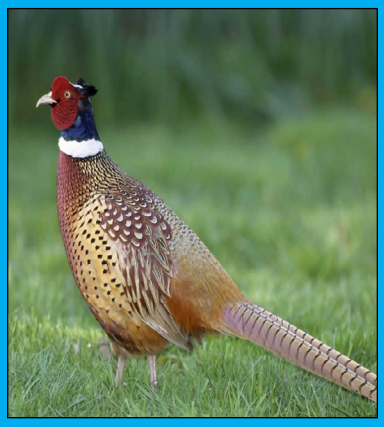
Integrated Natural Resources Management Plan

Kingsley Field Air National Guard Base
Klamath Falls, Oregon

Final



December 2018

Final
Integrated Natural Resources Management Plan
Kingsley Field Air National Guard Base
Klamath Falls, Oregon

Prepared for

Air National Guard
Plans and Requirements Branch
NGB/A4AM
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762

On Behalf Of

Oregon Air National Guard
173rd Fighter Wing
221 Wagner Street
Klamath Falls, Oregon 97603

December 2018

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SIGNATURE PAGE
OREGON AIR NATIONAL GUARD BASE
KLAMATH FALLS, OREGON

This Integrated Natural Resources Management Plan (INRMP), dated December 2018, was developed for Kingsley Field Air National Guard Base (ANGB) in accordance with the Sikes Act, as amended (16 United States Code §670a et seq.); Air Force Instruction 32-7064, *Integrated Natural Resources Management*; Department of Defense Instruction 4715.03, *Natural Resources Conservation Program*; and Department of Defense Manual 4715.03, *Integrated Natural Resources Management Plan Implementation Manual* in cooperation with the United States Fish and Wildlife Service (USFWS) and Oregon Department of Fish and Wildlife (ODFW). The management of natural resources in this INRMP reflects the mutual agreement of all parties.

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

By their signatures below, or an enclosed letter of concurrence, all parties grant their concurrence and acceptance of the following document.

Approving Officials:

Digitally signed by SMITH.JEFFREY.SCOTT.1043643246
Date: 2019.01.25 08:37:11 -08'00'

25 Jan 2019

Jeff Smith, Colonel
Commander, Kingsley Field Air National Guard Base

Date

1/31/19

Dan Blake
Field Supervisor, United States Fish and Wildlife Service

Date

1/2/19

Curt Melcher
Director, Oregon Department of Fish and Wildlife

Date

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ANNUAL REVIEW AND COORDINATION DOCUMENTATION
2019

This page is used to certify the annual review and coordination of the Integrated Natural Resources Management Plan (INRMP) for Kingsley Field Air National Guard Base in Oregon.

By their signatures below, the certifying official acknowledges that the annual review and coordination of the INRMP has occurred for the specified year.

Approving Officials:

Kingsley Field Air National Guard Base **Base Commander Signatory**	**Date**
United States Fish and Wildlife Service Signatory	**Date**
Oregon Department of Fish and Wildlife	**Date**

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ANNUAL REVIEW AND COORDINATION DOCUMENTATION
2020

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By their signatures below, the certifying official acknowledges that the annual review and coordination of the INRMP has occurred for the specified year.

Approving Officials:

Kingsley Field Air National Guard Base **Base Commander Signatory**	**Date**
United States Fish and Wildlife Service Signatory	**Date**
Oregon Department of Fish and Wildlife	**Date**

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ANNUAL REVIEW AND COORDINATION DOCUMENTATION
2021

This page is used to certify the annual review and coordination of the Integrated Natural Resources Management Plan (INRMP) for Kingsley Field Air National Guard Base in Oregon.

By their signatures below, the certifying official acknowledges that the annual review and coordination of the INRMP has occurred for the specified year.

Approving Officials:

Kingsley Field Air National Guard Base **Base Commander Signatory**	**Date**
United States Fish and Wildlife Service Signatory	**Date**
Oregon Department of Fish and Wildlife	**Date**

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ANNUAL REVIEW AND COORDINATION DOCUMENTATION
2022

This page is used to certify the annual review and coordination of the Integrated Natural Resources Management Plan (INRMP) for Kingsley Field Air National Guard Base in Oregon.

By their signatures below, the certifying official acknowledges that the annual review and coordination of the INRMP has occurred for the specified year.

Approving Officials:

Kingsley Field Air National Guard Base **Base Commander Signatory**	**Date**
United States Fish and Wildlife Service Signatory	**Date**
Oregon Department of Fish and Wildlife	**Date**

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ANNUAL REVIEW AND COORDINATION DOCUMENTATION
2023

This page is used to certify the annual review and coordination of the Integrated Natural Resources Management Plan (INRMP) for Kingsley Field Air National Guard Base in Michigan.

By their signatures below, the certifying official acknowledges that the annual review and coordination of the INRMP has occurred for the specified year.

Approving Officials:

Kingsley Field Air National Guard Base **Base Commander Signatory**	**Date**
United States Fish and Wildlife Service Signatory	**Date**
Oregon Department of Fish and Wildlife	**Date**

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1. EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) was developed for the Kingsley Field Air National Guard Base (ANGB) and the National Guard Bureau (NGB) in accordance with Air Force Instruction 32-7064, *Integrated Natural Resources Management;* Air Force Policy Directive 32-70, *Environmental Quality;* Department of Defense Instruction 4715.03, *Natural Resources Conservation Program*; and the provisions of the Sikes Act, as amended (16 United States Code [U.S.C.] §670a et seq.). This INRMP provides Kingsley Field ANGB with a description of the installation and its surrounding environment, and presents various management practices designed to mitigate negative impacts and enhance the positive effects of the installation's mission on regional ecosystems. These recommendations were balanced against the requirements of Kingsley Fields ANGB to accomplish its mission at the highest possible level of efficiency. To obtain an accurate assessment of the installation's influences, analyses were conducted to determine the physical and biotic nature of Kingsley Field ANGB and its surrounding environment, as well as the operational activities taking place. In some cases, the implementation of some of these recommendations sacrifices the improvement of the natural resources at Kingsley Field ANGB in deference to the safety and efficiency of the flying mission.

This INRMP is a practical guide for the management and stewardship of all natural resources present on Kingsley Field ANGB, while ensuring the successful accomplishment of the military mission. The INRMP was developed using an interdisciplinary approach in which information was gathered from a variety of organizations. Guidance was also solicited from a variety of federal and state agencies. A Task Force was formed, which included key installation personnel and individuals from various agencies that have an interest in Kingsley Field ANGB and the management of its resources. Representatives from the following federal and state regulatory agencies comprised the Task Force: United States Fish and Wildlife Service (USFWS) and Oregon Department of Fish and Wildlife (ODFW). These varying perspectives allowed for an accurate portrayal of the status and management needs of local ecosystems, balanced against the requirement for the installation to accomplish its mission(s) at the highest possible level of efficiency. As a result, the probable effects of Kingsley Field ANGB operations on the surrounding natural resources were projected, allowing for the development of possible operational alternatives that could result in lessening impacts on the environment.

Participation in the Task Force by representatives from the USFWS and ODFW satisfied the provisions of the Sikes Act (16 U.S.C. §670a et seq.). The Sikes Act requires the preparation of an INRMP in cooperation with the USFWS and the appropriate state fish and wildlife agency (i.e., ODFW). In addition, it is required that the resulting plan reflect the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources.

The maintenance and enhancement of biological diversity is particularly important in the management of natural resources and will be accomplished through the implementation of specific management practices identified in this INRMP. Biodiversity is simply defined as "the variety of life and its processes." Biodiversity does not just describe how many species there are or how evenly they are represented in a given community. Rather, biodiversity can be applied on four basic levels:

1. ***Genetic Diversity***—Refers to the variation of genotypes within a species that influences different characteristics among individuals or populations.

2. ***Species Diversity***—Refers to the number of different kinds of species within a given area.

3. ***Ecosystem Diversity***—Refers to the number, relative proportions, and interactions among communities within an ecosystem.

4. ***Landscape Diversity***—Can be defined as the composition of and interactions among ecosystems across a defined landscape.

By protecting a variety of habitats that support the greatest variety of life and its processes, this INRMP will help perpetuate the form and function of native communities, thus enhancing the long-term viability of Kingsley Field ANGB and ensuring its sustainability for military operations.

The INRMP presents practicable alternatives and recommendations that would minimize impact on the Kingsley Field ANGB missions while providing for management and stewardship of natural resources that would conserve and enhance existing ecosystems on the installation.

The overriding goal for this INRMP is to manage natural resources in a way for no net loss in Kingsley Field ANGB's capability to support the military mission of the installation. When feasible and when wildlife hazard attractants are not a concern, the following goals to manage natural resources will be completed:

1. Minimize habitat fragmentation and promote the natural connectivity of habitats
2. Protect native species and discourage non-native, invasive species
3. Protect rare and ecologically important species and unique or sensitive environments
4. Maintain or mimic natural processes
5. Protect genetic diversity
6. Restore species, communities, and ecosystems
7. Monitor impacts on biodiversity.

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

Throughout the development of this INRMP, management issues were identified in a number of natural resources subject areas. Some of these natural resources topics of concern could have an adverse impact on Kingsley Field ANGB's flying mission or future planning operations. One of the purposes of this INRMP is to identify goals and objectives for the installation and to obtain workable and useful solutions for each topic of concern. The topics of concern involving natural resource constraints to planning and mission operations are presented in Chapter 6.

2. GENERAL INFORMATION

2.1 PURPOSE AND SCOPE

This Integrated Natural Resources Management Plan (INRMP) has been developed for use by Kingsley Field Air National Guard Base (ANGB) and the National Guard Bureau (NGB) in accordance with Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*; Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*; Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*; and the provisions of the Sikes Act (16 United States Code [U.S.C.] §670a et seq.).

