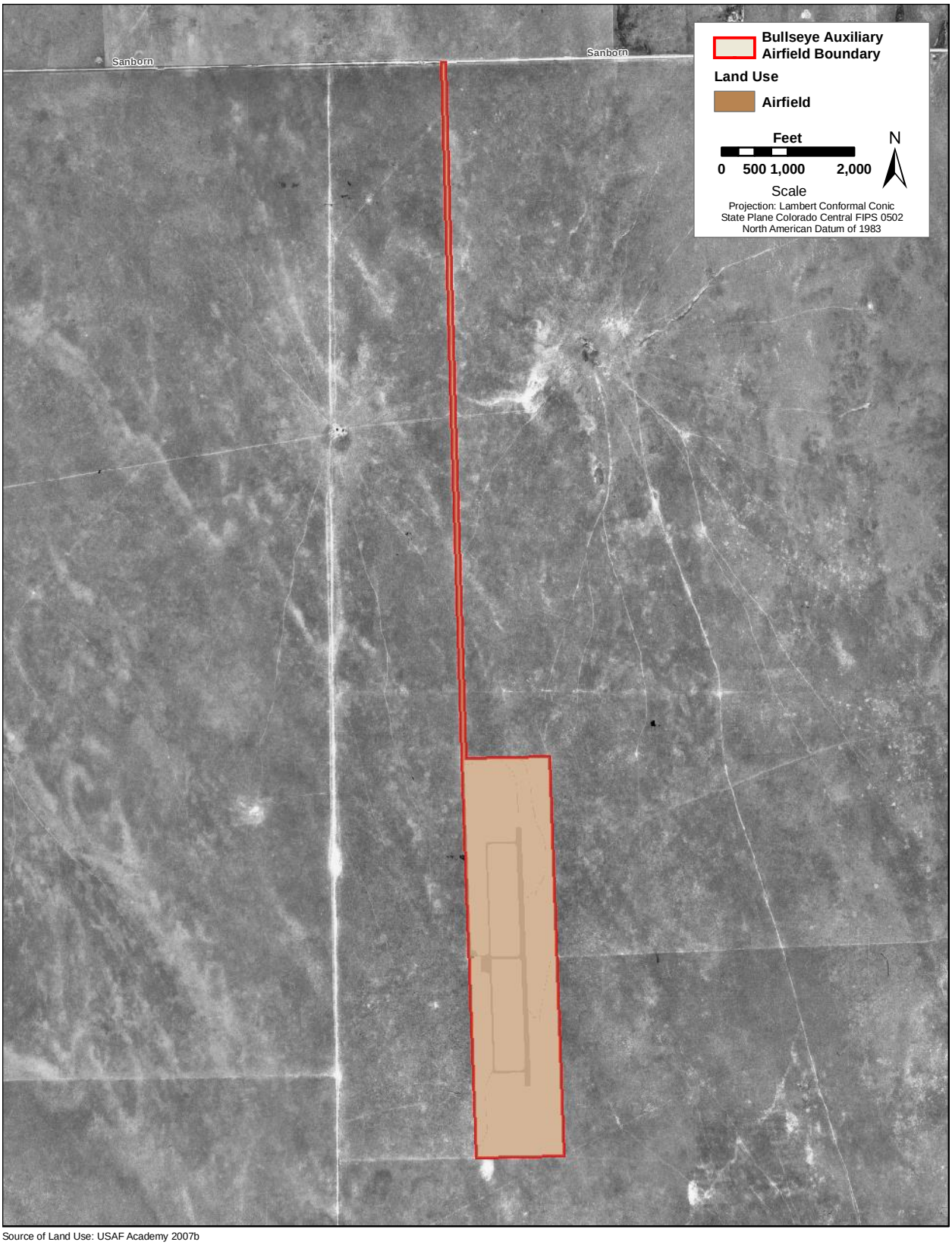
Many trails for hiking and biking follow existing service and access roads. Other single-track, multi-use recreational trails were constructed in the mid-2000's as part of the USAFA Trails Management Plan..

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. A 12-foot wide access road approximately 3 miles long 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 (ITC 1988).



Trails at Farish Recreation Area



Source of Land Use: USAF Academy 2007b

Land Use at the Bullseye Auxiliary Airfield

2.4.3 Current Major Impacts

Hazardous Materials and Hazardous Wastes

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 at the 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

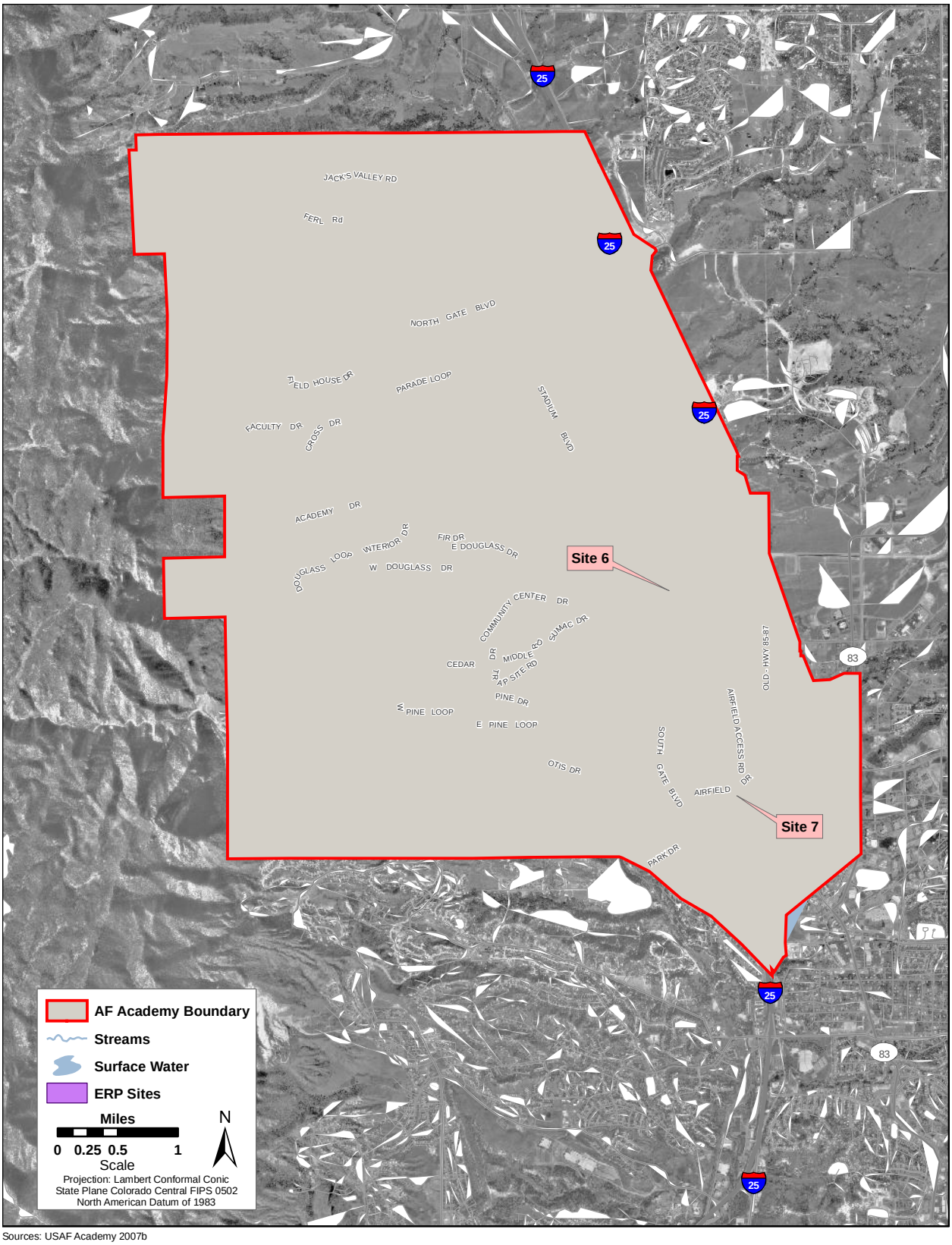
waste buried at Site 7 is believed to be present above the water table. During installation of monitoring well MW07-25 in the northeastern part of Site 7, municipal solid waste, including cloth, glass, paper, plastic, and metal fragments, was observed from a depth of approximately 15 feet BGS to a depth 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 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).



Sources: USAF Academy 2007b

Location of ERP Sites 6 and 7

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 update of the Air Installation Compatible Use Zone (AICUZ) Study (USAFA 2005b). 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 (USAFA 2006b).

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) (USAFA 2003).

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, AFI 32-7064 Integrated Natural Resources Management, 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 Impacts

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 of the base. Proposed new development includes expansion of the base cemetery, relocating the Visitor Center to the Northgate area, reconfigured interchanges and road connections on Interstate 25, the addition of campsites and other facilities at Farish Recreation Area, and expansion of training facilities in Jacks Valley.

2.4.5 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, soil erosion control, noxious weed and fire management, and forest insect and disease control are resource management activities necessary to sustain the training landscape.

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The AF environmental program adheres to the Environmental Management System (EMS) framework and it's Plan, Do, Check, Act cycle for ensuring mission success. Executive Order (EO) 13693, *Planning for Federal Sustainability in the Next Decade*, U.S. Department of Defense Instruction (DoDI) 4715.17, *Environmental Management Systems*, AFI 32-7001, *Environmental Management*, and international standard, ISO 14001:2004, 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 managing associated risks, and instilling a culture of continuous improvement. The INRMP serves as an administrative operational control that defines compliance-related activities and processes.

4.0 GENERAL ROLES AND RESPONSIBILITIES

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

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
Installation Commander	The Commander, 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

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
	hospital, all of which support nearly 4,000 cadets and a total military community of approximately 20,000 personnel. The 10 ABW Commander is the approving authority for the Academy's INRMP.
AFCEC Natural Resources Media Manager/Subject Matter Expert (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 resources health, and act as the focal point for issues on the Academy related to natural resources.
Installation Security Forces	The 10 SFS assists the Academy's NR Office with natural resources law enforcement issues. The 10 SFS can assist the natural resources program by observing natural resources conditions during routine patrols, apprehending individuals violating natural resources laws, and in the 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 do not conflict.
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
NEPA/Environmental Impact Analysis Process (EIAP) Manager	The Community Planning Function oversees EIAP for USAFA. The Planner ensures the INRMP activities that trigger NEPA are adequately described and analyzed in order to support a

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
	Finding of No Significant Impact, unless an environmental impact statement is warranted.
National Oceanic and Atmospheric Administration (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, it 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 provide wildland fire mitigation.
US Fish and Wildlife Service	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 for inhabiting the Academy are added to the Federal or state endangered species lists. In addition, these agencies should support Academy personnel during scheduled wildlife and vegetation surveys. These agencies are signatories to this INRMP. Cooperative Agreement (CA) between USAFA, USFWS, and CPW: This CA establishes the organizational relationships, responsibilities, and activities by which the USFWS and the CPW will provide support to the Academy. As requested by the Academy, the USFWS and CPW will provide administrative and technical assistance in support of its natural resources and outdoor recreation programs. The USFWS will also supply at least four full time equivalent (FTE) 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) can be contracted to monitor nuisance wildlife that have the potential to create a wildlife aircraft strike hazard. If so contracted, USDA-WS personnel would support activities that pertain to the Academy BASH Reduction Program. USDA-WS personnel would also be responsible for coordinating their activities with the 10 ABW/EM, 10 ABW/SE, Airfield Management (306 OSS/OSA), and Natural Resources.
10th Force Support Squadron – 10 FSS	The 10th FSS contributes to readiness and improves productivity of Academy people, 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 and the Farish Recreation Area.
Contract Services – 10 CES/CEOB	The 10 CES Contract Services is responsible for all grounds maintenance activities on the Academy. The 10 CES/CEOB will periodically review the types and condition of grounds

Office/Organization/Job Title (Listing is not in order of hierarchical responsibility)	**Installation Role/Responsibility Description**
	maintenance equipment to determine if new or additional equipment is needed for the proper maintenance of the Academy's landscapes.
Public Affairs—USAFA/PA	The 10 ABW/PA is responsible for the coordination of access for public events at the Academy. 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.

