Department of the Air Force

Integrated Natural Resources Management Plan

FE Warren

Installation Supplement

ABOUT THIS PLAN

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

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

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

DOCUMENT CONTROL

Standardized INRMP Template

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

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

NOTE: Installations are not required to update their INRMPs every time this template is updated. When it is time for installations to update their INRMPs, they should adopt the most recent version of this template available in the Plan Tool.

Installation INRMP

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

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

INRMP APPROVAL/SIGNATURE PAGES

Installation Supplement

2021 F. E. Warren INRMP Final signature page.pdf

INRMP APPROVAL/SIGNATURE PAGES

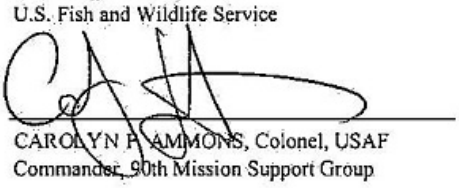
BRIAN NESVIK
Director, Wyoming Game and Fish Department

1-4-21
Date

TYLER ABBOTT Digitally signed by TYLER ABBOTT Date: 2020.12.11 08:04:23 -07'00'

TYLER ABBOTT
Wyoming Field Supervisor
U.S. Fish and Wildlife Service

12/11/2020
Date



CAROLYN P. AMMONS, Colonel, USAF
Commander, 90th Mission Support Group

14 Jul 21
Date

[SIGNATURE]

EXECUTIVE SUMMARY
Installation Supplement

EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) outlines the long-term plan for Francis E. Warren Air Force Base (F. E. Warren AFB) to manage natural resources in compliance with relevant statutes, executive orders, Presidential memoranda, regulations, and Air Force-specific requirements. This Plan, the F. E. Warren AFB INRMP, is a component of the base's Installation Development Plan and serves as the commander's decision document for natural resources management actions and associated compliance procedures. The INRMP integrates the base's natural resources management program with ongoing mission activities to conserve and protect natural resources in support of the military mission for present and future generations.

F. E. Warren AFB is committed to a proactive management strategy focused on an ecosystem-based approach to natural resources management including the protection and conservation of wildlife, habitat, and the surrounding watershed. The INRMP outlines a plan to implement this strategy by identifying (1) baseline information on the physical and biotic environment, (2) the military mission and its potential effects on natural resources, (3) goals, objectives, and projects for key natural resource management areas based on the projected trends, (4) personnel and support required for implementation of the INRMP and recommended projects, and (5) opportunities for consultation with stakeholders in the implementation process.

Current and Future Mission

The mission of the 90th Missile Wing (90 MW) is "Defend America with the world's premier combat-ready Intercontinental Ballistic Missiles (ICBM) force." The 90 MW hosts numerous tenants with a wide range of missions (see Section Military Missions for a more comprehensive list). The base supports 165 remote locations associated with missiles that are not included in this INRMP due to the nature of the lands associated with these facilities. These facilities are inaccessible to the public due to the nature of the mission and do not contain any significant natural resources.

Installation Natural Resources

F. E. Warren Air Force Base is located on 5,866 acres of rolling uplands on the west side of the City of Cheyenne, Wyoming. A vast majority of the base is unimproved and thus appropriate for implementation of conservation, restoration, and wildlife management actions. Numerous wetlands are located within the installation.

Previous biological surveys have identified a wide variety of native flora and fauna on the installation. Because of its location and size, the installation provides migratory feeding and wintering habitat for a variety of birds, including waterfowl and raptor species. Small mammals and their predators are also common on the installation. Many State "Species of Greatest Conservation Need" are known to reside on the installation. Federally-listed threatened species known to occur on the installation include the Preble's Meadow Jumping Mouse (Zapus hudsonius preblei). The U.S. Fish and Wildlife Service recently removed the Colorado butterfly plant (Oenothera coloradensis, previously listed as Gaura neomexicana ssp. coloradensis) from the Federal List of Endangered and Threatened Plants (List) due to recovery.

Natural Resources Management Concerns, Goals, Objectives

Key natural resource management issues at F. E. Warren AFB include: weed and pest control in riparian areas to protect threatened and endangered species (TES) habitat; management of pronghorn (Antilocapra americana) and Canada geese (Branta canadensis) to minimize mission interference; protection of wetlands as key components of the ecosystem, improve opportunities for outdoor recreation, and prevent wildfires to protect valuable assets on the installation. Management goals and objectives have been defined for numerous natural resource management areas based on regulatory requirements and projected trends. Other projects are identified that directly link to both a management

objective and a regulatory driver. An implementation schedule aids planning for resource allocation. The following goals are further expanded in Chapter 8:

- Goal 1: Incorporate natural resources information into all management decisions at F. E. Warren AFB.
- Goal 2: Maintain, preserve and enhance populations of existing native plants, fish, bats, and wildlife at sustainable levels and in line with F. E. Warren AFB's mission
- Goal 3: Increase public recreational opportunities and awareness of requirements for natural resources management at F. E. Warren AFB.
- Goal 4: Maintain a Current INRMP.

This INRMP details the steps needed to fulfill all compliance requirements related to natural resources and to foster environmental stewardship at F. E. Warren AFB, while considering the need to support the installation's mission. Therefore, full compliance and sound stewardship are dependent on the implementation of the INRMP through the appropriation of funds for the recommended projects. Additionally, annual reviews with the U.S. Fish and Wildlife Service (USFWS) and the Wyoming Game and Fish Department (WGFD) will ensure that the INRMP remains current and relevant.

1 OVERVIEW AND SCOPE

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

1.1 Purpose and Scope

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The purpose of the INRMP is to direct natural resources management at F. E. Warren Air Force Base, Wyoming. The INRMP will define natural resources management goals and objectives that are consistent with and support the military mission. The INRMP is based on the concept of ecosystem management within the framework of multiple uses as defined in Air Force Manual (AFMAN) 32-7003, Environmental Conservation. This INRMP fulfills the Sikes Act Improvement Act (SAIA) of 1997 (16 United States Code [U.S.C.] 670 et seq.) requirement. The SAIA requires each military installation in the United States to "prepare an INRMP that provides for appropriate management activities to include: (1) conservation and rehabilitation of natural resources on military installations, (2) sustainable multipurpose use of the resources to include hunting, fishing, trapping, and non-consumptive uses, and (3) subject to safety requirements and military security, public access to military installations to facilitate the use."

SAIA states that "consistent with the use of military installations to ensure preparedness of the Armed Forces, each integrated natural resources management plan, where appropriate and applicable, shall provide for (1) fish and wildlife management, land management, forest management and fish- and wildlife-oriented recreation; (2) fish and wildlife habitat enhancement or modifications; (3) wetland protection, enhancement, and restoration, where necessary for support of fish or wildlife; (4) integration of, and consistency among, the various activities conducted under the plan; (5)

establishment of specific natural resource management objectives and time frames for proposed action; (6) sustained use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management; (7) public access to the military installation that is necessary or appropriate subject to the requirements necessary to ensure safety and military security; (8) enforcement of applicable natural resource laws and regulations; and (9) no net loss in the capability of military installation lands to support the military mission.

1.2 Management Philosophy
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The INRMP serves as a key component of the Installation Development Plan (2017), providing background and rationale for the policies and programming decisions related to land use, resource conservation, facilities and infrastructure development, and operations and maintenance at F. E. Warren AFB ensuring current requirements are met and providing for future growth. The INRMP supports the mission by identifying the natural resources present on the installation, developing management goals for these resources, and integrating these management objectives into the military requirements for mission operations/support and regulatory compliance.

This INRMP outlines the steps needed to fulfill compliance requirements related to natural resources management and fosters environmental stewardship at F. E. Warren AFB. It is organized into the following principal sections: (1) an overview of the current status and conditions of the natural resources; (2) identification of potential impacts on natural resources; (3) the key natural resource management areas to be addressed based on the projected trends; (4) management recommendations that incorporate goals and objectives for each of the key natural resource management areas; and (5) specific activities for effective implementation of the INRMP.

Management issues and concerns, as well as goals and objectives, are developed from analysis of all the gathered information, and are reviewed by F. E. Warren AFB personnel involved with or responsible for various aspects of natural resources management. The INRMP was developed using an interdisciplinary approach and is based on existing information of the physical and biotic environments, mission activities, and environmental management practices at F. E. Warren AFB. Information was obtained from a variety of F. E. Warren AFB documents, interviews with installation personnel, on-site observations, and communications with both internal and external stakeholders. Coordination and correspondence with these agencies is documented and satisfies a portion of the requirements of 32 Code of Federal Regulations (CFR) 989 – Environmental Impact Analysis Process (EIAP). Goals and objectives require monitoring on a continuous basis and management strategies are updated whenever there are changes in mission requirements, adverse effects of natural resources, or changes in regulations governing management of natural resources. Internal and external stakeholders are presented in Section 4.0 General Roles and Responsibilities.

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

This INRMP outlines the steps needed to fulfill compliance related to natural resources

management and fosters environmental stewardship. It is organized into the following principal sections:

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

Management issues and concerns, as well as goals and objectives, are developed from analysis of all the gathered information, and are reviewed by F. E. Warren AFB personnel involved with or responsible for various aspects of natural resources management. The INRMP was developed using an interdisciplinary approach and is based on existing information of the physical and biotic environments, mission activities, and environmental management practices at F. E. Warren AFB. Information was obtained from a variety of documents, interviews with installation personnel, on-site observations, and communications with both internal and external stakeholders. Coordination and correspondence with these agencies is documented and satisfies a portion of the requirements of 32 Code of Federal Regulations (CFR) 989, Environmental Impact Analysis Process (EIAP). Goals and objectives require monitoring on a continuous basis and management strategies are updated whenever there are changes in mission requirements, adverse effects to or from natural resources, or changes in regulations governing management of natural resources.

1.3 Authority

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The INRMP facilitates compliance with federal, state, and local regulatory and statutory requirements that encompass the analysis

of potential environmental impacts, water and air quality, TES, migratory birds and other wildlife. Primary drivers relevant to natural resource management at F. E. Warren AFB include:

- 16 United States code (USC) 670 et seq. Sikes Act Improvement Act (SAIA);
- DOD Instruction (DODI) 4715.03, Natural Resources Conservation Program, 18 Mar 11;
- DOD Manual (DODM) 4715.03, Integrated Natural Resources Management Plan (INRMP) Implementation Manual, 25 Nov 13;
- Air Force Policy Directive (AFPD) 32-70, Environmental Considerations in Air Force Programs and Activities, 29 Jul 18;
- AFMAN 32-7003, Environmental Conservation, 20 April 20;
- AFI 91-212, Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program, 31 MAY 2018.

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

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

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

1.4 Integration with Other Plans

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As stated in Section 1.2 Management Philosophy, the INRMP is a component plan of the Installation Development Plan (IDP). The IDP was last updated in 2017.

INRMP revisions and concurrence with the final plan must be coordinated through the installation chain of command and all internal stakeholders. The NRM must ensure that the INRMP, Wildland Fire Management Plan, Bird/Wildlife Aircraft Strike Hazard (BASH) Plan, Integrated Cultural Resources Management Plan (ICRMP), Integrated Pest Management Plan (IPMP), and any other plans that may affect natural resources, are mutually supportive and not in conflict.

2 INSTALLATION PROFILE

Installation Supplement

Office of Primary Responsibility (OPR)	90 CES/CEIE has overall responsibility for implementing the natural resources management program and is the lead organization for monitoring compliance with applicable federal, state, and local regulations.
Natural Resources Manager/Point of Contact (POC)	Name: Alex Schubert Phone: 307-773-5098 Email: alex.schubert@us.af.mil
State and/or local regulatory POCs (Include agency name for Sikes Act cooperating agencies)	U.S. Fish and Wildlife Service,-Ecological Services, Tyler Abbott, Field Supervisor, tyler_abbott@fws.gov, 307-772-2374 Wyoming Game and Fish Department, Matt Withroder, Regional Wildlife Supervisor, matt.withroder@wyo.gov , 307-745-4046
Total acreage managed by installation	5,866
Total acreage of wetlands	64.7
Total acreage of forested land	0
Does installation have any Biological Opinions? (If yes, list title and date, and identify where they are maintained)	No
Natural Resources Program Applicability (Place an X in the brackets "[X]" next to each program that must be implemented at the installation. Document applicability and current management practices in Section 7.0)	[x] Fish and Wildlife Management [x] Outdoor Recreation and Access to Natural Resources [x] Conservation Law Enforcement [x] Management of Threatened, Endangered, and Host Nation-Protected Species [x] Water Resource Protection [x] Wetland Protection [x] Grounds Maintenance [ ] Forest Management [x] Wildland Fire Management [x] Agricultural Outleasing [x] Integrated Pest Management Program [x] Bird/Wildlife Aircraft Strike Hazard (BASH) [ ] Coastal Zone and Marine Resources Management [x] Cultural Resources Protection [x] Public Outreach [x] Geographic Information Systems (GIS)

2.1 Installation Overview

2.1.1 Location and Area

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F. E. Warren AFB occupies 5,866 acres, or approximately nine square miles, and is located on the western edge of the City of Cheyenne in southeastern Laramie County, Wyoming (Figure 1 - Vicinity Map). The base is approximately 11 miles north of the Colorado border and is situated west of Interstate 25 (I-25). It is approximately 100 miles north of Denver, Colorado, and 45 miles east of Laramie, Wyoming. Two major highways, I-25 and I-80, intersect about three miles from the main gate of the installation.

F. E Warren AFB is one of the few Air Force installations without a fixed-wing runway. The 90th Missile Wing is responsible for Missile Alert Facilities (MAF) and Launch Facilities (LF) supporting 150 Minuteman III ICBMs over an area encompassing 9,600 square miles in the states of Colorado, Nebraska, and Wyoming. Due to the lack of natural resources present, the remote nature, and high security at these sites, they are not included in this INRMP.

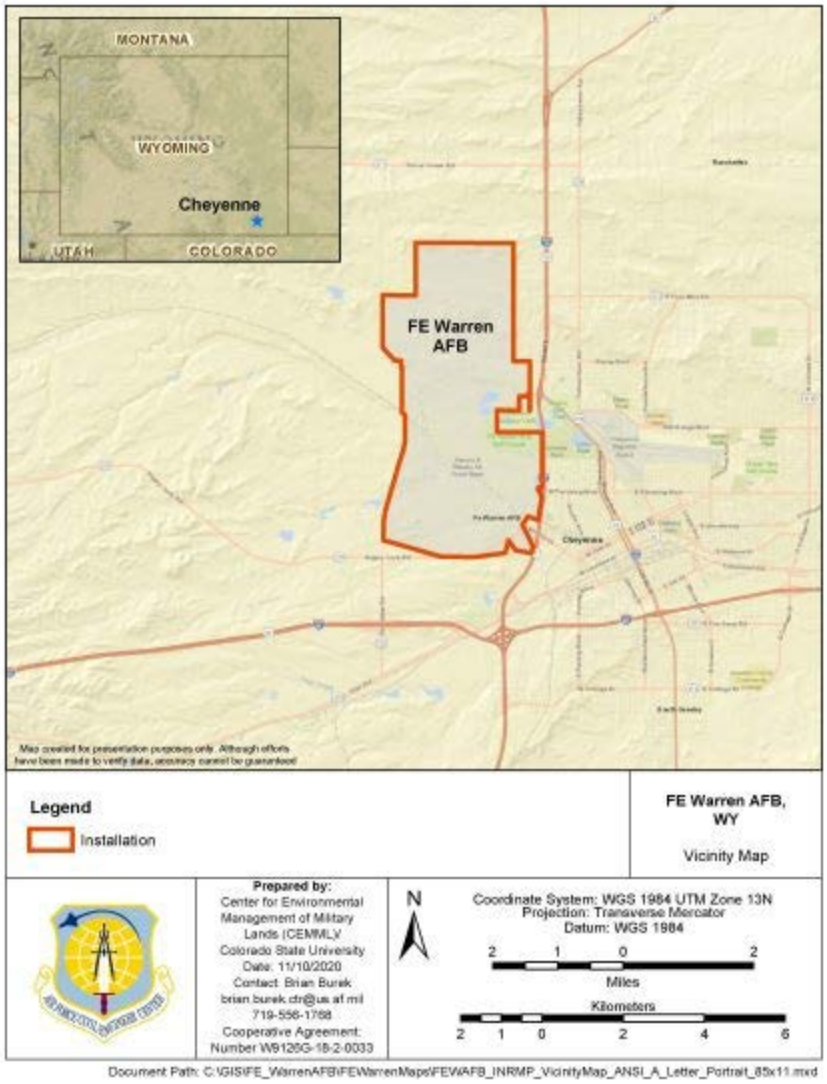

Figure 1 - Vicinity Map

Installation/GSU Location and Area Descriptions

Installation/ Geographically Separated Unit (GSU)	Main Use/ Mission	Acreage	Addressed in INRMP?	Describe Natural Resource Implications
F. E. Warren AFB	Home of the 90th Missile Wing, activated in 1963, which operates 150 Minuteman III ICBMs.	5866	All Sections of INRMP	Management of fish, wildlife, plants, threatened and endangered species, invasive species, migratory birds, and wetlands

2.1.2 Installation History

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F. E. Warren AFB is the oldest continuously active military installation in the Air Force. The base began as an Army post on July 4, 1867, when Fort D. A. Russell was established to protect track-laying crews of the Union Pacific Railroad. It ultimately became one of the largest cavalry posts in the United States, and remained an important military post well into the next century. This important contribution to United States history led to the central portion of the installation being designated as a National

Historic District and National Historic Landmark. Over the years, the Army post contained artillery, cavalry, and infantry units. The post's name was changed to Fort Francis E. Warren on January 1, 1930, in honor of Francis Emroy Warren, a Civil War Medal of Honor winner, the first Governor of the State of Wyoming, and a United States Senator. During the 1930s, Fort Warren transitioned to motorized vehicles; most horses and mules had departed by 1939.

Infantry and field artillery units left the post in 1940 and were replaced by the Quartermaster Replacement Training Center. The center supported about 26,000 troops at its peak and remained for the duration of World War II. The Air Force assumed control of the base in 1947 under the newly formed Air Training Command (now Air Education and Training Command). The installation was utilized as a training base until 1958, when it was assigned to the Strategic Air Command (SAC). At this time, it became the first Air Force installation dedicated solely to ICBM operations. Atlas D and E missiles were deployed to sites in northern Colorado, western Nebraska, and eastern Wyoming.

The 90th Strategic Missile Wing was activated on July 1, 1963, becoming the free world's largest ICBM unit. In the early 1960s, 200 Minuteman I missiles replaced the Atlas ICBMs. By 1975, all Minuteman I missiles had been replaced by the Minuteman III weapon systems. In 1986, 50 Peacekeeper missiles replaced 50 Minuteman III missiles. Deactivation of the 50 Peacekeeper missile systems began in October 2002.

In June 1992, the 90th Strategic Missile Wing was designated as the 90th Missile Wing, and reassigned to Air Combat Command (ACC), concurrent with the inactivation of SAC. On July 1, 1993, he realignment of the 20th Air Force from ACC to the Air Force Space Command (AFSPC) placed the 90th Missile Wing under its third Major Command in less than two years. Twentieth Air Force, headquarters for all the Nation's ICBM units, relocated to F. E. Warren AFB on October 1, 1993.

On October 1, 1997, the 90th Missile Wing was designated the 90th Space Wing, only to revert back to the 90th Missile Wing in 2008. In 200 , F. E. Warren AFB was transferred to the newly activated Air ForceGlobal Strike Command (AFGSC).

2.1.3 Military Missions

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The primary mission of the 90 MW is to "Defend America with the world's premier combat-ready ICBM force."

The responsibilities of the 90 MW are accomplished by the 90th Maintenance Group (90 MXG) (supporting the world's most powerful combat ICBM force), 90th Medical Group (90 MDG) (providing high-quality health care), 90th Mission Support Group (90 MSG) (civil engineering, communications, contracting, logistics readiness, services, and mission support), 90th Operations Group (90 OG) (operate, maintain, and monitor security of the ICBMs and MAFs and provide ready helicopter security, airlift, and rescue operations), and the 90th Security Forces Group (90 SFG) (command and control for security forces as well as law enforcement) along with their subordinate units and activities.

Listing of Tenants and Natural Resources Responsibility

Tenant Organization	Natural Resources Responsibility
20 AF Headquarters;	Maintenance and operation of ICBM force
253 Command and Control Group	Mobilizes communications/combat logistics
Air Force Office of Special Investigations (AFOSI)	N/A
American Federation of Government Employees (AFGE)	N/A
Army and Air Force Exchange Service (AAFES)	N/A
Army Corps of Engineers (USACE)	Designation and protection of wetlands. USACE on base deals with contract management.
Army Recruiting Station	N/A
Cheyenne U.S. Naval Reserve Center (USNRC)	N/A

Civil Air Patrol (CAP)	N/A
Defense Commissary Agency (DeCA)	N/A
Defense Investigative Service (DIS)	N/A
Non-Commissioned Officers Association (NCOA)	N/A
Wyoming Joint Forces Headquarters, Readiness Center and Field Maintenance (JFRC)	Safeguards Wyoming and protects nation. NR responsibility is to conduct activities in accordance with applicable NR laws. NR Contact - Amanda Thimmayya, Natural Resources Manager (307) 772-5036
Army Aviation Support Facility (AASF)	Ministers to the Wyoming Army National Guard Blackhawk Medevac Helicopter Unit
582 Helicopter Group Flight Safety	Bird Aircraft Strike Hazard (BASH) Plan
U.S. Postal Service (USPS)	N/A
Warren Federal Credit Union (WFCU)	N/A

2.1.4 Natural Resources Needed to Support the Military Mission

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Natural resources needed to support the military mission include habitat and species that provide positive aesthetic, social, and recreational attributes, which substantially contribute to the overall quality of life; wetlands for flood control and water quality functions; and open areas that maintain flexibility for future mission requirements. Management of these resources is addressed in this INRMP and the associated operational component plans.

2.1.5 Surrounding Communities

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The City of Cheyenne, the state capital and seat of Laramie County, is located just east of and adjacent to F. E. Warren AFB (Figure 2). Downtown Cheyenne is located approximately one mile due east of Gate 1. Unincorporated Laramie County surrounds F. E. Warren AFB to the north, south, and west. The most prominent land use east of the base is urban and suburban residential. Areas north, west, and south of the base are primarily low-density rural residential and rangeland (Laramie County 2001). F. E. Warren AFB is located at the northern edge of the Front Range.

F. E. Warren AFB is not only one of the largest single employers within the Cheyenne area, but also one of the major employers in Wyoming. The top four employers in Laramie County were F. E. Warren AFB, the State of Wyoming, the Federal Government, and Laramie County School District No. 1. According to the U.S. Census, in 2010 the population of Cheyenne was 59,489, an increase of 6,478 persons since 2000 (growth rate of 8%). The 2010 Census determined that the Laramie County population was estimated to be 91,738, up from 82,894 in 2000 (United States Census Bureau).