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

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

Specific management practices identified in this INRMP have been developed to enhance and maintain biological diversity within the installation. Specifically, management practices should:

- Minimize habitat fragmentation and promote the natural pattern and connectivity of habitats
- Protect native species and discourage non-native, invasive species
- Protect rare and ecologically important areas
- Protect unique sensitive environments
- Maintain or mimic natural processes
- Protect genetic diversity
- Restore species, communities, and ecosystems
- Monitor impacts on biodiversity.

Each of the management strategies described in this plan should be monitored so that modifications can be made during implementation if conditions change. There are four levels of biodiversity: genetic diversity, species diversity, ecosystem diversity, and landscape diversity. Human communities are entirely and completely dependent on the goods and services provided by our diverse ecosystems. Decline of these ecosystems and the biodiversity within them is one of the foremost limitations to human prosperity. Ecosystem sustainability is the key to both biological diversity and human existence. It is the goal of this INRMP to successfully integrate ecological sustainability with goals and objectives that will safely sustain human communities and the operational mission of Kingsley Field ANGB. By protecting a variety of habitats that support the greatest diversity of life, this INRMP helps perpetuate viable, sustainable populations of native species, and the communities they comprise. The protection of these species and communities, in turn, promotes the sustainability of functional ecosystems across the landscape. Appendix A of this INRMP provides the references for the document, while Appendix B provides a list of acronyms and abbreviations.

2.2 MANAGEMENT PHILOSOPHY

As part of its mission, the United States Air Force (USAF) and Oregon Air National Guard (ORANG) have chosen to be leaders in environmental and natural resources stewardship both now and in the future. The vitality of natural resources must be ensured in order to achieve their military mission. As a steward of natural resources, Kingsley Field ANGB acknowledges its commitment to be a conservation leader for its cognizant areas.

Conservation is an integration or blending of natural resources management and preservation designed to maintain ecosystem integrity. This INRMP provides conservation measures and is a dynamic document that will be maintained and adapted, as necessary, to reflect updated natural resources information. The development and implementation of this INRMP indicate Kingsley Field ANGB's commitment to natural resources.

This INRMP was developed using an interdisciplinary approach, and with information gathered from a variety of organizations. Information and guidance were also solicited from a variety of federal and state agencies. A Task Force was formed which included key installation personnel and individuals from various agencies that have interest in Kingsley Field ANGB and the management of its resources. Representatives from the following federal and state regulatory agencies comprised the Task Force: United States Fish and Wildlife Service (USFWS) and Oregon Department of Fish and Wildlife (ODFW). Correspondence with these agencies will be documented and will satisfy the requirements of 32 Code of Federal Regulations (CFR) 989, as amended, *The Environmental Impact Analysis Process*. Task Force participants from the Air National Guard (ANG) and Kingsley Field ANGB include the ANG Natural Resources Program Manager (NGB/A4AM), 173rd Fighter Wing (173 FW) Commander, 173 FW Environmental Management Office, 173 FW Safety Office, 173 FW Operations Group, 173 FW Maintenance Group, and the 173 FW Civil Engineering Group.

The Task Force ensured that information concerning the natural resources on or in the vicinity of the installation was accurate, and presented local and regional management strategies. As a result, the probable effects of installation operations on the surrounding natural and cultural

resources will be projected. This approach also allowed for insight into possible operational alternatives, which could result in reduced impacts on natural resources on the installation and in surrounding areas.

Participation in the Task Force by representatives from the USFWS and ODFW satisfies the provisions of the Sikes Act (16 U.S.C. §670a et seq.). The Sikes Act requires the preparation of an INRMP in cooperation with the USFWS and the appropriate state fish and wildlife agency (ODFW). In addition, it is required that the resulting plan reflects the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources. The Sikes Act, in addition to Department of Defense (DoD) Manual 4715.03 and AFI 32-7064, requires public comment on the INRMP at its inception, as well as during revisions when there is a mission change. Appendix C includes consultation with USFWS and ODFW and the Task Force meeting minutes.

The INRMP presents practicable alternatives and recommendations to allow for the protection and enhancement of natural resources and conservation of existing ecosystems, while minimizing impacts on the installation's mission(s). Consequently, implementation of some of these recommendations will sacrifice improvement of the installation's natural resources in deference to the safety and efficiency of the mission.

2.3 AUTHORITY

This INRMP is developed under, and proposes actions in accordance with, the applicable DoD and USAF policies, directives, and instructions. AFI 32-7064, *Integrated Natural Resources Management*, provides the necessary direction and instruction for preparing an INRMP. Issues are addressed in this plan using guidance provided under legislation, Executive Orders (EOs), Directives, and Instructions that include DoDI 4715.03, *Natural Resources Conservation Program*; DoD Manual 4715.03, *Integrated Natural Resources Management Plan*; AFPD 32-70, *Environmental Quality*; and AFI 32-7064. DoDI 4715.03 provides direction for DoD installations in establishing procedures for an integrated program for multiple-use management of natural resources (including biological and earth resources) on property and lands managed or controlled by DoD. DoD Manual 4715.03 provides the procedures to prepare, review, update, and implement INRMPs in compliance with the Sikes Act. AFPD 32-70 discusses general environmental quality issues, including proper cleanup of polluted sites, compliance with applicable regulations, conservation of natural resources, and pollution prevention. Appendix D summarizes key legislation and guidance used to create and implement this INRMP.

2.4 INTEGRATION WITH OTHER PLANS

This INRMP is intended to be compatible with other Kingsley Field ANGB planning documents. In preparing this document, other plans consulted are listed below. These documents can be found either as appendices to this INRMP or as Component Plans. Component Plans can be found electronically on the compact disk provided with this INRMP.

- ***Integrated Pest Management (IPM) Plan***—This plan describes how Kingsley Field ANGB will comply with the requirements of DoDI 4150.07, *DoD Pest Management*

Program, and AFI 32-1053, *Integrated Pest Management Program*. The plan provides guidance for operating and maintaining an effective IPM program at Kingsley Field ANGB, and ensures that pest management issues do not adversely impact military readiness and mission. The plan also identifies and implements strategies for managing specific pests at the installation and implements the use of both chemical and non-chemical control techniques to achieve effective pest management that minimizes economic, health, and environmental risks (Appendix E).

- ***Bird/Wildlife Aircraft Strike Hazard (BASH) Plan***—This plan provides guidance for BASH reduction in areas where flying operations are conducted. Specific operations in the plan include the establishment of a Bird/Wildlife Hazard Working Group, procedures for reporting hazardous bird activity, provisions to disseminate information to aircrews, procedures to eliminate or reduce conditions that attract birds and wildlife, and procedures to disperse birds and wildlife from the airfield (Appendix F).

- ***Integrated Cultural Resources Management Plan (ICRMP)***—This plan identifies compliance actions to be followed by the 173 FW in accordance with all applicable federal laws and regulations pertaining to cultural resource management. In addition, the plan provides a reference for the 173 FW Environmental Office and other personnel concerning cultural resource management issues that may arise (Component Plan A).

- ***Oil and Hazardous Substances Spill Prevention and Response Plan***—This plan establishes procedures, methods, equipment, and other criteria to prevent and respond to discharges of oil products and hazardous substances from non-transportation-related facilities into waters on the installation. The plan address spill prevention, spill control, and spill countermeasures (Component Plan B).

- ***Stormwater Pollution Prevention Plan***—This plan identified specific industrial activities potentially affecting stormwater runoff by building/shop, or geographic area on Kingsley Field ANGB, in which they occur. A description of the industrial activity, associated pollutants, and impacted stormwater outfalls associated with individual buildings/shops are included. The plan also includes stormwater control measures and monitoring schedules and procedures (Component Plan C).

3. INSTALLATION OVERVIEW

3.1 LOCATION AND AREA

The 173 FW leases 313.87 acres of Exclusive Use Area in the western portion of Klamath Falls International Airport, approximately 5 miles south of the City of Klamath Falls, Oregon (Figure 3-1). The entire airport comprises approximately 1,200 acres and is owned and operated by the City of Klamath Falls. The majority of the facilities at Kingsley Field ANGB are located west of the airport's runway complex. An overview of the installation is shown in Figure 3-2. Access to the installation is provided from the north by Altamont Road, a north-south roadway accessible via Klamath Falls Highway (State Route 140). Regional access is provided by U.S. Highway 97, Green Springs Highway (State Route 66), and Klamath Falls-Malin Highway (State Route 39).

3.2 INSTALLATION HISTORY

The airfield at Kingsley Field was established as Klamath Falls Municipal Airport in 1928. In 1942, the U.S. Navy selected Klamath Falls Airport as a site for a Naval Air Station. The Naval Air Station was constructed in 1945. The airfield and building area consisted of 3, 200-foot (ft)-wide runways of varying length, several buildings, and a variety of hangar facilities.

After World War II, the air station was closed following less than 1 year of operation. A portion of the facility was returned to the City of Klamath Falls for use as a municipal airport, and the remainder was turned over to the U.S. Department of the Interior. In 1954, the Department of the Interior property was transferred to USAF to establish an all-weather fighter inceptor complex. Part of the city-owned property was leased to the USAF to meet the requirements of the new mission. Existing buildings were rehabilitated, and new buildings were constructed beginning in 1955. The airport was dedicated as Kingsley Field in 1957.

In 1979, USAF realignment removed active USAF units from Kingsley Field, and in 1981, the 142nd Fighter Interceptor Group of the ORANG assumed alert detachment responsibility for air defense alert from the USAF. In 1986, unit training assembly weekends began. The fighter training squadron was renamed the 173 FW in 1996. Over the years, the unit has been assigned several different types of aircraft. The latest conversion to the F-15 aircraft occurred in 1998.