5.0 TRAINING

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

Installation Supplement – Training

- *NRMs at Category I installations must take the course, DoD Natural Resources Compliance, endorsed by the DoD Interservice Environmental Education Review Board and offered for all DoD Components by the Naval 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.*
    -

6.0 RECORDKEEPING AND REPORTING

6.1 Recordkeeping

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

Installation Supplement – Recordkeeping

USAFA Natural Resources records are stored in office files 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 Media Manager and Subject Matter Specialists should refer to the Environmental Reporting Playbook for guidance on execution of data gathering, quality control/quality assurance, and report development.

Installation Supplement –Reporting

USAFA Natural Resources responds to all data calls and information request through the USAFA Environmental Manager and IST.

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

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

Installation Supplement –Natural Resources Program Management

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, and public safety.

Management of the fish and wildlife program at the Academy is implemented through USAF Academy Instruction 32-7001, *Natural Resources on the USAF Academy*, 21 July 2016. Additionally, a cooperative agreement between the USFWS, the CPW and the Academy, effective October 2012 through September 2017, establishes the organizational relationships, responsibilities, and activities by which the USFWS and CPW will provide support to the Academy's natural resources program.

The Academy supports an active recreational fishing program at the Kettle Creek Lakes, Ice Lake, and Deadman's Lake. A fishing program is also maintained at the Farish Recreation Area (Grace Lake, Leo Lake, and Sapphire Lake). The lakes are stocked with rainbow trout and channel catfish from approximately March through October. No resources for fishing exist at the Bullseye Auxiliary Airfield. Receipts from the previous years' fishing permit sales are placed 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 at Leo Lake at the Farish Recreation Area. A USAFA annual ($21), one-day ($7.25), and second rod ($5.00) fishing permit is required and is available to active duty military, military retirees, DoD civilians, and their sponsored guests. The eligibility requirements and other regulations are outlined in USAFAI 32-7001 (Natural Resources on the USAF Academy).

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-established in 1988 following years of deer-automobile accidents and has continued annually in an effort to control deer numbers within the carrying capacity of the Academy's habitat and to help prevent deer-vehicle collisions and other property damage. Cow elk hunting began in 2001 in response to a rapidly growing elk population and similar habitat and safety concerns as with the deer. Limited turkey hunting is offered though the CPW Rookie Sportsman program. 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 and elk licenses to issue each season. Currently the goal is to maintain the deer herd at 200 to 300 animals and the elk herd at approximately 25-30 animals. 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 will employ six basic approaches for managing wildlife and habitat.

- **Inventorying and Monitoring Wildlife.** Wildlife inventorying and monitoring, such as annual aerial and ground surveys in cooperation with the CPW, for deer and elk populations will continue. The information obtained through such surveys will be used to detect any long-term changes in population size or structure. All data collected in these programs will be shared with the CPW . Inventorying and monitoring of the Preble's meadow jumping mouse will continue, as discussed in the Management of Threatened and Endangered Species, Species of Concern and Habitats section of this plan. Approaches for managing all rare, threatened, or endangered species will also be discussed in that section. Inventorying and monitoring of additional wildlife and plant species may be warranted based on consultation with the CNHP (see Topic No. FW-1). Creating, monitoring, and updating GIS data on wildlife species will allow the Academy to store, retrieve, present, and analyze wildlife data to make informed management decisions.
- **Controlling Invasive Species.** The Academy will continue existing programs to monitor and control invasive species at the Academy. Additional invasive weeds control efforts, as outlined in the Academy's Integrated Noxious Weed Management Plan (CNHP 2015) should be implemented (see Integrated Pest Management Program section). Programs to monitor for potential aquatic invasive species, especially the crustacean fish parasite Lernea and the New Zealand mud snail, will continue in cooperation and with guidance from the CPW. The lakes will also be monitored for nuisance and unwanted fish species (e.g. crappie, golden shiner, goldfish, etc.).
- **Restoring Degraded Academy Areas.** Identify degraded areas (e.g. training and recreation areas) and restore using native species in accordance with the USAFA Erosion Control, Revegetation, and Tree Care Standards.
- **Protecting Sensitive Areas.** The Academy will maintain the biological diversity of the Academy's lands 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).
- **Sustain 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 base 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 on the Academy. Opportunities to conserve this species is high due to the habitat overlap with the protected Preble's meadow jumping mouse riparian habitat. Abundant cover of the butterfly's wild hops (*Humulus lupulus*) host plant is found throughout the Academy's wetland and riparian habitat.
- **Managing for Migratory Birds.** The 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 that the Academy avoid impacting birds protected under the MBTA by surveying for nesting birds in areas proposed for disturbance, such as prescribed burning, and, if necessary, waiting until the nesting and fledging process is complete. Alternatively, the USFWS recommends

that conducting activities outside of nesting areas or outside of the general migratory bird nesting season that extends from March through August can 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, such as the guide for conserving shorebirds on DOD lands (Harrington 2007). Additionally, the Air Force also encourages coordination with, and support of, the Colorado PIF Land Bird Conservation Plan (Colorado Partners in EDM 2000).
- 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; APLIC and USFWS 2005). The Academy 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 (NA Waterfowl Management Plan 1998), the United States Shorebird Conservation Plan (Brown et al. 2001) and the North American Waterbird Conservation Plan (Kushlan 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 support of State Wildlife Action Plans as part of a comprehensive installation natural resources program. Consequently, the Academy should formally review Colorado's Comprehensive Wildlife Conservation Strategy and Wildlife Action Plans (CDOW 2006), and consult frequently with the Regional CPW office in Colorado Springs to determine areas where the Academy may participate in future wildlife conservation partnerships with the CPW and other partners in support of the Colorado Wildlife Action Plans.

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 outdoor recreation opportunities for military personnel and their families, DOD civilian employees, and the general public. Among the outdoor recreation activities provided are 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 of recreational use 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 for use during the performance of authorized government activities.

Detailed information concerning recreational access, policies, and regulations is available on the NaturalResources 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 a cooperative agreement with the US Fish and Wildlife Service in 2003 for the operation and management of the natural resources program, the base had an Air Force-employed 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 base hunting and fishing permitting requirements. Due to the USFWS organizational structure and supervisory controls required for law enforcement personnel, USFWS could not support a conservation law enforcement position under the agreement.

Since 2003, it has been determined that the anticipated duties and workload for a CLEO did not justify re-staffing the position with an Air Force employee or other qualified government agency personnel. For the few annual incidents requiring law enforcement support (e.g., wildlife-vehicle accidents, removal of hazardous wildlife), the base now 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 nuisance and hazardous wildlife problems and recreation permitting issues in-house.

The most routine wildlife law enforcement violations are failing to possess a valid base fishing permit, or fishermen exceeding the creel limit. Although there is a loss of reimbursable funding revenue due to the fishing permit violations, the financial loss does not justify the expense of supporting a CLEO position. For the most part, the fishermen do a good job of policing themselves and watch out for individuals violating the regulations. In rare cases, 10th Security Forces may be asked to intervene with a written violation notice or assistance to remove an offender from the installation.

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

As presented in the Threatened and Endangered Species and Species of Concern section of this plan, the USFWS and the CPW were contacted regarding the presence of threatened and endangered species in the geographic area of the Academy to satisfy Section 7(c) of the ESA (16 U.S.C. 1536). Table: Federal and State-Listed Species Found in El Paso County presents a list of the federally and state-listed species that have been documented on, that migrate through, or whose historic ranges overlap with the Academy.

The goal for this section is to manage the Academy on a regional ecosystem-based approach that manages sensitive species while still allowing for the consultation process outlined in the operational coordination decision chart, as required by the ESA. While single-species management is not promoted as a general philosophical management approach, specific methods are used to protect threatened, endangered, and rare species beyond management of the ecosystem. Other procedures in place for management of threatened, endangered, and rare species include modifying the ecosystem and human interactions within this environment.

Presently, the threatened Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) is the only federally-listed species found on the Air Force Academy property. Since 2000, the base has protected the mouse and its habitat through implementation of a Biological Opinion and Conservation Agreement (USFWS 2000), which is renewable on a 5-year cycle. Other plant, animal, and invertebrate species of state special concern have also been identified through field surveys performed by the Colorado Natural Heritage Program (2012) and Natural Resources staff.

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

Watershed protection is important to natural resources management at the Academy because it directly affects both surface water and groundwater quality and is critical to maintain valuable riparian, wetland, and aquatic habitats. Increased volume and velocity of stormwater flows resulting from off-base development, especially along the eastern border of the Academy, has caused serious erosion and habitat loss on most tributaries of Monument Creek. Projects that would help mitigate this damage, both on and off-base, are identified in the Monument Creek Watershed Restoration Plan (October 2016). Unpaved roads, utility lines, and firebreaks constructed on the very fragile soils found in many parts of the Academy and the Farish Recreation Area, are also a source of erosion and potential sedimentation. BMPs developed for Jack's Valley, the Cadet Area, Community Center, and the Main Airfield provide excellent approaches to reduce erosion and sedimentation in those areas.

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

Wetlands are important natural systems because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, unique flora and fauna niche provision, stormwater attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the "waters of the United States" under Section 404 of the 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 generally include swamps, marshes, bogs, and similar areas" 33 CFR 328.3 (b) (USACE 1987).

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, 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 still 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 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 height. 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 of this plan, the 10-year and 100-year floodplains on the Academy were mapped in 2003.

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. SAFO 791.1 re-delegates authority for the management of floodplains to the SAF/MI, and indicates that authority could be further re-delegated.

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.

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

Landscaping Practices: Environmentally and economically beneficial 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.

Since the Academy's Natural Resources Office does not have primary responsibility for grounds maintenance in the Academy's improved areas, this section will focus primarily on IPM and invasive species management.

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.

Challenging in that 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, killed 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 described as "park-like." As fighting and suppressing 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 1,500 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 for nutrients, sunlight and moisture has been exacerbated by the recent drought, with tree mortality on the rise.

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 insects, diseases, and parasites; 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 and within cantonment areas. An ongoing urban forest tree and shrub inventory is designed to information on tree health and cultural needs. The forestry staff manages this inventory, and coordinates with the Grounds Maintenance staff in an effort to effectively to manage the Academy's urban forest resource.

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 removed. 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 markets for local timber products. Forest products research includes a study whereby biomass produced from forest management operations is being mixed with coal to run a co-generation electric plant near Cañon City, Colorado. Other biomass facilities are being considered, which could facilitate disposal of additional small woody debris. Cooperative efforts to find viable markets for small wood are being considered, including a Colorado State Forest Service project which would utilize a rail siding on the Academy in support of an innovative new forest product. A logging cooperator on base has been researching options to promote sales

of wood chips to the landscaping market. Currently all felled trees will be taken to the Natural Resources Woodlot to be sold to the public averaging approximately $3,500 annually.

Forest Management at the 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.

1. **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.

   The mountain pine beetle has caused increasing mortality on the Academy in recent years, with 80 infested pines removed in 2006, and 280 removed in 2007. The forestry staff has been coordinating with the U.S Forest Service, El Paso County and the City of Colorado Springs in an effort to focus on this issue from a strategic regional basis. Supplemental staff has been brought on to perform intensive field surveys to locate infested trees, and funding has been bolstered to assure prompt treatment of all infested trees before beetle emergence in early summer. The Academy is cooperating with the U.S. Forest Service to perform field surveys along their shared boundaries, and plans to combine forces in attending to infested trees. The Academy is committed to protecting its forested landscape from a widespread beetle epidemic, as currently occurring in other parts of Colorado. An aggressive beetle management program has been the top forestry priority for the past several years, and will likely remain so for the near future. The mountain pine beetle is 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 70-90 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 or junipers 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. Intermediate thinning entries or "improvement harvests" 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.

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.

2. **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 slopes along the western edge of the Academy. 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.

   There are also some very impressive old-growth mixed conifer stands along riparian areas such as Goat Camp Creek. These are experiencing fairly high amounts of mortality due to over-maturity, with multi-storied canopies developing as a result of mortality among dominant trees.

   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 thinned to a residual basal area of approximately 70-90 BA/acre. Diseased trees will be highest priority for removal. Areas that are inoperable due to steep, dissected terrain will be left unmanaged, but wherever possible, strategic fuelbreaks 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.

3. **Ponderosa Pine Plantations:** Nearly 400 acres of pine plantations exist within the eastern one-third of the Academy. These plantations, ranging in age from 10 to 50 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.

   Overstocked plantations have been thinned using tree spades, with designated trees removed from the ground with roots intact and delivered to sites either on-base or off-base for replanting. Trees are paid for by the recipient and holes resulting from removed trees are refilled by the contractor.