Every July, Cheyenne revives its past with Frontier Days, the world's largest outdoor rodeo; first held in 1897. Landmarks in Cheyenne include the Wyoming State Capitol and the state Supreme Court building.

Figure 2 - Aerial Photo of F. E. Warren AFB and Surrounding Community

2.1.6 Local and Regional Natural Areas

Installation Supplement

Local and regional natural areas can increase natural resources management options at military installations. Natural areas within five miles of F. E. Warren AFB are limited to recreational parks in the City of Cheyenne. The Greater Cheyenne Greenway is a 10-foot wide, reinforced concrete path that can be utilized by pedestrians and bicyclists throughout the City and portions of the County. The Greenway serves as a safe and accessible recreational corridor; a key component of the non-motorized transportation system; an open-air science, ecology, history, and health classroom for students of all ages; and a vital public space integral in building sustainable, vibrant and healthy neighborhoods and a cohesive community. The Greenway connects neighborhoods, schools and socioeconomic divides and is a critical part of the City/County infrastructure

Regional natural areas such as Curt Gowdy State Park, Pine Bluffs, and the Medicine Bow National Forest do, however, provide wildlife habitat as well as recreational opportunities. Rocky Mountain National Park is located 90 miles southwest of Cheyenne. Grand Teton National Park and Yellowstone National Park are located diagonally across the state in the northwest corner of Wyoming.

2.2 Physical Environment

2.2.1 Climate

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The climate of F. E. Warren AFB, located near the Front Range of the Rocky Mountains and on the high plains, is best described as semi-arid (Installation Development Plan 2017). The base experiences moderately warm summers and cold winters with an average annual temperature of 46° F. The average daily maximum and minimum temperatures are 83°F in July and 26°F in January. Temperature extremes range from -34°F to 100°F.

Annual average precipitation is approximately 14 inches in the form of rain or snowfall, with an average winter snowfall of 52 inches. Snowfall is common nine months out of the year due to the high plains environment (more than 6,000 feet above sea level), with the first snowfall of the season typically occurring in late September and the last snowfall in May. Winter is the driest season, with average monthly precipitation of less than one inch. Late spring and early summer are the wettest times of the year, with just over two inches average monthly precipitation. Severe thunderstorms occur in the late spring to summer months and can result in flash flooding conditions, large hail, and even occasional tornadoes. The peak of the tornado season along the Front Range is in June, while the greatest flash flooding potential exists in July and August.

Prevailing winds are from the northwest or west throughout the year, with secondary peaks in wind frequency from south to north, spring through autumn. The annual average wind speed is 13 miles per hour (mph); however, days of high winds are common with wind gusts often exceeding 50 mph, especially in the fall and winter months.

The highest monthly average relative humidity (RH) is 72 percent, recorded in May and June, and the lowest is 36 percent, recorded in July and August. Typically, RHs dip much lower than these averages indicate and during dry periods often drop into the single digits during the heat of the day.

A national weather service station is located at 1301 Airport Parkway; in the vicinity of the Cheyenne Municipal Airport. Hourly data is accessible via the Cheyenne National Weather Service web site.

Climate-related changes may be having impacts on species and natural systems, including changes in the timing of biological events (i.e., phonological changes), such as the onset and end of breeding seasons, migration, and flowering; shifts in geographic ranges; and changes in community dynamics
and populations.

Climate variability and extreme climate events may significantly affect native ecosystems and may require the F. E. Warren AFB to adjust natural resources management strategies to support military mission requirements and address the needs of sensitive species. The installation should consider historical regional trends in climate, and projections of future climate change vulnerabilities and risk to natural infrastructure and sensitive species using authoritative region-specific climate science. The installation may need to develop installation-specific climate data and region-specific climate projections. The installation should consider developing goals and objectives for ecosystem management and biodiversity conservation. These should employ an adaptive ecosystem-based management approach that will enhance the resiliency of the ecosystem to adapt to changes in climate.

The ecological impacts associated with climate change do not exist in isolation, but combine with and exacerbate existing stresses on our natural systems. Vulnerability to climate change has been discussed as having three principle components: sensitivity, exposure, and adaptive capacity. Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate-related stimuli. Exposure is the nature and degree to which a system is exposed to significant climate variations. Adaptive capacity is the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.

2.2.2 Landforms

Installation Supplement

F. E. Warren AFB is situated on the western edge of the Great Plains, with the Laramie Mountains on the horizon to the west (Barlow and Knight 1999). The topography is characterized by broad plateaus that are nearly flat in the historic core and increase in slope along the ridgelines and Crow Creek (Installation Development Plan 2013). Elevation ranges from 6,118 feet in the southeast corner, where Crow Creek crosses the boundary, to 6,405 feet in the northern area (U.S. Air Force 1996). Landforms in the Great Plains include ridges, hills, knolls, fans, terraces, and dunes.

2.2.3 Geology and Soils

Installation Supplement

The installation exists within the Great Plains Physiographic Province, High Plains Section. The oldest age of rocks in this geographic area is Precambrian, and the youngest are from recent times (Installation Development Plan, 2013). The geology of F. E. Warren AFB is dominated by the Ogallala and Arikaree formations. The Ogallala Formation is the youngest bedrock formation in the survey area. It consists of gravel, sand and silt washed down from the Laramie Mountains (to the west) during the late Miocene epoch. The Arikaree Formation is a sandstone formation dating back to the Miocene and late Oligocene epochs (NRCS 2001). The predominant soil series is classified texturally as loamy, where average topsoil depth ranges from four to six inches (Figure 3 - Soil Types). The subsoil is composed primarily of alluvial clay and extends from a depth of approximately 6 to 36 inches.

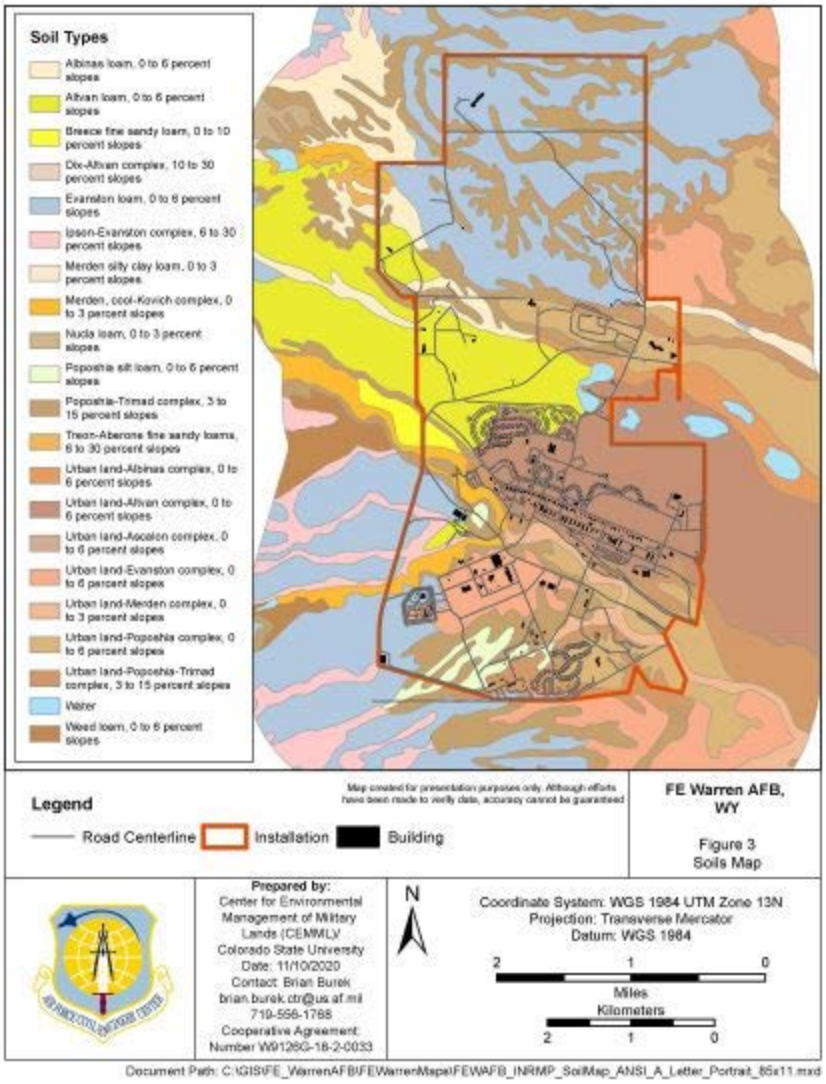

Figure 3 - Soil Types

2.2.4 Hydrology

Installation Supplement

Two reservoirs, several small ponds, portions of three creeks, and two unnamed tributaries are present on F. E. Warren AFB (Figure 4 - Hydrologic Features). Lake Pearson reservoir is made up of two basins connected by a thin culvert used to control water flow between the basins. This reservoir was constructed between 1957 and 1970. Marshes (cattails, bulrush, and standing water in the spring) and wet meadows (thick grasses and non-native forbs) are present around the north basin of Lake Pearson. Lake Centennial reservoir, constructed in 1988, is a flood control basin intended to hold installation run-off from flooding the City of Cheyenne. Several small ponds are located adjacent to Crow Creek and its tributaries. The reservoirs are used heavily for recreation by base personnel. Waterfowl and shorebirds utilize the reservoirs and ponds for feeding and nesting habitat.

F. E. Warren AFB lies mainly in the Crow Creek and Diamond Creek watersheds. The major drainage is Crow Creek, the headwaters of which originate in the Laramie Mountains. Crow Creek flows from northwest to southeast across the southern half of the base. It is a perennial stream with meandering sand and gravel bed channel. Crow Creek has substantial woody biomass, with stream banks and flood plains that are well vegetated (Hazlett, 1999a). Diamond Creek enters the base

from the west, south of Crow Creek, and flows northeast, where it joins Crow Creek. Diamond Creek is a smaller, more sinuous, ephemeral stream. One unnamed tributary to Crow Creek is located south of Diamond Creek and also flows from inside the base boundary eastward into Crow Creek. Dry Creek is significantly smaller than the other two creek systems. It is located on the northern half of the base and flows from the center of the base eastward. It is not shown on all maps and may not flow during most months, hence the name. For flood control purposes, a dam was built on Dry Creek, however no water is held there on a permanent basis. Just south of Dry Creek is another unnamed tributary, which begins near the center of the base and flows eastward. Crow Creek is part of the Platte River drainage which flows southeast from Cheyenne, eventually connecting to the South Platte River approximately ten miles east of Greeley, Colorado.

Floodplain maps show this drainage to have a 100-year floodplain line near the base boundary.

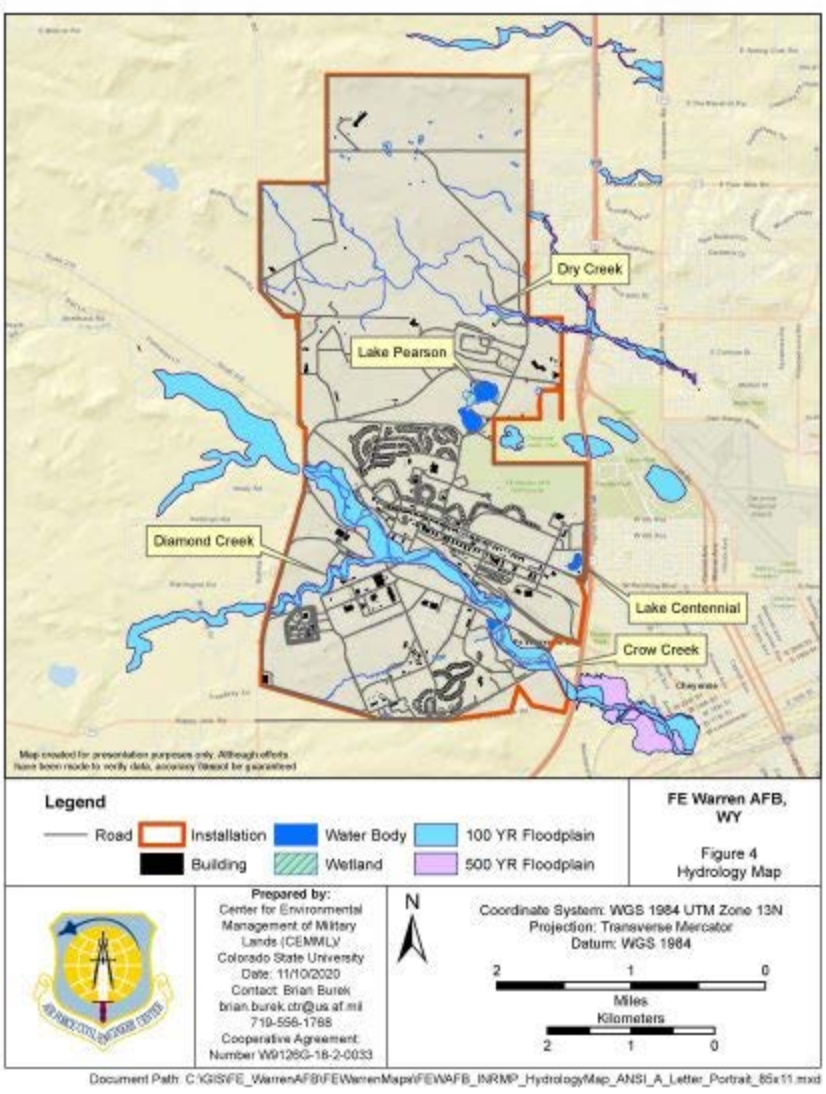

Figure 4 - Hydrologic Features

2.3 Ecosystems and the Biotic Environment

2.3.1 Ecosystem Classification
Installation Supplement

The Hierarchical Framework of Ecological Units is an established classification and mapping system that identifies land and water areas at different levels of resolution with similar capabilities and potentials for management. Depending on scale, ecological units are designed to exhibit similar patterns in (1) potential natural communities, (2) soils, (3) hydrologic function, (4) landform and topography, (5) lithology, (6) climate, and (7) natural processes such as nutrient cycling, productivity, succession, and natural

disturbance regimes associated with flooding, wind, or fire. Maps of these ecological units may be used to delineate ecosystems, assess resources, conduct environmental analyses, and manage and monitor natural resources (Cleland et al., 1997).

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources (EPA 2004). At the ecoregion scale, ecological units are recognized by differences in global, continental, and regional climatic regimes and gross physiography (Cleland *et al*., 1997). Three levels of ecoregions, adapted from Bailey (1980), are identified in the hierarchy: Domains, Divisions, and Provinces. Descriptions for F. E. Warren AFB follow:

- The Dry Domain is characterized by annual losses of water through evaporation at the earth's surface exceeding annual water gains from precipitation. Within this domain, F. E. Warren AFB further would be classified as the semiarid steppe, a transitional belt between the desert and humid climates.
- The Temperate Steppe Division encompassing F. E. Warren AFB includes areas with a semiarid continental climatic regime in which, despite maximum summer rainfall, evaporation usually exceeds precipitation. The vegetation is steppe, sometimes called shortgrass prairie and semi-desert. Typical steppe vegetation consists of numerous species of short grasses that grow in sparsely distributed bunches. Scattered shrubs and low trees sometimes grow in the steppe; all gradations of cover are present, from semi-desert to woodland. Because ground cover is sparse, much soil is exposed.
- The Great Plains-Palouse Dry Steppe Province is characterized by rolling plains and tablelands of moderate relief in a broad belt that slopes gradually eastward from an elevation of 5,500 feet near the foot of the Rocky Mountains to 2,500 feet in the central states. The Palouse region occupies a series of loess-covered basalt tablelands with moderate to high relief, ranging in elevation from 1,200 to 6,000 feet. Except for the presence of shrubs, the Palouse grassland resembles the Great Plains shortgrass prairie. Its dominant species include bluebunch wheatgrass, fescue, and bluegrass. Large herds of buffalo migrated with the seasons across the steppe plains. The pronghorn antelope is probably the most abundant large ungulate, but mule deer and whitetail deer are common where brush cover is available. The lagomorphs, prairie dogs, and other small rodents are preyed upon by the coyote and several other mammalian and avian predators.

These areas are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources within the same geographical areas.

2.3.2 Vegetation

Installation Supplement

Historic and current vegetation as well as turf and landscaped areas influence wildlife found on F. E. Warren AFB.

2.3.2.1 Historic Vegetation Cover

Installation Supplement

In support of historic preservation initiatives at F. E. Warren AFB, a report on historic vegetation was prepared by the University of Wyoming (Barlow and Knight 1999). This report concluded that historic vegetation (i.e., just prior to establishment of Fort D. A. Russell in 1867) was essentially of two major types: mixed-grass prairie and riparian meadows and shrublands. Trees were absent or found only sporadically.

Significant changes impacting vegetation that have occurred since the base was first established include the construction of roads and buildings, planting of trees in the areas now known as the Historic District, and apparent spread of these trees onto the adjacent Crow Creek floodplain. Also, the mixed-grass prairie has been subjected to extensive military exercises. However, apart from the lawns, tree-lined boulevards, and buildings, investigators concluded that much of the rolling grassland of the central and northern upland is very similar to what was present in the 1860s (Barlow and Knight 1999).

2.3.2.2 Current Vegetation Cover

Installation Supplement

Vegetation at F. E. Warren AFB currently consists of mixed-grass prairie grasslands dominated by planted crested wheatgrass (*Agropyron cristatum*), riparian bottomlands with willow thickets, dry and wet meadows, and scattered cottonwood trees (Easter and Douglas 1996; Barlow and Knight 1999). The abundance of trees that exist in the riparian zones today probably originated as a result of former transplanting, landscaping, and natural establishment of seedlings from planted trees (Connor 1993; Barlow and Knight 1999). Riparian zones on Crow Creek are now dominated by tall shrubs of coyote willow (*Salix exigua*), with scattered cottonwood (*Populus deltoides*), in association with peachleaf willow (*Salix amygdaloides*), green ash (*Fraxinus pennsylvanica*),

boxelder (*Acer negundo*), and the introduced Russian olive (*Elaeagnus angustifolia*) (Barlow and Knight 1999). Portions of Crow Creek also contain beaver ponds, and it is presumed that beaver presence here has varied over the long term with the amount of shrub and tree cover present. While beaver are usually characterized as agents of secondary succession, on a local scale they may elevate groundwater levels to favor vegetation encroachment and succession and stabilize creek channel meandering. This is countered to some extent by their reduction of woody cover. Diamond Creek and the Unnamed Drainage support less woody vegetation, except in lower reaches of Diamond Creek, where there are patches of willow, wild currant (*Ribes* spp.), and cottonwood near the confluence with Crow Creek. Willow distribution has been mapped by Jones (2003) and noxious weed distribution by Heidel and Laursen (2002).

Vegetation habitats are classified by dominant species in the area. Defining habitats is necessary to assess the potential presence of wildlife, threatened and endangered species, and other sensitive areas. In turn, these evaluations make it possible to identify areas that require management.

Six basic vegetation cover types have been documented on F. E. Warren AFB (Center for Environmental Management of Military Lands [CEMML] 1996) and their distribution is shown in Figure 5 - Plant Community Distribution. Categories include:

- Crested wheatgrass (planted),
- Wet meadow (plowed and unplowed areas),
- Mixed grassland and gravel breaks,
- Riparian areas,
- Cottonwood stands, and
- Other (including wetlands, open water, urban, landfill, railroads, and roads).

The number of hectares and percent cover by vegetation type at F. E. Warren AFB are identified below.

Number of Hectares and Percent Cover by Vegetation Type

Vegetation Cover Type	Hectares	Percent
Mixed Grassland/Gravel Breaks	1202.60	50.69%
Crested Wheatgrass	301.20	12.69%
Wet Meadow	96.36	4.06%
Urban/Other	750.26	31.62%
Cottonwood Stand	22.12	0.93%

A recent study of riparian habitats identified eight riparian plant associations present at F. E. Warren AFB with varying imperilment ranks (Hazlett 1999a).

Species of primary concern include the Colorado butterfly plant (*Gaura neomexicana coloradensis*) and the noxious weeds—Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), Dalmatian toadflax (*Linaria dalmatica*), and common hound's tongue (*Cynoglossum officinale*)—prevalent in riparian zones and some upland areas.

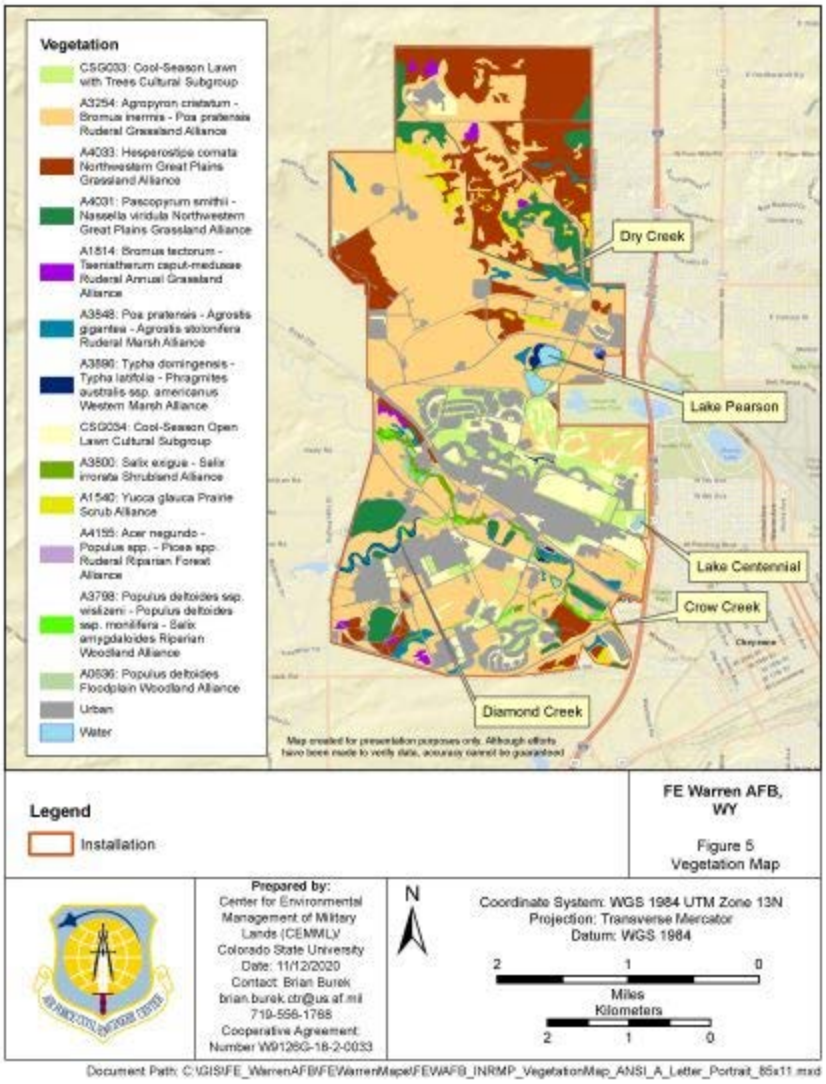

Figure 5 - Vegetation Map

2.3.2.3 Future Vegetation Cover
Installation Supplement

Future vegetative cover is expected to be much the same as current vegetative cover. The base is expected to remain mixed-grass prairie grasslands, riparian bottomlands with willow thickets, dry and wet meadows, and scattered cottonwood trees.