F-15 Aircraft, 173 Fighter Wing

3.3 MILITARY MISSIONS

As an F-15 Formal Training Unit, Command AETC, the mission of the 173 FW is to train F-15 pilots, support combat operations, and to serve Oregon. The 173 FW currently flies F-15 Eagle

and a Primary Authorized Aircraft of 32. The unit is allotted 5,600 flight hours resulting in approximately 4,900 annual sorties with an average sortie duration of 1.3 hours. Training operations take place with Goose Military Operations Area (MOA), Juniper Low MOA, Juniper North and South MOAs, Hart North and South MOAs, Dolphin MOA, and Warning Area 93 (ORANG 2017).

3.4 SURROUNDING COMMUNITIES

Kingsley Field ANGB is located approximately 5 miles southeast of central Klamath Falls, the seat for Klamath County. The small community of Altamont is located adjacent to the northern boundary of Kingsley Field.

Both the City of Klamath Falls and Klamath County have adopted comprehensive plans and zoning ordinances that include goals to preserve agricultural land and concentrate development within the urban growth boundary; preserve wilderness; encourage public participation; encourage efficient transportation; maintain the quality of resources; and provide adequate housing and services to the citizens of the region (Klamath County 2010).

Kingsley Field, the ORANG installation, and the adjacent industrial park have all been annexed into the city of Klamath Falls and are located within the city's urban growth boundary, which separates urban from rural land uses and serves as the basis for land-use management agreements between the City and the County. The expansion of the City of Klamath Falls is allowed within the urban-growth boundary, whereas most of the land outside the urban-growth boundary would continue to be used for farming, forestry, or low-density residential development (Klamath County 2010). Land use at the airport is guided by the airport master plan, which was last updated in January 2005 (Mead & Hunt 2005). The airport is currently working on updating the master plan.

Zoning for Kingsley Field is designated public facility under the City's jurisdiction and allows for a variety of governmental uses. The surrounding area is designated for a variety of agricultural, residential, commercial, and industrial uses. Land to the south, east, and west is within the County limits and is largely designated as an Exclusive Farm Use (EFU) Zone by Klamath County Community Development Land Use Zones. The purpose of the EFU Zone is to preserve unique agricultural land for future use, to preserve open space, to enhance regional scenic quality, and to protect air and water quality (Klamath County 2010). To the north of Kingsley Field, residential, light industrial, and public facility zoning exists within city limits.

Land adjacent to the airport to the northwest and northeast is used for various commercial and industrial activities including the Klamath Falls County School District Bus Shop, located approximately 0.3-mile north of the installation, and United Airlines and Klamath Aircraft Inc., located at the airport, adjacent to the northwest boundary of the installation. Directly adjacent to the northern boundary of the airport is the Babe Ruth Baseball Complex. There are some single residences approximately 0.6-mile north and 0.4-mile northeast of the airport. The Klamath Basin Research & Extension Center, operated by Oregon State University, is directly adjacent to the installation on the western boundary.

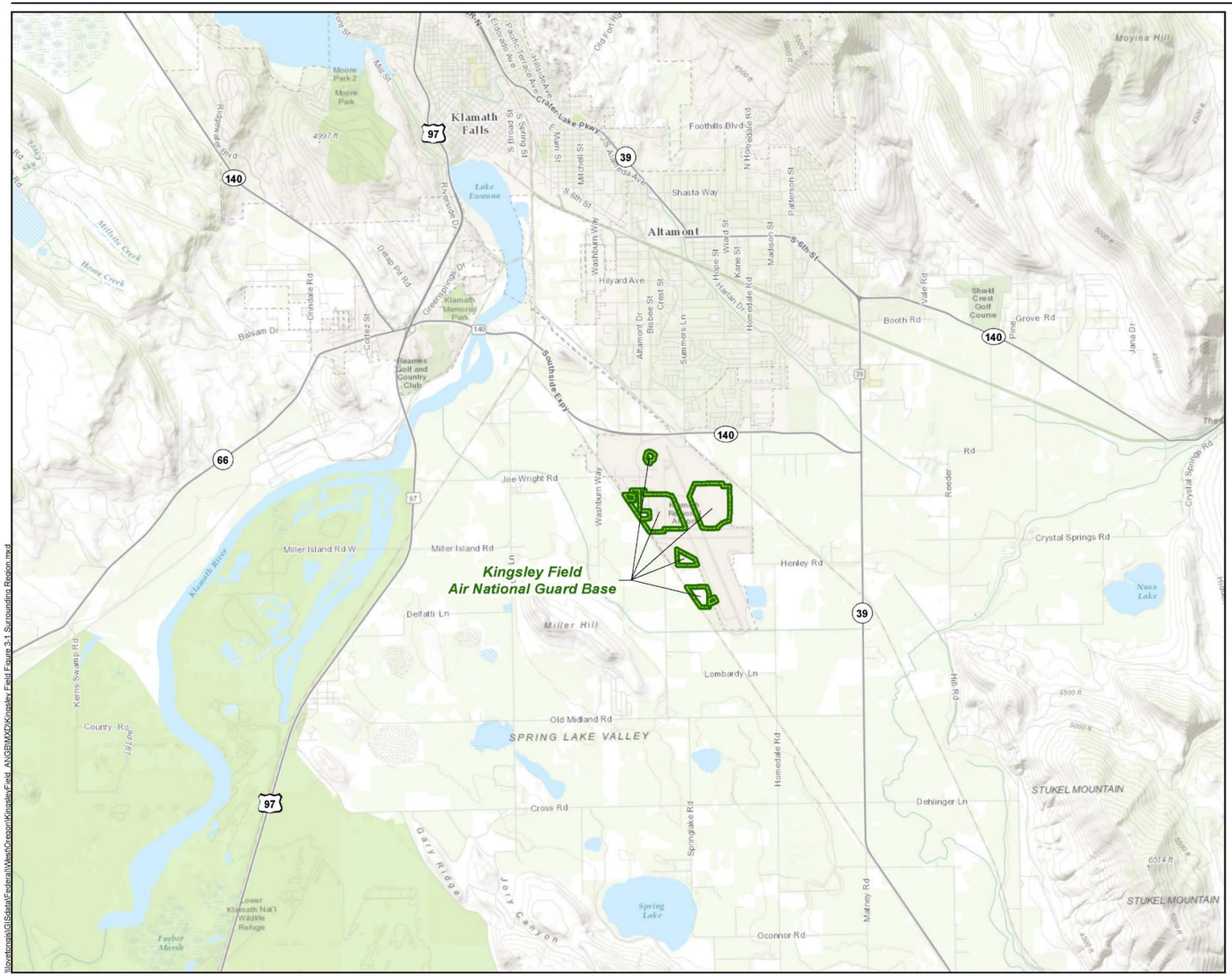

Figure 3-1
Kingsley Field ANGB and Surrounding Region
Klamath County, Oregon

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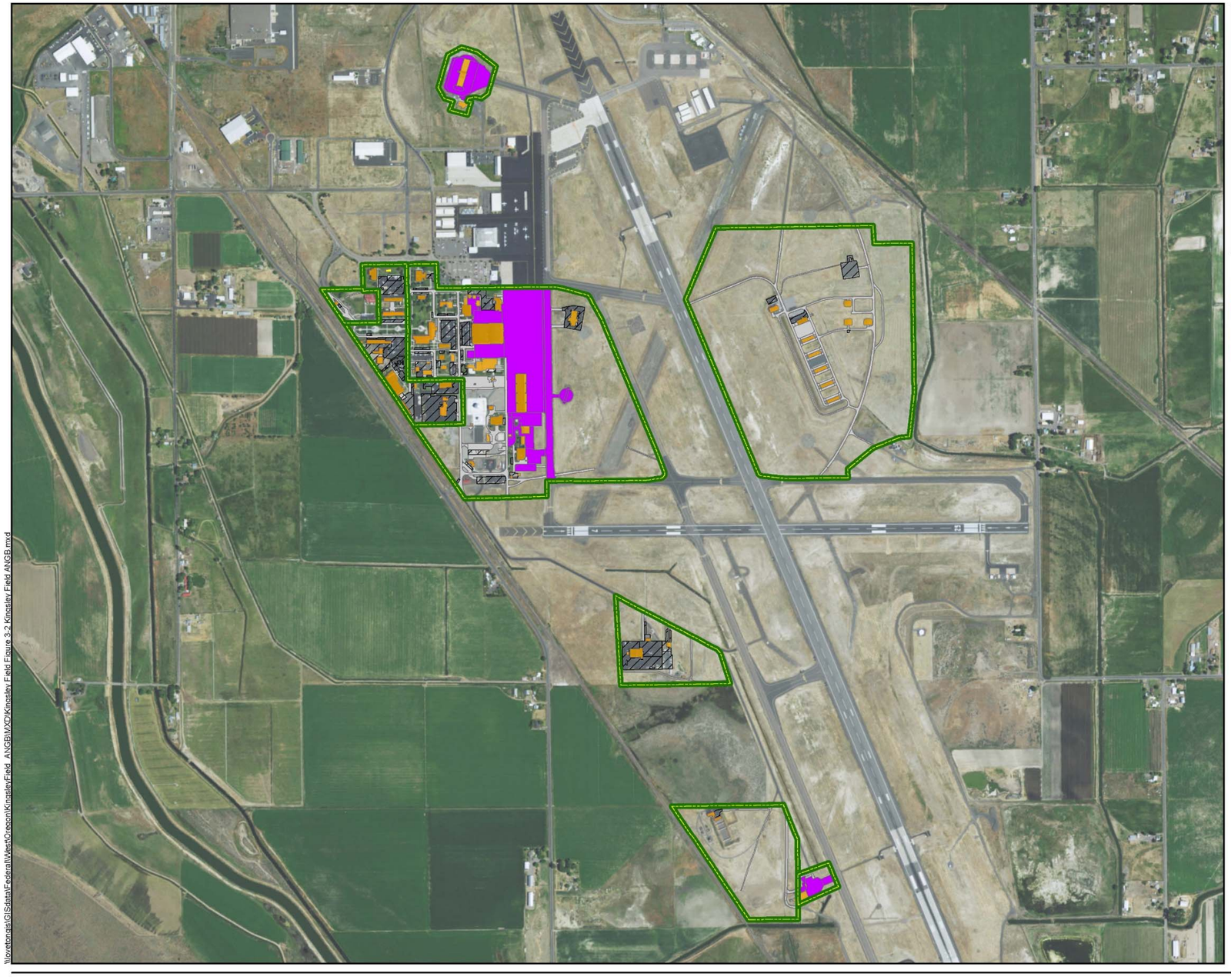