   Thinning of these plantations will continue. Plantations will be thinned to approximate 20' x 20' spacing, allowing a generous variance to retain the healthiest trees and avoid leaving a straight-rowed "tree farm" appearance. Spring will continue to be the preferred time for this program, as this optimizes tree survivability.

   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.

4. **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 combat this threat, Natural Resources will be planting a series of trees and shrubs that will both reduce the risk to wildfire, provide diversity which can strength forest health, and start to define the urban and "wildland" forests.

Forest Management at the Farish Recreation Area

Considerable mortality exists in many of the forest stands at Farish, particularly in the Engelmann spruce and aspen in the developed north portion. There is some incidence of spruce beetle mortality, although the area is fortunately not at high risk for a major spruce epidemic, as confirmed by a recent 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.

The aspen in the north are 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, with beetle populations increasing. Farish is fortunate in that ponderosa pine comprises only a small percentage of the forest ecosystem, limiting the overall potential impact from this beetle. The mountain pine beetle is approaching epidemic conditions in nearby Woodland Park, CO, however, so attention and vigilance to beetle activity at Farish is of utmost importance. 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, however, is important to preserve the beautiful forested landscape for the future.

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 at the Academy and Farish

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 the U.S. Forest Service Bessey Nursery in Nebraska. The nursery would then germinate the seeds and ship the bare root seedlings back to the Academy to be planted.

Survival rates are approximately 25-35% for these planted seedlings based on estimates from the USAFA Silviculturalist. 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.

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.

Slash piles resulting from several of these logging units have been placed in a meadow along the Shubarth Trail. The rest have been removed through prescribed fire operations.

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.

1. **Biotic Agents:**

a. **Mountain Pine Beetle (MPB):** The MPB (*Dendroctonus ponderosae*) is at epidemic levels in the Colorado mountains, currently infesting nearly 700,000 acres and causing widespread tree mortality in lodgepole pine. Mortality in the lower elevation ponderosa pine is approaching epidemic levels in some areas of the Front Range, with increasing levels seen recently on the Academy.

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; debarking; bucking and wrapping in plastic; or removing to a "safe" place, several miles from susceptible pines. The Academy, Pike National Forest, El Paso County and City of Colorado Springs are currently 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 very 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.

b. **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. The Ips beetle attacks a range of tree sizes. While much Ips damage is found in tree tops 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 poisoning, 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 also a 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.

c. **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 (tree tops 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.

d. **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 "witches 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. 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.

e. **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.

f. **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.

g. **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 more bushy 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.

h. **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

i. **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 twig beetle (*Pityophthorus* spp.) has been active for years, killing individual branches and sometimes entire tops of trees. The pine sawyer has caused incidental foliage stunting. 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.

The U.S. Forest Service Forest Pest Health office in Lakewood, CO review annual proposals from a variety of government agencies in the Colorado-Wyoming area for forest management in response to insect and disease problems. The Academy has been awarded grants for MPB and dwarf mistletoe projects over the past five years, although competition for these funds has increased recently due to the growing MPB issue across the region.

2. Abiotic Agents:

a. **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 effected 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.

b. **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.

c. **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.
d. **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.

In the process of identifying forestry actions, a list of goals was generated that were used to create ecologically sustainable management objectives.

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 this, 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 2008 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 should 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 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, 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 can be very effective in reducing fuel loadings and restoring forests to a more natural and open condition. Forest thinning 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 (tree tops 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 have been developed for several communities in the areas surrounding the Academy and Farish. 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 acquired 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 and for the overall management of the Academy stables. Unfortunately, the plan was never completely implemented, so some localized overgrazing still exists. A major 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 sufficiently before returning to grazing. The plan also required the development of adequate watering sources for the animals at each of the five pastures. Although the fencing requirements of the plan were met, water sources were not developed and the plan could not be completely 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 only partly implemented because the base lacks an adequate composting facility. The heavy disposal of some manure in the pastures has resulted at times in burning or smothering vegetation. Using vegetation transects, photo documentation, and exclosure plots, the condition of the pastures is periodically monitored to prevent resource damage from over-grazing, noxious weeds, or the proliferation of trails.

Off-road vehicle (ORV) use continues to have a negative impact on some of the Academy's rangelands. The development of new roads and trails by off-road vehicles causes vegetation damage, harassment of wildlife, soil erosion and sedimentation, habitat fragmentation, and the spread of noxious weeds.

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

Pest species are typically native species 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, there is use of pesticides, herbicides, rodenticides, and insecticides 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, rattlesnakes, deer mice, mosquitoes. General household pests include miller moths and cockroaches. Nuisance or hazardous wildlife include bear, coyote, fox, mice, pocket gopher, prairie dog, raccoon, skunk, tree squirrel, mountain lion, and bats (USAFA 2007c).

The 10 CES Pest Management Coordinator implements an integrated pest management program that is based on nonchemical measures and the judicious use of pesticides in controlling most household pests on the base. All pesticides used on the Academy must be included 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. It sets the Measures of Merit for base pest management, which are as follows: Merit 1—all DOD bases will have a Pest Management Plan prepared, reviewed, and updated annually by the end of fiscal year (FY) 1997; Merit 2—by the end of FY 2000, DOD bases will reduce the amount of pesticides applied annually by 50 percent from the FY 1993 baseline in pounds of active ingredients; and Merit 3—by the end of FY 1998, all DOD Base pesticide applicators will be properly certified within 2 years of use. 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.

Typical Installation Pest Management Plans outline and describe policies, standards, and requirements for the CE personnel in performing all operations in connection with the Pest Management Program on the installation and are consistent with DODI 4150.7. Control measures for rats and a variety of insect pests that could be detrimental to the health and welfare of base personnel and property are briefly described in the Pest Management Plan for the Academy (USAFA 2012).

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."

IPM has been implemented at the Academy through the IPM Plan. The Plan sites 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 has 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
- Ornamental plant and turf 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, nonchemical means of control for insects will be used if possible. However, when chemical treatments are necessary the Academy will comply 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.

In the process of identifying grounds maintenance actions, a list of goals was generated that were used to create ecologically sustainable management objectives.

Invasive Species Management: At the Academy, invasive species management is an important component of the habitat and range 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. 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.

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. Generally speaking, the Colorado Noxious Weed Act addresses five major areas;

- Definition of Noxious Weeds
- Definition of Native Plants
- Duties and Powers of Local Governing Bodies
- Duties of State Governing Entities
- Establishment of a position for a State Weed Coordinator.

In 1999 the Academy implemented a program to control noxious weeds using biological controls in cooperation with the Texas Agricultural Experiment Station. Also, in the summer of 2002 and 2003 the CNHP mapped 14 selected noxious weeds found on the Academy and at the Farish Recreation Area. The project was undertaken to provide the Academy Natural Resources office with information on noxious weeds to serve as the basis for the development of a formal Integrated Weed Management plan. In 2004 an Integrated Noxious Weed Management Plan was produced for the Academy which is incorporated into this INRMP as a component plan (Land Stewardship Consulting, Inc. 2004). The plan designated 14 noxious weed species as targets for eradication, suppression, or containment. The plan stipulated a monitoring program to measure the effectiveness of management efforts at the Academy and to provide some measure of progress toward meeting goals for weed management and eradication. Permanent baseline monitoring plots were established for ten species. Subsequent CNHP weed surveys and mapping in 2007 and 2012 identified several new noxious weeds on the Academy, and currently over 20+ species are actively monitored and managed. CNHP also updated the Noxious Weed Management Plan to incorporate new management goals and objectives for the additional weed species (CNHP 2015).

In 2005, the CNHP established a monitoring program for 13 species of noxious weeds at the Academy. This program was established following the guidelines provided in the Academy's Integrated Noxious Weed Management Plan. Permanent baseline monitoring plots were established for 10 of the target species and plot and photo monitoring is performed annually 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, etc.)(CNHP 2005-2016).

Nonnative, Invasive Plants at the Academy

Nonnative, invasive plant species have the potential to be a major contributor to ecosystem destabilization. Nonnative 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 nonnative, 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, nonnative species have also been intentionally introduced for erosion control, landscaping, or wildlife food plots.

Invasive and nonnative species are found on the Academy and the Farish Recreation Area. Although formal inventories for invasive and nonnative species have not yet been performed at the Bullseye Auxiliary Airfield, casual surveys have indicated they are not an issue. The Academy's Integrated Noxious Weed Management Plan (CNHP 2015) outlines a strategy for the control of those species at the Academy and the Farish Recreation Area.

List A species are designated by the Commissioner of Agriculture for eradication. List B species are species for which the Commissioner (in consultation with the state noxious weed advisory committee, local governments, and other interested parties) develops and implements state noxious weed management plans designed to stop the continued spread of these species. List C species are species for which the Commissioner (in consultation with the state noxious weed advisory committee, local governments, and other interested parties) will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.

Table: Summary of Nonnative and Invasive Plant Species

Common Name	Latin Name	2014 Colorado Weed List	Current Management
Myrtle spurge	***Euphorbia myrsinites***	**A**	**Rapid response**
Bouncingbet	***Saponaria officinalis***	**B**	**Rapid response**
Bull thistle*	***Cirsium vulgare***	**B**	**Active management**
Canada thistle*	***Cirsium arvense***	**B**	**Active management**
Common teasel*	***Dipsacus fullonum***	**B**	**Opportunistic management**
Dalmatian toadflax	***Linaria dalmatica***	**B**	**Rapid response**
Dame's rocket	***Hesperis matronalis***	**B**	**Rapid response**
Hoary cress (Whitetop)*	***Cardaria draba***	**B**	**Active management**
Houndstongue	***Cynoglossum officinale***	**B**	**Rapid response**
Knapweeds (spotted, diffuse and hybrid)*	***Centaurea* spp.**	**B**	**Active management**
Leafy spurge*	***Euphorbia esula***	**B**	**Active management**
Musk thistle*	***Carduus nutans***	**B**	**Active management**
Russian knapweed*	***Acroptilon repens***	**B**	**Active management**
Russian olive*	***Elaeagnus angustifolia***	**B**	**Active management**
Scotch thistle*	***Onopordum acanthium***	**B**	**Active management**
Yellow toadflax*	***Linaria vulgaris***	**B**	**Opportunistic management**
Salt cedar (Tamarisk)	***Tamarix ramosissma***	**B**	**Rapid response**
Chicory	*Chichorium intybus*	C	Not managed
Common burdock	*Arctium minus*	C	Not managed
Common mullein*	*Verbascum thapsus*	C	Not managed
Common St. Johnswort*	***Hypericum perforatum***	**C**	**Active management**
Downy brome (cheatgrass)*	*Bromus tectorum*	C	Not managed
Field bindweed	*Convolvulus arvensis*	C	Not managed
Poison hemlock	*Conium maculatum*	C	Not managed
Quackgrass	*Elymus repens*	C	Not managed
Wild proso millet	*Panicum miliaceum*	C	Not managed
Siberian peashrub	***Caragana arborescens***	**NA**	**Considering for management**
Tatarian honeysuckle	***Lonicera tatarica***	**NA**	**Opportunistic management**
Yellow spring bedstraw	*Gallium verum*	NA	Rapid response

Prior to 1999, most noxious weed control on the Academy and Farish involved hand-pulling, seed head harvesting and herbicide spraying. The first major nonchemical efforts to control invasive and nonnative species at the Academy began in 1999 through a cooperative effort involving the Texas Agricultural Experiment Station, the DOD and 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 control invasive and nonnative species using biological controls. The focus of the program is threefold:

1. Establish approved insects and mites for control of various Federal- and state-listed noxious weeds at various sites within the five locations
2. Redistribute established insects and mite to additional weed infestations
3. Monitor the reduction in weed infestations through Global Positioning System (GPS) mapping of infestation perimeters and plant measurements that include density, height, and other variables.

The biological weed control and monitoring program was abolished in 2014 after it was determined that some weed species (e.g. knapweeds, yellow toadflax,) were not sufficiently affected by the biological agents. Field surveys also revealed the released bio-agents had established new populations basewide to help perpetuate some level of biological control without further bio-agent releases or management actions.