2.3.2.4 Turf and Landscaped Areas
Installation Supplement

A landscape development plan has been prepared for F. E. Warren AFB to address the historic, cultural, and eco-regional context of the base (Geo-Marine Inc. 2003). Prototypical landscape treatments are provided, including plant palettes, hardscape recommendations, site furnishings, and amenities. Three distinct districts plus major street corridors encompassing many areas are identified as follows:

- Historic District

- Barracks and Dorms, Parade Fields, 20th Air Force and 90th Missile Wing Headquarters Buildings, Family Campground, Officers Quarters, Quarters 92 and Visiting Officers Quarters (VOQ), Sergeant's Row, Stables, Office and Administrative Buildings, Cemetery, and Community Facilities.
- North District
  - Industrial Area, Base Lakes, Golf Course, Medical Complex, Capehart/MCP Housing, Atlas Housing, Community Facilities, Gate One/Visitor Control Center, and Open Space.
- South District
  - Industrial Area, Carlin Heights Housing, 800 Series Dorms, Office/Administrative Buildings, Gate 2, Community Facilities, and Open Space.
- Corridors
  - Randall Avenue, Missile Drive, Fort Steele Way, Rogers Drive, South Frontier Road, and Old Glory Road.

Within these districts, turf and landscaped areas are managed through a grounds maintenance contract that specifies varieties of sod, grass, trees, and shrub species to be used in the developed areas of the installation. Class 1 areas are sodded with Kentucky bluegrass. Grass seed is mixed at the following rate: Western wheatgrass (1/4 pound), Blue Bunch wheatgrass (1/4 pound), Green Needle grass (1/4 pound), Indian Rice grass (1/8 pound), and Thick Spike wheatgrass (1/8 pound). Selection of trees is as follows: Group 1 (Aspen, Quaking Aspen, Rocky Mountain Juniper); Group 2 (Limber Pine); Group 3 (Crab Apple, Blue Spruce, Canadian Choke Cherry, Black Hills Spruce, Ponderosa Pine, Austrian Pine, Lodge Pole Pine, Amur Maple); and Group 4 (Highlands Cottonwood, Narrow Leaf Cottonwood, Lance Leaf Cottonwood, Green Ash, Birch, Bur Oak, Hackberry, Honey Locust, Douglas Fir). Shrubs include Group 5 (Currant, Pea Shrub, Potentilla, Rocky Mountain Sumac, Spirea, Flowering Plum, Spreading Cotoneaster, Rock Cotoneaster, Hedge Cotoneaster) and Group 6 (Dogwood, Rabbit Brush, Buffalo Berry, Euonymus, Lilac, Andorra Juniper, Mountain Mahogany, Curl-Leaf, Broadmoor Juniper, Buffalo Juniper, Tam Juniper).

2.3.3 Fish and Wildlife

Installation Supplement

Fish and wildlife that occur on F. E. Warren AFB are species common to the high plains ecosystems, which have evolved in shortgrass prairie habitats. However, the diversity of habitats available on F. E. Warren AFB (e.g., mixed-grass prairie bisected by riparian communities) supports a variety of terrestrial birds, mammals, reptiles, amphibians, fish, and invertebrates. Additionally, due to the urban/developed nature of much of the base, some species are present which would not naturally occur in a shortgrass prairie setting, such as fox squirrel (*Sciurus niger*) and house finches (Carpodacus mexicanus). Most species present are somewhat tolerant of human disturbance.

Species or groups of species of primary concern include the pronghorn (*Antilocapra americana*), migratory birds, Preble's meadow jumping mouse (*Zapus hudsonius preblei*), Canada Goose (Branta canadensis), beaver (*Castor canadensis*), bats, trout (fisheries), and pest or nuisance species.

The pronghorn is a species indigenous to interior western and central North America. Though not an antelope, it is often known in North America as the pronghorn antelope, or simply antelope because it closely resembles the true antelopes of the Old World and fills a similar ecological niche due to similar behavior and habitat requirements.

F. E. Warren currently has a large population of pronghorn that is monitored on a regular basis. Population estimates and sex ratios are determined to aid in herd management. This is and will be a continuous action to aid in resource management on base.

2.3.4 Threatened and Endangered Species and Species of Concern

Installation Supplement

Currently, one species listed as threatened under the Endangered Species Act (ESA) inhabits riparian areas at F. E. Warren AFB, the Preble's meadow jumping mouse (Zapus hudsonius preblei). Furthermore, the Colorado butterfly plant (Oenothera coloradensis, originally listed as Gaura neomexicana ssp. coloradensis) was, in 2019, removed from the Federal List of Endangered and Threatened Plants (List) due to recovery. A Post De-listing Monitoring Plan for the Colorado butterfly plant is currently in place. The ESA requires that populations of de-listed species continued to be monitored for at least 5 years after

delisting occurs. Populations of the Preble's meadow jumping mouse and the Colorado butterfly plant will continue to be monitored on an annual basis. Their distributions on the base are shown in Figure 6 - Threatened and Endangered Species Distribution. In addition, the USFWS, in cooperation with F. E. Warren AFB, operates and maintains a pre-release conditioning facility for the endangered black-footed ferret (Mustela nigripes). The facility fully contains ferrets until they are released offsite back into the wild.

Federally listed species utilizing habitat in the Platte River system such as the interior least tern (Sterna antillarum), piping plover (Charadrius melodus), pallid sturgeon (Scaphirhynchus albus), whooping crane (Grus americana) and western prairie fringed orchid (Platanthera praeclara) as well as their habitat have the potential to be impacted by water depletions of hydrologic resources on base.

Numerous species may be also found on the base as either resident species or migrants that are (1) designated by the Wyoming Game and Fish Department as "Species of Greatest Conservation Need"; (2) protected under the Migratory Bird Treaty Act (MBTA), or (3) Bald and Golden Eagle Protection Act (BGEPA). The names of these species are shown below.

Common Name	**Scientific Name**	**Group**	**Status**
Northern Leopard Frog	*Lithobates pipiens*	amphibians	WY Species of Greatest Conservation Need
Tiger salamander	*Ambystoma mavortium*	amphibians	MBTA, WY Species of Greatest Conservation Need
Peregrine Falcon	*Falco peregrinus*	birds	MBTA, WY Species of Greatest Conservation Need
Bald Eagle	*Haliaeetus leucocephalus*	birds	BGEPA/MBTA, WY Species of Greatest Conservation Need
Golden Eagle	*Aquila chrysaetos*	birds	BGEPA/MBTA, WY Species of Greatest Conservation Need
Swainson's Hawk	*Buteo swainsoni*	birds	MBTA, WY Species of Greatest Conservation Need
Burrowing Owl	*Athene cuniculari*	birds	MBTA, WY Species of Greatest Conservation Need
American Kestrel	*Falco sparverius*	birds	MBTA, WY Species of Greatest Conservation Need
Black-crowned Night Heron	*Nycticorax nycticorax*	birds	MBTA, WY Species of Greatest Conservation Need
American White Pelican	*Pelecanus erythrorhynchos*	birds	MBTA, WY Species of Greatest Conservation Need
Baird's Sparrow	*Ammodramus bairdii*	birds	MBTA, WY Species of Greatest Conservation Need
Blue Grosbeak	*Passerina caerulea*	birds	MBTA, WY Species of Greatest Conservation Need
Blue-gray Gnatcatcher	*Polioptila caerulea*	birds	MBTA, WY Species of Greatest Conservation Need
Burrowing Owl	*Athene cunicularia*	birds	MBTA, WY Species of Greatest Conservation Need
Caspian tern	*Hydroprogne caspia*	birds	MBTA, WY Species of Greatest Conservation Need
Chestnut-collared Longspur	*Calcarius ornatus*	birds	MBTA, WY Species of Greatest Conservation Need
Common Loon	*Gavia immer*	birds	MBTA, WY Species of Greatest Conservation Need
Great Blue Heron	*Ardea herodias*	birds	MBTA, WY Species of Greatest Conservation Need

Common Nighthawk	*Chordeiles minor*	birds	MBTA, WY Species of Greatest Conservation Need
Common Yellowthroat	*Chordeiles minor*	birds	MBTA, WY Species of Greatest Conservation Need
Ferruginous Hawk	*Buteo regalis*	birds	MBTA, WY Species of Greatest Conservation Need
Grasshopper Sparrow	*Ammodramus savannarum*	birds	MBTA, WY Species of Greatest Conservation Need
MacGillivray's Warbler	*Geothlypis tolmieri*	birds	MBTA, WY Species of Greatest Conservation Need
McCown's Longspur	*Rhynchophanes mccownii*	birds	MBTA, WY Species of Greatest Conservation Need
Merlin	*Falco columbarius*	birds	MBTA, WY Species of Greatest Conservation Need
Northern Goshawk	*Accipiter gentilis*	birds	MBTA, WY Species of Greatest Conservation Need
Northern Plains Killifish	*Fundulus kansae*	fishes	WY Species of Greatest Conservation Need
Common Shiner	*Luxilus cornutus*	fishes	WY Species of Greatest Conservation Need
Moose	*Alces americanus*	mammals	WY Species of Greatest Conservation Need
Swift Fox	*Vulpes velox*	mammals	WY Species of Greatest Conservation Need
Eastern Spiny Softshell	*Apalone spinifera spinifera*	reptiles	WY Species of Greatest Conservation Need
Western Painted Turtle	*Chrysemys picta bellii*	reptiles	WY Species of Greatest Conservation Need
Cylindrical Papershell	*Anodontoides ferussacianus*	mollusks	WY Species of Greatest Conservation Need

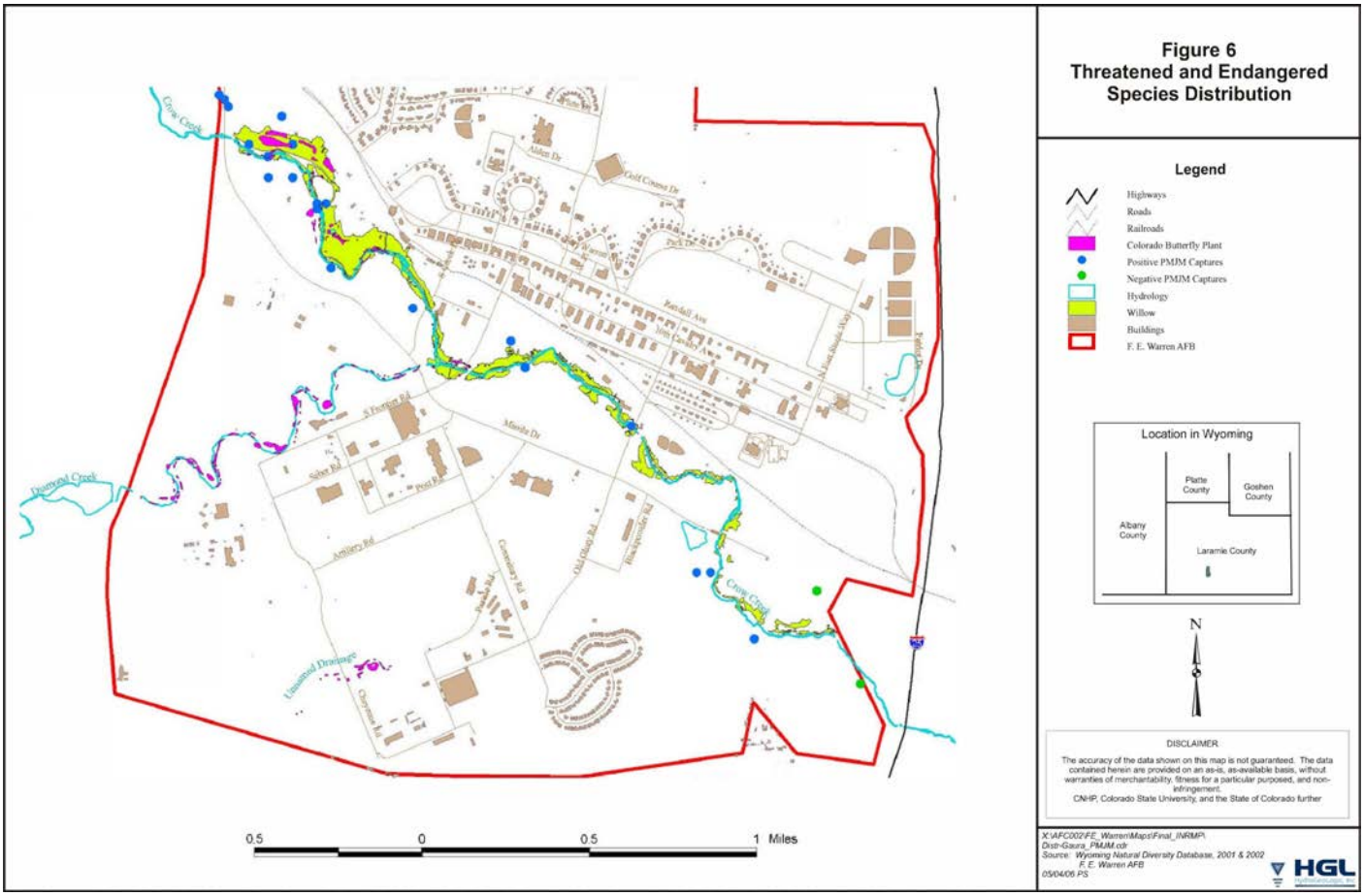

Figure 6 – Species with Endangered Species Act (ESA) requirements. The Preble's meadow jumping mouse is designated as Federally Threatened. The Colorado butterfly plant was removed from the list in 2019, but will require at least 5 years of post de-listing monitoring in accordance with ESA requirements.

In addition, pro-active conservations at F. E. Warren AFB to protect species that are candidates for, or petitioned for listing under the Endangered Species Act, may help to reduce the need for listing these species, or reduce the need to designate critical habitat for these species on the installation. Currently, a butterfly species, the regal fritillary (Speyeria idalia), may occur on the installation and has been petitioned for listing and has received a positive 90-Day finding from the U.S. Fish and Wildlife Service. In addition, the monarch butterfly (Danaus plexippus plexippus) is currently a candidate species for Endangered Species Act listing. Pro-active conservation measures will be taken to survey for, and protect these species and their habitat, as well as other species that are candidates, or petitioned for federal ESA listing, in order to prevent critical habitat designation at F. E. Warren AFB.

Pollinators, such as most bees and some birds, bats, and other insects, play a crucial role in flowering plant reproduction and in the production of most fruits and vegetables. F. E. Warren AFB recognizes the importance and growing concern for pollinators in the environment. Due to the many benefits pollinators provide, such as improved ecosystems and economy, F. E. Warren AFB is conserving habitat for pollinators and the monarch butterfly species.

2.3.5 Wetlands and Floodplains

Installation Supplement

Wetlands are defined by the U.S. Army Corps of Engineers (USACE) as 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. A jurisdictional wetland must meet all three parameters (hydrology, hydrophytic vegetation, and hydric soil) under normal circumstances. For a wetland to be considered jurisdictional, it must be adjacent to or share a direct connection to inland waters, lakes, rivers, and streams that are navigable waters of the United States or tributaries thereof. Wetlands provide important flood control and water quality functions for ecosystem integrity.

In a recent Inventory of Wetlands and Other Waters of the United States within F. E. Warren AFB, wetlands totaled approximately 64.7 acres and open water bodies totaled approximately 35 acres (Figure 4 - Hydrology Features). Of these features, jurisdictional wetlands and open water bodies within Waters of the United States encompass approximately 62.3 and 4.2 acres, respectively. A total of 148 wetlands were verified (Smith and Mullen, 2004).

Four wetland habitat classifications exist at F. E. Warren AFB, including Open Water, Palustrine Emergent, Palustrine Scrub-Shrub, and Palustrine Forested wetlands. Within these types, there are generally various wetland subclassifications (Smith and Mullen 2004). Plants common to wetlands on the base include horsetail (*Equisetum laevigatum*), Nebraska sedge (*Carex nebrascensis*), blackcreeper sedge (*Carex praegracilis*), common spikerush (*Eleocharis palustris*), common threesquare bulrush (*Scirpus pungens*), and Torrey's rush (*Juncus torreyi*) (CEMML 1996). Wetlands associated with the riparian areas on F. E. Warren AFB also provide habitat for two federally protected species, the Colorado butterfly plant and Preble's meadow jumping mouse, and should be given special management consideration.

Historically, two types of human disturbance have negatively impacted the wetland areas. Old refuse dumps were established and remain along portions of Crow Creek. Additionally, growth in the riparian zones around the creeks was controlled for security reasons. However, mowing and spraying of riparian zones ceased in 1989. The riparian zones are currently reestablishing with stands of young willows and other wetland vegetation. Beaver activity assists in the establishment of new riparian areas and is evident along portions of Crow Creek (CEMML 1996).

2.3.6 Other Natural Resource Information
Installation Supplement

N/A

2.4 Mission and Natural Resources

2.4.1 Natural Resource Constraints to Mission and Mission Planning
Installation Supplement

Natural resources support the military mission; however, they also have the potential to serve as a constraint. Mission impacts to natural resources must be minimized in accordance with compliance requirements as well as stewardship responsibilities.

Natural resources, in particular listed species and wetlands, constrain future development at F. E. Warren AFB. Moist meadows along Crow and Diamond Creeks and an unnamed drainage basin along the southwestern part of the base support the Colorado butterfly plant, listed as threatened under the ESA. Two of the largest known populations occur on F. E. Warren AFB and are managed with the assistance of the Wyoming Natural Diversity Database and the USFWS. The base's Crow Creek drainage also contains habitat suitable to support the Preble's meadow jumping mouse, which is currently listed as threatened under the ESA. The mouse is limited in distribution to very few documented sites in Wyoming and Colorado.

Although the black-footed ferret is not found on base in a wild state, a facility was built (Building 2277) that can aid in the reintroduction of black-footed ferrets into the wild. A species native to Wyoming, the black-footed ferret is considered the rarest of North American mammals. As part of the National Species Recovery Plan, F. E. Warren AFB has been, and will continue to be, an active partner with the USFWS and other federal and state agencies in protecting and managing this species. Black-footed ferrets are brought in from off-base breeding facilities to Building 2277 for pre-release conditioning. In this facility, ferrets are provided with the opportunity to interact with prairie dogs, their primary prey, in a relatively natural free-ranging condition prior to reintroduction into their natural habitat off base. Building 2277 was reactivated in 2017. From 2017-2021, black-footed ferrets have been pre-conditioned at the facility. Once pre-conditioning is complete the ferrets are released into historic habitat to assist the USFWS in achieving recovery goals for this species. Current plans are to continue pre-conditioning black-footed ferrets at the F. E. Warren AFB facility in 2022, and to possibly expand the use of the facility for other black-footed ferret research purposes in the future. Black-footed ferrets will not be released on base since the base does not support active wild prairie dog colonies, which are crucial for ferret survival.

Water withdrawal from Crow Creek or future groundwater wells might result in the depletion of the Platte River system and may require formal consultation with the USFWS given the potential for downstream effects to federally listed species and their habitat. Consultation will be undertaken on a case-by-case basis as projects are proposed.

Federal law and Air Force policy require that installations avoid or minimize harm to wetlands and floodplains. An inventory completed in December 2004 verified 148 wetlands on the installation. Areas that receive the most management attention are situated along Crow and Diamond Creeks and at the west end of North Lake Pearson. Meadow and riparian vegetation associated with these wetlands are important wildlife habitat areas. Meadows along Crow and Diamond Creeks make up much of the Colorado butterfly plant and Preble's meadow jumping mouse habitats. Before initiating any project that will involve a wetland area, a Section 404 (Clean Water Act) permit may have to be obtained from the USACE. In addition, the USFWS wetland inventory database will be consulted in support of future projects that may affect wetland areas.

Portions of F. E. Warren AFB that are located within the 100-year floodplain generally follow the same boundaries that encompass the wetlands. Periodic flooding is a major consideration for proposed development and environmental management activities in the floodplain. Executive Order 11988, Floodplain Management requires that development in floodplains be avoided. F. E. Warren AFB will avoid development in floodplains, when practicable.

Noxious weeds are an additional constraint. On some sites, certain management techniques are precluded because of plant, invertebrate, and vertebrate species of concern, water quality considerations, and human health issues. Noxious weed management must be considered in plans involving ground disturbance.