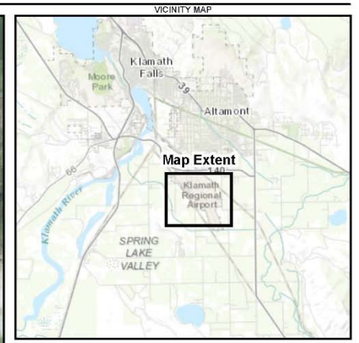

Legend

- Installation Boundary
- Airfield Surface
- Athletic Court and Field
- Building
- Parking Area
- Road

Map Date: 9/22/2017
Data Sources: ESRI 2016, Kingsley ANGB 2017
Projection: WGS 1984 UTM 10N Meter

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Figure 3-2
Kingsley Field ANGB
Klamath County, Oregon

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3.5 LOCAL AND REGIONAL NATURAL AREAS

Kingsley Field is located in a region with several large natural areas. Six National Wildlife Refuges (NWRs) have been established within the Klamath Basin within Klamath County, Oregon, and Siskiyou and Modoc Counties, California (Figure 3-1). These include Klamath Marsh NWR, Upper Klamath NWR, Bear Valley NWR, Lower Klamath NWR, Tule Lake NWR, and Clear Lake NWR.

Lower Klamath NWR
Source: USFWS.

Klamath Marsh NWR is located approximately 70 miles north of Kingsley Field ANGB. The refuge is a large natural marsh, consisting of 40,000 acres of wet meadows and open water wetlands. The refuge provides important nesting, feeding, and staging habitat for waterfowl and the sandhill crane. Klamath Marsh NWR offers canoeing and kayaking opportunities for visitors, in addition to waterfowl hunting and quality fishing opportunities.

Upper Klamath NWR is located approximately 45 miles north of Kingsley Field ANGB. This refuge includes approximately 29,000 acres of freshwater hard-stem cattail marsh and open water. In addition, the refuge includes approximately 30 acres of forested uplands. Upper Klamath NWR provides nesting and brood rearing areas for waterfowl and colonial nesting birds. Upper Klamath NWR is only accessible by boat and provides visitors opportunities for hunting, fishing, wildlife viewing, and photography.

Bear Valley NWR is located approximately 20 miles southwest of Kingsley Field ANGB. This refuge was established as a night roosting site for wintering bald eagles and consists of 4,200 acres of old growth ponderosa pine, incense cedar, white fir, and Douglas fir. In recent areas, more than 300 bald eagles have used the refuge roost in a single night. In addition, the refuge supports nesting habitat for several pairs of bald eagles. Bear Valley NWR is not open to the public except for deer hunting before 1 November.

Lower Klamath NWR is located approximately 20 miles south of Kingsley Field ANGB. This refuge includes approximately 50,000 acres of shallow marshes, open water, grassy uplands, and croplands. The refuge provides feeding, resting, nesting, and brooding habitat for waterfowl and other water birds as it is located on the Pacific Flyway. Lower Klamath NWR offers visitor opportunities including visitor centers, hunting, wildlife viewing, ranger-led interpretation programs, environmental education, and photography.

Tule Lake NWR is located approximately 30 miles southeast of Kingsley Field ANGB. This refuge contains approximately 39,000 acres of open water and crop land. Approximately 17,000 acres of the refuge is leased for agricultural use. The open water habitat is important for the endangered Lost River sucker and shortnose sucker. The refuge also provides important habitat for migrating waterfowl during the spring and fall migrations. Visitor opportunities include Tule Lake hunting within two marshes accessible by boat, spaced-blind hunting in dry fields, and open hunting in agricultural areas. Wildlife observation is made available via the

10-mile auto tour route. Visitor centers, interpretive programs, and environmental education programs are also available.

The Clear Lake NWR is located approximately 50 miles southeast of Kingsley Field ANGB. This refuge includes approximately 20,000 acres of open water and 26,000 acres of upland bunchgrass, low sagebrush, and juniper habitat. Islands within the lake provide nesting sites for a variety of water birds. The upland areas provide habitat for pronghorn antelope, mule deer, and sage grouse. Clear Lake NWR is closed to the public except during the limited waterfowl and pronghorn antelope hunting season.

Clear Lake NWR
Source: USFWS.

Other natural areas in proximity to Kingsley Field ANGB include Crater Lake National Park, Lava Beds National Monument, Winema National Forest, Fremont National Forest, Klamath National Forest, and Modoc National Forest.

4. PHYSICAL ENVIRONMENT

4.1 CLIMATE

Oregon enjoys a mild, though varied climate with only rare occurrences of devastating weather elements such as cloudbursts, tornadoes, or hailstorms severe enough to cause serious, widespread damage. The single most important geographic feature of the climate of Oregon is the Pacific Ocean whose coastline makes up the western border. Because of the normal movement of air masses from west to east, most of the systems moving across Oregon have been modified extensively in traveling over the Pacific. As a result, winter minimum and summer maximum temperatures in the west, and to a lesser extent in the eastern portion, are greatly moderated. The occurrence of extreme low or high temperatures is generally associated with the occasional invasion of the continental air masses. The unlimited supply of moisture available to those air masses that move across the Pacific is largely responsible for the abundant rainfall over western Oregon and the higher elevations of the eastern portion.

The Cascade Mountains parallel the Coast Range about 75 miles to the east and to within 50 to 75 miles of the California border, where the two ranges merge, forming a fairly broad, rugged mountain chain known as the Rogue River Mountains. The Cascades rise from the broad valley of the Willamette eastward to an average height of about 5,000 ft; a few peaks exceed 10,000 ft. One of these, Mount Hood, at an elevation of 11,245 ft, is the highest point in the state. Once again, the air masses from the west are forced to ascend, causing them to give up additional moisture. The rain potential of the marine air, however, is greatly reduced by passage over the Coast Range; therefore, the rainfall on the west slopes of the Cascades at a corresponding elevation is only about one-half to two-thirds as great as on the Coast Range. Precipitation amounts decrease rapidly once the crest is crossed and descent down the eastward side begins.

Continental air masses coming south from Canada also influence weather patterns in south-central Oregon. The average annual rainfall in Oregon varies from less than 8 inches (in.) in the drier Plateau Regions to as much as 200 in. at points along the upper west slopes of the Coast Ranges. Table 4-1 includes a summary of climate data for Kingsley Field ANGB in 2016. Klamath Falls had an average annual rainfall of about 12 in. in 2016. Precipitation is distributed evenly throughout the year, with slightly wetter, rainy conditions prevailing in fall and winter. In 2016, the driest months were July, August, and September. The wettest months included January, March, October, and December (National Oceanic and Atmospheric Administration [NOAA] 2017). Average temperatures in the winter month are approximately 30 to 40 degrees Fahrenheit (°F). During the summer months, average temperatures are in the 60s.

Table 4-1 Climate Summary for Klamath Falls, Oregon, 2016

Month	Normal Temperature (°F)—Daily			Total Rain (Inches)—Monthly
	Maximum	Minimum	Mean	
January	50	-10	30.4	2.26
February	64	20	39.2	0.27
March	67	22	41.4	1.84
April	81	18	48.1	0.69
May	84	30	52.9	0.81
June	94	28	60.7	0.82
July	98	34	65.0	0.42
August	96	38	66.4	0.00
September	87	26	55.9	0.12
October	76	23	46.0	2.48
November	71	20	41.2	0.76
December	49	7	28.7	1.51
Source: NOAA 2017.				

4.2 LANDFORMS

Klamath County is located on the Modoc Plateau, which lies where the Basin and Range Province from the east meets the Cascade Mountains in the west. Regional topography is influenced by the Cascade Mountains, which form the western and part of the northern boundary of Klamath County. Foothills and smaller ranges are dispersed throughout the county. Principle landscape features in the area consist of basins enclosed on two or more sides by steep mountain ridges. Elevation ranges from about 4050 ft above mean sea level (MSL) on the basin floors to more than 7,000 ft above MSL on higher ridges. Mount Shasta is located approximately 56 miles southwest of Kingsley Field ANGB; at 14,179 ft, it is the second highest peak in the Cascade Range.

Kingsley Field is located on a plain that slopes gently to the southeast and is bounded with the surrounding hills by northwest-southeast trending faults. The topography at Kingsley Field ANGB consists of gently undulating terrain with relatively flat slopes with elevations ranging from 4,085 to 4,095 ft above MSL (Figure 4-1).