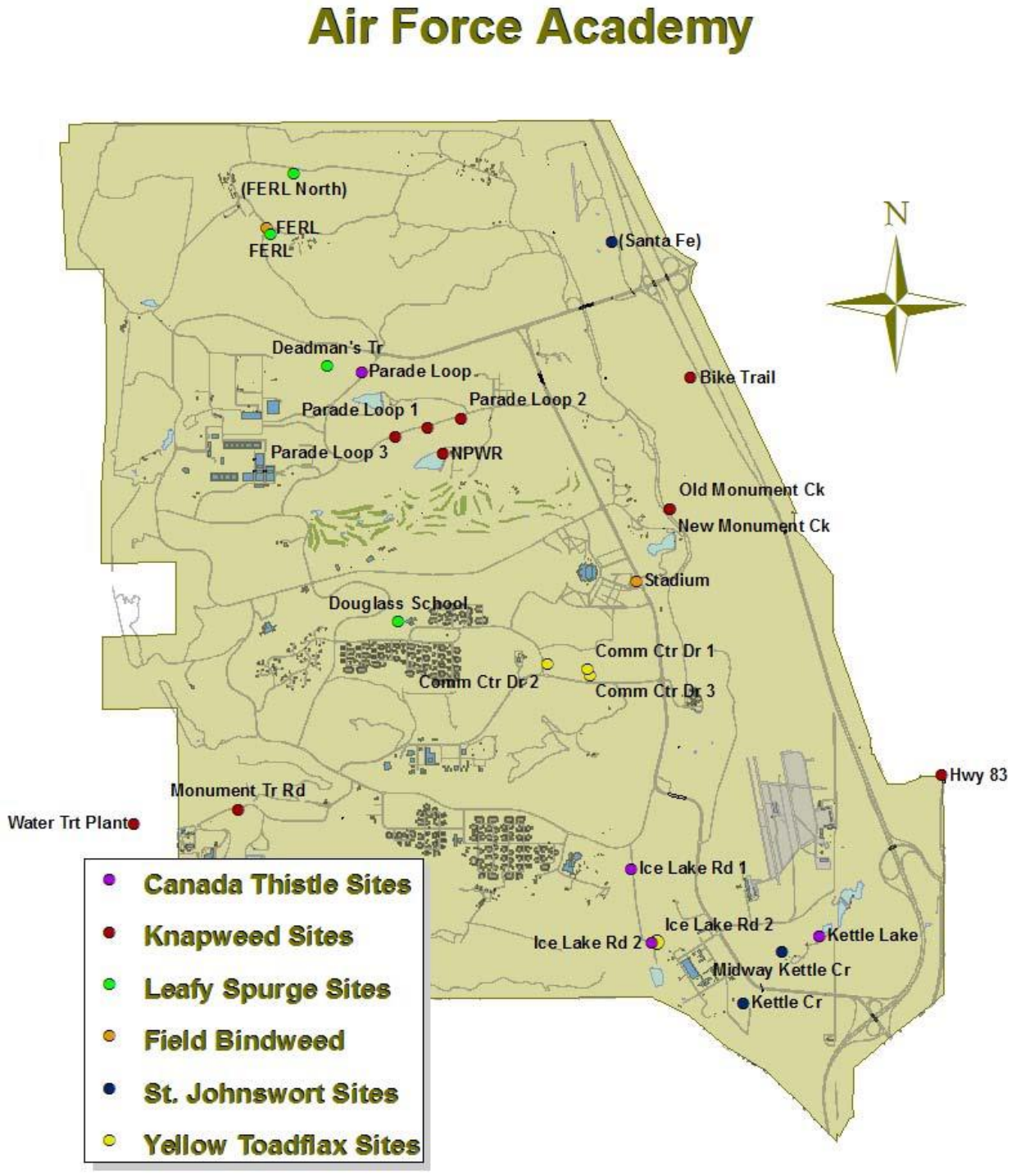
Weed monitoring and periodic basewide weed surveys and mapping are performed to serve as the basis for development and implementation of a formal Integrated Weed Management Plan (CNHP 2015). Weed management priorities have been set for the Academy and Farish that are based primarily on four factors: (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 is given a high priority for management due to its status as a List A species, for which eradication is required by State Law. However, common St. John's Wort is also given a high priority for management; although State and County weed management statutes do not require eradication of this species, its distribution at the Academy is localized and eradication is feasible at present. This species is also a threat to significant natural resources at the Academy (USAFA 2008).

Farish Recreation Area

Nonnative plants found on Farish include smooth brome which is found in former agricultural areas in the southern parts of the property, leafy spurge which is invading from private land along the south boundary, yellow toadflax which is prevalent in wet meadows, and Canada thistle and musk thistle which are also found in the meadows at Farish (USAFA 2001). Other weed species will be controlled in the future using an Integrated Weed Management (IWM) approach (USAFA 2015).

Bullseye Auxiliary Airfield

Although formal inventories for invasive and nonnative species have not yet been performed at the Bullseye Auxiliary Airfield, casual surveys have indicated they are not an issue.



Initial Biological Control Release Sites

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 includes a number of natural resources issues affecting the safe and efficient operation of the Academy's airfields. This section will focus specifically on actions required to ensure compliance with airfield safety requirements with the least environmental impacts. Additionally, management at the recently closed Aardvark Auxiliary Airfield has been modified (e.g., tree removal through transplanting and cutting has been curtailed). If the airfield becomes active again in the future, tree removal through transplanting and cutting will resume.

Natural Resources coordinates closely with Airfield Management on wildlife and other BASH-related issues through participation on the Bird-Hazard Working Group and attendance at quarterly Airfield Operations Board meetings. Natural Resources also reviews and updates the BASH plan on an annual basis in coordination with the Flight Safety Officer and other airfield staff.

Natural Resources generally advocates 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.

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

Baseline inventories of cultural resources at the Academy were completed in late 1996, and an ICRMP has been completed (See Chapter 15.0 Associated Plans, Tab 4). In July 1995, the Colorado State Historic Preservation Office (SHPO) determined that the Academy campus was eligible for listing on the National Register of Historic Places (NRHP). That determination, which included the landscape boundaries of the original 1955 Master Plan, was based on the unique combination of natural and built elements found on the Academy. In April 2004, the National Park Service established the Academy's Cadet Area as a National

Historic Landmark. Natural resources managers must take into account the significance of the Academy's cultural resources and viewsheds, and ensure that their actions do not adversely impact those cultural resources (USAFA 2003). Details of these cultural resources and management recommendations can be found in the Academy's ICRMP which was updated in 2016.

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. There are eight archeological sites at Farish, but the sites are not significant. Farish also has three structures that are eligible for the NRHP. Any work being done on these structures must be coordinated with the Colorado SHPO.

Bullseye 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 (ITC 1988).

Paleobotanical Sites on the Academy

In the early 1990s, research teams from Fort Hays State University, Kansas, identified and examined areas on the Academy containing 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 is kept confidential to ensure protection of the resource.

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 an iSportsman website (usafa.isportsman.net) established in 2016. 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 also leads events such as Arbor Day recognition, a FireWise community open house, and Creek Week cleanup.

7.16 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 of one kind or another. 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 has an extensive GIS database to assist in ecosystem management activities on the Academy and at its geographically separated units. Natural resources management relies heavily upon GIS to provide analysis and display of natural resources data gathered on the Academy. GIS also provides support for the entire environmental program as well as the training community. The Academy will utilize GIS for complex analyses such as project siting, training operations planning, environmental data interpolations, and risk assessments.

8.0 MANAGEMENT GOALS AND OBJECTIVES

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

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

Installation Supplement – Management Goals and Objectives

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

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, 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 SOP's 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 help 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 with information covering program activities, rules and regulations, maps, photographs, and outdoor recreation opportunities. Coordinate with USAFA Public Affairs to update the site and maintain its functionality.

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, Bald and Golden Eagle Protection Act, wildland fire, road kill wildlife possession, etc.

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: Attend Colorado Front Range Roundtable meetings as time allows. Participate on collaborative teams dedicated to exploring complex and pressing natural resource issues, especially affecting the USAFA and Farish.

Project 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.

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 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 (~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 any indication of chronic wasting disease.

Project 2.1.3: Coordinate with 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, 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 writing/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 basewide 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 and elk licenses to be issued for the following hunting season to help maintain a target population of less than 300 deer and 40 elk.

Project 2.3.3: Sustain a flock of <100 Merriam's turkey to prevent bird-human conflicts. Consider reinstituting a fall and/or spring turkey hunt, or coordinating with Colorado Parks and Wildlife on a trapping/relocation program, if the population objective is not being met.

Project 2.3.4: Continue to discuss with CPW ways to reduce the "trophy" nature of the buck deer hunting.

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 at least every 3 to 5-years to develop a metric of 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 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.

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.

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: As required, implement projects (e.g., revegetation, stream restoration, road and trail closure, noxious weed control) that eliminate or minimize threats and promote habitat conservation, maintain off- and on-base habitat corridors and genetic connectivity, and minimize incidental take within the approximate 3300-acre USAFA Preble's Conservation Zone.

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

Project 2.7.4: Participate in the preparation and implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan.

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 that are 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-year's to evaluate the occurrence, abundance, threats, and management needs of special status species.

Project 2.8.4: Conduct field surveys every 5-year's 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 regulation 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: Utilize 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 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.

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

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 basewide 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 1,400 acres (10%) of forest annually using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy GeoBase.

Project 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. 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. An estimated 400 trees per year will be sprayed.

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 Forest City 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 quality of management planning and accomplishment reporting.

Project 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.

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 sweep 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. An annual estimated 200 trees will be cut.

Project 4.6.3: Accomplish a baseline 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: Update hazard tree inventory every five years. Include 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.

Objective 4.7: Maintain an active reforestation program.

Project 4.7.1: Supplement existing ponderosa pine seedbank by collecting cones from high quality pines at varying elevations during bumper crop years, estimated at every five years for ponderosa pine. Ensure sufficient genetic diversity by collecting from at least twenty trees within each seedlot. Send cones to Bessey USFS Nursery for extraction and cold storage.

Project 4.7.2: Supplement existing Douglas-fir seedbank by collecting cones from high quality firs at elevations of 7,000'+ during bumper crop years (estimated at every three years), to a maximum of 20% of potential seedlings in the USAFA seedbank. Send cones to Bessey Nursery for extraction and storage.

Project 4.7.3: Establish a seedbank for Engelmann spruce by collecting from high quality Engelmann spruce at Farish, to a maximum of 5% of potential seedlings in the USAFA seedbank. Send cones to Bessey Nursery for extraction and storage.

Project 4.7.4: Submit annual seedling sowing requests for 750 seedlings to the USFS Bessey Nursery for spring delivery. Request 80% ponderosa pine at varying elevations to afford flexibility in potential planting locations in the event of a wildfire.

Project 4.7.5: Plant 750 seedlings in spring within burn scars or other disturbed areas, according to genetic adaptability guidelines (±400' and ±300' in elevation for ponderosa pine and Douglas fir, respectively).

Project 4.7.6: Perform seedling survival surveys at years 1, 3 and 5 following planting. Schedule replanting as necessary.

Project 4.7.7: In the event of a major wildfire, submit an emergency sowing request to the Bessey Nursery for seedlings for the following spring, reflecting appropriate species and elevations for the burn area.

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: Clear aspen regeneration harvest units. Pile logging slash outside of units for future prescribed burning. Fence both harvest units with field fencing sufficient to prevent elk entry.

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 a study plan to capture growth response and effectiveness of treatment based on season treated, aspect, elevation, etc. 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: Thin existing pine plantations as necessary to prevent disease, fire hazards, and overstocking.

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 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 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: Host workshop biannually for project planners and others involved in landscape design to increase awareness of construction impacts on trees. Address trenching, grading, pruning and long-term landscape care.

Project 4.12.5: Chair an urban forest council with representatives from Natural Resources, Grounds Maintenance; Forest City (housing); and the CE service contractor.

Project 4.12.6: Collect urban tree inventory data on 2,000 trees biyearly, to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor critical tree health issues such as emerald ash borer.

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: Update the Wildland Fire Memorandum of Understanding (MOU) between the USAFA and USFWS upon expiration of the existing agreement in 2017.

Project 5.2.2: 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: Clear 70 acres annually of Gambel oak and other brush for fuelbreaks, and to break up continuity of dense brushy fuels. 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: Limb conifers retained within shaded fuelbreak areas to a height of approximately six feet. An estimated 3oo trees will be limbed annually.

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: 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.

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: Secure a smoke permit and perform a prescribed broadcast burn on the one-acre Academy Drive site to enhance the rare aster Plains Ironweed (*Vernonia marginata*).