Constraints on the military mission are illustrated in Figure 7 – Constraints Map and TES conservation zones are illustrated in Figure 8 -

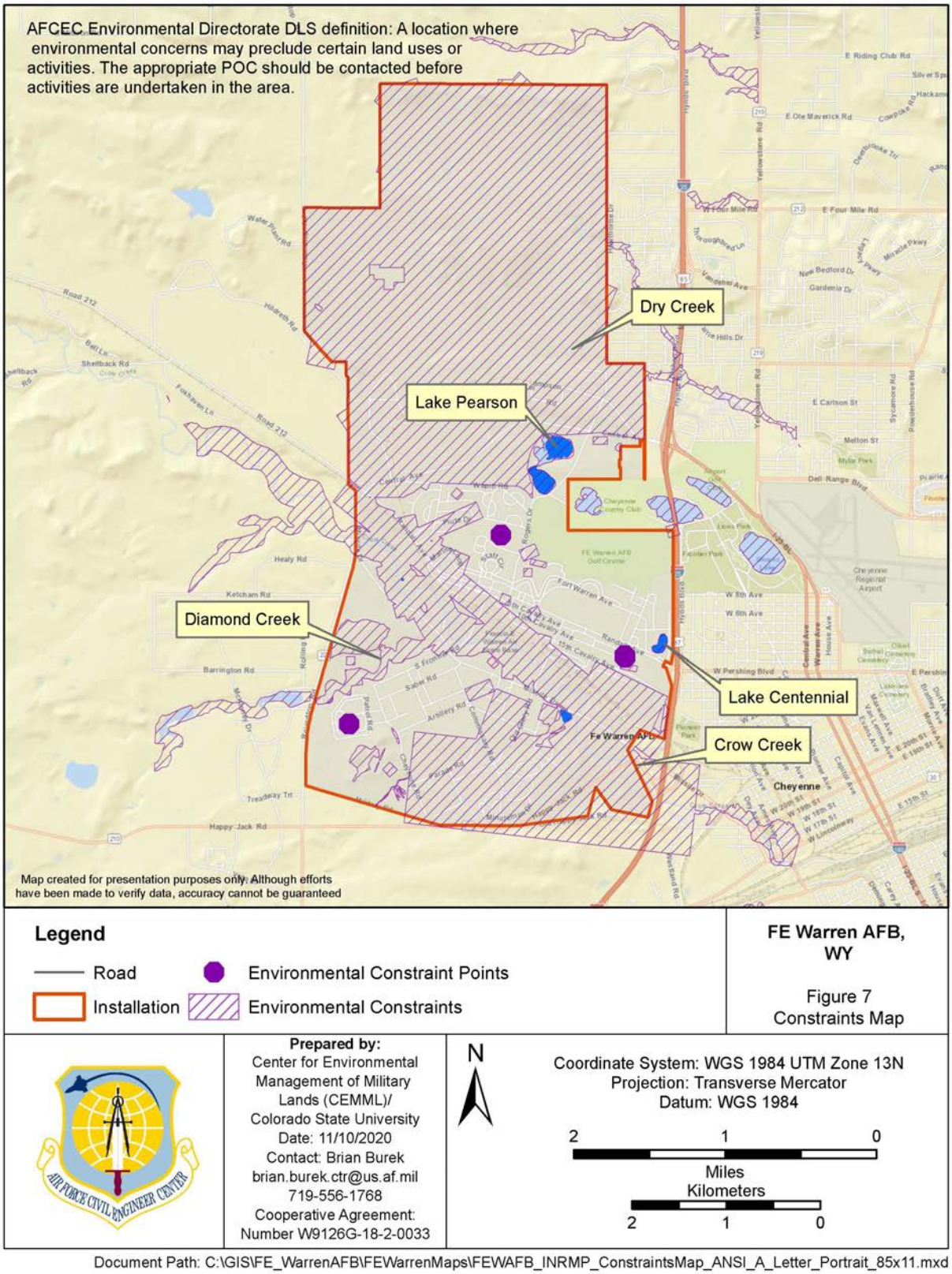

Figure 7 - Composite Constraints

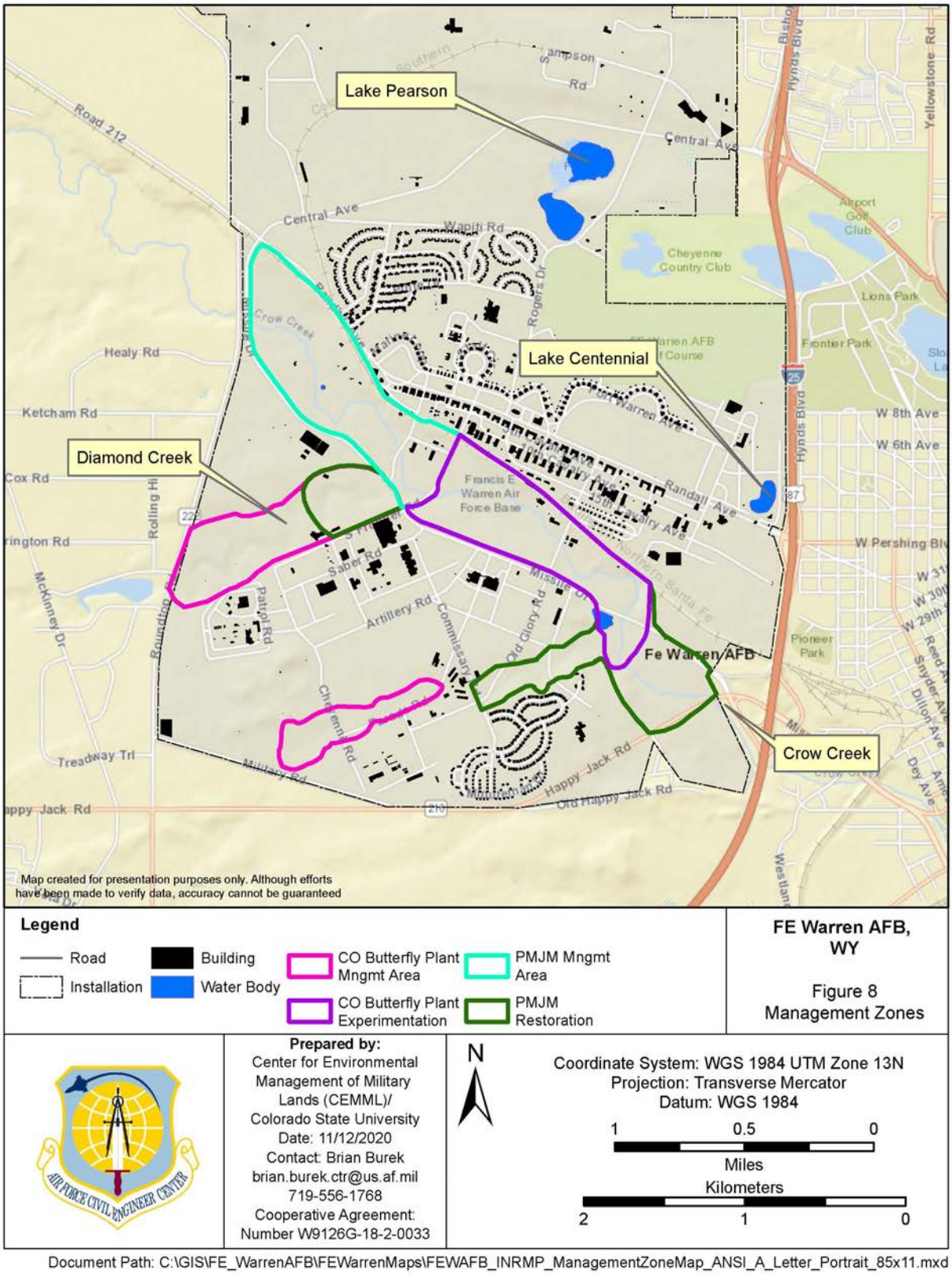

Figure 8 - Conservation Zones for Threatened and Endangered Species

2.4.2 Land Use

Installation Supplement

Wyoming is located in the Rocky Mountain section of the western United States. It is bordered on the north by Montana, on the east by South Dakota and Nebraska, on the south by Colorado and Utah, and on the west by Utah, Idaho, and Montana. The Great Plains meet the Rocky Mountains in Wyoming, and the state is a great plateau broken by a number of important mountain ranges. The Laramie, Medicine Bow and Sierra Madre ranges are located in the southern portion of Wyoming. The Continental Divide cuts through Wyoming from the northwest to the south central border. Rivers east of the Divide drain into the Missouri River Basin and eventually the Atlantic Ocean.

Wyoming is the center of the continent's pronghorn herd and boasts the largest pronghorn population of any state or province. Wyoming is also the home of the world's largest single elk herd. Mule deer are found in every county. Cottontails and jackrabbits abound in Wyoming's wide open spaces along with coyotes, bobcats, and a variety of fur-bearing animals. The sage grouse is one of Wyoming's most widely distributed upland gallinaceous birds. Pheasants, chukar, Hungarian partridge, and wild turkeys also occur in Wyoming, although like the greater sage grouse, they do not inhabit F. E. Warren AFB. Many species of waterfowl, including ducks, geese and the rare trumpeter and whistler swans, are found in Wyoming. Over 99 percent of land in Wyoming is classified as rural (State of Wyoming 2014).

The mineral extraction industry and the travel and tourism sector are the main drivers behind Wyoming's economy. Unlike most other states, Wyoming does not possess an individual or corporate income tax. The Federal government owns 48 percent of Wyoming's landmass, while 6 percent is controlled by the state. Historically, agriculture has been an important component of Wyoming's economic identity. Its overall importance to the performance of Wyoming's economy has waned; however, it is still an essential part of the culture and lifestyle. In 2012, the total value of agricultural production in Wyoming was $1.4 billion. The main agricultural commodities produced in Wyoming include livestock (beef), hay, sugar beets, grain (wheat and barley), and wool (State of Wyoming, 2014).

Land use patterns at F. E. Warren AFB continue to follow the patterns established more than a century ago although additional facility development and supporting infrastructure have evolved over time as missions and requirements have changed or expanded (Figure 9 - Existing Land Use). Of the 5,866 acres at F. E. Warren AFB, approximately 1,585 are categorized as improved, 621 as semi-improved, and 3,660 as unimproved lands (Land Management Plan, 1992-1995).

Today, there are 1,215 structures and approximately 38 miles of roads at F. E. Warren AFB. Buildings and roads are primarily clustered in the southern half of the base. The highest density of roads and buildings are north of Crow Creek, on the opposite side of the railroad tracks that roughly parallel the Crow Creek corridor. This area includes the Historic District with over 200 historic buildings, a golf course, cemetery, medical clinic, parade grounds, and mixed-use administrative, industrial, and community facilities. To the south of Crow Creek, there are large tracts of open space, an industrial/mission complex (including a helicopter operations complex and weapons storage area) along Diamond Creek, several closed landfills, and a housing complex with associated buildings along the southern boundary of the base. There are a few buildings within the floodplain, including the central heating plant and its fuel stores and the liquid propane tank farm. Also, Crow Creek is bordered by railroad tracks on the north and by Missile Drive on the south; there are several road crossings. The northern portion of the installation is dominated by large open spaces along with outdoor recreation, accompanied housing, industrial, and mission facilities (IDP 2017).

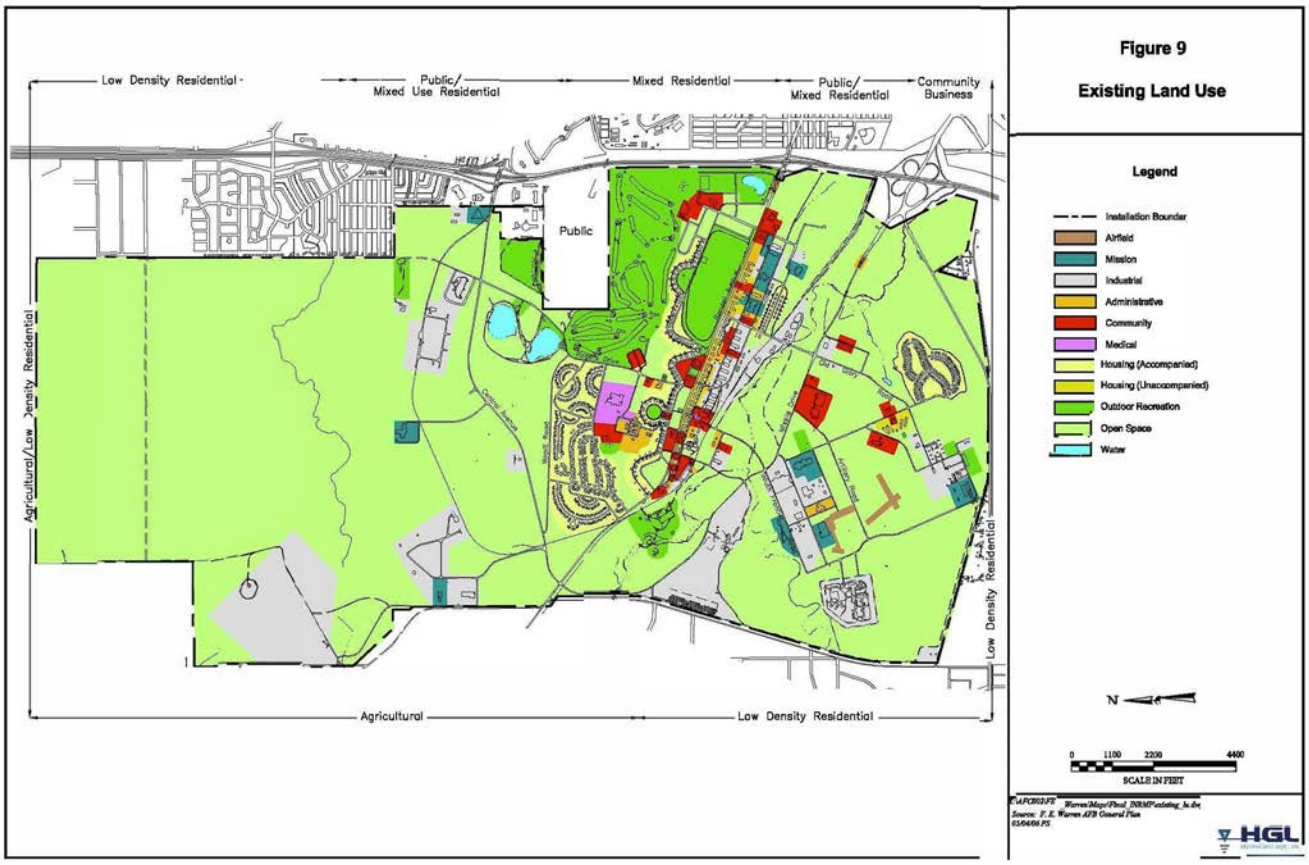

Figure 9 - Existing Land Use

2.4.3 Current Major Mission Impacts on Natural Resources

Installation Supplement

The objective at F. E. Warren AFB is to minimize impacts on natural resources. Potential impacts in terms of environmental quality have been assessed. Leaks and spills from Aboveground Storage Tanks (AST) and Underground Storage Tanks (UST), associated piping, and volatile organic compound (VOC) emissions pose the most potential harm to the environment. F. E. Warren AFB has an aggressive Fuel Storage Tank Management Program on base and throughout the missile complex to ensure compliance with all applicable laws. There are no permitted hazardous waste storage facilities on base. Solid waste is collected, weighed, and transported to a permitted landfill off-site.

There are no critical air quality regions within 60 miles of the base. Related to air permitting requirements, the base possesses a synthetic minor air permit to cover air emissions generated on the installation. Noise impacts to surrounding communities are minimal, since the only aircraft maneuvering and landing at the installation are helicopters.

Stormwater is discharged into Diamond and Crow Creeks pursuant to the permit issued by the Wyoming Department of Environmental Quality (WDEQ) (IDP, 2017). A Stormwater Pollution Prevention Plan documents stormwater management practices and serves as a guide for personnel who are responsible for ensuring that the potential for stormwater contamination is minimized (SWPPP 2013). In addition to the SWPPP, the base also maintains a Stormwater Master Plan (SWMP). The base has two stormwater permits issued by the Wyoming Department of Environmental Quality.

F. E. Warren AFB is on the National Priorities List for environmental cleanup under the Federal Facility provisions of Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; i.e., "Superfund"). As a result of this listing, a Federal Facilities Agreement was established between the base, the Environmental Protection Agency (EPA), and the WDEQ. Twenty on-base sites requiring remediation were identified, including spills, a fire training area, landfills, firing ranges, and areas with unexploded ordnance (UXO). Five plumes of solvent-contaminated groundwater were also discovered. These plumes cover approximately 700 acres. Only one plume, from the closed former base Landfill 3, which contains low levels of

trichloroethylene (TCE), extends slightly off-base, under Happy Jack Rd to a physically separated section of F. E. Warren AFB property referred to as "the South Forty." The base connected this area (the site of a former residential enclave) to the Cheyenne water system in 1997 (IDP 2017).

2.4.4 Potential Future Mission Impacts on Natural Resources

Installation Supplement

Potential future impacts to the natural resources at F. E. Warren AFB are largely related to development both on- and off-base. Future land use plans on base are illustrated in Figure 9 - Future Land Use Distribution. Laramie County's future land use map depicts "rural density" residential land uses (five to ten acres per dwelling unit) to the north and west of the base and "urban density" development to the south and the northwest. Residential development adjacent to the base boundary creates encroachment issues for F. E. Warren AFB.

In support of the Conservation and Management Plan for the Colorado Butterfly Plant and Preble's Meadow Jumping Mouse (CNHP, 2004), a list of potential future projects that may impact these federally listed species at F. E. Warren AFB was generated in coordination with the 90th Civil Engineer Squadron. Projects with the potential to impact riparian habitat include a stormwater detention project that may divert 100-year storm flows into Crow Creek. Transportation improvement projects also have the potential to increase run-off through stormwater drains into the Crow Creek drainage. Paving the access road and parking areas at the Family Camp adjacent to Upper Crow Creek would also increase impervious surfaces within the Crow Creek floodplain. Due to funding and other higher priority projects, these projects have not been executed, but are anticipated in the future.

Advance communication between proponents of on-base projects and the Environmental Management Flight relative to potential impacts on listed species and their habitats is a requirement of the National Environmental Policy Act (NEPA).

Although the South Platte River does not run directly through F. E. Warren AFB, Crow Creek is located within the South Platte River system. Depletions to the Platte River system require formal consultation with the USFWS given the potential for downstream effects to the federally listed whooping crane (*Grus americana*), interior least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), pallid sturgeon (*Scaphirhynchus albus*), and western prairie fringed orchid (*Platanthera praeclara*). In addition, depletions may contribute to the destruction or adverse modification of designated critical habitat for the whooping crane. Although the whooping crane may not occur within the boundaries of F. E. Warren AFB, potential effects of projects within the river system must be analyzed. Project elements that could be associated with depletions to the Platte River system include, but are not limited to:

- ponds (detention/recreation/irrigation storage/stock watering);
- lakes (recreation/irrigation/storage/ municipal storage/power generation);
- reservoirs (recreation/irrigation storage/municipal storage/power generation);
- created or enhanced wetlands;
- hydrostatic testing of pipelines;
- wells;
- diversion structures;
- dust abatement;
- wildland fire suppression; and
- water treatment facilities.

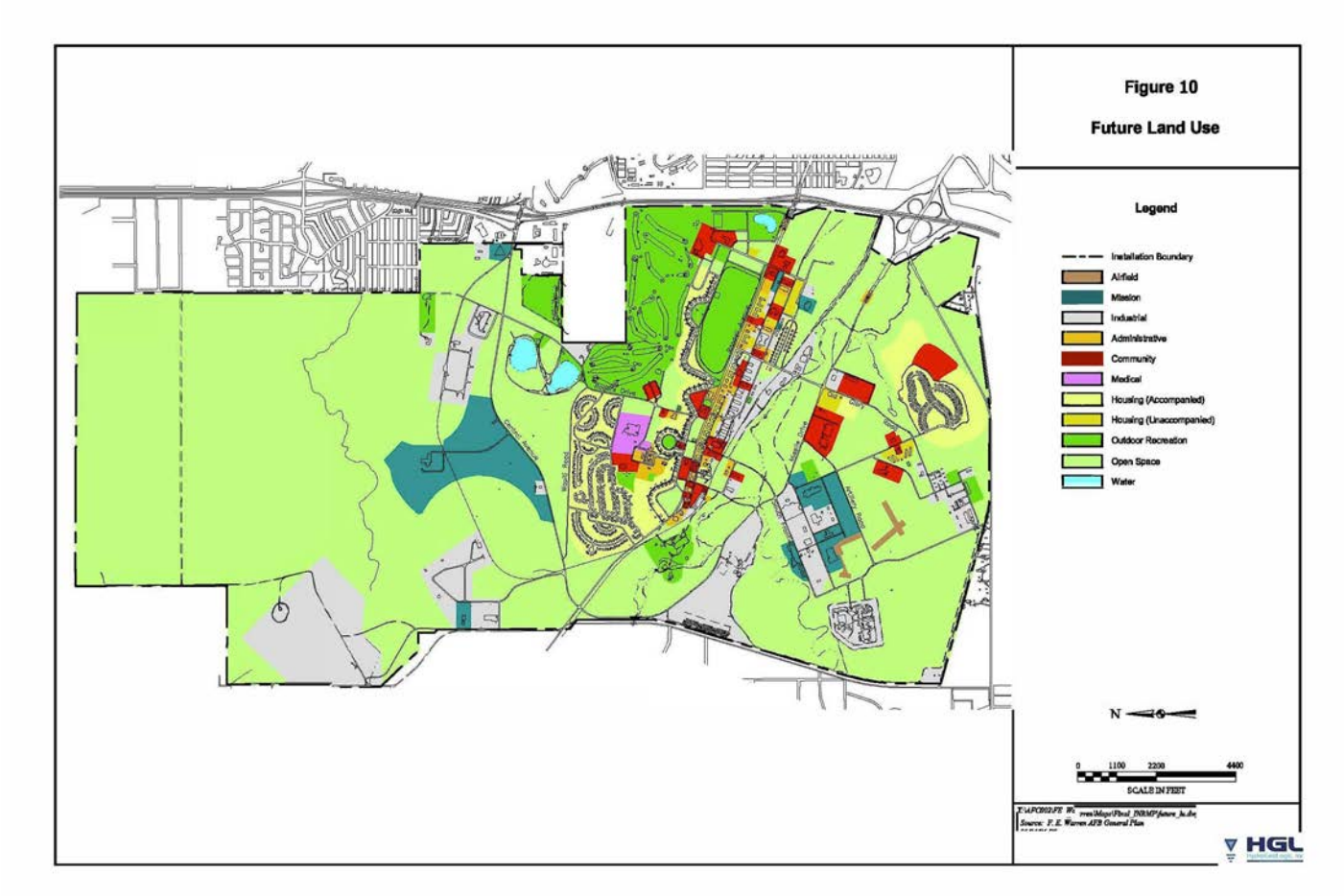

Figure 10 - Future Land Use

3 ENVIRONMENTAL MANAGEMENT SYSTEM

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

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

4 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.

Installation Supplement

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

Installation Commander	The 90th Missile Wing Commander ensures that an INRMP is developed, maintained, and implemented. In so doing, the commander is responsible for approving the INRMP, certifying the annual review of the INRMP as valid and current, providing appropriate funding and staffing to ensure implementation of the INRMP, and controlling access to and use of installation's natural resources.
AFCEC Natural Resources Media Manager/SME/Subject Matter Specialist (SMS)	The Air Force Civil Engineer Center (AFCEC) is a field operating agency of the Air Force Civil Engineer. It provides Air Force leaders with the comprehensive expertise and professional services necessary to protect, preserve, restore, develop and sustain environmental and installation resources. In addition, AFCEC assists F. E. Warren AFB in implementing the INRMP with reach back support and funding.
Installation Natural Resources Manager/POC	Natural resource management-related responsibilities in the Environmental Element include: • maintaining an organization with the resources and personnel available to accomplish the INRMP; • implementing this INRMP and its programs to ensure the inventory, classification, and management of all applicable natural resources; • coordinating with local, state, and federal government and civilian conservation organizations relative to natural resources management; • ensuring the ongoing and timely coordination of current and planned land uses between mission, natural resources, environmental, legal, and master planning; • ensuring all installation personnel are aware of and comply with procedures and requirements, laws, regulations, and other measures that promote environmental quality necessary to accomplish objectives of this INRMP; • reviewing environmental documents (e.g., environmental impact assessments and permits), construction designs and proposals, to ensure adequate protection of natural resources through review and consideration of the technical guidance presented in this INRMP; • inspecting and reviewing mitigation measures implemented for the protection of natural resources to ensure they are properly functioning and meeting their intended goals; and • ensuring compliance with laws and regulations related to the environment and natural resources.
Installation Security Forces	General Enforcement
Installation Unit Environmental Coordinators (UECs); see AFI 32-7001 for role description	Serve as the *Environmental Management Systems* conduit between installation environmental function and their unit
Installation Wildland Fire Program Manager	Responsible for developing the *Integrated Wildland Fire Management Plan* and reviews and approves burn plans for prescribed fires
Pest Manager	Responsible for controlling pests on base
Range Operating Agency	Responsible for operation of military ranges
Conservation Law Enforcement Officer (CLEO)	Protects natural and cultural resources

National Environmental Policy Act (NEPA)/Environmental Impact Analysis Process (EIAP) Manager	Ensures National Environmental Policy Act compliance
NOAA/ National Marine Fisheries Service (NMFS)	NOAA-Predictions of climate and weather/NMFS-Stewards of ocean resources and habitats
US Forest Service	Manages and protects national forests and grasslands
USFWS	The USFWS is the primary federal agency with which F. E. Warren AFB cooperates on natural resources management. Collaborative efforts include federal-listed species management and noxious weed and pest management. In accordance with the Sikes Act, the USFWS is a cooperating agency in implementation of this INRMP. INRMP reviews are coordinated with the appropriate USFWS field station. The USFWS Field Office Supervisor serves as the primary point-of-contact for installations during the formal INRMP review process. F. E. Warren AFB has an embedded USFWS employee who is tasked with managing the installation's natural resources.
Base Grounds Maintenance	Responsible for maintenance of base vegetation height, and other necessary maintenance activities, as necessary.
90th Civil Engineer Squadron Commander	The 90th Civil Engineer Squadron Commander and staff ensure that plans and studies supporting the Installation Development Plan, including the INRMP, are accomplished as necessary and that necessary actions are implemented.
Civil Engineering, Operations Flight	Some activities of the Operations Flight overlap with natural resources management programs. Road repair and maintenance, weed and pest control, fire prevention and suppression, and grounds maintenance are part of the operations mission that could impact natural resources. The Environmental Element supports the Operations Flight to accomplish these missions by providing them regulatory and technical guidance, reviewing and requesting permits, consulting with other agencies, and assisting with wildland fire management and integrated pest management.
Public Affairs	Public support of natural resources management at F. E. Warren AFB is vital to ensuring a regional approach. Therefore, Public Affairs plays an important role in natural resources management by disseminating information to the public regarding F. E. Warren's natural resource management programs and how they support state and regional environmental awareness and protection. Public Affairs is responsible for promoting an understanding of military operations among its various constituents and providing professional advice and support to installation leaders and activities related to public outreach.