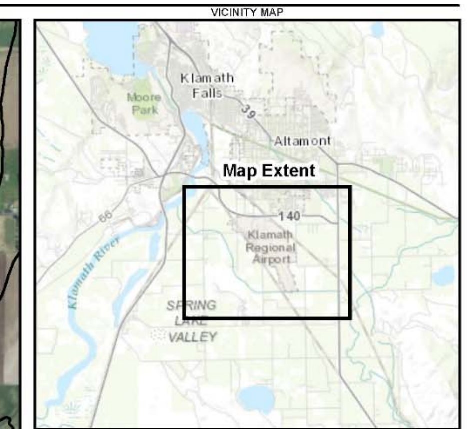

Figure 4-1
Topographic Map
Klamath County, Oregon

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4.3 GEOLOGY AND SOILS

Geology

The geology of the Klamath Falls area consists of unconsolidated to semi-consolidated lacustrine clay, silt, sand, and gravel. Mudflow and fluvial deposits and discontinuous layers of peat occur in places. Klamath Lake sporadically covered the area during the Pleistocene era; consequently, an undetermined thickness of poorly consolidated sedimentary rock underlies the area. A down-faulted crystal block, or graben, also lies beneath the Klamath Basin.

The Klamath Falls region is a geologically active area related to volcanic activity. Many minor surface fractures traverse a region within a 33-mile radius of Klamath Falls, continuing the West Klamath Lake fault zone. The long-term rate of vertical displacement is about 0.3 millimeter per year. The lengths of the faults and the measured displacements suggest that the West Klamath lake fault zone is capable of tectonic earthquakes as large as magnitude 7.25 (United States Geological Survey [USGS] 1997). In 1993, two earthquakes (magnitudes 5.9 and 6.0) near Klamath Falls occurred causing two fatalities and $10 million in damages (Earthquake Engineering Research Institute 1993). Many other potentially active faults lie east of the Cascades, notably along the east side of Klamath Valley. Local volcanic earthquakes would produce ground motion at Crater Lake, but the likely maximum magnitude of such events is about 5, which is much smaller than for tectonic earthquakes. An additional potential source of earthquakes is the Cascadia subduction zone, the fault zone that forms the boundary between the tectonic plates that contain the North American continent and the Pacific Ocean floor. Although distant, the potential exists for this zone to generate magnitude 8 to 9 earthquakes (USGS 1997).

At Kingsley Field ANGB, geothermal test holes drilled at the airfield reached more than 1,500 ft without encountering bedrock. No major faults are known to exist directly beneath the installation; however, a fault and associated shallow geothermal water are located just northeast of the property.

Soils

The Henley-Poe-Laki association is the general soils classification assigned to the Klamath Falls area. It is characterized by moderately deep soils that formed alluvial (stream-deposited) and lacustrine (lake-deposited) sediments. These soils are found on bottomlands, low terraces, and floodplains. All of these soils have a high water table, and many are subject to flooding because soil drainage capabilities range from moderate to poor. The erodibility of the soils is considered low to moderate.

Soils under Kingsley Field are dominated by the Henley-Poe-Laki soil series with smaller areas of Malin, Hosley, and Scherrard soils (Natural Resources Conservation Service [NRCS] 2017). The dominant soils are generally moderately deep or very deep, somewhat poorly drained and moderately well-drained, and formed in floodplains and lake bottoms from alluvial or lacustrine sediments, or from volcanic material such as ash or tuff. Locally, the soils have an inducted hardpan layer beginning at depths of 2 or 3 ft. The water table levels are high, ranging from the surface during wet periods to 10 ft below ground surface during dry periods. These soils present important building limitations. Although areas outside the installation have been zoned EFU, no

soils or areas within the installation are designated as either unique or prime farmland (NRCS 2010). Figure 4-2 includes the soils located within Kingsley Field ANGB; a description of these soils is presented below.

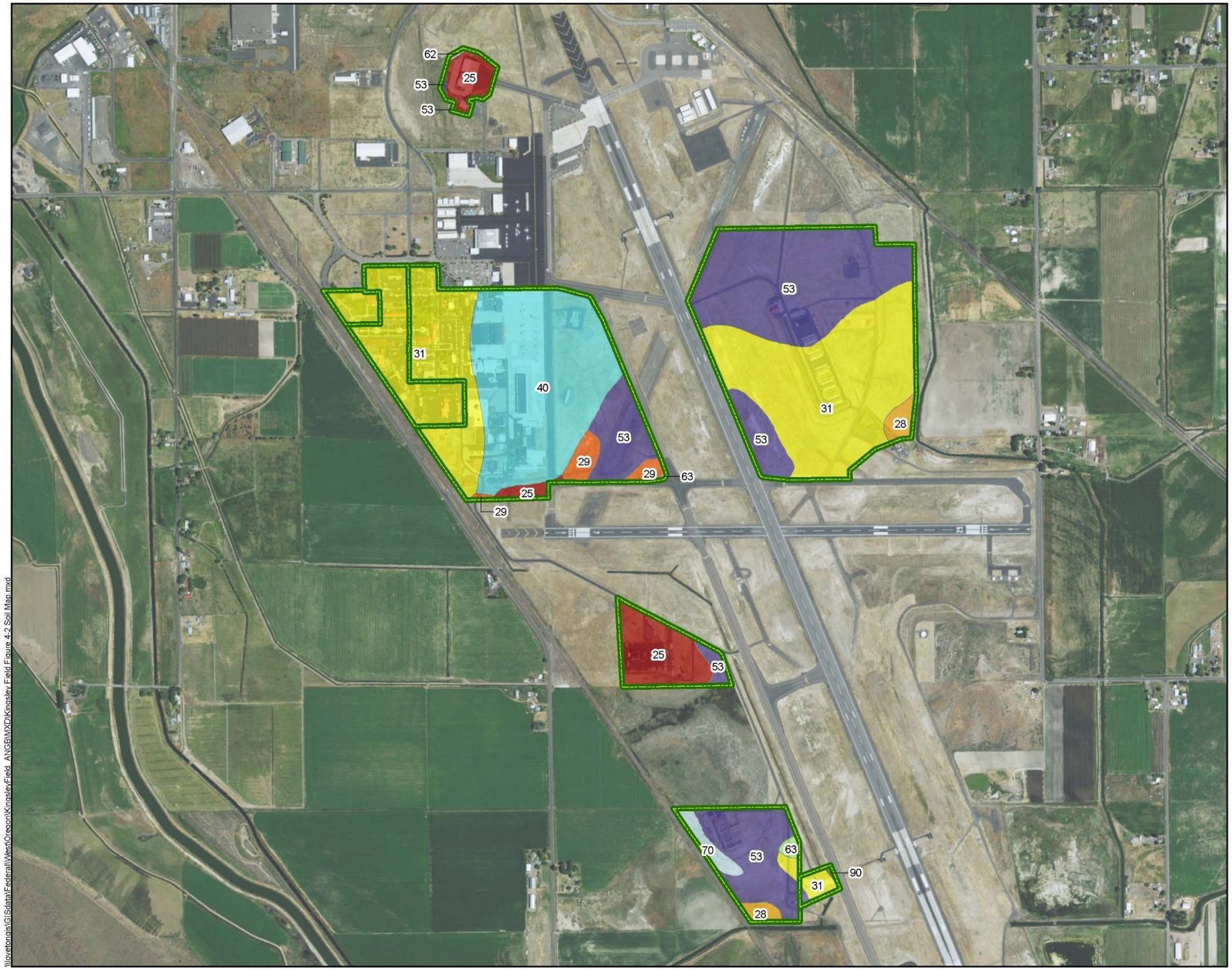
Hosley Loam—Hosley loam soils are located in the Main Cantonment/Munitions Storage Area South/Alert Area. Because of wetness and high potential frost action, this soil has important limitations for such community uses such as home sites, small buildings, and roads. Flooding is also a limitation for home sites and buildings in areas not protected by dikes or other structures. Low strength and potential frost action are limitations if the soil material is used for road fill. Excavations to a depth of more than 2 ft likely will encounter the hardpan and water table, and roadbeds need to be elevated where they cross this soil. Moderately slow permeability, wetness, and soil depth can cause septic tank absorption fields to function poorly or fail within a few years. Because of failure or partial failure of absorption fields on this soil, a sanitary sewer system has been constructed for suburban areas near Klamath Falls. This soil is in capability subclass IVw.

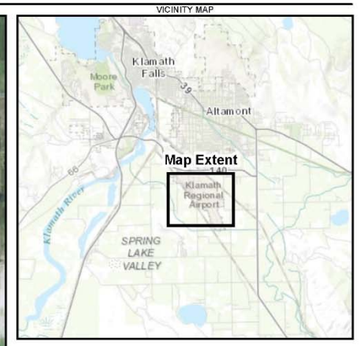
Henley-Laki complex—This soil is located within the flightline and airfield. Because of wetness, potential frost action, and flooding hazards, these soils have important limitations for community uses such as home sites and small buildings. Potential frost action and wetness also are limitations for roads. Elevated roadbeds are commonly constructed on this complex. Wetness in both soils and soil depth in the Henley soil can cause septic tank absorption fields to function poorly and fail within a few years. Because of failure or partial failure of such systems on this complex, a large sanitary sewer has been constructed for suburban areas near Klamath Falls. This complex is in capability subclass IVw.

Malin clay loam—This soil is located within the Munitions Storage Area North/Alert Area. Because of wetness, the hazard of flooding, and tendency of the upper part of the soil to shrink and swell on drying and wetting, this soil has important limitations for such community uses as home sites, small buildings, and roads. Wetness and slow permeability can cause septic tank absorption fields placed in this soil to fail within a few years. Because of failure or partial failure of absorption fields on this soil, a large sanitary sewer system has been constructed for suburban areas south of Klamath Falls. This soil is in capability subclass IIIw.

Henley loamy fine sand—This soil is located within the 500 area/alert area. Because of wetness, potential frost action, and the cemented hardpan, this soil has important limitations for such community uses as home sites, small buildings, and roads. Because of the water table and hardpan, excavations mainly cannot be made to a depth of more than 2 or 3 ft. Seepage into groundwater is a potential hazard where lagoons and landfills are placed on this soil. Soil depth and wetness can cause septic tank absorption fields to function poorly or fail within a few years. Many home sites are on this soil in rural areas. This soil is in capability subclass IVw.