Project 5.5.1.1: Install monitoring plots to evaluate results of this burn. Assess annually at the end of the growing season.

Project 5.5.1.2: Update the existing three-year prescribed fire burn plan for the Plains Ironweed site, upon expiration in 2016. Incorporate into annual INRMP update.

Project 5.5.2: Develop a prescribed burn plan to enhance meadow habitat in a 16-acre area south of the Cadet area.

Project 5.5.2.1: Install monitoring plots to evaluate results of this burn, and collect baseline vegetation data. Assess annually thereafter.

Project 5.5.2.2: Secure a smoke permit and perform a prescribed broadcast burn on this 16-acre site.
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Project 5.5.3: Develop a prescribed burn plan to burn slash piles resulting from aspen harvest units at Farish (Project 4.8.1), to reduce wildfire hazard.

Project 5.5.3.1: Secure a smoke permit and perform a winter prescribed burn on this site.

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 the Pikes Peak Wildfire Prevention Partners (PPWPP). Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.

Project 5.7.2: Help plan and host the annual PPWPP “Living with Wildfire” community education conference.

Project 5.7.3: 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: Continue to charge 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 free lifetime fishing permits to disabled veterans (DAV) with a 60% or higher disability rating from the Department of Veterans Affairs. Continue to coordinate with Airfield Management to provide handicapped DAV 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. 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. Only 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 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: Continually 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 USAFA Public Affairs to maintain an enjoyable and environmentally sustainable camping area for non-profit organizations.

Project 6.3.1: Update the user requirements and regulations for the B-52 camping area.

Project 6.3.2: Prepare a site management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.

Project 6.3.2: Consider charging a nominal user fee to help offset the cost of maintaining and improving the camping area.

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: Annually 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.

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

9.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

The purpose of this section is to present a road map for accomplishing of specific management actions to satisfy the management goals and objectives by implementing Annual Work Plans. 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 Work Plans may be modified as part of the annual review of this plan by the INRMP Working Group to ensure that these tasks are continually emphasized and accomplished when practicable.

The Office of Management and Budget considers funding for the preparation and implementation of this INRMP, as required by the Sikes Act, and the associated NEPA analysis and documentation to be a high priority. However, the reality is that not all of the projects and programs identified in this INRMP will receive immediate funding. As such, the actions identified in this INRMP need to be reviewed by the Academy NR Staff and placed into four priority categories based on guidance provided in AFI 32-7064 and AFI 32 7001 *Environmental Budgeting*. These four priority ranks or categories are briefly described as follows:

- Level 0 – "Natural resources management actions recurring on an annual or more frequent basis that are 'must do' activities. Ongoing natural resources management activities identified in an approved INRMP are Level 0 requirements if they are essential for the successful implementation of the goals and objectives stated in the plan….Level 0 requirements include funding for personnel, travel, training, and supply costs, as well as recurring inventories, surveys, sampling, monitoring, reporting and record keeping, …." (AFI 32-7064).
- Level 1 – "A non-recurring requirement, occurring only one time or less frequently than once a year, that corrects an out-of-compliance condition and references a valid statutory driver in the year programmed. Valid drivers include federal laws, regulatory mandates, and state laws applicable to federal activities. Level 1 projects include the initial preparation and five-year revisions of an INRMP" (AFI 32-7064). Level 1 projects also include those needed for compliance with EOs 11988 (Floodplain Management) and 11990 (Protection of Wetlands) such as wetlands and floodplains surveys and inventories, and actions to protect, develop, monitor, and restore wetlands and floodplains (AFI 32-7001).
- Level 2 – "A non-recurring requirement for activities and projects programmed in a fiscal year which is in advance of the year in which compliance is mandatory and necessary to prevent non-compliance beyond the program year. Legal drivers are the same as for Level 1." (AFI 32-7064). These actions are characterized by AFI 32-7001 as actions which would "prevent non-compliance."
- Level 3 – "Non-recurring activities and projects that are not explicitly required by an applicable legal driver, but are needed to enhance the environment beyond statutory compliance." (AFI-32-7064)

Funding sources are also identified in AFI 32-7064 and AFI 32-7001. While some of the actions described in this INRMP could potentially be funded under "Environmental Compliance" in addition to "Conservation Resources Management" (*sensu* AFI 32-7001) 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 (AFI 32-7064). 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 entirety of the two referenced AFIs, and any subsequent supplements or revisions, in preparing each year's budget for implementation of the actions identified in this INRMP.

This INRMP reflects the commitment set forth by the Academy to conserve, protect, and enhance the natural resources present on the installation. This INRMP is the final plan that will direct the natural resources management the Academy from FY 2018 through FY 2022. 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 the biological communities inhabiting the base. In addition, the natural resources management measures described in this Plan will protect the Academy's ecosystems and their components from unacceptable damage or degradation.

Natural resources and land use management issues are not the only factors contributing to the development and implementation of the INRMP. Base management and other seemingly unrelated issues affect the implementation of this Plan. It is of utmost importance to the implementation of this INRMP that base personnel take "ownership" of the Plan (i.e., individual or organizational responsibility to implement the INRMP), to provide the necessary resources (e.g., personnel and equipment), and to allocate the appropriate funding to enact the plan. It is extremely important that an INRMP Working Group be established to aid in the continued development of and commitment to the implementation of this INRMP. The INRMP Working Group shall be made up of the key base and host unit personnel, and will assume an oversight role to ensure the effective implementation of this Plan. Top- and middle-level management representation, as well as representation from several individuals with day-to-day on-base field experience, will provide the INRMP Working Group with the leadership and structure necessary for the successful implementation of this INRMP.

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.

Currently, Academy personnel are responsible for implementing programs at the base other than the natural resources management responsibilities that will be necessary to implement this INRMP. Additional sources of temporary labor, such as seasonal employees (e.g., summer hires), could be utilized to augment current staff. Outside agency reimbursable hires and guardsman, reservists, or active-duty USAF personnel assigned to the Academy on temporary duty are another source of supplemental labor. Implementation of a number of projects discussed in this INRMP will require active outside assistance. The outside assistance might come from state and Federal agencies, private consortiums and organizations, universities, and contractors. Using these resources is the most efficient and cost-effective method for acquiring expertise on a temporary basis. The INRMP Working Group should assess the level of additional resources necessary to fully implement this Plan during the INRMP annual review process and determine the extent to which outside assistance will be required.

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 Force Support Squadron, 306th Flight Safety and Airfield Management, 10th Security Forces, USAFA Public Affairs,

Colorado Parks and Wildlife, and the US Fish and Wildlife Service. Annual review of the INRMP and Work Plans provide an opportunity for these organizations to comment on the status of USAFA's resource management and recommend areas for improvement.

The USAFA Natural Resources program is currently staffed with US Fish and Wildlife Service employees from Colorado Fish and Wildlife Conservation Office (COFWCO) through a Sikes Act Cooperative Agreement with the Air Force. The staff includes four, full-time, professional scientists: Natural Resource Manager, Wildlife Biologist, Forester, and Range Technician. Volunteers, seasonal USFWS employees, and Student Conservation Association interns hare also utilized periodically to accomplish various projects.

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 AFI 32-7064 and implemented using funds obtained through the USAF budgeting process.

10.0 ANNUAL WORK PLANS

The INRMP Annual Work Plans are included in this section. These projects are listed by fiscal year, including the current year and four succeeding years. For each project and activity, a specific timeframe for implementation is provided (as applicable), as well as the appropriate funding source, and priority for implementation. The work plans provide all the necessary information for building a budget within the AF 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 Air Force 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 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 on Invasive Species. However, the INRMP signatories would not contend that the INRMP is not be implemented if not accomplished within 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 support long-term

compliance with specific requirements within natural resources law; but is not directly tied to specific compliance within the proposed year of execution.

FY18 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, 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 SOP's for future actions.		In House	Low
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.		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. Coordinate with USAFA Public Affairs to create the site and maintain site functionality.		In House, PA	Low

Project/Work Plan		Funding Source	Priority Level
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, EQ XQPZOS6022Q	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, road kill wildlife possession, etc.		In House	Low
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, PA	Low
1.6.3: Attend Colorado Front Range Roundtable meetings as time allows. 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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
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).			
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 any indication of chronic wasting disease.		In House	Low
2.1.3: Coordinate with USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.		In House	Low
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

Project/Work Plan		Funding Source	Priority Level
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, 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 writing/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 basewide count of deer, elk, turkey, and other non-game wildlife of interest.		In House	Low

Project/Work Plan		Funding Source	Priority Level
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 less than 300 deer and 40 elk.		In House	Low
2.3.3: Sustain a flock of <100 Merriam's turkey to prevent bird-human conflicts. Consider reinstituting a fall and/or spring turkey hunt, or coordinating with Colorado Parks and Wildlife on a trapping/relocation program, if the population objective is not being met.		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
2.6.1: 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 XQPZOS6017Q	High
2.7.2: Develop stream restoration and stabilization designs and construction cost estimates for approximately 3500' of degraded		In House, EQ XQPZOS6020Q	High

Project/Work Plan		Funding Source	Priority Level
Preble's meadow jumping mouse habitat on Black Squirrel Creek.			
2.7.3: As warranted, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any relevant change in habitat suitability.		In House	Medium
2.7.4: Participate in the preparation and implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan.		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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
adverse impact that an altered rate and volume of off-base stormwater is having on USAFA natural resources, infrastructure, and aesthetics.			
3.1.4: Continue to advocate through the Pikes Peak Regional Stormwater Task Force 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 XQPZOS6020Q	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: Utilize native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.		In House	Low
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	Low
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	Low
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,		In House, EQ XQPZOS6020Q	High

Project/Work Plan		Funding Source	Priority Level
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.			
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 to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.		EQ XQPZOS6051Q	Medium
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. Apply herbicides on up to 450 acres of weeds per year.		In House, EQ XQPZOS6021Q	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.		In House, 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, FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.		In House, 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, FSS	Low
4.3.1: Inventory 1,400 acres of forest using detailed stand exams to monitor ecosystem health and identify		In House, EQ XQPZOS6099Q	Medium

Project/Work Plan		Funding Source	Priority Level
management needs. Incorporate data into Academy GeoBase.			
4.3.2: Perform forest health walkthrough surveys on 10,000 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 XQPZOS6099Q, USFS 2N funds	Medium
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 XQPZOS6099Q, 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 XQPZOS6099Q, USFS 2N funds	Medium
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 XQPZOS6099Q	Medium
4.4.3: Coordinate with the Academy Biology faculty to develop the senior capstone course SE-460 on utilizing aerial reconnaissance to detect beetle-infested trees in a timely manner.		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		In House, EQ XQPZOS6099Q, USFS 2N funds	Medium

Project/Work Plan		Funding Source	Priority Level
on field survey and tree removal activities.			
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 XQPZOS6099Q	Medium
4.6.4: Perform subsequent annual field check of trees in Fam Camp, Farish or near trailheads rated as potentially hazardous (class 4 in the USFS Hazard Tree Rating System) in annual hazard tree inventories.		In House	Medium
4.6.5: Promptly remove trees identified as imminently hazardous (class 6 or possibly class 4) within Projects 4.6.4.		EQ XQPZOS6099Q	High
4.7.5: Plant 750 seedlings in spring 2018 within burn scars or other disturbed areas, according to genetic adaptability guidelines ($\pm$400' and $\pm$300' in elevation for ponderosa pine and Douglas fir, respectively).		EQ XQPZOS6099Q	Low
4.7.6: Perform seedling survival surveys for areas planted in 2013, 2015 and 2017. Schedule replanting as necessary.		In House	Low
4.7.7: In the event of a major wildfire, submit an emergency sowing request to the Bessey Nursery for seedlings for the following spring, reflecting appropriate species and elevations for the burn area.		In House	Medium
4.8.3: Perform field surveys in aspen harvest units cut in 2015 to monitor regeneration success. Check fence condition in all aspen units and fix as needed.		In House	Low
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
4.10.1: Manage Natural Resource woodlot for firewood sales. Submit sales receipts per USAF protocol.		In House	Low

Project/Work Plan		Funding Source	Priority Level
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	Low
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	Low
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 urban tree care workshop for Grounds Maintenance, other landscaping staff and quality control inspectors. Address post-planting tree care, watering regimes, pruning, etc.		In House, EQ XQPZOS6045Q	Low