Staff Judge Advocate	The Staff Judge Advocate provides legal advice, counsel, and services to command, staff, and subordinate elements at F. E. Warren AFB. Their responsibilities with regard to integrated natural resources management include: • interpretation and application of laws, regulations, statutes, and other directives to the management of natural resources on the installation; • coordinating with the Office of the Judge Advocate General, the Department of Justice, and other government agencies on environmental disputes and litigation; and • advising the 90th Missile Wing on compliance with environmental laws.
90th Force Support Squadron	The Force Support Squadron Outdoor Recreation staff handle the sale of fishing and hunting licenses and work face-to-face with the public in answering recreation-related questions.
Area Military Installations	F. E. Warren AFB shares some regional natural resources management issues with other Front Range military installations including Peterson Air Force Base, Schriever Air Force Base, Cheyenne Mountain Air Force Station, the U.S. Air Force Academy, Fort Carson Army Post, Pueblo Chemical Depot, and Buckley Air Force Base. Partnerships and crosstalk may occur between installations with comparable habitat types likely to raise similar management issues.
Natural Resource Conservation Service	The Natural Resources Conservation Service (NRCS) is a branch of the U.S. Department of Agriculture (USDA). NRCS programs provide environmental, societal, financial, and technical benefits that include, but are not limited to: (1) sustaining and improving agricultural productivity; (2) providing cleaner, safer, and more dependable water supplies; (3) reducing damage caused by floods and other natural disasters; (4) enhancing natural resource bases that support continuing economic development, recreation, and other purposes. NRCS also conducts and publishes soil surveys.
US Geological Survey	The U.S. Geological Survey (USGS) provides maps, reports, and information to help F. E. Warren AFB manage its water, energy, mineral, and land resources.
Animal and Plant Health Inspection Service, Wildlife Services	The Animal and Plant Health Inspection Service (APHIS) Wildlife Services, a branch of the USDA, provides animal damage management and promotes noxious weed control programs.
U.S. National Park Service	The National Park Service provides continuing technical support to F. E. Warren AFB in cultural resources management.
Wyoming Department of Agriculture	Within the Wyoming Department of Agriculture, the Weed and Pest Council provides technical assistance to establish integrated weed or pest management programs at the county level. Programs exercise methods for preventing, containing, or controlling undesirable plants or pests, including education, cultural methods, preventative measures, pesticide methods, physical methods, management, and biological agents.
Wyoming Department of Environmental Quality	The Wyoming Department of Environmental Quality's mission is to protect, conserve and enhance the environment for the benefit of current and future generations. Water quality is the most relevant area to natural resources management at F. E. Warren AFB.

Wyoming Natural Diversity Database	The Wyoming Natural Diversity Database (WYNDD) is a service and research unit of the University of Wyoming that maintains a comprehensive database on the distribution and ecology of rare plants, rare animals, and important plant communities in Wyoming. WYNDD data, analyses, and staff expertise contribute to effective strategies of natural resources management and more efficient compliance with environmental regulations. WYNDD is a member of a network of similar programs established throughout North America. Each program uses the same database methodology and software, and receives technical support from NatureServe, the coordinating organization. Together, NatureServe and its network of natural heritage programs are the most complete source of information about rare and endangered species and threatened ecosystems.
Wyoming Game and Fish Department	The WGFD is responsible for managing most fish and wildlife within the state, including those on federal lands. Specific cooperation between F. E. Warren AFB and the WGFD generally involves pronghorn, Canada goose and any other game animal management. As a signatory of the INRMP management actions on base are coordinated to reflect a similarity on how the state manages natural resources.

Other Interested Parties	Other organizations interested in natural resources at F. E. Warren AFB include: The Nature Conservancy, whose mission is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. F. E. Warren AFB may leverage the expertise of the Wyoming Chapter in the development of management plans for rare plants. The North American Pronghorn Foundation, whose mission is to ensure the future of free-roaming, wild pronghorn. The foundation provides financial and other assistance to continue research, public education, interagency cooperation, habitat development, sound management practices, and issue advocacy through protective legislative policy. The Wildlife Heritage Foundation of Wyoming, whose mission is to create an enduring natural legacy for future generations through stewardship of all Wyoming's wildlife. The Wyoming Chapter of the Wildlife Society, whose mission is to promote wise conservation and management of all wildlife resources in Wyoming by serving and representing wildlife professionals. The Wyoming Native Plant Society, a non-profit organization dedicated to encouraging the appreciation and conservation of the native flora and plant communities of Wyoming through education, research, and communication. Implementation of this INRMP also requires assistance from other directorates and divisions such as Contracting (procurement) and Logistics, Safety, Comptroller (budget process), and commanders of assigned and tenant units and activities.
Others	

5 TRAINING

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

Installation Supplement

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

All individuals who will be enforcing fish, wildlife, and natural resources laws on USAF lands must receive specialized, professional training on the enforcement of fish, wildlife, and natural resources in compliance with the Sikes Act. This training may be obtained by successfully completing the Land Management Police Training course at the Federal Law Enforcement Training Center (http://www.fletc.gov/)

- Individuals participating in the capture and handling of sick, injured, or nuisance wildlife should receive appropriate training, to include training that is mandatory to attain any required permits
- Personnel supporting the BASH program should receive flight line drivers training, training in identification of bird species occurring on airfields, and specialized training in the use of firearms and pyrotechnics as appropriate for their expected level of involvement
- The DoD supported publication Conserving Biodiversity on Military Lands -- A Handbook for Natural Resources Managers (http://dodbiodiversity.org) provides guidance, case studies, and other information regarding the management of natural resources on DoD installations

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

6 RECORDKEEPING AND REPORTING

6.1 Recordkeeping

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

Installation Supplement

Installation Supplement -- Recordkeeping

N/A

6.2 Reporting

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

Installation Supplement

Annual reporting to the USFWS and WGFD is accomplished yearly in accordance with stipulations included on multiple fish and wildlife-related permits from these agencies.

7 NATURAL RESOURCES PROGRAM MANAGEMENT

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

Installation Supplement

Installation Supplement -- Natural Resources Program Management

7.1 Fish and Wildlife Management
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

The Sikes Act, as amended in 1997 (16 USC 670 a-1[b]), requires each military agency to ensure that services are provided for managing natural resources, including fish and wildlife, on each military installation. Under Air Force guidance, F. E. Warren AFB is considered a Category I installation. This classification is based on the presence of suitable habitat for conserving and managing fish and wildlife resources. The installation also shall engage in cooperative agreements with the state game and fish department and USFWS to protect, conserve, and manage such resources.

Most visibly, F. E. Warren AFB supports a large population of pronghorn. Management of pronghorn populations on base is necessary because they lack a natural predator on base and their population has increased steadily over the years. Large numbers of pronghorn were somewhat confined within the base perimeter when it was fenced in 2002; ingress and egress from the base is limited to where Crow Creek and the BNSF RR enters and exits the base. The pronghorn population must be managed to ensure the social carrying capacity of the base is not exceeded and that a viable and healthy population is maintained (Rosenlund 1992). The pronghorn herd is currently managed in cooperation with the Wyoming Game and Fish Department. An annual archery pronghorn hunting season is held in the northern most portion of the installation. This area is managed as a Wyoming Hunter Management Area.

Section 7.4 discusses the habitat that supports the variety of fish and wildlife species on F. E. Warren AFB. Improvements to riparian habitat in terms of noxious weed control will benefit wildlife and TES at F. E. Warren AFB. Noxious weed control is described in Sections 7.10 Agricultural Outleasing and 7.11 Integrated Pest Management Program.

Beaver (Castor canadensis) populations are invaluable in restoring eroded stream banks, enhancing riparian areas and wetlands, and improving water quality. However, their activity in areas along Crow Creek and Diamond Creek must be monitored regularly. In 2003, beaver activity on Crow Creek in the vicinity of the Family Campground resulted in the loss of several mature trees and many saplings, causing flooded trails and roadways.

In addition to their role in controlling insect numbers, it is important to sustain bat populations to maintain ecosystem integrity. However, bats can be a rabies vector and a nuisance when they inhabit the historic buildings at F. E. Warren AFB. The Integrated Pest Management Plan (Woodlot Alternatives Inc. 2014) describes physical exclusion and mechanical removal techniques. November through March is the best time to exclude bats from buildings because young bats have learned to fly and will not be trapped within the structure. When excluding bats from roosting in buildings, alternative roost structures are recommended. Proper placement of alternative roosts will aid in the successful eviction of bats from where they are unwanted. F. E. Warren has placed alternative roosting structures throughout the base.

F. E. Warren AFB will review all projects to ensure compliance with the Migratory Bird Treaty Act of 1918 (MBTA), which provides for protection against intentional and incidental take, and with Executive Order 13186, January 10, 2001, Responsibilities of Federal Agencies to Protect Migratory Birds. Unless permitted by regulation, the MBTA provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. The USFWS, Office of Migratory Bird Management periodically publishes a list of Birds of Conservation Concern (USFWS OMBM 2008). While the MBTA protects all migratory birds, the birds of concern list identifies species, subspecies, or populations that are likely to become candidates for listing under the ESA as well as serving as a guide to species upon which protection will focus. Based on habitat and known distribution, 30 species of concern potentially occur on F. E. Warren AFB; either as breeding residents or migrants.

All Canada geese (Branta canadensis), including resident flocks, are protected by Federal and state laws. In Wyoming, management responsibility for Canada geese is shared by the USFWS, the USDA, and the WGFD. Under the guidelines set forth by the MBTA, it is illegal to hunt, kill, sell, purchase, or possess migratory birds or their parts (feathers, nests, eggs, etc.) except as permitted by regulations adopted by the USFWS and the WGFD. Open spaces with well-manicured lawns, dotted with ponds and lakes, and lack of predators create an environment in which geese thrive. Management options for Canada geese are described in AFI 91-212, Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program. Special permits are required for some of the control methods discussed.

The interaction between fish and wildlife management and outdoor recreation at F. E. Warren AFB is described in Section 7.2 - Outdoor Recreation and Public Access to Natural Resources. Hunting and trapping have occurred in the past. A Wing Instruction (FEWAFB I32-7064) was developed to allow limited archery only pronghorn hunting at F. E. Warren AFB. This activity is currently restricted to the northern portions of the installation.

In recent years, the Pearson Lakes have been stocked with 3,000 – 5,000 trout per year. The timing of stocking is coordinated to minimize heat stress to these cold water fish species. The trout have been stocked twice in the spring and twice in the fall. The trout are obtained from the Saratoga National Fish Hatchery, as well as commercial hatcheries.

7.2 Outdoor Recreation and Public Access to Natural Resources
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

F. E. Warren AFB strives to maximize and encourage benefits and use within the constraints of the mission and capacity of its resources, while protecting and preserving the resources for future generations through a program of multiple use. There are approximately 428 acres of land, most of which are in or near the Historic District, used for outdoor recreation that contribute significantly to the quality of life on the installation. Facilities include an 18-hole golf course, athletic fields (soccer and baseball), tennis courts, and basketball courts. The ICBM and Heritage Museum also presents exhibits depicting the history of missiles and the mission.

The riparian areas inhabited by the Preble's meadow jumping mouse and Colorado butterfly plant on Crow Creek frequently are used for outdoor recreation. There is a picnic area, family campground (FamCamp), and interpretive signs along the upper portion of Crow Creek to identify the flora and fauna, with access via a dirt road. Some development activities have occurred in this area to upgrade the campground and picnic area (e.g., flats plowed beside a portion of Crow Creek in 2003). This area provides a recreation source for base personnel in the form of trails for walking, jogging, and biking. Given existing species and environmental protection, noise and dust concerns, and mission constraints, there are no on-base areas suitable for off-road vehicles (ORV) use; also known as all-terrain vehicles (ATV). Only Entomology, Natural Resources, and Security Forces personnel are allowed to use these types of vehicles and only in approved areas.

The base has three recreational lakes, one in the southeast portion of the base near the main gate (Lake Centennial) and the other two, adjacent to each other, near the center of the base (North and South Lake Pearson). These are stocked with fish and used year-round for non-motorized boating, fishing, and observation of wildlife and waterfowl. Catch and release fishing with artificial lures is permitted in portions of Crow Creek; Diamond Creek is closed to all fishing.

Hiking and biking trails have been designed to link all of the high pedestrian activity centers and recreation areas of the base, as well as provide the greatest visual diversity and experiences during use. These trails comprise approximately 14 miles of concrete, asphalt, or boardwalk surfaces. A Pedestrian and Bicycle Circulation Plan was developed and illustrates various recommendations (Geo-Marine Inc. 2003) and is maintained by the 90th Civil Engineer Squadron (90 CES).

F. E. Warren AFB offers one of the best opportunities in the local area to view many species of wildlife in both urban and undisturbed settings. The Crow Creek riparian area affords opportunities to see white-tailed deer, beaver, muskrat, and numerous bird species. Trail visitors also are able to see the Colorado butterfly plant in its natural habitat. A checklist of birds found at F. E. Warren AFB by month has been developed in coordination with the National Fish and Wildlife Foundation. These brochures can be obtained through Natural Resources or the Outdoor Recreation office on base. The lakes provide opportunities to observe migrating and resident waterfowl, shorebirds, and other avian species. Roads circling the lakes are closed to vehicle traffic to enhance habitat and make the wildlife watching and hiking more pleasant. The presence of pronghorn grazing in grassland areas also is of interest.

Because of the nature of the mission and concerns about firearms on the installation, the base has determined that hunting with firearms in not an acceptable management alternative for pronghorn population control. However in 2016, an archery only hunting program for pronghorn was developed and approved. Under the recently approved Air Force Wing Instruction. An "archery only" pronghorn hunting program began in 2017 at F. E. Warren AFB in cooperation of the Wyoming Game and Fish Department (WGFD). Through formal agreements between the AF and the WGFD, much of the northern portion of the F. E. Warren AFB was designated as a Wyoming Game and Fish Department "Hunter Management Area." The Wyoming Game and Fish Department Game Wardens provided necessary patrols and enforcement of hunting rules. Hunter success rate during the hunter exceeded 20 percent during the 2017 season. Current plans are to continue the archery hunting program until at least 2025. Further evaluation in the future to determine if expanded hunting opportunities can exist on base not only as a recreational opportunity but also to bring pronghorn and Canada goose populations to appropriate objective levels will be investigated in the future. Further evaluations will be conducted to determine if expanded on-base hunting opportunities can be offered to serve as both a recreational outlet and a means of bringing pronghorn and Canada goose populations to objectively appropriate levels.

The Outdoor Recreation Program Manager (90 FSS) manages most outdoor recreation activities, including the FamCamp facility, and provides rental equipment, information, Tickets and Travel, and an Outdoor Adventure Program. They also sell fishing permits. Dispersed outdoor recreation opportunities, such as fishing, wildlife watching, hiking and archaeological interpretation, are managed by personnel from the 90 CES Environmental Management Element.

Recreational usage categories refer to the different categories of personnel such as Active Duty, Retirees, ID card holders, and the General Public. At F. E. Warren AFB most recreational activities "including hiking, fishing, and birdwatching" are open to Active Duty, Retirees, ID card holders, and other personnel (including dependents) that have access to the base via appropriate forms of sponsorship. The General Public does not have recreational activity access to F. E. Warren AFB. The Archery Only Pronghorn hunting season was specifically designed to allow hunting opportunities for Active duty military, military reservists, National Guard, military and DoD civilian retirees, Federal Affiliates assigned to F. E. Warren AFB, and DoD civilian personnel assigned to F. E. Warren AFB, and their dependents. The General Public does not have recreational access to pronghorn hunting at F. E. Warren AFB.

7.3 Conservation Law Enforcement

Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

The Sikes Act mandates that DoD installations employ adequate numbers of professionally trained natural resources personnel, including law enforcement personnel, to implement the INRMP. It also authorizes DoD to enforce all federal environmental laws,

including the National Historic Preservation Act, Archeological Resources Protection Act, MBTA, Clean Water Act, and ESA when violations occur. DoD Directive 4715.3 (May 3, 1996) further states that "Professional natural and cultural resources staff shall oversee the enforcement of applicable laws as an integral part of an installation's conservation program."

Many aspects of natural resources management require effective conservation law enforcement. In the past, F. E. Warren AFB has hired a Conservation Law Enforcement Officer. Reasonable access to the installation is provided by the commander for federal and state conservation officers for the purpose of fish and wildlife law enforcement.

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

Applicability Statement

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

Program Overview/Current Management Practices

The Endangered Species Act of 1973 (P.L. 93-205) protects fish, wildlife, and plants listed as threatened or endangered. Endangered and threatened species could be impacted due to destruction, modification, or curtailment of habitat, overutilization, and effects of disease, pollution, or predation. Species likely to become threatened in the foreseeable future may be designated as rare, protected, candidate, or species of special concern. In addition to individual species, some rare, natural vegetation ecosystems also may be protected. Air Force Policy Directive 32-70, Environmental Quality states that installations must prepare and maintain a current inventory of endangered species and habitats as part of the base habitat inventory.

Colorado Butterfly Plant

In 2000, the Colorado butterfly plant (*Gaura neomexicana coloradensis*) was listed as threatened under the ESA by the USFWS. Recently the Colorado plant has been reclassified as (Oenothera coloradensis). It was first documented on F. E. Warren AFB, Crow and Diamond Creek riparian habitat, in 1978 by Robert Dorn, and later on the Unnamed Drainage in 1986. Available information indicates that F. E. Warren AFB supports one of the largest known Colorado butterfly plant populations in the world, as well as the only population on federal lands. The viability of the base population is critical to the long-term survival and recovery of this taxon. Management activities, including weed control through biologic agents have been implemented to aid in populations occurring on base. The U.S. Air Force began sponsoring research on the Colorado butterfly plant population at F. E. Warren AFB in 1984. Studies from 1984 to 1986 monitored tagged Colorado butterfly plants in a series of plots on Crow and Diamond Creeks, determining their reproduction levels and characterizing soil moisture (Marriott 1989, Mountain West Environmental Services 1985). Researchers began a complete census of flowering Colorado butterfly plants in 1986. This research has continued annually from 1988 to 2018. Information garnered from these surveys aid with management decisions for the species. In addition, demographic monitoring was conducted over part of three growing seasons (Floyd 1995a, Floyd and Ranker 1998). Based on the results, three studies have addressed Colorado butterfly plant response to one-time vegetation management treatments (Burgess 2003, Floyd 1995b, Munk 1999, Munk et al. 2002).

The primary conservation issues for Colorado butterfly plants on F. E. Warren AFB relate to habitat degradation. Factors currently influencing Colorado butterfly plant habitat include encroachment by weeds and willow, other habitat changes, and changes to both stream flow and groundwater hydrology. The most significant long-term threat to Colorado butterfly plant may be competition from noxious weeds. The riparian zones along Crow Creek, Diamond Creek, and the Unnamed Drainage are now primarily managed for Colorado butterfly plants. In 1982, a Memorandum of Understanding and management plan to protect Colorado butterfly plants on the base were signed by the U.S. Air Force, USFWS, and The Nature Conservancy. The Invasive Species Control Plan clarifies how noxious weeds are addressed at F. E. Warren AFB. Heidel and Laursen (2002) estimated that noxious weeds occupy approximately 180 acres (35.5 percent) of the 508 acres of riparian habitat on base. Distributions of Canada thistle (*Cirsium arvense*) and leafy spurge (Euphorbia esula) are the most extensive, followed by Dalmatian toadflax (*Linaria dalmatica*) and common hound's tongue (Cynoglossum officinale). Heidel and Laursen (2002) reported a negative correlation between distribution of Colorado butterfly plant and dense stands of Canada thistle. This may be due to competition for light, nutrients, and space or to allelopathic interactions (Heidel and Laursen 2002, Wilson 1981). Mowing and herbicide spraying were curtailed in 1989, with the exception of mowing to demarcate Crow Creek recreational zones and riparian habitat.

Preble's Meadow Jumping Mouse

In May of 1998, the Preble's meadow jumping mouse (PMJM) subspecies (*Zapus hudsonius preblei*) was listed as threatened under the ESA by the USFWS. PMJM was first documented on F. E. Warren AFB in 1888 by Bailey (Krutzsch 1954). URS-Berger (1984) confirmed continued presence of PMJM. Efforts to capture PMJM during the summers of 1993 and 1994 were unsuccessful (Compton and Hughie 1993), but the Wyoming Cooperative Research Unit captured two PMJM along Crow Creek within F. E. Warren AFB in 1995 (Elliott 1996, Garber 1995, USFWS 1998). In 1996, the Colorado Natural Heritage Program captured eight PMJM along Crow Creek (Schuerman and Pague 1997). Beginning in 1996, the Wyoming Natural Diversity Database from the University of Wyoming began trapping along drainages, with captures documented in 1998, 1999, 2002, 2003, 2013, and 2018 along Crow Creek. Surveys in 1997, 2000, 2001, and 2017 failed to capture PMJM. Eight jumping mice were captured during the 2020 surveys.

The primary issues that F. E. Warren AFB needs to address to achieve long-term conservation of PMJM are its small population size, isolation of populations, habitat degradation, and potential for catastrophic events (CNHP 2004).