Henley variant loam—This soil is located on portions of the airfield, and is a somewhat poorly drained soil. Henley variant loam is very limited for excavation, with the water table at 6–12 in. from the surface, and only an inch of depth to a thin cemented pan. This soil is in land capability subclass IVw.





Legend

Installation Boundary

Soil

- (25) Henley loamy fine sand
- (28) Henley-Laki loams, MLRA 21
- (29) Henley variant loam
- (31) Hosley loam
- (40) Laki-Henley loams
- (53) Malin clay loam
- (62) Poe loamy fine sand
- (63) Poe fine sandy loam
- (70) Scherrard clay loam
- (90) Zuman loamy fine sand

Map Date: 8/17/2017
Data Sources: ESRI 2016, USDA NRCS 2016
Projection: WGS 1984 UTM 10N Meter

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Feet

Figure 4-2
Soil Map
Klamath County, Oregon

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Laki-Henley loams—Laki-henley loams are located in a portion of the airfield, as well as in the area of aircraft pavement, operations, and maintenance. This soil is moderately well drained, with the water table between 36 and 60 in., and a rare flooding frequency. This soil is in land capability subclass IVs.

Poe loamy fine sand—This soil can be found at Kingsley Field ANGB in a small area of the northern installation boundary. Poe loamy fine sand has a depth of 20 to 40 in. to the duripan, and is somewhat poorly drained. The water table is found between 12 and 36 in., and the soil is rarely flooded. The soil capability subclass is IIIs.

Poe fine sandy loam—This soil is located in the southern portion of the installation on the airfield. It is somewhat poorly drained, with a water table from 12 to 36 in., and a rare occurrence of flooding. The soil capability subclass is IIIs.

Scherrard clay loam—Scherrard clay loam is located at Kingsley Field ANGB in the southwestern portion of the site, near the firing range. This soil is somewhat poorly drained, with a high water table and frequent ponding. The soil capability subclass is IVw.

Zuman loamy fine sand—This soil can be found in the southeastern boundary of the installation along the airfield. Zuman loamy fine sand is poorly drained, with a high water table and frequent ponding. Its soil capability subclass is IIIw.

4.4 HYDROLOGY

Water resources presented in this INRMP include surface and groundwater resources. Surface water resources comprise lakes, rivers, and streams and are important for a variety of reasons including economic, ecological, recreational, and human health. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition. The quality and availability of surface and groundwater are addressed in this section.

4.4.1 Surface Water

Klamath Falls is located in the Upper Klamath Basin, which comprises the drainages of the Williamson, Sprague, Sycan, Lost, Wood, and Klamath rivers. The Wood, Sprague, and Williamson rivers drain into Upper Klamath Lake. Upper Klamath Lake is drained at its south end by the Link River into Lake Ewauna, which is located at the foot of the Cascades, northwest of Klamath Falls. Lake Ewauna drains to the Klamath River about 1 mile south of Klamath Falls. Surface waters in the vicinity of the installation are shown on Figure 4-3.

Kingsley Field is located within the Lost River drainage basin. The Lost River Diversion Channel, located just south of the airport's primary runway, connects the Klamath and Lost Rivers about 3 miles south of Klamath Falls. The Lost River Diversion Channel is a major hydrologic feature of the region, but it has almost no influence on surface hydrology at Kingsley Field because natural drainage patterns have been modified by construction of the airfield and development of an irrigation and drainage ditch system—the Klamath Project—operated by the Bureau of Reclamation. Water from the Lost River Diversion Channel can flow in either

direction depending on demand and irrigation requirements. During the irrigation season, flow is to the east, but during high runoff conditions in the winter, flow from the Lost River can be diverted to Klamath Falls. In Klamath County, the Lost River is listed as impaired by the U.S. Environmental Protection Agency (USEPA). This is the only impaired waterbody in the vicinity of the installation.

The stormwater drainage system at Kingsley Field is comprised of gravity sewers and surface inlets, culverts, earthen channels, and portions of a drainage ditch system. All surface water runoff at Kingsley Field eventually reaches the system of major drainage ditches that traverse the airfield. The ditches do not affect airfield operations because they cross the airfield via an underground aqueduct. These ditches generally discharge into the Lost River (ORANG 2011). Runoff from the installation has not violated any water quality standards in recent years.

Kingsley Field ANGB is covered by the National Pollutant Discharge Elimination System (NPDES) permit for the City of Klamath Falls-Klamath Falls Airport. The Oregon Department of Environmental Quality (ODEQ)-issued NPDES number is general permit number 1200-Z (ORANG 2011). Industrial activities at the installation are contained within 5 drainage basins that generally slope from northwest to southeast to the Lost River Diversion Channel. These basins are associated with various activities involving the use of hazardous materials including:

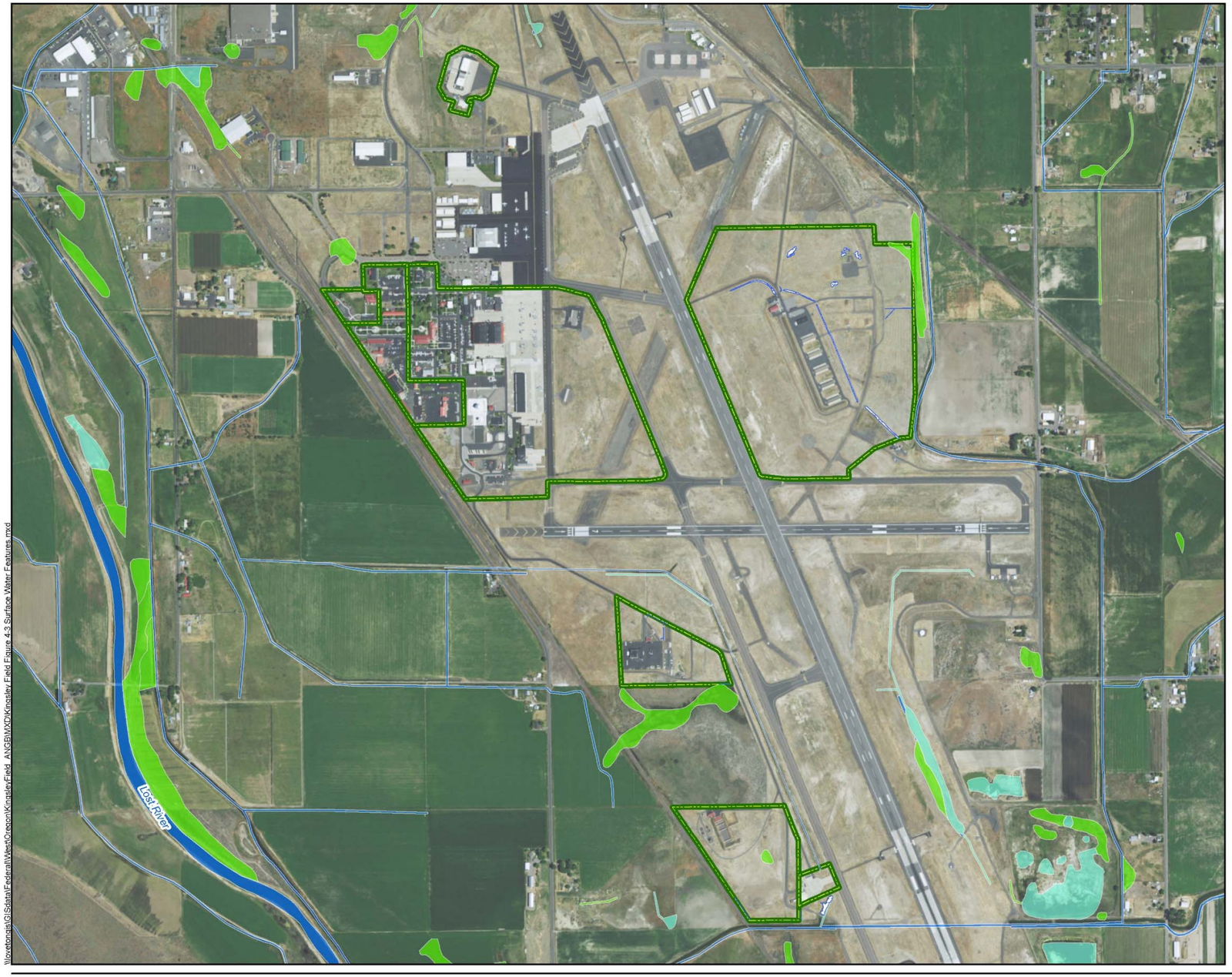
- Maintenance facilities—storage of hazardous substances
- Maintenance shops—hydraulic fluids, fuels, lubricants, solvents
- Hazardous waste accumulation points
  - Aboveground storage tanks – fuel transfers
  - Vehicle maintenance – receiving/dispensing fuel, maintenance
  - Aircraft parking apron – refueling, deicing, minor maintenance
- Wash racks—oil, grease.

The 173 FW operates under a Stormwater Pollution Prevention Plan (SWPPP) which provides engineering and management strategies designed to improve the quality of stormwater runoff from the installation (ORANG 2011). This SWPPP can be found in Component Plan C.