Project/Work Plan		Funding Source	Priority Level
4.12.4: Host biannual workshop for project planners and others involved in landscape design to increase awareness of construction impacts on trees. Address trenching, grading, pruning and long-term landscape care.		In House	Low
4.12.5: Chair an urban forest council with representatives from Natural Resources, Grounds Maintenance; Forest City (housing); and the CE service contractor.		In House	Low
4.12.6: Collect urban tree inventory data on 2,000 trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.		In House	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 in February. Host Arbor Day ceremony annually in April.		In House	Low
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 XQPZOS6099Q, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.		EQ XQPZOS6099Q, 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 AFCE180105	Medium
5.2.2: Update the Wildland Fire Management Annual Operating Plan (AOP).		In House	Medium

Project/Work Plan		Funding Source	Priority Level
5.3.1: Clear 70 acres annually of Gambel oak and other brush for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.		WFC, EQ AFCE180105	Medium
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 AFCE180105	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 AFCE180105	Low
5.4.2: Reassess the SOQ housing area with fuel hazard assessments of homes, coordinating with USAFA firefighters to identify hazards and prioritize treatments.		In House, WFC EQ AFCE180105 10CES/CEF	Low
5.5.1: Secure a smoke permit and perform a prescribed broadcast burn on the one-acre Academy Drive site to enhance Plains Ironweed (*Vernonia marginata*).		In House, WFC EQ AFCE180105, 10CES/CEF	Low
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.		In House	Low
5.5.2: Develop a prescribed burn plan to enhance meadow habitat in a 16-acre area south of the Cadet area. (Burn will be scheduled for 2016).		In House, WFC EQ AFCE180105	Low
5.5.4: Assess the need for and benefits of additional prescribed fire, and update INRMP accordingly.		In House, WFC EQ AFCE180105	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		In House	Low

Project/Work Plan		Funding Source	Priority Level
include month and year) in attribute data. Add to applicable GeoBase layers.			
5.7.1: Play an active role in the Pikes Peak Wildfire Prevention Partners (PPWPP). Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.		In House	Low
5.7.2: Help plan and host the annual PPWPP "Living with Wildfire" community education conference.		In House	Low
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.		In House	Low
6.1.1: Continue to charge 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 free lifetime fishing permits to disabled veterans (DAV) with a 60% or higher disability rating from the Department of Veterans Affairs. Continue to coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.		In House, 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. 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. Only stock whirling disease-free fish in accordance with CPW regulations.		In House	Low
6.1.6: Opportunistically control any undesirable fish species without		In House	Low

Project/Work Plan		Funding Source	Priority Level
having a detrimental impact on the stocked fish population.			
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 XQPZOS6098Q	Low
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, 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 XQPZOS6098Q	Low

Project/Work Plan		Funding Source	Priority Level
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: Update the user requirements and regulations for the B-52 camping area.		In House, PA	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.		In House, PA	Low
6.3.3: Consider charging a nominal user fee to help offset the cost of maintaining and improving the camping area.		In House, PA	Low
6.4.1: Annually 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

FY20 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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
inventories or studies, or perform monitoring			
1.2.1: Coordinate with and advise the 10 ABW, 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 SOP's for future actions.		In House	Low
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.		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. Coordinate with USAFA Public Affairs to create the site and maintain site functionality.		In House, PA	Low
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 XQPZOS6022S	Low

Project/Work Plan		Funding Source	Priority Level
1.5.3: Obtain necessary permits, including Clean Water Act 404, Migratory Bird depredation and salvage, Bald and Golden Eagle Protection Act, wildland fire, road kill wildlife possession, etc.		In House	Low
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, PA	Low
1.6.3: Attend Colorado Front Range Roundtable meetings as time allows. 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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
collaborate on findings and articulate management needs.			
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 any indication of chronic wasting disease.		In House	Low
2.1.3: Coordinate with USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.		In House	Low
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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
cormorant), and mitigate any airfield BASH concerns.			
2.2.3: Interact at least quarterly with Airfield Management, Flight Safety, 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 writing/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 basewide 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 less than 300 deer and 40 elk.		In House	Low
2.3.3: Sustain a flock of <100 Merriam's turkey to prevent bird-human conflicts. Consider reinstituting a fall and/or spring turkey hunt, or coordinating with Colorado Parks and Wildlife on a trapping/relocation program, if the population objective is not being met.		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

Project/Work Plan		Funding Source	Priority Level
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
2.6.1: 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 XQPZOS6017S	High
2.7.2: Develop stream restoration and stabilization designs and construction cost estimates for approximately 6800' of degraded Preble's meadow jumping mouse habitat on Monument Branch.		In House, EQ XQPZOS6020S	High
2.7.3: As warranted, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any relevant change in habitat suitability.		In House	Medium
2.7.4: Participate in the preparation and implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan.		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

Project/Work Plan		Funding Source	Priority Level
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 through the Pikes Peak Regional Stormwater Task Force 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		In House, EQ XQPZOS6020S	High

Project/Work Plan		Funding Source	Priority Level
impacts on USAFA and downstream areas.			
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: Utilize native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.		In House	Low
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	Low
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	Low
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 XQPZOS6020S	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 to assess the effectiveness of weed control efforts, impacts to		EQ XQPZOS6051S	Medium

Project/Work Plan		Funding Source	Priority Level
significant natural resources, and the need for adaptive weed management.			
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. Apply herbicides on up to 450 acres of weeds per year.		In House, EQ XQPZOS6021S	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.		In House, 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, FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.		In House, 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, FSS	Low
4.3.1: Inventory 1,400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy GeoBase.		In House, EQ XQPZOS6099S	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 XQPZOS6099S, USFS 2N funds	Medium
4.3.3: Perform 150 acres of forest management annually to enhance		EQ	Medium

Project/Work Plan		Funding Source	Priority Level
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.		XQPZOS6099S, USFS 2N funds	
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 XQPZOS6099S, USFS 2N funds	Medium
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 XQPZOS6099S	Medium
4.4.3: Coordinate with the Academy Biology faculty to develop the senior capstone course SE-460 on utilizing aerial reconnaissance to detect beetle-infested trees in a timely manner.		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 XQPZOS6099S, 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 XQPZOS6099S	Low
4.6.1: Perform annual sweep of all managed trails at the USAFA and		In House	Medium

Project/Work Plan		Funding Source	Priority Level
Farish to identify potentially hazardous trees.			
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 XQPZOS6099S	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. GPS tree locations and maintain data in GeoBase.		In House, EQ XQPZOS6099S; EQ XQPZOS6045S	Medium
4.7.1: Supplement existing ponderosa pine seedbank by collecting cones from high quality pines at varying elevations, if bumper crop exists in autumn 2019. Ensure sufficient genetic diversity by collecting from at least ten trees within each seedlot. Send cones to Bessey USFS Nursery for extraction and cold storage.		In House, EQ XQPZOS6099S	Low
4.7.4: Submit annual seedling sowing requests for 750 seedlings to the USFS Bessey Nursery for spring delivery. Request 80% ponderosa pine at varying elevations to afford flexibility in potential planting locations in the event of a wildfire.		In House	Low
4.7.5: Plant 750 seedlings in spring 2019 within burn scars or other disturbed areas, according to genetic adaptability guidelines (±400' and ±300' in elevation for ponderosa pine and Douglas fir, respectively).		EQ XQPZOS6099S	Low
4.7.6: Perform seedling survival surveys for areas planted in 2014, 2016 and 2018. Schedule replanting as necessary.		In House	Low
4.7.7: In the event of a major wildfire, submit an emergency sowing request to the Bessey Nursery for seedlings for the following spring,		In House	Medium

Project/Work Plan		Funding Source	Priority Level
reflecting appropriate species and elevations for the burn area.			
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing. Check fence condition in all aspen units and fix as necessary.		In House	Low
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 oak study sites established in 2016 to quantitatively and photographically document growth response.		In House	Low
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	Low
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		In House	Low

Project/Work Plan		Funding Source	Priority Level
attribute data. To the extent feasible, digitize all beetle-infested trees removed to help track trends and focus subsequent field surveys.			
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 urban tree care workshop for Grounds Maintenance, other landscaping staff and quality control inspectors. Address post-planting tree care, watering regimes, pruning, etc.		In House, EQ XQPZOS6045S	Low
4.12.5: Chair an urban forest council with representatives from Natural Resources, Grounds Maintenance; Forest City (housing); and the CE service contractor.		In House	Low
4.12.6: Collect urban tree inventory data on 2,000 trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.		EQ XQPZOS6045S	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 in February. Host Arbor Day ceremony annually in April.		In House	Low
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

Project/Work Plan		Funding Source	Priority Level
4.13.1: Coordinate with Airfield Operations to ensure that trees are removed from airfield clear zones.		In House, EQ XQPZOS6099S, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.		EQ XQPZOS6099S, 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 Gambel oak and other brush for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.		WFC, EQ AFCE190105	Medium
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 on the one-acre Academy Drive site to enhance Plains Ironweed (*Vernonia marginata*).		In House, WFC EQ AFCE190105, 10CES/CEF	Low
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.		In House	Low
5.5.2: Develop a prescribed burn plan to enhance meadow habitat in a 16-		In House, WFC EQ AFCE190105	Low

Project/Work Plan		Funding Source	Priority Level
acre area south of the Cadet area. (Burn will be scheduled for 2016).			
5.5.4: 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 Pikes Peak Wildfire Prevention Partners (PPWPP). Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.		In House	Low
5.7.2: Help plan and host the annual PPWPP "Living with Wildfire" community education conference.		In House	Low
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.		In House	Low
6.1.1: Continue to charge 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 free lifetime fishing permits to disabled veterans (DAV) with a 60% or higher disability rating from the Department of Veterans Affairs. Continue to coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.		In House, F&W Reimbursable Account	Low
6.1.2: Periodically conduct angler interviews and collect creel information to track angler success		In House	Low

Project/Work Plan		Funding Source	Priority Level
and satisfaction with the fishing program and recreational experience.			
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. 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. Only 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 XQPZOS6098S	Low
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		In House	Low

Project/Work Plan		Funding Source	Priority Level
provide volunteers, or train new volunteers, for trail construction and maintenance.			
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, 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 XQPZOS6098S	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: Update the user requirements and regulations for the B-52 camping area.		In House, PA	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.		In House, PA	Low
6.3.3: Consider charging a nominal user fee to help offset the cost of maintaining and improving the camping area.		In House, PA	Low
6.4.1: Annually 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

Project/Work Plan		Funding Source	Priority Level
6.4.2: As necessary, close and restore undesirable ORV trails using signage, fencing, barriers, revegetation, and erosion control features.		In House	Low

FY21 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, 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 SOP's for future actions.		In House	Low
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.		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	Low

Project/Work Plan		Funding Source	Priority Level
Coordinate with USAFA Public Affairs to create the site and maintain site functionality.			
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, EQ XQPZOS6022T	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, road kill wildlife possession, etc.		In House	Low
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, PA	Low
1.6.3: Attend Colorado Front Range Roundtable meetings as time allows. 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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
and maximize effectiveness of forest management across boundaries.			
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 any indication of chronic wasting disease.		In House	Low
2.1.3: Coordinate with USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.		In House	Low
2.1.4: Coordinate with Civil Engineering, Forces Support Squadron, and the base housing contractor to provide animal-resistant trash receptacles to protect wildlife		In House	Medium

Project/Work Plan		Funding Source	Priority Level
and reduce potentially hazardous wildlife-human interaction.			
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, 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 writing/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 basewide count of deer, elk,		In House	Low

Project/Work Plan		Funding Source	Priority Level
turkey, and other non-game wildlife of interest.			
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 less than 300 deer and 40 elk.		In House	Low
2.3.3: Sustain a flock of <100 Merriam's turkey to prevent bird-human conflicts. Consider reinstituting a fall and/or spring turkey hunt, or coordinating with Colorado Parks and Wildlife on a trapping/relocation program, if the population objective is not being met.		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
2.6.1: 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 XQPZOS6017T	High
2.7.2: Develop stream restoration and stabilization designs and		In House, EQ	High

Project/Work Plan		Funding Source	Priority Level
construction cost estimates for approximately 6800' of degraded Preble's meadow jumping mouse habitat on Monument Branch.		XQPZOS6020T	
2.7.3: As warranted, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any relevant change in habitat suitability.		In House	Medium
2.7.4: Participate in the preparation and implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan.		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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
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.			
3.1.4: Continue to advocate through the Pikes Peak Regional Stormwater Task Force 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 XQPZOS6020T	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: Utilize native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.		In House	Low
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	Low
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	Low
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.		In House, EQ XQPZOS6020T	High