Conservation Agreements

Formal conservation agreements are required for all U.S. Air Force installations containing TES, in accordance with AFI 32-7064 under authority of the ESA. A Conservation and Management Plan for the Colorado butterfly plant (*Oenothera coloradensis* formerly *Gaura neomexicana* ssp. *coloradensis*) and Preble's meadow jumping mouse (*Zapus hudsonius preblei*) has been developed by the CNHP. Copies of the most recent plan are maintained in the Environmental Management Element office at F. E. Warren AFB. The USFWS was consulted throughout development of this plan, the primary purpose of which is to describe the specific objectives and strategies required to secure the long-term conservation of these two species within F. E. Warren AFB. Conservation zones for these species are illustrated in Figuren 8 - Threatened and Endangered Species Conservation Zones.

In accordance with the Sikes Act, the base has entered into a Cooperative Agreement (CA) with the USFWS and WGFD. A copy of the most recent CA is maintained by the F. E. Warren AFB Environmental Management Element. This CA, in part, calls for the operation and maintenance of a black-footed ferret pre-release conditioning facility on F. E. Warren AFB. The facility, categorized as a Science Research Laboratory, is located on the northeastern side of the base, north of Central Avenue and Gate 5, near the horse stable area. The base provided the property and initial construction for the facility. The facility operations, staffing and funding have traditionally been accommodated by mutual agreement between F. E. Warren AFB and the USFWS.

Transient and/or Potential TES

No other TES are known to inhabit the base. Ute ladies' tresses orchid (*Spiranthes diluvialis*), and whooping crane (*Grus americana*) could potentially, and in some cases do, occur in the surrounding region. While the Ute ladies' tresses orchid, a federally threatened species, does not occur on F. E. Warren AFB, riparian areas are a prime habitat for this species. A population of this species does occur just north of the base on Horse Creek. Federally listed species utilizing habitat in the Platte River system such as the whooping crane (*Grus americana*), interior least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), pallid sturgeon (*Scaphirhynchus albus*), and western prairie fringed orchid (*Platanthera praeclara*) as well as their habitat have the potential to be impacted through habitat change. Actions that may affect listed species or their habitat require ESA Section 7 consultation with the USFWS and such consultation will be initiated if any such "may affect" actions are identified.

7.5 Water Resource Protection
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

Air Force Manual 32-1067 *Water and Fuel Systems* addresses compliance for a number of water quality issues, including storm water pollution prevention. F. E. Warren AFB developed a Storm Water Pollution Prevention Plan (SWPPP) to document storm water management practices and procedures for minimizing pollutant contributions to the environment through storm water contact and flow and to serve as a guide for personnel (SWPPP 2013).

The major obstacle to storm water runoff on F. E. Warren AFB is the railroad embankment, which bisects the base in a general east-west line just north of Crow Creek. The embankment divides the storm drainage system onto two general subsystems. Storm water runoff south of Crow Creek feeds naturally into several gullies and Diamond Creek. Interstate 25, to the east, also blocks water draining onto the base and eventually into the City of Cheyenne from flowing into Crow Creek. This north-south running barrier funnels water to the southeast into the city along Randall Ave. and into the city north of the railroad tracks.

Storm drainage structures have been installed at various times over the past 50 years. These systems include drainage culverts, underground storm drainage systems, roadside ditches, and curb and gutters. Most underground systems are undersized based on current standards. Also, many are silted-in and either partially or completely ineffective. The existing system cannot handle a 10-year design storm, considered a minor event. Also, a 100-year design storm, considered a major event, would not be controlled by existing structures. Major rain events have created base-wide flooding problems that have impacted the mission and caused damage. F. E. Warren AFB has programmed a construction project to create a safer, controlled storm drainage system for both the minor and major design storms.

As part of USGS' National Water-Quality Assessment Program, the South Platte River Basin study combines information on water chemistry, physical characteristics, stream habitat, and aquatic life to provide science-based insights for current and emerging water issues in surface waters (streams, rivers, reservoirs) and ground waters. The results can contribute to informed decisions that result in practical and effective water resource management and strategies that protect and restore water quality as well as TES and habitat downstream from the base.

7.6 Wetland Protection
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

Recognizing the potential for continued or accelerated degradation of the nation's water, including wetlands, the U.S. Congress enacted the Clean Water Act in 1972. Jurisdictional wetlands are considered Waters of the United States and are subject to regulation by the USACE under Section 404 of the Clean Water Act. Executive Order 11990 also directs federal agencies to consider potential adverse impacts on wetlands by avoidance, minimization, and/or mitigation of adverse impacts from all federal actions. DoDI 4715.3 specifies that DoD lands shall be managed for the goal of no net loss of wetlands. If a wetland impact is proposed, first it will be determined if the wetland can be protected by avoiding any impacts all together. If not, efforts will be made to minimize impacts and mitigate those that must occur; appropriate steps will be taken to apply for permits prior to commencement of construction.

The health of the wetlands at F. E. Warren AFB continues to be important to the TES populations, as well as for the maintenance of surface hydrology, waterfowl populations, and aesthetic reasons. The Wetlands Inventory (Smith and Mullen, 2004) provided general data suitable for general planning activities such as identifying the presence or absence of wetlands; evaluating potential impacts; and identifying potential development, wildlife habitat, recreation, or education opportunities and constraints. However, this mapping does not provide sufficient information to obtain a permit under Section 404 of the Clean Water Act for project-specific impacts.

7.7 Grounds Maintenance
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

Activities described in the F. E. Warren AFB Landscape Development Plan (Geo-Marine Inc. 2003) support preservation of the historical character, improvement of the image, quality of life enhancement, conservation of water and natural resources, and reduction of landscape maintenance.

In support of the Landscape Development Plan, the Integrated Pest Management Plan (Woodlot Alternatives Inc. 2014) identifies various management practices designed to mitigate negative impacts and to enhance the positive effects of the installation's mission on local native ecosystems. The grounds maintenance contract further specifies services to be provided. All of these documents are included as attachments to this INRMP.

F. E. Warren AFB has been selected for the "Tree City USA" award for the past 30+ years. The base has an inventory regarding the location and species of existing trees on the installation. Only the naturally occurring trees along Crow Creek were not individually inventoried.

7.8 Forest Management
Installation Supplement

Applicability Statement

This section applies to USAF installations that maintain forested land on USAF property. This section **IS NOT** applicable to this installation.

Program Overview/Current Management Practices

N/A

7.9 Wildland Fire Management
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

AFI 32-7003, *Environmental Conservation* requires a Wildland Fire Management Plans (WFMP) for Air Force installations with unimproved grounds that present a wildfire hazard as well as installations that use prescribed burns as a land management tool.

An installation WFMP (IWFMP; CEMML, 2006) was developed for F. E. Warren AFB as an associated plan to support this INRMP (see Section Associated Plans Tab WFMP). This plan establishes the methods and protocols necessary to control fire frequency, intensity, and size on F. E. Warren AFB to comply with federal and state laws and to meet land stewardship goals and responsibilities. At the same time, it provides for firefighter and public safety and allows continuation of military activities necessary for the 90th Missile Wing and other military units to maintain a high level of mission readiness. Through a program of prevention, pre-suppression, and suppression, it seeks to protect all base infrastructure and, to the extent feasible, natural and cultural resources. The IWFMP delineates an organizational structure and responsibilities for the wildland fire management program; provides a risk assessment and decision analysis framework; establishes two fire management areas based largely on the density of housing and base infrastructure; outlines tactics for prevention and suppression, including a standard operating procedure (SOP), as well as equipment requirements; provides general guidelines for a prescribed burn program; and updates monitoring and reporting requirements.

Relative to natural resources management, the IWFMP establishes prescribed burn programs that value the quality and effectiveness of treatments, primarily ecosystem health and viability, above acres burned. The Air Force has centralized all wildland fire actions to the Wildland Fire Center at Eglin AFB, Florida. All prescribed burns will be performed in coordination with the Wildland Fire Center. Prescribed burning should be used as a tool to reduce fuel loads and enhance desirable properties of the ecosystem; however, it is not currently known what the full range of fire effects on the grasslands might be, especially considering introduced and invasive species. An overall plan needs to be developed that includes a determination of when and where prescribed fire can be used appropriately, with particular emphasis on the environmental response to burning and control of invasive species.

In particular, it is not currently known if fire is beneficial to habitat for the federally threatened Colorado butterfly plant and Preble's meadow jumping mouse. Prescribed fire will not be implemented in any area considered to be habitat for these species without accomplishing Section 7 consultation with USFWS. Wildfire protection priorities also will consider riparian areas. However, no water will be drawn from any of the surface streams on F. E. Warren AFB during fire management or wildfire incidents.

7.10 Agricultural Outleasing
Installation Supplement

Applicability Statement

This section applies to USAF installations that lease eligible USAF land for agricultural purposes. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

The management of lands at F. E. Warren AFB for traditionally defined agricultural purposes has been minimal. In the past, sheep were allowed to graze in the northwest corner of the base as a means of vegetation control. Further analysis will be required to determine the carrying capacity and potential impacts of grazing at F. E. Warren AFB.

7.11 Integrated Pest Management Program
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

The Federal Noxious Weed Act of 1974, Executive Order 13112 signed in 1999 require that F. E. Warren AFB control the noxious weeds that are present throughout the riparian zones. Noxious weeds common along Crow Creek include Canada thistle (Cirsium arvense), leafy spurge (Euphorbia esula), common hound's tongue (Cynoglossum officinale), and Dalmatian toadflax (Linaria dalmatica). In addition, field bindweed (Convolvulus arvensis) occurs on base in widely dispersed locations. Weed control is complicated by several factors: the Air Force has mandated a 50 percent reduction in pesticide use; the herbicides that are most effective on the noxious weeds present cannot be used in riparian areas and the complete curtailment of weed control in Colorado butterfly plant habitat since 1990 has led to increasingly dense and widespread stands of the noxious weeds. Weed control and a failure to control weeds each pose potential adverse impacts to Preble's meadow jumping mouse and the Colorado butterfly plant. Experimental biological controls have been used since 2011, and monitoring of their effects is ongoing. Based on recent analysis, more aggressive approaches need to be employed to combat noxious weeds. A sustained, long-term effort consisting of several complementary approaches to weed control will be necessary to abate this significant threat (IDP 2017). In 2016, an experimental project was started at F. E. Warren AFB to explore the possibility of using sheep to control invasive Dalmation toadflax. This project is expected to be continued in future years.

The goal of the F. E. Warren AFB Integrated Pest Management Plan (Woodlot Alternatives Inc. 2014) is to maintain an acceptable quality of life and aesthetically pleasing landscape while minimizing costs and adverse effects that pesticides may have on the environment. This plan includes specific guidelines for pest management in TES Conservation Zones (Figure 8 - Threatened and Endangered Species Conservation Zones) as well as designates focus areas for weed management (Figure 11 –

Invasive Plant Map). Note the invasive plant species Dalmation toadflax and cheatgrass are not included on Figure 11 since these species now occur to some degree across the entire installation.

The Entomology Shop (90 CES/CEOHE) is responsible for the pest management program. The Pest Control Manager, under the direction of the Base Civil Engineer, is responsible for implementing pest management programs. The Natural Resources Manager is responsible for working with 90 CES/CEOHE to provide base pest management program oversight, including environmental coordination.

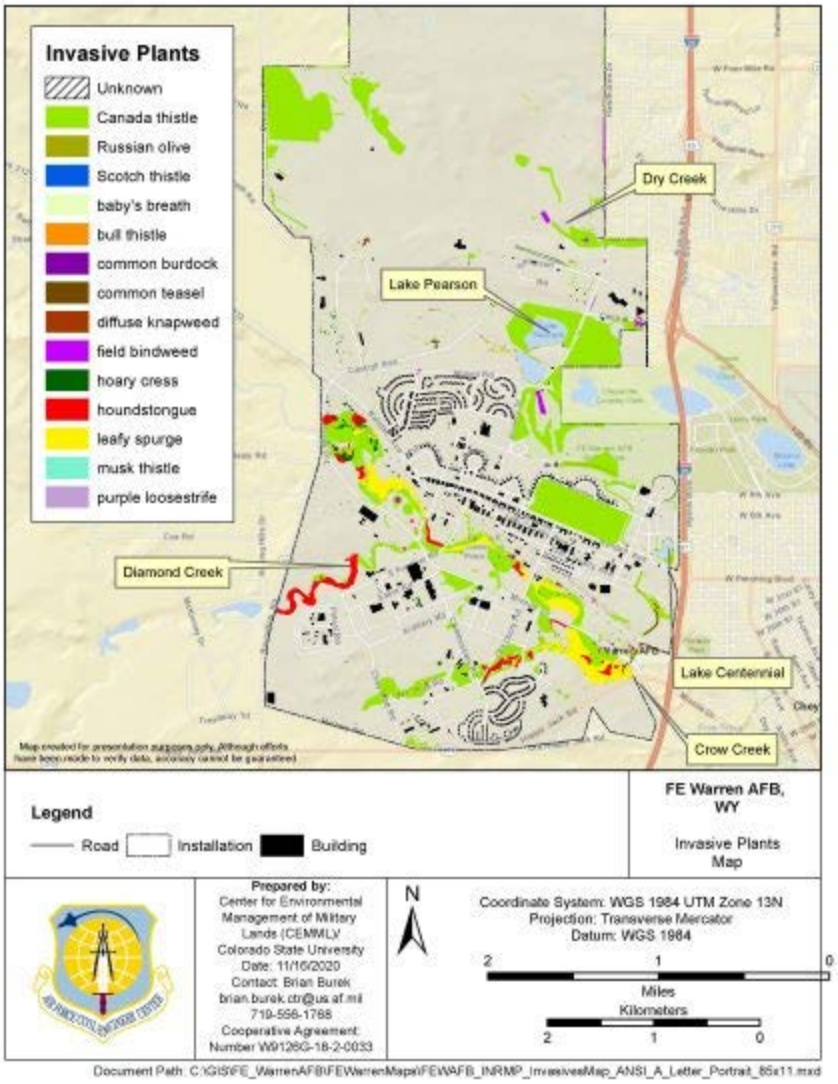

Figure 11 - Invasive Plants Map (Note: Dalmation toadflax and cheatgrass not included on map as these species now occur to some degree across the entire installation

7.12 Bird/Wildlife Aircraft Strike Hazard (BASH)
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

A bird aircraft strike hazard (BASH) for helicopter operations exists at F. E. Warren AFB and in the vicinity due to resident and migratory bird species. The base and the associated local flying areas are located near a major migratory flyway. The annual migration of various species and the presence of resident birds, on or around the base, create BASH concerns. Control of Canada goose populations have been addressed by removal of permitted adults and egg oiling to alleviate some BASH potential. Although bird strikes have been rare in the immediate vicinity of the airfield, the potential for bird strikes exists during all phases of flight. Historically, the greatest potential for bird strikes exists during low-level operations. Daily and seasonal bird movements may create hazardous conditions. The 90 MW Plan 91-2 (i.e., BASH) provides a program to minimize aircraft exposure to potentially hazardous bird strikes at F. E. Warren AFB. The plan establishes a Bird Hazard Working Group, managed by 90 MW/SE, in accordance with AFI 91-202, The U. S. Air Force Mishap Prevention Program (5 Aug 11) and AFI 91-

212 Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program; develops procedures for reporting hazardous bird activity and alerting aircrews; creates provisions to disseminate information to all assigned and transient aircrews on specific bird hazards and procedures for avoidance; and recommends actions to eliminate/reduce environmental conditions that may bird aircraft strike hazards (Section 15 - Associated Plans, Bash Plan).

7.13 Coastal Zone and Marine Resources Management
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

N/A

7.14 Cultural Resources Protection
Installation Supplement

Applicability Statement

This section applies to USAF installations that have cultural resources that may be impacted by natural resource management activities. This section **IS** applicable to this installation.

Program Overview/Current Management Practices

In 1969, the central portion of F. E. Warren AFB along Randall Ave. was designated as a historic district under the National Register of Historic Places and in 1972 it was redesignated the Fort D. A. Russell National Historic Landmark. The Fort D. A. Russell National Historic Landmark District was updated in 2018 to expand the boundary beyond Randall Ave. to encompass Cold War assets.

The entire installation has been surveyed for cultural resources. The Integrated Cultural Resources Management Plan (located in Section 15 - Associated Plans, ICRMP),

- designates specific responsibility for recognizing and maintaining cultural resources;
- provides a complete inventory of all known and potential cultural resources;
- outlines a specific strategy for maintaining cultural resources and complying with federal, state, and local preservation programs and legislation, and DoD and USAF directives;
- outlines standard operating procedures and current action plans for budgeting, tracking, and scheduling activities;
- establishes a comprehensive procedure for coordinating cultural resources management with the installation's mission;
- provides a detailed evaluation of mission impact on cultural resources and the resolution of adverse effects; and
- establishes programs to increase public awareness of cultural resources on USAF lands (F. E. Warren AFB 2009).

7.15 Public Outreach
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

Public access to the installation is restricted, requiring scheduled visitors to sign in at the main gate with photo identification and proof of vehicle registration and insurance. However, developing outreach programs for the surrounding community is a high priority and is coordinated by the Natural Resources Manager as long as such programs can be accomplished within mission constraints.

As part of the Right Start program, all newcomers receive a 15-minute presentation on TES, pronghorn, fishing opportunities, and general "do's and don'ts" related to planning projects. Right Start is presented two times per month.

7.16 Climate Change Vulnerabilities
Installation Supplement

Applicability Statement

This section applies to USAF installations that have identified climate change risks, vulnerabilities, and adaptation strategies using authoritative region-specific climate science, climate projections, and existing tools. This section **IS/IS NOT** applicable to this installation.

Program Overview/Current Management Practices

Climate-related changes may be having impacts on species and natural systems, including changes in the timing of biological events (i.e., phonological changes), such as the onset and end of breeding seasons, migration, and flowering; shifts in geographic ranges; and changes in community dynamics and populations.

F. E. Warren AFB has a continental climate typical of the high plains. The National Oceanic and Atmospheric Association climate station closest to F. E. Warren AFB is at the Cheyenne Municipal Airport, located 4.3 km (2.7 miles) northeast of the installation at the same elevation (Station 481675; USDI NOAA 2012). The average annual precipitation during recent years (1984-2014) was 39.2 cm (15.6 inches), with heaviest rainfall in May, followed by June and July (USDI NOAA 2015). The average annual temperature over this same period was 7.9 °C (46.3 °F), peaking in July (Heidel et al. 2020).

The following discussion relates to climate impacts relevant to the recently de-listed Colorado butterfly plant, but could also pertain to any other species that inhabits the installation. Meteorological data were compiled into datasets for comparing with census results. The early part of the growing season leading up to flowering is referred to as "spring" (April-June), a period when Colorado butterfly plants germinate, grow vegetatively, and flowering plants begin to bolt. As such, spring conditions are important to recruitment and reproduction. The later part of the growing season, referred to as "summer" (July-August), is an indeterminate period of Colorado butterfly plant flowering and fruiting. It is also a key period in the establishment of seedlings and survival of vegetative plants. The combination of spring and summer data represents general growing season climate conditions. Monthly climate data are compiled into annual spring, summer and growing season datasets (Heidel et al. 2020).

Meteorological trends provide context for population trends. The mean monthly temperatures and total monthly precipitation early and late in the growing season (1984-2019; April-June; July-September) (Figures 12, 13, 14, and 15; USDI NOAA 2019) show an overall pattern of rising summer temperatures and diminishing summer precipitation. Tests have also been run using annual water year data (October- September of following year; see Wepprich et al. 2019) and Crow Creek stream flow data (USGS).

Climate data compiled for Colorado butterfly plant (*Oenothera coloradensis*) monitoring

Period	Precipitation	Temperature
April-June ("Spring")	Net spring precipitation	Average spring mean monthly
July-Sept ("Summer")	Net summer precipitation	Average summer mean monthly

Characterization of F. E. Warren AFB climate conditions and their influence on Colorado butterfly plant using monthly datasets can be confounded by short-term weather events and anomalous months. For example, the start of Colorado butterfly plant monitoring was preceded by a flood on August 1, 1985 that was classified as a 100-year flood event (USDI Geological Survey 1989) and which shows up as a summer spike in 1985 precipitation. In the City of Cheyenne, downstream of Colorado butterfly plant habitat, rainfall levels exceeded 17.8 cm (7 in; USDI Geological Survey 1989). Only 7.6-10.2 cm (3-4 inches) of rain fell on F. E. Warren AFB that day but the flood brought high volumes of water down Crow Creek. The

flood matted vegetation and deposited alluvium on Crow Creek, but not on the tributaries (Rocky Mountain Heritage Task Force 1987). Since then, there was a minor spring flood in 1995, a minor but prolonged flood event in June 1999 (Munk 1999), and a minor flood event in July 2001 (Burgess et al. 2005). Summer flooding is associated with storm cell events and spring flooding is associated with high winter snowpack. Floods are described as part of the natural disturbance regime (Fertig 2001, Heidel et al. 2020).

There are also localized weather events associated with storm cells that can affect parts of the population differently. In 2018, repeated heavy hail during July hailstorms damaged Colorado butterfly plants throughout Diamond and Unnamed Creeks, but not on Crow Creek. Damage was evidenced by scarred and broken flowering stems stripped of most buds, flowers and fruits, and by shredded leaves. However, most other species of forbs had much greater damage, and species such as common milkweed (Asclepias speciosa), wild licorice (Glycyrrhiza lepidota) and Canada thistle (Cirsium arvense) had no remaining flowering or fruiting material. Moreover, Colorado butterfly plants resumed flowering or produced new branches in August, whereas these other species died without regrowth. Likewise, in 2011, heavy hail damage to Colorado butterfly plant was noted in the Unnamed Creek subpopulation at the start of monitoring (Heidel et al. 2020).