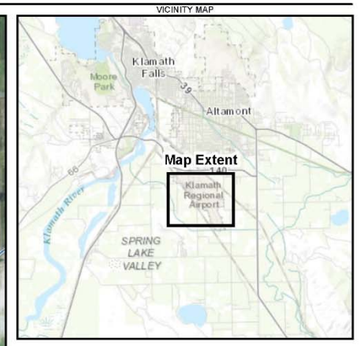
4.4.2 Groundwater

In the vicinity of Kingsley Field, groundwater levels are high, ranging from 2 to 10 ft below the surface. Under natural conditions, groundwater levels probably would be even higher; however, the established drainage system effectively lowers the water level and controls the direction of movement. Although high concentrations of methane and iron are reported to occur in water from some wells in the area, local groundwater quality is considered moderately good (ORANG 2011). The widespread occurrence of shallow, low-permeability clay and silt strata tends to prevent movement of potentially contaminated shallow groundwater into deep aquifers.

Kingsley Field is underlain by a thick sequence of sedimentary deposits ranging in composition from clay to sand. The small amounts of sand and great amounts of finer materials occurring in the Kingsley Field area reduce subsurface permeability. Consequently, regional groundwater sources do not yield significant quantities of water to wells in the Klamath Falls area. No known groundwater wells are located within one-quarter mile of the Kingsley Field ANGB.



VICINITY MAP



Legend

- Installation Boundary
- Freshwater Pond
- Riverine
- Freshwater Emergent Wetland
- Wetland Boundary from 2014 Survey

Map Date: 9/22/2017
Data Sources: ESRI 2016, USFWS 2017, Kingsley ANGB 2017
Projection: WGS 1984 UTM 10N Meter

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Figure 4-3
Surface Water Features
in the Vicinity of Kingsley Field ANGB
Klamath County, Oregon

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5. ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

5.1 ECOSYSTEM CLASSIFICATION

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. Oregon is an ecologically diverse state. The western portion of Oregon is influenced by the coast and receives an abundance of precipitation three seasons of the year. In contrast, the eastern portion of Oregon lies within the rain shadow of the Cascades and is much drier. Kingsley Field ANGB is in the Eastern Cascades Slopes and Foothills Ecosystem. This ecosystem receives less precipitation than ecoregions to the west and experiences greater temperature extremes. This ecosystem is dominated by open forests containing ponderosa pine and some lodgepole pine. The vegetation has adapted to the prevailing dry, continental climate and frequent fire (USEPA n.d.). Within the Eastern Cascades Slopes and Foothills Ecosystem, Kingsley Field ANGB is located within the Klamath/Goose Lake Basins ecoregion. This ecoregion covers river floodplains, terraces, and lake basins. This ecoregion was historically mostly wet meadows and wetlands containing a variety of wildrye, bluegrass, and wheatgrass species; however, most wet areas have been drained for agricultural purposes. Several NWRs are within the Klamath/Goose Lake Basin ecoregion, which is important to preserve the marshland, regional biodiversity, and at-risk bird and fish species (USEPA n.d.).

5.2 VEGETATION

5.2.1 Historic Vegetative Cover

Kingsley Field ANGB is located in the high desert, and plants found in this region generally have adaptations to survive in dry conditions, such as a gray-green color, unpalatability to native desert animals, and moisture-saving adaptations. Pre-settlement vegetation at Kingsley Field ANGB would have been primarily composed of natural high-desert shrub-steppe habitat that was commonly found in the Klamath Basin. This habitat is dominated by evergreen shrubs such as antelope bitterbrush (*Purshia tridentata*), sagebrush (*Artemisia* spp.), and rabbitbrush (*Chrysothamnus* spp.) (W&H Pacific 2007). Other species found include Western juniper (*Juniperus occidentalis*) and ponderosa pine (*Pinus ponderosa*).

5.2.2 Current Vegetative Cover

The City of Klamath Falls and surrounding areas are within the high desert region of southern Oregon. Vegetation is characterized by plant communities that include western juniper woodland, ponderosa pine, antelope bitterbrush, and big sagebrush (*Artemisia tridentata*). Much of this habitat near the City of Klamath Falls has been converted to agriculture or modified to facilitate urban development (ANG 2014). As with most urbanized areas in the region, specific historic vegetation communities at Kingsley Field have been disturbed by past and ongoing construction, maintenance, and operational activities. Most vegetated areas are currently mowed and actively landscaped, and little natural vegetation or habitat remains. Small areas of the facility possess mixtures of antelope bitter-brush, big sagebrush, and other plants commonly found in the Oregon high desert.

The airfield is predominantly mowed grassland, while surrounding areas are largely agricultural. Ornamental and landscape plantings are typically non-native species. Drainage ditches at Kingsley Field ANGB and the surrounding Crater Lake airport support aquatic and wetland vegetation, such as cattails (*Typha* spp.), and rushes (*Juncus* spp.). Much of the natural vegetation has been altered and mowed to accommodate the development and maintenance of runways and other facilities in support of the military mission.

Table 5-1 summarizes the land cover and vegetative communities documented on Kingsley Field ANGB and Klamath Falls Airport, classified by the national vegetation class.

Table 5-1 Vegetation Communities in the Vicinity of Kingsley Field ANGB

Community	Description
Shrub-Steppe	Shrub-steppe was the common vegetation type in Klamath Falls, but has been largely converted to agriculture and developed land. Characterized by an open shrub layer of sagebrush, rabbitbrush, antelope bitterbrush, ponderosa, and juniper.
Agriculture	A common vegetation cover in the City of Klamath Falls and surrounding Kingsley Field. Characterized by row crops (largely potatoes) and cover crops such as alfalfa and wheat.
Grassland	The airfield and much of the area within Kingsley Field ANGB consists of mowed maintained grassland.
Aquatic Habitat	Aquatic habitats include ponds, irrigation ditches, and wetlands. Many of these areas have open water and little vegetative cover, but species found include cattails and rushes.
Developed Land	Developed areas are largely paved, but vegetation includes ornamental landscape plantings such as fruit trees, flowering shrubs such as forsythia, and annual flowers.
Sources: W&H Pacific 2007; ANG 2014.	

No formal vegetation surveys have been completed at Kingsley Field ANGB. Some of the most prevalent invasive terrestrial species of south-central Oregon are listed in Table 5-2. Although some of these species apparently are numerous in the general region of Kingsley Field ANGB, no installation-specific surveys for invasive and non-native species are available to date for Kingsley Field ANGB. The potential exists for Kingsley Field ANGB to develop a relationship with the county to survey and manage noxious weeds. Section 4.7 provides recommendations for discovery of, and potential mitigation options for, invasive non-native species at Kingsley Field ANGB.

Table 5-2 Oregon Noxious Weeds

Scientific Name	Common Name
Acroptilon repens	Russian knapweed
Alliaria petiolata	Garlic mustard
Cardaria draba	Whitetop hoary cress
Carduus acanthoides	Plumeless thistle
Carduus nutans	Musk thistle
Centaurea diffusa	Diffuse knapweed
Centaurea stoebe ssp. *micranthos*	Spotted knapweed
Centaurea solstitialis	Yellow starthistle
Centaurea virgate	Squarrose knapweed
Chondrilla juncea	Rush skeletonweed
Cirsium arvense	Canada thistle
Cirsium vulgare	Bull thistle
Conium maculatum	Poison hemlock
Cynoglossum officinale	Hound's tooth
Dipsacus laciniatus	Cutleaf teasel
Euphorbia esula	Leafy spurge
Euphorbia myrsinites	Myrtle spurge
Hieracium aurantiacum	Orange hawkweed
Hypericum perforatum	St. Johnswort, Klamath weed
Iris pseudacorus	Yellow flag iris
Isatus tinctoria	Dyer's woad
Lepidium latifolium	Perennial pepperweed
Linaria dalmatica	Dalmation toadflax
Linaria vulgaris	Yellow toadflax, butter and eggs
Lythrum salicaria	Purple loosestrife
Nardus stricta	Matgrass
Onopordum acanthium	Scotch thistle
Onopordum tauricum	Taurian thistle
Potentilla recta	Sulfur cinquefoil
Salvia aethiopis	Mediterranean sage
Senecio jacobaea	Tansy ragwort
Solanum rostratum	Buffalobur
Taeniatherum caput-medusae	Medusahead rye
Tribulus terrestris	Puncturevine
Tripleurospermum perforatum	Scentless false mayweed
Xanthium spinosum	Spiny cocklebur
Source: Calonie and Rabe, n.d.	

5.2.3 Turf and Landscaped Areas

Typical landscaping surrounding buildings at Kingsley Field ANGB

Mowed grassland is located throughout the installation adjacent to runways and taxiways, and on roadway medians; landscaped grass is located around buildings. These landscaped and mowed areas are maintained on a regular basis during the growing season.

No formal surveys have been completed of Kingsley Field ANGB's landscape trees and other vegetation species. Species found around buildings are generally non-native ornamental species, such as fruit trees and flowers, and mowed turf lawn. Adjacent to runways and taxiways are typically mowed grassland species, likely comprised of a mix of native and non-native graminoid and forb species. A 2011 survey for endangered species included observations of typical native and non-native species found in surveyed areas. During this survey, intermediate wheatgrass (*Elytrigia intermedia*) was identified as the dominant plant species over most of the surveyed sites (ANG 2012a).

Other common species observed during the surveys included native species such as saltgrass (*Distichlis spicata*); squirreltail (*Elymus elymoides*), greasewood (*Sarcobatus vermiculatus*), rabbitbrush (*Ericameria nauseosa* and *E. viscidiflorus*), and willowherb (*Epilobium* sp.). Prevalent non-native species include sweetclover (*Melilotus albus*), yellow sweetclover (*M. officinalis*), alfalfa (*Medicago sativa*), prickly lettuce (*Lactuca serriola*), filaree (*Erodium cicutarium*), intermediate wheatgrass, and thistles (*Cirsium* spp.) (ANG 2012a). Other common landscape species on the installation include cherry trees (*Prunus* sp.), Callery pear (*Pyrus calleryana*), Douglas-fir (*Pseudotsuga menziesii*), and crabapple (*Malus* spp.).