Project/Work Plan		Funding Source	Priority Level
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.			
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 to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.		EQ XQPZOS6051T	Medium
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. Apply herbicides on up to 450 acres of weeds per year.		In House, EQ XQPZOS6021T	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.		In House, 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, FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.		In House, 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, FSS	Low

Project/Work Plan		Funding Source	Priority Level
4.3.1: Inventory 1,400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy GeoBase.		In House, EQ XQPZOS6099T	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 XQPZOS6099T, USFS 2N funds	Medium
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 XQPZOS6099T, 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 XQPZOS6099T, USFS 2N funds	Medium
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 XQPZOS6099T	Medium
4.4.3: Coordinate with the Academy Biology faculty to develop the senior capstone course SE-460 on utilizing aerial reconnaissance to detect beetle-infested trees in a timely manner.		In House	Low
4.4.4: Perform field inventory for beetle-infested trees on privatized land on the USAFA and arrange for		In House, EQ XQPZOS6099T, USFS 2N funds	Medium

Project/Work Plan		Funding Source	Priority Level
prompt removal of infested trees via contract. Coordinate with Forest City on field survey and tree removal activities.			
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 XQPZOS6099T	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 XQPZOS6099T	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. GPS tree locations and maintain data in GeoBase.		In House, EQ XQPZOS6099T; EQ XQPZOS6045T	Medium
4.7.1: Supplement existing ponderosa pine seedbank by collecting cones from high quality pines at varying elevations, if bumper crop exists in autumn 2019. Ensure sufficient genetic diversity by collecting from at least ten trees within each seedlot. Send cones to Bessey USFS Nursery for extraction and cold storage.		In House, EQ XQPZOS6099T	Low
4.7.4: Submit annual seedling sowing requests for 750 seedlings to the USFS Bessey Nursery for spring delivery. Request 80% ponderosa pine at varying elevations to afford flexibility in potential planting locations in the event of a wildfire.		In House	Low

Project/Work Plan		Funding Source	Priority Level
4.7.5: Plant 750 seedlings in spring 2019 within burn scars or other disturbed areas, according to genetic adaptability guidelines (±400' and ±300' in elevation for ponderosa pine and Douglas fir, respectively).		EQ XQPZOS6099T	Low
4.7.6: Perform seedling survival surveys for areas planted in 2014, 2016 and 2018. Schedule replanting as necessary.		In House	Low
4.7.7: In the event of a major wildfire, submit an emergency sowing request to the Bessey Nursery for seedlings for the following spring, reflecting appropriate species and elevations for the burn area.		In House	Medium
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing. Check fence condition in all aspen units and fix as necessary.		In House	Low
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 oak study sites established in 2016 to quantitatively and photographically document growth response.		In House	Low
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		In House	Low

Project/Work Plan		Funding Source	Priority Level
post-treatment photos immediately following thinning operation; after the next growing season, and at five years after treatment. Establish digital catalog for storage			
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	Low
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 urban tree care workshop for Grounds Maintenance, other landscaping staff and quality control inspectors. Address post-planting tree care, watering regimes, pruning, etc.		In House, EQ XQPZOS6045T	Low
4.12.5: Chair an urban forest council with representatives from Natural Resources, Grounds Maintenance; Forest City (housing); and the CE service contractor.		In House	Low
4.12.6: Collect urban tree inventory data on 2,000 trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.		EQ XQPZOS6045T	Low

Project/Work Plan		Funding Source	Priority Level
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 in February. Host Arbor Day ceremony annually in April.		In House	Low
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 XQPZOS6099T, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.		EQ XQPZOS6099T, 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 Gambel oak and other brush for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.		WFC, EQ AFCE190105	Medium
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		WFC, EQ AFCE190105	Low

Project/Work Plan		Funding Source	Priority Level
distance will depend on fuel type, density and terrain.			
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 on the one-acre Academy Drive site to enhance Plains Ironweed (*Vernonia marginata*).		In House, WFC EQ AFCE190105, 10CES/CEF	Low
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.		In House	Low
5.5.2: Develop a prescribed burn plan to enhance meadow habitat in a 16-acre area south of the Cadet area. (Burn will be scheduled for 2016).		In House, WFC EQ AFCE190105	Low
5.5.4: 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 Pikes Peak Wildfire Prevention Partners (PPWPP). Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.		In House	Low
5.7.2: Help plan and host the annual PPWPP "Living with Wildfire" community education conference.		In House	Low
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.		In House	Low

Project/Work Plan		Funding Source	Priority Level
6.1.1: Continue to charge 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 free lifetime fishing permits to disabled veterans (DAV) with a 60% or higher disability rating from the Department of Veterans Affairs. Continue to coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.		In House, 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. 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. Only 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		In House, EQ XQPZOS6098T	Low

Project/Work Plan		Funding Source	Priority Level
Mountain Biking Association (IMBA) and other trail organizations. Re-route trails as necessary to promote long-term sustainability and reduce annual maintenance needs.			
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, 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 XQPZOS6098T	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: Update the user requirements and regulations for the B-52 camping area.		In House, PA	Low

Project/Work Plan		Funding Source	Priority Level
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.		In House, PA	Low
6.3.3: Consider charging a nominal user fee to help offset the cost of maintaining and improving the camping area.		In House, PA	Low
6.4.1: Annually 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

FY22 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, 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		In House	Low

Project/Work Plan		Funding Source	Priority Level
recommendations and practical remedial SOP's for future actions.			
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.		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. Coordinate with USAFA Public Affairs to create the site and maintain site functionality.		In House, PA	Low
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, EQ XQPZOS6022U	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, road kill wildlife possession, etc.		In House	Low
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

Project/Work Plan		Funding Source	Priority Level
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, PA	Low
1.6.3: Attend Colorado Front Range Roundtable meetings as time allows. 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		In House	Low

Project/Work Plan		Funding Source	Priority Level
observe and interact with wildlife through various media. Provide "Living With Wildlife" brochures to educate the public on how to minimize wildlife-human conflicts.			
2.1.2: Monitor the deer and elk population for any indication of chronic wasting disease.		In House	Low
2.1.3: Coordinate with USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.		In House	Low
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, 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 writing/reviewing the BASH Plan.		In House	Medium

Project/Work Plan		Funding Source	Priority Level
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 basewide 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 less than 300 deer and 40 elk.		In House	Low
2.3.3: Sustain a flock of <100 Merriam's turkey to prevent bird-human conflicts. Consider reinstituting a fall and/or spring turkey hunt, or coordinating with Colorado Parks and Wildlife on a trapping/relocation program, if the population objective is not being met.		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

Project/Work Plan		Funding Source	Priority Level
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
2.6.1: 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 XQPZOS6017U	High
2.7.2: Develop stream restoration and stabilization designs and construction cost estimates for approximately 6800' of degraded Preble's meadow jumping mouse habitat on Monument Branch.		In House, EQ XQPZOS6020U	High
2.7.3: As warranted, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any relevant change in habitat suitability.		In House	Medium
2.7.4: Participate in the preparation and implementation of a USFWS Preble's Meadow Jumping Mouse Recovery Plan.		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

Project/Work Plan		Funding Source	Priority Level
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 through the Pikes Peak Regional Stormwater Task Force 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 XQPZOS6020U	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: Utilize native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.		In House	Low

Project/Work Plan		Funding Source	Priority Level
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	Low
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	Low
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 XQPZOS6020U	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 to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.		EQ XQPZOS6051U	Medium
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 XQPZOS6021U	Medium

Project/Work Plan		Funding Source	Priority Level
Apply herbicides on up to 450 acres of weeds per year.			
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.		In House, 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, FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.		In House, 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, FSS	Low
4.3.1: Inventory 1,400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy GeoBase.		In House, EQ XQPZOS6099U	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 XQPZOS6099U, USFS 2N funds	Medium
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 XQPZOS6099U, 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		In House, EQ XQPZOS6099U, USFS 2N funds	Medium

Project/Work Plan		Funding Source	Priority Level
from 300 to 1,000 annually, with an average of 700 per year.			
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 XQPZOS6099U	Medium
4.4.3: Coordinate with the Academy Biology faculty to develop the senior capstone course SE-460 on utilizing aerial reconnaissance to detect beetle-infested trees in a timely manner.		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 XQPZOS6099U, 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 XQPZOS6099U	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 XQPZOS6099U	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		In House, EQ XQPZOS6099U; EQ XQPZOS6045U	Medium

Project/Work Plan		Funding Source	Priority Level
document and track tree health conditions. GPS tree locations and maintain data in GeoBase.			
4.7.1: Supplement existing ponderosa pine seedbank by collecting cones from high quality pines at varying elevations, if bumper crop exists in autumn 2019. Ensure sufficient genetic diversity by collecting from at least ten trees within each seedlot. Send cones to Bessey USFS Nursery for extraction and cold storage.		In House, EQ XQPZOS6099U	Low
4.7.4: Submit annual seedling sowing requests for 750 seedlings to the USFS Bessey Nursery for spring delivery. Request 80% ponderosa pine at varying elevations to afford flexibility in potential planting locations in the event of a wildfire.		In House	Low
4.7.5: Plant 750 seedlings in spring 2019 within burn scars or other disturbed areas, according to genetic adaptability guidelines (±400' and ±300' in elevation for ponderosa pine and Douglas fir, respectively).		EQ XQPZOS6099U	Low
4.7.6: Perform seedling survival surveys for areas planted in 2014, 2016 and 2018. Schedule replanting as necessary.		In House	Low
4.7.7: In the event of a major wildfire, submit an emergency sowing request to the Bessey Nursery for seedlings for the following spring, reflecting appropriate species and elevations for the burn area.		In House	Medium
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing. Check fence condition in all aspen units and fix as necessary.		In House	Low
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 oak study sites established in 2016 to quantitatively and photographically document growth response.		In House	Low

Project/Work Plan		Funding Source	Priority Level
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	Low
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	Low
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		In House	Low

Project/Work Plan		Funding Source	Priority Level
commensurate irrigation needs by planting zone.			
4.12.3: Host annual urban tree care workshop for Grounds Maintenance, other landscaping staff and quality control inspectors. Address post-planting tree care, watering regimes, pruning, etc.		In House, EQ XQPZOS6045U	Low
4.12.5: Chair an urban forest council with representatives from Natural Resources, Grounds Maintenance; Forest City (housing); and the CE service contractor.		In House	Low
4.12.6: Collect urban tree inventory data on 2,000 trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.		EQ XQPZOS6045U	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 in February. Host Arbor Day ceremony annually in April.		In House	Low
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 XQPZOS6099U, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.		EQ XQPZOS6099U, 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

Project/Work Plan		Funding Source	Priority Level
5.2.2: Update the Wildland Fire Management Annual Operating Plan (AOP).		In House	Medium
5.3.1: Clear 70 acres annually of Gambel oak and other brush for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.		WFC, EQ AFCE190105	Medium
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 on the one-acre Academy Drive site to enhance Plains Ironweed (*Vernonia marginata*).		In House, WFC EQ AFCE190105, 10CES/CEF	Low
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.		In House	Low
5.5.2: Develop a prescribed burn plan to enhance meadow habitat in a 16-acre area south of the Cadet area. (Burn will be scheduled for 2016).		In House, WFC EQ AFCE190105	Low
5.5.4: 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

Project/Work Plan		Funding Source	Priority Level
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 Pikes Peak Wildfire Prevention Partners (PPWPP). Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.		In House	Low
5.7.2: Help plan and host the annual PPWPP "Living with Wildfire" community education conference.		In House	Low
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.		In House	Low
6.1.1: Continue to charge 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 free lifetime fishing permits to disabled veterans (DAV) with a 60% or higher disability rating from the Department of Veterans Affairs. Continue to coordinate with Airfield Management to provide handicapped DAV access though Gate K-1 with the proper credentials.		In House, 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. 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. Only stock		In House	Low

Project/Work Plan		Funding Source	Priority Level
whirling disease-free fish in accordance with CPW regulations.			
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 XQPZOS6098U	Low
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, 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