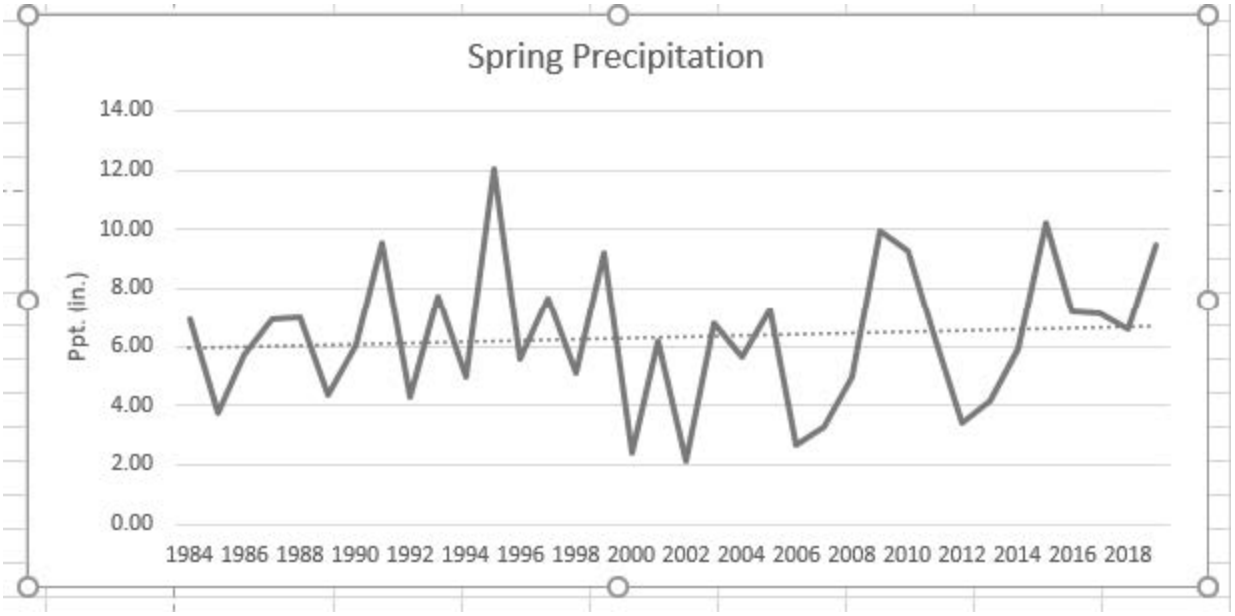

Figure 12. Precipitation totals in Cheyenne, WY (1984-2019), showing the early growing season (spring) values

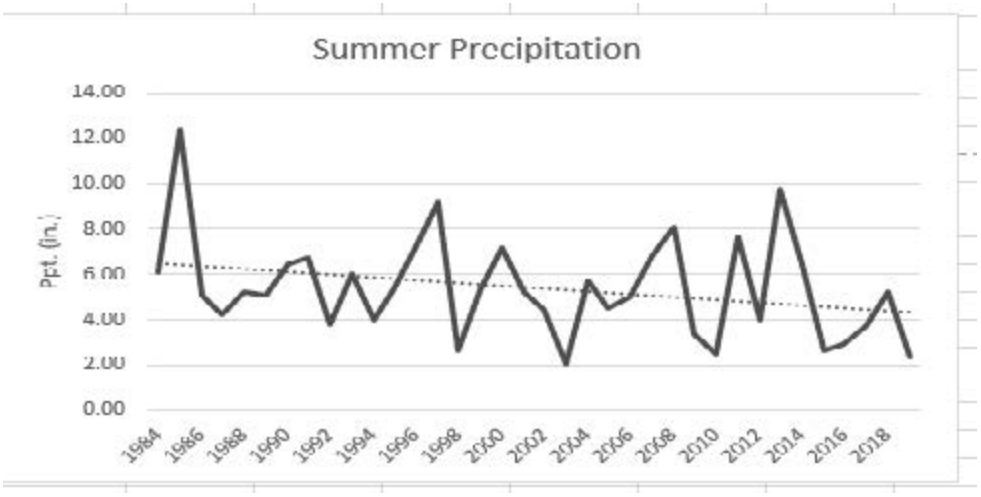

Figure 13. Precipitation totals in Cheyenne, WY (1984-2019), showing the late growing season (summer) values

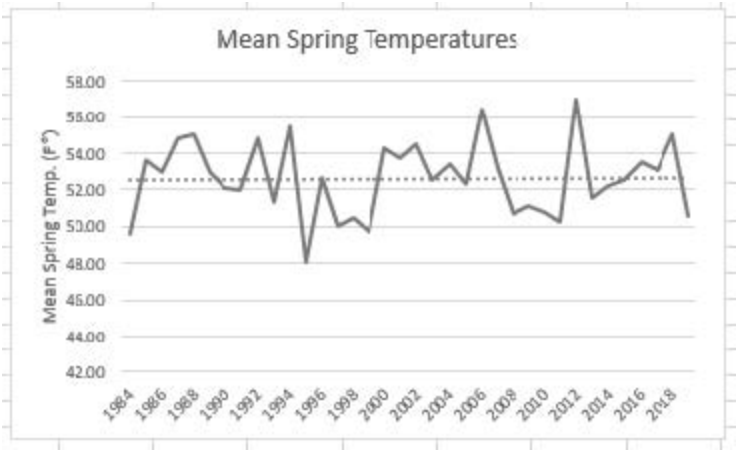

Figure 14. Mean monthly temperature in Cheyenne, WY (1984-2019), showing the early growing season (spring) and the late growing season (summer) values.

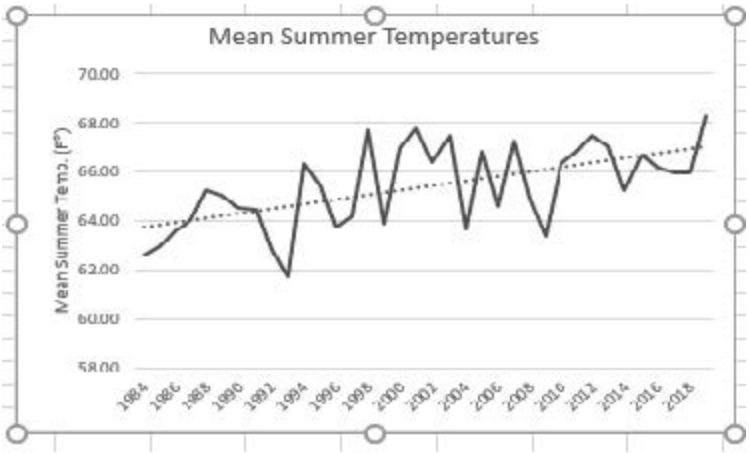

Figure 15. Mean monthly temperature in Cheyenne, WY (1984-2019), showing the early growing season (spring) and the late growing season (summer) values.

7.17 Geographic Information Systems (GIS)
Installation Supplement

Applicability Statement

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

Program Overview/Current Management Practices

F. E. Warren AFB has full Geographic Information System (GIS) and AutoCAD capabilities for assembling, storing, manipulating, and displaying geographically referenced information. The Air Force is taking a proactive approach to implementing GIS at installations through its GeoBase initiative, an effort to centralize mapping processes. The GeoBase vision is "One Installation…One Map" with a mission to attain, maintain, and sustain one geospatial infrastructure supporting all installation requirements. This geospatial infrastructure includes the people, processes, and resources used in the collection, analysis, and display of geo-referenced data to support the installation mission. Existing mission systems and processes are enhanced by visualizing their assets and information via an installation map (IDP 2017).

Successful implementation of this INRMP involves the collection, analysis, and synthesis of data sets and their incorporation into the decision making process. GIS is a mechanism to communicate geospatial information across all operations at F. E. Warren AFB. This GIS information is readily available to planners and engineers involved in the day-to-day operations of F. E. Warren AFB from the 90th Civil Engineer Squadron, Execution Support Office (90 CES/CENME).

8 MANAGEMENT GOALS AND OBJECTIVES

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

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

Installation Supplement

GOAL 1: NATURAL RESOURCES INFORMATION IS INCORPORATED INTO ALL MANAGEMENT DECISIONS AT F. E. WARREN AFB.

- OBJECTIVE 1.1: Maintain a qualified staff within the Environmental Element.
    - PROJECT 1.1.1: Natural Resources Manager should attend national, regional and state conference and training courses, as appropriate and subject to funding.
- OBJECTIVE 1.2: Integrate natural resources information in base planning.
    - PROJECT 1.2.1: Establish an internal INRMP Implementation Task Force.
    - PROJECT 1.2.2: Develop "consultation zone" map to base program managers who have jurisdiction over projects that could impact Colorado butterfly plant and PMJM habitats.
    - PROJECT 1.2.3: Interact quarterly with Safety Office and BASH Team, or more frequently if needed.

GOAL 2: MAINTAIN, PRESERVE AND ENHANCE POPULATIONS OF EXISTING NATIVE FLORA AND FAUNA AT SUSTAINABLE LEVELS AND IN LINE WITH F. E. WARREN AFB'S MISSION.

- OBJECTIVE 2.1: Strive to maintain pronghorn populations at the social carrying capacity established for F. E. Warren AFB of between 150 and 175 individuals.
    - PROJECT 2.1.1: Continue monthly pronghorn counts to assess population trends and status.
    - PROJECT 2.1.2: Collaborate with WGFD to ensure actions are in line with state management goals.
    - PROJECT 2.1.3: Obtain required permits from the WGFD to reduce pronghorn herd numbers. Maintain a sustainable male to female pronghorn ratio through immobilization, hazing, relocation, hunting, luring, sharpshooting, and/or other deterrents when the social carrying capacity is exceeded.
    - PROJECT 2.1.4: Develop and implement methods to minimize pronghorn presence in the Historic District (harassment or other forms of non-lethal deterrents).
    - PROJECT 2.1.5: Increase public education on base to reduce pronghorn-vehicle problems. Placement of pronghorn roadway warning signs along busy thoroughfares on base.
- OBJECTIVE 2.2: Manage migratory bird species and habitat in accordance with BASH objectives.
    - PROJECT 2.2.1: Ensure Canada Goose/other wildlife populations are maintained in accordance with BASH objectives.
    - PROJECT 2.2.2: Continue coordination with local partners (e.g., Bird Conservancy of the Rockies, Cheyenne Audubon Chapter) to ensure bird surveys are conducted to better understand these species presence on base and their habitat needs.
    - PROJECT 2.2.3: Perform migratory bird surveys/other wildlife surveys, as necessary, when projects may affect species habitat.
    - PROJECT 2.2.4: In accordance with AFI 91-212, utilize other bird/wildlife management methods, including but not limited to trapping and relocation, effigies, birds of prey/avian, or canine programs to address BASH/nuisance wildlife issues.

- OBJECTIVE 2.3: Establish framework for management actions related to species of concern potentially occurring at F. E. Warren AFB or impacted by base operations.
    - PROJECT 2.3.1: Coordinate with Wyoming Natural Diversity Database and Wyoming Game and Fish Department to establish potential for sensitive species presence on base.
    - PROJECT 2.3.2: Utilize information from the surveys to determine the need for more detailed management actions.
    - PROJECT 2.3.3: Continue to support the USFWS Black-Footed Ferret Recovery Team and assist in operation of the on-base pre-release conditioning facility.
- OBJECTIVE 2.4: Enhance Conservation Law Enforcement Activities on Base.
    - PROJECT 2.4.1: Update the Wing Instruction for fish and wildlife, as necessary.
    - PROJECT 2.4.2: Coordinate with Wing and Security Forces to heighten Conservation Law Enforcement protection on base, as needed.
    - PROJECT 2.4.3: Develop a Memorandum of Agreement between the Air Force and WGFD to enhance fish and wildlife enforcement, when necessary.

- OBJECTIVE 2.5: Control nuisance animals on base.
    - PROJECT 2.5.1: Develop a monitoring strategy for beaver populations and their activity. Develop a protocol for beaver control, limiting active management to areas where activity is in direct conflict with safety issues.
    - PROJECT 2.5.2: Develop and implement beaver management protocol to address beaver activity in areas needing active management.
    - PROJECT 2.5.3: Educate base residents regarding house cat policy on base.
    - PROJECT 2.5.4: Obtain appropriate Federal/State-issued bird/wildlife removal permits when need to address nuisance wildlife issues.
- OBJECTIVE 2.6: Maintain wetlands with no net loss to greatest extent practicable.
    - PROJECT 2.6.1: Continue to consult with the USACE on actions that may affect wetlands.
    - PROJECT 2.6.2: Ensure project proponents acknowledge and consider jurisdictional wetland delineation for any activity that may affect a known or suspected wetland.
- OBJECTIVE 2.7: Implement Invasive Species Control Plan.
    - PROJECT 2.7.1: Control or eradicate noxious plant species, in part, through continued use of biocontrol agents. Annually map invasive species and track effectiveness of invasive species control efforts.
    - PROJECT 2.7.2: Explore opportunities to allow grazing of sheep or goats on base to control noxious plant species, particularly in riparian areas.
    - PROJECT 2.7.3: Develop volunteer program to test effectiveness of hand-pulling common hound's tongue and other invasive plants.
    - PROJECT 2.7.4: Consult with local partners (e.g., Cooperative Extension, Laramie County Weed and Pest District) to collaborate on leafy spurge, Dalmatian toadflax, Canada thistle, purple loosestrife, common teasel, cheatgrass, and common hound's tongue control.
    - PROJECT 2.7.5: Annually map invasive species and track effectiveness of invasive species control efforts.
- OBJECTIVE 2.8: Implement the Wildland Fire Management Program.
    - PROJECT 2.8.1: Update Wildland Fire Management Plan in coordination with the Wildland Fire Center.
    - PROJECT 2.8.2: Engage with the Wildland Fire Management Center to determine if prescribed burns should be conducted in future years.
- OBJECTIVE 2.9: Ensure that Colorado butterfly plant and PMJM subpopulations persist on all three drainage and threats to Colorado butterfly plant and PMJM are eliminated within F. E. Warren boundary.
    - PROJECT 2.9.1: Annually monitor Colorado butterfly plant and PMJM numbers and habitat.
    - PROJECT 2.9.2: Evaluate the use of a combination of goat/sheep grazing and re-seeding with native species to reduce the competitive advantage of weeds.
    - PROJECT 2.9.3: Monitor results of each weed control method for effectiveness, manageability, and adverse impacts on Colorado butterfly plant or PMJM and adapt methods as appropriate.
    - PROJECT 2.9.4: If authorized, explore the possibility of mowing in high-priority grassy areas to increase the amount of open habitat and reduce competition for light with Colorado butterfly plant seedlings.
    - PROJECT 2.9.5: Implement habitat improvement tasks relative to weed control, willow management, and riparian system connectivity.
    - PROJECT 2.9.6: Coordinate with weed control experts and the USFWS to design the most appropriate weed control strategy for Colorado butterfly plant and PMJM habitat.
    - PROJECT 2.9.7: Develop and implement Best Management Practices for offsetting impacts to Colorado butterfly plant and PMJM.
    - PROJECT 2.9.8: Institutionalize chain of communication between base wildlife biologist and other base work centers.
    - PROJECT 2.9.9: Maintain appropriate channel and floodplain features. Carefully monitor and mitigate unavoidable hydrological alteration. Control sedimentation and altered runoff through active implementation of the Stormwater Management Plan, required by the Municipal Separate Storm Sewer System permit.
    - PROJECT 2.9.10: Explore the feasibility of Cooperative Agreement regarding use of Conservation Crews from the Student Conservation Association (SCA) for weed control in riparian areas.

GOAL 3: INCREASE INSTALLATION RECREATIONAL OPPORTUNITIES AND AWARENESS OF REQUIREMENTS FOR NATURAL RESOURCES MANAGEMENT AT F. E. WARREN AFB.

- OBJECTIVE 3.1: Expand installation education initiatives specifically related to native habitats, fish and wildlife species, and their management in support of the military mission.
    - PROJECT 3.1.1: Continue to highlight natural resource management information in Right Start briefings to base newcomers.

- PROJECT 3.1.2: Develop educational package for the base that synthesizes the most important information on Colorado butterfly plant and PMJM habitats.
- PROJECT 3.1.3: Maintain natural resources information for F. E. Warren AFB on eDash web site.
- PROJECT 3.1.4: Submit at least two general awareness articles on natural resources in the base newspaper every year.
- PROJECT 3.1.5: Sponsor events highlighting natural resources in association with commemorative days or celebrations.

- OBJECTIVE 3.2: Continue to provide high-quality opportunities for natural resources oriented outdoor recreation.
  - PROJECT 3.2.1: Provide fishing opportunities in base waters through stocking of fish and/or habitat improvement.
  - PROJECT 3.2.2: If needed, investigate the use of triploid white Amur to address any vegetation issues in the newly deepened North Pearson Reservoir.
  - PROJECT 3.2.3: Monitor aeration systems at North and South Pearson Lakes and determine if the system is worthwhile in terms of habitat improvement for fish.
  - PROJECT 3.2.4: Enhance recreational opportunities at Lake Centennial, most importantly by limiting the number of Canada goose.
  - PROJECT 3.2.5: Annually review fee collection for fishing permits and make adjustments, as needed.
  - PROJECT 3.2.6: Increase awareness of Base policy prohibiting off-road vehicle use.

GOAL 4: MAINTAIN A CURRENT INRMP.

- OBJECTIVE 4.1: Monitor the success and failure of natural resource management projects and initiatives in support of adaptive management.
  - PROJECT 4.1.1: Develop and implement a monitoring plan for natural resources.
  - PROJECT 4.1.2: Identify opportunities with internal stakeholders regarding data sharing opportunities at F. E. Warren AFB.
  - PROJECT 4.1.3: Assess data sharing opportunities with regional stakeholders (e.g. Wyoming Game and Fish Department, U. S. Fish and Wildlife Service, Wyoming Natural Diversity Database).
- OBJECTIVE 4.2: Ensure INRMP is reviewed and concurred upon by all significant stakeholders.
  - PROJECT 4.2.1: Conduct annual reviews of INRMP.
  - PROJECT 4.2.2: Identify natural resource management adjustments based on monitoring data.
  - PROJECT 4.2.3: Prioritize natural resource management projects and initiatives.
  - PROJECT 4.2.4: Review and revise budget requests for natural resources management.
  - PROJECT 4.2.5: Update the INRMP as needed.

9 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

9.1 Natural Resources Management Staffing and Implementation

Installation Supplement

F. E. Warren AFB's INRMP will be implemented upon signature by the 90 MW/CC. Currently, a dedicated individual from USFWS is embedded in 90 CES/CEIE to assist with INRMP implementation and the annual review and update of the INRMP.

Staffing is currently a USFWS GS-0401-11 biologist provided via a cooperative agreement between the Air Force and USFWS.

9.2 Monitoring INRMP Implementation

Installation Supplement

Annual external stakeholder meetings will be held to ensure that the INRMP is implemented to an acceptable level.

9.3 Annual INRMP Review and Update Requirements

Installation Supplement

The INRMP will be reviewed by 90 CES/CEIE as needed and an annual meeting will occur with WGFD, USFWS and F. E. Warren AFB personnel. These meetings will be documented and agreements will be signed when completed. Any substantive changes or recommendations will be discussed during the biannual Environmental, Safety and Occupation Health meetings with 90 MW/CC.

The INRMP will be evaluated annually and a revision will occur if review of procedures so warrants, additional species are listed, land area increases or decreases or any other operational changes occur. In addition, the INRMP will also be revised if a mission change occurs. The annual review will include an assessment of status of implementation of the past year's planned activities and revise/update the work plans as necessary to maintain five years-worth of work plans.

The INRMP requires annual review, IAW DoDI 4715.03 and AFMAN 32-7003, to ensure the achievement of mission goals, verify the implementation of projects, and establish any necessary new management requirements. This process involves installation natural resources personnel and external agencies working in coordination to review the INRMP. If the installation mission or any of its natural resources management issues change significantly after the creation of the original INRMP, a major revision to the INRMP is required. The need to accomplish a major revision is normally determined during the annual review with USFWS, the appropriate state, and NOAA (if required). The NRM/POC documents the findings of the annual review in an Annual INRMP Review Summary and obtains signatures from the coordinating agencies on review findings. By signing the Annual INRMP Review Summary, the collaborating agency representatives assert concurrence with the findings. If any agency declines to participate in an on-site annual review, the NRM submits the INRMP for review along with the Annual INRMP Review Summary document to the agency via official correspondence and request return correspondence with comments/concurrence.

The USFWS, the state, NOAA (if applicable), and the NRM/Section conduct an Annual INRMP Review Meeting. This meeting takes place in person with respective representatives for each agency. Individuals may telephone or video call if they cannot attend in person. During this meeting the NRM/Section updates the external stakeholders/parties with the end of the year execution report and coordinates future work plans and any necessary changes to management methods, etc. All parties review the INRMP and begin preliminary collaborative work on updating the INRMP (new policies, procedures, impacts, mitigations, etc.) as applicable.

10 ANNUAL WORK PLANS

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

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

Installation Supplement

Annual Work Plans

Work Plans should extend out to current year plus 4 additional years

Resource Category	Goal	Objective	Occurrence	FY	OPR	Funding Source	Priority Level	PB28 Code*	Standard Title*	Project Number	Description

				2022		AFCEC	Low				PROJECT 1.1.1: Natural Resources Manager to attend national, regional, and state conference and training courses, as appropriate and subject to funding.
				2022		Project GHLNOS100921	Medium				PROJECT 2.1.3: Obtain required permits from the WGFD to reduce pronghorn herd numbers. Maintain a sustainable male to female pronghorn ratio through immobilization, hazing, relocation, hunting, sharpshooting, and/or other deterrents when the social carrying capacity is exceeded.
				2022		Project GHLNOS100921	Medium				PROJECT 2.5.2: Develop and implement beaver management protocol to address beaver activity in areas needing active management.
				2022		Project GHLNOS100621	Medium				PROJECT 2.7.1: Control or eradicate noxious plant species, in part, through continued use of biocontrol agents. Annually map invasive species and track effectiveness of invasive species control efforts.
				2022		Project GHLNOS100521	High				PROJECT 2.10.1: Annually monitor Colorado butterfly plant and PMJM numbers and habitat.

				2022		In House	Medium				PROJECT 3.2.1: Provide fishing opportunities in base waters through stocking of fish and/or habitat improvement.
				2022		in house	High				PROJECT 4.2.1: Conduct annual reviews of INRMP.
				2023		AFCEC	Low				PROJECT 1.1.1: Natural Resources Manager to attend national, regional, and state conference and training courses, as appropriate and subject to funding.
				2023		Project GHLNOS100522	Low				PROJECT 1.2.2: Review and update, as need, the "consultation zone" map to base program managers who have jurisdiction over projects that could impact Colorado butterfly plant and PMJM habitats.
				2023		Project GHLNOS100922	Medium				PROJECT 2.1.3: Obtain required permits from the WGFD to reduce pronghorn herd numbers. Maintain a sustainable male to female pronghorn ratio through immobilization, hazing, relocation, hunting, sharpshooting, and/or other deterrents when the social carrying capacity is exceeded.

				2023		Project GHLNOS100922	Medium				PROJECT 2.2.1: Ensure Canada Goose population is maintained in accordance with BASH objectives.
				2023		Project GHLNOS100922	Low				PROJECT 2.4.1: Update the Wing Instruction for fish and wildlife, as needed.
				2023		Project GHLNOS100922	Medium				PROJECT 2.5.2: Develop and implement beaver management protocol to address beaver activity in areas needing active management.
				2023		Project GHLNOS100622	Medium				PROJECT 2.8.1: Control or eradicate noxious plant species, in part, through continued use of biocontrol agents. Annually map invasive species and track effectiveness of invasive species control efforts.
				2023		Project GHLNOS100322	Medium				PROJECT 2.9.1: Update Wildland Fire Management Plan in coordination with the Wildland Fire Center.
				2023		Project GHLNOS100522	High				PROJECT 2.10.1: Annually monitor Colorado butterfly plant and PMJM numbers and habitat.
				2023		In House	High				PROJECT 3.2.1: Provide fishing opportunities in base waters through stocking of fish and/or habitat improvement.

				2023		in house	High				PROJECT 4.2.1: Conduct annual reviews of INRMP.
				2024		AFCEC	Low				PROJECT 1.1.1: For currency, Natural Resources Manager to attend national, regional, and state conference and training courses, as appropriate and subject to funding.
				2024		Project GHLNOS100923	Medium				PROJECT 2.1.3: Obtain required permits from the WGFD to reduce pronghorn herd numbers. Maintain a sustainable male to female pronghorn ratio through immobilization, relocation, and/or sharpshooting when the social carrying capacity is exceeded.
				2024		Project GHLNOS100923	Medium				PROJECT 2.1.5: Increase public education on base to reduce pronghorn-vehicle problems.
				2024		Project GHLNOS100923	Medium				PROJECT 2.2.1: Ensure Canada Goose population is maintained in accordance with BASH objectives.

				2023		Project GHLNOS197635	High				Project 2.3.2: This project is designed to monitor species with status under the ESA and to monitor other invert. resources on the base. Monitoring Monarchs, Regal Fritillary butterflies; Suckley's cuckoo, American, and western bumblee bees, aquatic invertebrates or other SGCN inverts.
				2024		Project GHLNOS100623	Medium				PROJECT 2.8.1: Aggressively control or eradicate noxious plant species, in part, through continued use of biocontrol agents. Annually map invasive species and track effectiveness of invasive species control efforts.
				2024		Project GHLNOS100323	Medium				PROJECT 2.9.1: Update WFMP in coordination with the Wildland Fire Center.
				2024		Project GHLNOS100523	High				PROJECT 2.10.1: Annually monitor Colorado butterfly plant and PMJM numbers and habitat.
				2024		In House	High				PROJECT 3.2.1: Provide fishing opportunities in base waters through stocking of fish and/or habitat improvement.
				2024		In house	High				PROJECT 4.2.1: Conduct annual reviews of INRMP.

				2025		AFCEC	Low				PROJECT 1.1.1: Natural Resources Manager to attend national, regional, and state conference and training courses, as appropriate and subject to funding.
				2025		Project GHLNOS100924	Medium				PROJECT 2.1.3: Obtain required permits from the WGFD to reduce pronghorn herd numbers. Maintain a sustainable male to female pronghorn ratio through immobilization, hazing, relocation, hunting, and/or sharpshooting when the social carrying capacity is exceeded.
				2025		Project GHLNOS100924	Medium				PROJECT 2.2.1: Ensure Canada Goose population is maintained in accordance with BASH objectives.
				2025		Project	High				Project 2.3.2: This project is designed to monitor species with status under the ESA and to monitor other invert. resources on the base. Monitoring Monarchs, Regal Fritillary butterflies; Suckley's cuckoo, American, and western bumblee bees, aquatic invertebrates or other SGCN inverts.

				2025		Project GHLNOS100624	Medium				PROJECT 2.8.1: Control or eradicate noxious plant species. Annually map invasive species and track effectiveness of invasive species control efforts.
				2025		Project GHLNOS100324	Medium				PROJECT 2.9.1: Update WFMP in coordination with the Wildland Fire Center.
				2025		Project GHLNOS100524	High				PROJECT 2.10.1: Annually monitor Colorado butterfly plant and PMJM numbers and habitat.
				2025		In House	High				PROJECT 3.2.1: Provide fishing opportunities in base waters through stocking of fish and/or habitat improvement.
				2025		In House	Low				PROJECT 4.1.1: Develop and implement a monitoring plan for natural resources.
				2025		In House	High				PROJECT 4.2.1: Conduct annual reviews of INRMP.

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

INRP	MMA	T&E	MNRA	WTLD
P&F, CN	Mgt, Species	Mgt, Habitat	Compliance Public Notification	Mgt, Wetlands / FloodPlains
Interagency/Intraagency, Government, Sikes Act	Interagency/Intraagency, Government, Sikes Act	Mgt, Species	Plan Update, Other	Monitor Wetlands
Interagency/Intraagency, Government, Sikes Act, CLEO	Outsourced Environmental Services, CN	Mgt, Invasive Species	Recordkeeping, Other	Interagency/Intraagency, Government, Sikes Act
Outsourced Environmental Services, CN	Supplies, CN	Mgt, Nuisance Wildlife	Outreach	Outsourced Environmental Services, CN

Supplies, CN	Supplies, CN, CLEO	Interagency/Intraagency, Government, Sikes Act		
Supplies, CN, CLEO	Vehicle Leasing, CN	Interagency/Intraagency, Government, Sikes Act, CLEO		
Equipment Purchase / Maintain, CN		Outsourced Environmental Services, CN		
Vehicle Leasing, CN		Supplies, CN		
Vehicle Fuel & Maintenance, CN		Supplies, CN, CLEO		
Mgt, Wildland Fire		Equipment Purchase / Maintain, CN		
Plan Update, INRMP		Vehicle Leasing, CN		
Plan Update, Other		Vehicle Fuel & Maintenance, CN		
Mgt, Habitat		Plan Update, Other		
Mgt, Species		Environmental Services, CN		
Mgt, Invasive Species				
Mgt, Nuisance Wildlife				
Recordkeeping, Other				
Environmental Services, CN				

11 REFERENCES

Standard References *(Applicable to all USAF installations)*

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

12 ACRONYMS

Standard Acronyms *(Applicable to all USAF installations)*

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

Installation Supplement

- **20 AF** – 20th Air Force
- **37 HS** – 37th Helicopter Squadron
- **90 CES** – 90th Civil Engineer Squadron
- **90 MDG** – 90th Medical Group
- **90 MSG** – 90th Mission Support Group
- **90 MW** – 90th Missile Wing
- **90 MXG** – 90th Maintenance Group
- **90 OG** – 90th Operations Group
- **90 SFG** – 90th Security Forces Group

- **153 CACS** – 153rd Command and Control Squadron
- **AAFES** – Army and Air Force Exchange Service
- **AASF** – Army Aviation Support Facility
- **ACC** – Air Combat Command
- **AFGE** – American Federation of Government Employees
- **AFGSC** – Air Force Global Strike Command
- **AFOSI** – Air Force Office of Special Investigations
- **AFPD** – Air Force Policy Directive
- **AFSPC** – Air Force Space Command
- **CAP** – Civil Air Patrol
- **CEMML** – Center for Environmental Management of Military Lands
- **CNHP** – Colorado Natural Heritage Program
- **DeCA** – Defense Commissary Agency
- **DIS** – Defense Investigative Service
- **FamCamp** – Family Campground
- **FEW** – F. E. Warren Air Force Base
- **FLETC** – Federal Law Enforcement Training Center
- **ICBM** – Intercontinental Ballistic Missile
- **JRFC** – Wyoming Joint Forces Headquarters, Readiness Center
- **LF** – Launch Facility
- **MAF** – Missile Alert Facility
- **NCOA** – Non-Commissioned Officers Association
- **PMJM** – Preble's Meadow Jumping Mouse
- **SAC** – Strategic Air Command
- **USNRC** – Cheyenne U.S. Naval Reserve Center
- **VOQ** – Visiting Officers Quarters
- **WDEQ** – Wyoming Department of Environmental Quality
- **WFCU** – Wyoming Federal Credit Union
- **WGFD** – Wyoming Game and Fish Department
- **WYNDD** – Wyoming Natural Diversity Database

13 DEFINITIONS

Standard Definitions *(Applicable to all USAF installations)*

- Natural Resources Playbook – Definitions Section

A ANNOTATED SUMMARY OF KEY LEGISLATION RELATED TO DESIGN AND IMPLEMENTATION OF THE INRMP

Federal Public Laws and Executive Orders	
National Defense Authorization Act of 1989, Public Law (P.L.) 101-189; Volunteer Partnership Cost-Share Program	Amends two Acts and establishes volunteer and partnership programs for natural and cultural resources management on DoD lands.
Defense Appropriations Act of 1991, P.L. 101-511; Legacy Resource Management Program	Establishes the "Legacy Resource Management Program" for natural and cultural resources. Program emphasis is on inventory and stewardship responsibilities of biological, geophysical, cultural, and historic resources on DoD lands, including restoration of degraded or altered habitats.

EO 11514, *Protection and Enhancement of Environmental Quality*	Federal agencies shall initiate measures needed to direct their policies, plans, and programs to meet national environmental goals. They shall monitor, evaluate, and control agency activities to protect and enhance the quality of the environment.
EO 11593, *Protection and Enhancement of the Cultural Environment*	All Federal agencies are required to locate, identify, and record all cultural resources. Cultural resources include sites of archaeological, historical, or architectural significance.
EO 11987, *Exotic Organisms*	Agencies shall restrict the introduction of exotic species into the natural ecosystems on lands and waters which they administer.
EO 11988, *Floodplain Management*	Provides direction regarding actions of Federal agencies in floodplains, and requires permits from state, territory and Federal review agencies for any construction within a 100-year floodplain and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for acquiring, managing and disposing of Federal lands and facilities.
EO 11989, *Off-Road vehicles on Public Lands*	Installations permitting off-road vehicles to designate and mark specific areas/trails to minimize damage and conflicts, publish information including maps, and monitor the effects of their use. Installations may close areas if adverse effects on natural, cultural, or historic resources are observed.
EO 11990, *Protection of Wetlands*	Requires Federal agencies to avoid undertaking or providing assistance for new construction in wetlands unless there is no practicable alternative, and all practicable measures to minimize harm to wetlands have been implemented and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.
EO 12088, *Federal Compliance with Pollution Control Standards*	This EO delegates responsibility to the head of each executive agency for ensuring all necessary actions are taken for the prevention, control, and abatement of environmental pollution. This order gives the U.S. Environmental Protection Agency (US EPA) authority to conduct reviews and inspections to monitor federal facility compliance with pollution control standards.

EO 12898, *Environmental Justice*	This EO requires certain federal agencies, including the DoD, to the greatest extent practicable permitted by law, to make environmental justice part of their missions by identifying and addressing disproportionately high and adverse health or environmental effects on minority and low-income populations.
EO 13112, *Invasive Species*	To prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*	The USFWS has the responsibility to administer, oversee, and enforce the conservation provisions of the Migratory Bird Treaty Act, which includes responsibility for population management (e.g., monitoring), habitat protection (e.g., acquisition, enhancement, and modification), international coordination, and regulations development and enforcement.
United States Code	
Animal Damage Control Act (7 U.S.C. § 426-426b, 47 Stat. 1468)	Provides authority to the Secretary of Agriculture for investigation and control of mammalian predators, rodents, and birds. DoD installations may enter into cooperative agreements to conduct animal control projects.
Bald and Golden Eagle Protection Act of 1940, as amended; 16 U.S.C. 668-668c	This law provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
Clean Air Act, (42 U.S.C. § 7401– 7671q, July 14, 1955, as amended)	This Act, as amended, is known as the Clean Air Act of 1970. The amendments made in 1970 established the core of the clean air program. The primary objective is to establish Federal standards for air pollutants. It is designed to improve air quality in areas of the country which do not meet federal standards and to prevent significant deterioration in areas where air quality exceeds those standards.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (Superfund) (26 U.S.C. § 4611–4682, P.L. 96-510, 94 Stat. 2797), as amended	Authorizes and administers a program to assess damage, respond to releases of hazardous substances, fund cleanup, establish clean-up standards, assign liability, and other efforts to address environmental contaminants. Installation Restoration Program guides cleanups at DoD installations.
Endangered Species Act (ESA) of 1973, as amended; P.L. 93-205, 16 U.S.C. § 1531 et seq.	Protects threatened, endangered, and candidate species of fish, wildlife, and plants and their designated critical habitats. Under this law, no federal action is allowed to jeopardize the continued existence of an endangered or threatened species. The ESA requires consultation with the USFWS and the NOAA Fisheries (National Marine Fisheries Service) and the preparation of a biological evaluation or a biological assessment may be required when such species are present in an area affected by government activities.
Federal Aid in Wildlife Restoration Act of 1937 (16 U.S.C. § 669–669i; 50 Stat. 917) (Pittman-Robertson Act)	Provides federal aid to states and territories for management and restoration of wildlife. Fund derives from sports tax on arms and ammunition. Projects include acquisition of wildlife habitat, wildlife research surveys, development of access facilities, and hunter education.
Federal Environmental Pesticide Act of 1972	Requires installations to ensure pesticides are used only in accordance with their label registrations and restricted-use pesticides are applied only by certified applicators.
Federal Land Use Policy and Management Act, 43 U.S.C. § 1701–1782	Requires management of public lands to protect the quality of scientific, scenic, historical, ecological, environmental, and archaeological resources and values; as well as to preserve and protect certain lands in their natural condition for fish and wildlife habitat. This Act also requires consideration of commodity production such as timbering.
Federal Noxious Weed Act of 1974, 7 U.S.C. § 2801–2814	The Act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.
Federal Water Pollution Control Act (Clean Water Act [CWA]), 33 U.S.C. §1251–1387	The CWA is a comprehensive statute aimed at restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Primary authority for the implementation and enforcement rests with the US EPA.
Fish and Wildlife Conservation Act (16 U.S.C. § 2901–2911; 94 Stat. 1322, PL 96-366)	Installations encouraged to use their authority to conserve and promote conservation of nongame fish and wildlife in their habitats.

Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.)	Directs installations to consult with the USFWS, or state or territorial agencies to ascertain means to protect fish and wildlife resources related to actions resulting in the control or structural modification of any natural stream or body of water. Includes provisions for mitigation and reporting.
Lacey Act of 1900 (16 U.S.C. § 701, 702, 32 Stat. 187, 32 Stat. 285)	Prohibits the importation of wild animals or birds or parts thereof, taken, possessed, or exported in violation of the laws of the country or territory of origin. Provides enforcement and penalties for violation of wildlife related Acts or regulations.
Leases: Non-excess Property of Military Departments, 10 U.S.C. § 2667, as amended	Authorizes DoD to lease to commercial enterprises Federal land not currently needed for public use. Covers agricultural outleasing program.
Migratory Bird Treaty Act 16 U.S.C. § 703–712	The Act implements various treaties for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful without a valid permit.
National Environmental Policy Act of 1969 (NEPA), as amended; P.L. 91-190, 42 U.S.C. § 4321 et seq.	Requires federal agencies to utilize a systematic approach when assessing environmental impacts of government activities. Establishes the use of environmental impact statements. NEPA proposes an interdisciplinary approach in a decision-making process designed to identify unacceptable or unnecessary impacts on the environment. The Council of Environmental Quality (CEQ) created Regulations for Implementing the National Environmental Policy Act [40 Code of Federal Regulations (CFR) Parts 1500– 1508], which provide regulations applicable to and binding on all Federal agencies for implementing the procedural provisions of NEPA, as amended.
National Historic Preservation Act, 16 U.S.C. § 470 et seq.	Requires federal agencies to take account of the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). Provides for the nomination, identification (through listing on the NRHP), and protection of historical and cultural properties of significance.
National Trails Systems Act (16 U.S.C. § 1241–1249)	Provides for the establishment of recreation and scenic trails.
National Wildlife Refuge Acts	Provides for establishment of National Wildlife Refuges through purchase, land transfer, donation, cooperative agreements, and other means.

National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd–668ee)	Provides guidelines and instructions for the administration of Wildlife Refuges and other conservation areas.
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001–13; 104 Stat. 3042), as amended	Established requirements for the treatment of Native American human remains and sacred or cultural objects found on Federal lands. Includes requirements on inventory, and notification.
Rivers and Harbors Act of 1899 (33 U.S.C. § 401 et seq.)	Makes it unlawful for the USAF to conduct any work or activity in navigable waters of the United States without a federal permit. Installations should coordinate with the U.S. Army Corps of Engineers (USACE) to obtain permits for the discharge of refuse affecting navigable waters under National Pollutant Discharge Elimination System (NPDES) and should coordinate with the USFWS to review effects on fish and wildlife of work and activities to be undertaken as permitted by the USACE.
Sale of certain interests in land, 10 U.S.C. § 2665	Authorizes sale of forest products and reimbursement of the costs of management of forest resources.
Soil and Water Conservation Act (16 U.S.C. § 2001, P.L. 95-193)	Installations shall coordinate with the Secretary of Agriculture to appraise, on a continual basis, soil/water-related resources. Installations will develop and update a program for furthering the conservation, protection, and enhancement of these resources consistent with other federal and local programs.

Sikes Act (16 U.S.C. § 670a–670l, 74 Stat. 1052), as amended	Provides for the cooperation of DoD, the Departments of the Interior (USFWS), and the State Fish and Game Department in planning, developing, and maintaining fish and wildlife resources on a military installation. Requires development of an INRMP and public access to natural resources and allows collection of nominal hunting and fishing fees. NOTE: AFI 32-7064 sec 3.9. Staffing. As defined in DoDI 4715.03, use professionally trained natural resources management personnel with a degree in the natural sciences to develop and implement the installation INRMP. (T-0). 3.9.1. Outsourcing Natural Resources Management. As stipulated in the Sikes Act, 16 U.S.C. § 670 et. seq., the Office of Management and Budget Circular No. A-76, Performance of Commercial Activities, August 4, 1983 (Revised May 29, 2003) does not apply to the development, implementation and enforcement of INRMPs. Activities that require the exercise of discretion in making decisions regarding the management and disposition of government owned natural resources are inherently governmental. When it is not practicable to utilize DoD personnel to perform inherently governmental natural resources management duties, obtain these services from federal agencies having responsibilities for the conservation and management of natural resources.
DoD Policy, Directives, and Instructions	
DoD Instruction 4150.07 *DoD Pest Management Program* dated 29 May 2008	Implements policy, assigns responsibilities, and prescribes procedures for the DoD Integrated Pest Management Program.
DoD Instruction 4715.1, *Environmental Security*	Establishes policy for protecting, preserving, and (when required) restoring and enhancing the quality of the environment. This instruction also ensures environmental factors are integrated into DoD decision-making processes that could impact the environment, and are given appropriate consideration along with other relevant factors.
DoD Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*	Implements policy, assigns responsibility, and prescribes procedures under DoDI 4715.1 for the integrated management of natural and cultural resources on property under DoD control.

OSD Policy Memorandum – 17 May 2005 – *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance Concerning Leased Lands*	Provides supplemental guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission. INRMPs must address the resource management on all lands for which the subject installation has real property accountability, including leased lands. Installation commanders may require tenants to accept responsibility for performing appropriate natural resource management actions as a condition of their occupancy or use, but this does not preclude the requirement to address the natural resource management needs of these lands in the installation INRMP.
OSD Policy Memorandum – 1 November 2004 – *Implementation of Sikes Act Improvement Act Amendments: Supplemental Guidance Concerning INRMP Reviews*	Emphasizes implementing and improving the overall INRMP coordination process. Provides policy on scope of INRMP review, and public comment on INRMP review.
OSD Policy Memorandum – 10 October 2002 – *Implementation of Sikes Act Improvement Act: Updated Guidance*	Provides guidance for implementing the requirements of the Sikes Act in a consistent manner throughout DoD and replaces the 21 September 1998 guidance Implementation of the Sikes Act Improvement Amendments. Emphasizes implementing and improving the overall INRMP coordination process and focuses on coordinating with stakeholders, reporting requirements and metrics, budgeting for INRMP projects, using the INRMP as a substitute for critical habitat designation, supporting military training and testing needs, and facilitating the INRMP review process.
USAF Instructions and Directives	
32 CFR Part 989, as amended, and AFI 32-7061, Environmental Impact Analysis Process (EIAP)	Provides guidance and responsibilities in the EIAP for implementing INRMPs. Implementation of an INRMP constitutes a major federal action and therefore is subject to evaluation through an Environmental Assessment or an Environmental Impact Statement.
AFI 32-1015, *Integrated Installation Planning*	This publication establishes a comprehensive and integrated planning framework for development/redevelopment of Air Force installations..
AFMAN 32-7003, *Environmental Conservation*	Implements AFPD 32-70, *Environmental Quality;* DoDI 4715.03, *Natural Resources Conservation Program*; and DoDI 7310.5, *Accounting for Sale of Forest Products*. It explains how to manage natural resources on USAF property in compliance with Federal, state, territorial, and local standards.

AFMAN 32-7003, *Environmental Conservation*	This Manual implements AFPD 32-70 and DoDI 4710.1, *Archaeological and Historic Resources Management.* It explains how to manage cultural resources on USAF property in compliance with Federal, state, territorial, and local standards.
AFI 32-10112 *Installation Geospatial Information and Services (IGI&S)*	This instruction implements Department of Defense Instruction (DoDI) 8130.01, Installation Geospatial Information and Services (IGI&S) by identifying the requirements to implement and maintain an Air Force Installation Geospatial Information and Services program and Air Force Policy Directive (AFPD) 32-10 Installations and Facilities.
AFPD 32-70, *Environmental Quality*	Outlines the USAF mission to achieve and maintain environmental quality on all USAF lands by cleaning up environmental damage resulting from past activities, meeting all environmental standards applicable to present operations, planning its future activities to minimize environmental impacts, managing responsibly the irreplaceable natural and cultural resources it holds in public trust and eliminating pollution from its activities wherever possible. AFPD 32-70 also establishes policies to carry out these objectives.
Policy Memo for Implementation of Sikes Act Improvement Amendments, HQ USAF Environmental Office (USAF/ILEV) on January 29, 1999	Outlines the USAF interpretation and explanation of the Sikes Act and Improvement Act of 1997.

B WILDLAND FIRE MANAGEMENT PLAN

C BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD (BASH) PLAN

D GOLF ENVIRONMENTAL MANAGEMENT (GEM) PLAN

E INTEGRATED CULTURAL RESOURCES MANAGEMENT PLAN (ICRMP)

F INTEGRATED PEST MANAGEMENT PLAN (IPMP)

G REGULATORY COORDINATION

H MASTER UPDATE LIST FOR INRMP

INRMP Master Update List

Log each technical update on this list. Create more pages as necessary. Refer to the memo from each annual review meeting for additional details on associated updates.

Update Number	Date Created	INRMP Section / Page	Brief Description of Update and Rationale
1	03MAR2018	Sec. 7.4 /Pg. 48	Reference to greenback cutthroat trout removed because species does not occur on base and is not native to area.
2		/	
3		/	
4		/	
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18		/	

I ENVIRONMENTAL ASSESSMENT FOR THE INRMP

J CONSERVATION LAW ENFORCEMENT PROGRAM ANNUAL OPERATIONS PLAN

K THREATENED AND ENDANGERED SPECIES MANAGEMENT PLAN

L FISH AND WILDLIFE MANAGEMENT PLAN

M OUTDOOR RECREATION PLAN

N FOREST MANAGEMENT PLAN

O GRAZING AND CROPLAND MANAGEMENT PLANS

P INVASIVE SPECIES CONTROL PLAN

Q WATERSHED PROTECTION

R WETLANDS MANAGEMENT AND MITIGATION PLANS

S FLOODPLAIN PROTECTION

T MIGRATORY BIRD PROTECTION