Project/Work Plan		Funding Source	Priority Level
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 XQPZOS6098U	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: Update the user requirements and regulations for the B-52 camping area.		In House, PA	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.		In House, PA	Low
6.3.3: Consider charging a nominal user fee to help offset the cost of maintaining and improving the camping area.		In House, PA	Low
6.4.1: Annually 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

FY19 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

Project/Work Plan		Funding Source	Priority Level
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, 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 SOP's for future actions.		In House	Low
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.		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. Coordinate with USAFA Public Affairs to create the site and maintain site functionality.		In House, PA	Low
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

Project/Work Plan		Funding Source	Priority Level
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, EQ XQPZOS6022U	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, road kill wildlife possession, etc.		In House	Low
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, PA	Low
1.6.3: Attend Colorado Front Range Roundtable meetings as time allows. 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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
considered for funding annually by the deadline (~Oct. 1).			
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 any indication of chronic wasting disease.		In House	Low
2.1.3: Coordinate with USAFA Pest Management and BioEnvironmental to identify, control, and report wildlife diseases such as rabies, plague, and avian influenza.		In House	Low
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		In House	Medium

Project/Work Plan		Funding Source	Priority Level
impacts cannot be avoided by adjusting the project scheduling.			
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, 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 writing/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 basewide 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 less than 300 deer and 40 elk.		In House	Low
2.3.3: Sustain a flock of <100 Merriam's turkey to prevent bird-human conflicts. Consider reinstituting a fall and/or spring turkey hunt, or coordinating with Colorado		In House	Low

Project/Work Plan		Funding Source	Priority Level
Parks and Wildlife on a trapping/relocation program, if the population objective is not being met.			
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
2.6.1: 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 XQPZOS6017U	High
2.7.2: Develop stream restoration and stabilization designs and construction cost estimates for approximately 6800' of degraded Preble's meadow jumping mouse habitat on Monument Branch.		In House, EQ XQPZOS6020U	High
2.7.3: As warranted, refine the delineation of the USAFA Preble's Conservation Zone buffer to reflect any relevant change in habitat suitability.		In House	Medium
2.7.4: Participate in the preparation and implementation of a USFWS		In House	Medium

Project/Work Plan		Funding Source	Priority Level
Preble's Meadow Jumping Mouse Recovery Plan.			
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 through the Pikes Peak Regional Stormwater Task Force for improvements in stormwater and urban runoff planning		In House	Low

Project/Work Plan		Funding Source	Priority Level
and regulation to protect the USAFA watershed.			
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 XQPZOS6020U	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: Utilize native plants and seed mixes and rangeland seeding techniques for all revegetation and restoration projects in non-improved areas.		In House	Low
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	Low
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	Low
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 XQPZOS6020U	High

Project/Work Plan		Funding Source	Priority Level
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 to assess the effectiveness of weed control efforts, impacts to significant natural resources, and the need for adaptive weed management.		EQ XQPZOS6051U	Medium
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. Apply herbicides on up to 450 acres of weeds per year.		In House, EQ XQPZOS6021U	Medium
4.2.1: Revise and implement the horse grazing management plan to sustain or improve range condition and trend.		In House, 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, FSS	Low
4.2.3: Continue to require the feeding of weed-free certified hay to government and privately-owned horses.		In House, 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, FSS	Low
4.3.1: Inventory 1,400 acres of forest using detailed stand exams to monitor ecosystem health and identify management needs. Incorporate data into Academy GeoBase.		In House, EQ XQPZOS6099U	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		In House, EQ XQPZOS6099U, USFS 2N funds	Medium

Project/Work Plan		Funding Source	Priority Level
management needs. Resurvey areas pruned for mistletoe to detect new infections and ensure treatment effectiveness.			
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 XQPZOS6099U, 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 XQPZOS6099U, USFS 2N funds	Medium
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 XQPZOS6099U	Medium
4.4.3: Coordinate with the Academy Biology faculty to develop the senior capstone course SE-460 on utilizing aerial reconnaissance to detect beetle-infested trees in a timely manner.		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 XQPZOS6099U, 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		In House, EQ XQPZOS6099U	Low

Project/Work Plan		Funding Source	Priority Level
represents approximately 14,000 acres, including stands with at least 20 square feet of basal area per acre.			
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 XQPZOS6099U	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. GPS tree locations and maintain data in GeoBase.		In House, EQ XQPZOS6099U; EQ XQPZOS6045U	Medium
4.7.1: Supplement existing ponderosa pine seedbank by collecting cones from high quality pines at varying elevations, if bumper crop exists in autumn 2019. Ensure sufficient genetic diversity by collecting from at least ten trees within each seedlot. Send cones to Bessey USFS Nursery for extraction and cold storage.		In House, EQ XQPZOS6099U	Low
4.7.4: Submit annual seedling sowing requests for 750 seedlings to the USFS Bessey Nursery for spring delivery. Request 80% ponderosa pine at varying elevations to afford flexibility in potential planting locations in the event of a wildfire.		In House	Low
4.7.5: Plant 750 seedlings in spring 2019 within burn scars or other disturbed areas, according to genetic adaptability guidelines ($\pm$400' and $\pm$300' in elevation for ponderosa pine and Douglas fir, respectively).		EQ XQPZOS6099U	Low
4.7.6: Perform seedling survival surveys for areas planted in 2014, 2016 and 2018. Schedule replanting as necessary.		In House	Low

Project/Work Plan		Funding Source	Priority Level
4.7.7: In the event of a major wildfire, submit an emergency sowing request to the Bessey Nursery for seedlings for the following spring, reflecting appropriate species and elevations for the burn area.		In House	Medium
4.8.3: Perform surveys in aspen harvest units cut between 2000 and 2006 to assess feasibility of removing fencing. Check fence condition in all aspen units and fix as necessary.		In House	Low
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 oak study sites established in 2016 to quantitatively and photographically document growth response.		In House	Low
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	Low
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

Project/Work Plan		Funding Source	Priority Level
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	Low
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 urban tree care workshop for Grounds Maintenance, other landscaping staff and quality control inspectors. Address post-planting tree care, watering regimes, pruning, etc.		In House, EQ XQPZOS6045U	Low
4.12.5: Chair an urban forest council with representatives from Natural Resources, Grounds Maintenance; Forest City (housing); and the CE service contractor.		In House	Low
4.12.6: Collect urban tree inventory data on 2,000 trees to be utilized by the Grounds Maintenance staff to prioritize tree care needs and to monitor tree health issues.		EQ XQPZOS6045U	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 in February. Host Arbor Day ceremony annually in April.		In House	Low
4.12.9: In accordance with the base's Erosion Control, Revegetation, and Tree Care Standards, ensure all projects adhere to tree care		In House	Low

Project/Work Plan		Funding Source	Priority Level
specifications to help ensure health and longevity of newly planted landscapes, and minimize damage to trees from construction work.			
4.13.1: Coordinate with Airfield Operations to ensure that trees are removed from airfield clear zones.		In House, EQ XQPZOS6099U, 306/OSS	Medium
4.13.2: Remove any trees that may pose a BASH issue by providing nesting habitat.		EQ XQPZOS6099U, 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 Gambel oak and other brush for fuelbreaks, and to break up continuity of dense brushy fuels. Masticate brush, or pile for subsequent prescribed burning.		WFC, EQ AFCE190105	Medium
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 on the one-acre Academy Drive site to enhance Plains Ironweed (*Vernonia marginata*).		In House, WFC EQ AFCE190105, 10CES/CEF	Low

Project/Work Plan		Funding Source	Priority Level
5.5.1.1: Install monitoring plots to evaluate results of this burn; assess at the end of the growing season.		In House	Low
5.5.2: Develop a prescribed burn plan to enhance meadow habitat in a 16-acre area south of the Cadet area. (Burn will be scheduled for 2016).		In House, WFC EQ AFCE190105	Low
5.5.4: 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 Pikes Peak Wildfire Prevention Partners (PPWPP). Attend and/or host monthly meetings and assist with fuel hazard reduction demonstration projects.		In House	Low
5.7.2: Help plan and host the annual PPWPP "Living with Wildfire" community education conference.		In House	Low
5.7.3: Host an educational booth at the annual USAFA Fire Open House in August.		In House	Low
6.1.1: Continue to charge 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 free lifetime fishing permits to disabled veterans (DAV) with a 60% or higher disability rating from the Department of Veterans Affairs. Continue to coordinate with Airfield Management to provide handicapped		In House, F&W Reimbursable Account	Low

Project/Work Plan		Funding Source	Priority Level
DAV access though Gate K-1 with the proper credentials.			
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. 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. Only 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 XQPZOS6098U	Low
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		In House	Low

Project/Work Plan		Funding Source	Priority Level
that enhance the user experience, improve trail sustainability, and protect the environment.			
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, 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 XQPZOS6098U	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: Update the user requirements and regulations for the B-52 camping area.		In House, PA	Low
6.3.2: Prepare a camping area management plan to mitigate ongoing erosion, vegetation damage, and the proliferation of social trails.		In House, PA	Low
6.3.3: Consider charging a nominal user fee to help offset the cost of maintaining and improving the camping area.		In House, PA	Low
6.4.1: Annually provide training to 10th Security Forces, 10 Civil Engineering Squadron, and the Jacks Valley Training Area Superintendent		In House	Low

Project/Work Plan		Funding Source	Priority Level
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.			
6.4.2: As necessary, close and restore undesirable ORV trails using signage, fencing, barriers, revegetation, and erosion control features.		In House	Low

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

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2. Sikes Act
3. eDASH Natural Resources Program Page
4. Natural Resources Playbook – a Internal AF reference available at https://cs1.eis.af.mil/sites/ceportal/CEPlaybooks/NRM2/Pages/

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12.0 ACRONYMS

12.1 Standard Acronyms (Applicable to all AF installations)

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

12.2 Installation Acronyms

AW	10 Air Base Wing
AW/EM	10 AW Environmental Management Office
CDNR	Colorado Department of Natural Resources
CDPHE	Colorado Department of Public Health and the Environment
CEV	Air Force Environmental Management
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
FSS	Force Support Squadron
HQ USAF/ILEV	USAF Environmental Office
MPB	Mountain Pine Beetle
MSG	Mission Support Group
OG/OGA	Operations Group Airfield
OR/PA	Outdoor Recreation and Public Access
PM10	particulate matter equal to or less than 10 microns in size
PM2.5	particulate matter equal to or less than 2.5 microns in diameter
PMJM	Preble's Meadow Jumping Mouse
PSD	Prevention of Significant Deterioration
RCP	Reimbursable Conservation Program
REOTS	Reserve Equipment Operators Training School
REPI	Readiness Environmental Protection Initiative
RGL	Regulatory Guidance Letter
SE	Safety Officer
SFS	10th Security Forces Squadron
SVS	10th Services Squadron
SIP	State Implementation Plan
TNC	The Nature Conservancy
USAFA	U.S. Air Force Academy

13.0 DEFINITIONS

13.1 Standard Definitions (Applicable to all AF installations)

- Natural Resources Playbook – Definitions Section

13.2 Installation Definitions

- **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.

14.0 APPENDICES

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

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

Federal Public Laws and Executive Orders	
	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, Exotic and 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 U.S. Fish and Wildlife Service (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

Federal Public Laws and Executive Orders	
	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 Public Laws and Executive Orders	
	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 Integrated Natural Resources Management Plan 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

Federal Public Laws and Executive Orders	
	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

Federal Public Laws and Executive Orders	
	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	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 32-7062, Air Force Comprehensive Planning	Provides guidance and responsibilities related to the USAF comprehensive planning process on all USAF-controlled lands.
AFI 32-7064, Integrated Natural Resources Management	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.
AFI 32-7065, Cultural Resources Management	This instruction 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.
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.

Appendix B. Academy INRMP Documentation and Correspondence

Appendix C. Academy Natural Resources Revised Database

Appendix D. Forest Management Treatments

Appendix E. Summary of INRMP Actions for FY 2017 Through FY 2021

Appendix F. INRMP Update Report

15.0 ASSOCIATED PLANS

Tab 1 – Wildland Fire Management Plan

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

Tab 3 – Golf Environmental Management (GEM) Plan

Tab 4 – Integrated Cultural Resources Management Plan (ICRMP)

Tab 5 – Integrated Pest Management Plan (IPMP)

Tab 6 – Integrated Noxious Weed Management Plan

Tab 7 - Trails Management Plan and Maintenance Standards

Tab 8 – Conservation and Management Plan for Preble's Meadow Jumping Mouse on USAFA