5.3 FISH AND WILDLIFE

California Quail (Idaho Fish and Game)

Kingsley Field ANGB is composed of open mowed grassland habitat and drainage ditches that provide habitat for animal species, including migratory songbirds which use these areas as spring and fall stopover points. Wildlife at Kingsley Field is limited to species that have adapted to high levels of human activity and disturbance, which limits wildlife to areas of open space. Several species of mammals, birds, and reptiles are found in the open spaces surrounding the installation. Lakes, rivers, canals, ditches, and ponds on and adjacent to the airfield also attract waterfowl, fish, and amphibians (ORANG 2007).

No comprehensive biological surveys have been completed at Kingsley Field ANGB to determine wildlife presence and habitat at the installation. Field surveys for endangered species were completed in 2008 and 2011, but non-listed species were not documented.

5.3.1 Birds

A large variety of bird species are found in the high desert and aquatic habitats in the general vicinity of Kingsley Field ANGB. Birds most commonly observed at Kingsley Field ANGB include ring-necked pheasant (*Phasianus colchicus*), California quail (*Callipepla californica*), mourning dove (*Zenaida macroura*), and barn owl (*Tyto alba*). Lakes, rivers, canals, ditches, and ponds on and adjacent to the airfield also attract large numbers of waterfowl. Aquatic habitats on and in the vicinity of Kingsley Field consist of the Lost River Diversion Canal and shallow, narrow drainage and irrigation ditches. The larger canals and ditches located on base and ponds adjacent to the Base serve as feeding and resting areas for several species of ducks and shorebirds. Waterfowl also nest in grasses adjacent to the runways (ORANG 2007).

Although no formal survey of bird species has been undertaken at Kingsley Field ANGB, several bird species that are known to occur on the installation as a result of bird aircraft strikes. This includes raptors, vultures, and birds of prey, such as red-tailed hawks (*Buteo jamaicensis*), great horned owls (*Bubo virginianus*), and turkey vultures (*Cathartes aura*). Waterfowl and shorebird species are also attracted to the airfield and have been involved in aircraft strikes, including Northern shovelers (*Anas clypeata*), mallards (*A. platyrhynchos*), herring gulls (*Larus argentatus*), and killdeer (*Charadrius vociferous*). Several species of perching bird have been involved in strikes, including horned larks (*Eremophila alpestris*), barn swallows (*Hirundo rustica*), cliff swallows (*H. pyrrhonota*), tree swallows (*Tachycineta bicolor*), American robin (*Turdus migratorius*), song sparrow (*Melospiza melodia*), and cedar waxwing (*Bombycilla cedrorum*) (ORANG 2008). Other birds observed on the installation include northern harrier (*Circus cyaneus*) and red-winged blackbirds (*Agelaius phoeniceus*).

5.3.2 Mammals

Mammals common to habitats occurring at Kingsley Field include mountain cottontail (*Sylvilagus nuttallii*), black-tailed jack rabbit (*Lupus californicus*), northern pocket gopher (*Thomomys talpoides*), Belding's ground squirrel (*Spermophilus beldingi*), ermine (*Mustela erminea*), and deer mouse (*Peromyscus maniculatus*) (ORANG 2007 and ORANG 2011). Other mammals that occur in the vicinity of the installation include mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), badger (*Taxidea taxus*), feral dog (*Canis domesticus*), California ground squirrel (*S. beecheyi*), Merriam's ground squirrel (*S. canus*), yellow-bellied marmot *(Marmota flaviventris*), voles (*Microtus* spp.) and mice (*Peromyscus* sp.). An aircraft strike with a silver-haired bat (*Lasionycteris noctivagans*) was also recorded at Kingsley Field ANGB (ORANG 2008).

5.3.3 Reptile and Amphibians

Reptiles that are commonly found on and near Kingsley Field ANGB include the gopher snake (*Pituophis melanoleucus*), desert shorthorned lizards (*Phrynosoma douglasii*), and western fence

lizard (*Sceloporus occidentalis*). Amphibians commonly found along the drainage and irrigation ditches are the long-toed salamander (*Ambystoma macrodactylum*) and the Pacific tree frog (*Hyla regilla*) (ORANG 2011).

Reptiles and amphibians are a vital part of the regional, high-desert ecosystem. Healthy populations of these species are necessary for maintaining diverse, functional ecosystems through control of insects and rodents, and as prey for a variety of avian and mammalian species. The Partners in Amphibian and Reptile Conservation and the National Military Fish and Wildlife Association have made recommendations to control the intentional collection or translocation of reptiles and amphibians and to document presence of captive or commercially purchased reptiles and amphibians on military installations.

5.3.4 Fisheries

Pumpkinseed sunfish caught in a drainage ditch at Kingsley Field ANGB

Fisheries habitat on the installation is limited at Kingsley Field ANGB. Aquatic habitats on and in the vicinity of Kingsley Field consist of the Lost River Diversion Canal and shallow, narrow drainage and irrigation ditches. Small non-game fish species, such as dace and chub (*Gila* spp.), are expected to occur in the Lost River Diversion Canal (larger game fish are prevented from entering the canal by diversion structures). Drainage ditches at Kingsley Field were surveyed in 2011 as part of a fish survey assessing the potential presence of two listed species on the installation. Fish of several species were abundant in two of the three ditches on the installation. Species collected during the surveys included fathead minnows (*Pimephales promelas*), tui chub (*Gila bicolor*), pumpkinseed sunfish (*Lepomis gibbosus*), speckled dace (*Rhinichthys osculus*), and yellow perch (*Perca flavescens*). Dissolved oxygen was well below the 2 milligrams per liter considered conducive to fish life during the August survey.

5.4 THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

The USFWS and ODFW were contacted regarding the presence of threatened and endangered species in the geographic area of Kingsley Field ANGB pursuant to the requirements of Section 7(c) of the Endangered Species Act (ESA) (16 U.S.C. 1536) and the Oregon Endangered Species Act, and Oregon administrative rules for threatened and endangered species (Oregon Administrative Code 635-100-0100 to 0130). Under the ESA, an "endangered species" is defined as any species that is in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Table 5-3 includes a list of federal and state listed species occurring in Klamath County, Oregon.

Table 5-3 Federal and State Listed Species in Klamath County, Oregon

Scientific Name	Common Name	Federal Status	State Status
Amphibians			
Rana pretiosa	Oregon spotted frog	T	
Birds			
Charadrius nivosus	Western snowy plover	T	T
Coccyzus americanus	Yellow-billed cuckoo	T	
Strix occidentalis caurina	Northern spotted owl	T	T
Fish			
Chasmistes brevirostris	Shortnose sucker	E	E
Deltistes luxatus	Lost River sucker	E	E
Salvelinus confluentus	Bull trout	T	
Mammals			
Canis lupus	Gray wolf	E	
Gulo gulo	Wolverine	T	T
Lynx canadensis	Canada lynx	T	
Vulpes macrotis	Kit fox		T
Plants			
Astragalus applegatei	Applegate's milk-vetch	E	E
Astragalus peckii	Peck's milk-vetch		T
Botrychium pumicola	Pumice grape-fern		T
Calochortus greenei	Greene's mariposa-lily		C
Eriogonum prociduum	Prostrate buckwheat		C
Gratiola heterosepala	Boggs Lake hedge-hyssop		T
Limnanthes floccosa ssp. *bellingeriana*	Bellinger's meadow-foam		C
Perideridia erythrorhiza	Red-root yampah		C
Pinus albicaulis	Whitebark pine	C	
Rorippa columbiae	Columbia cress		C

Sources: Oregon Department of Agriculture 2017; USFWS 2017; ODFW 2017; Oregon State University 2016.

Notes: E = Endangered
T = Threatened
C = Candidate.

Three listed species are known to occur at Kingsley Field ANGB: Applegate's milk-vetch (*Astragalus applegatei*), shortnose sucker (*Chasmistes brevirostris*), and Lost River sucker (*Deltistes luxatus*). In 2011, an endangered species survey was completed at Kingsley Field ANGB to determine the presence/absence of these species and their habitats on the installation.

Applegate's Milk-Vetch (*Astragalus applegatei*)

Applegate's milk-vetch is a federally endangered and narrowly distributed endemic known to occur only in southern Klamath County, Oregon. Currently occupied sites are located within 5 miles of the city of Klamath Falls. Applegate's milk-vetch was believed extinct until its rediscovery in 1983 (Yamamoto 1985). This species is limited to a very specific soil regime resulting in a very specific habitat type. At one time, this species probably occupied many more areas in the Klamath Basin; however, agricultural and urban development has resulted in widespread depletion, fragmentation, and modification of Applegate's milk-vetch habitat.

Applegate's milk-vetch is a slender, low-growing, vine-like herbaceous perennial in the Fabaceae (pea) family. The plant commonly forms mats close to the ground with simple or branching stems extending approximately 10 to 30 in. long and up to 16 in. tall from the taproot. Applegate's milk-vetch has small, compound leaves, with approximately 7–13 leaflets per leaf, and dark red to brown stems. The plant flowers from June to August, when it produces loose white flowers with lavender or light-pink tips. The Melissa blue butterfly (*Plebejus melissa*) is a specific known pollinator (USFWS 2009).

Applegate's milk-vetch at an airport site.

Fruits are leguminous pods, approximately half an inch long, and mottled purple and green. After the flowering season, the aboveground portion of the plant dies back completely (approximately June to August) and then turn to light brown as the stems dry out and the aboveground portion of the plant dies back completely. Seed dispersal is mostly localized via wind, but may also occur from rodent ingestion or other dispersion methods such as mowing (ANG 2012a).

According to historical studies, Applegate's milk-vetch grows best in flat, open grasslands, characterized by alkaline soils and seasonal flooding. The USFWS determined that habitat for Applegate's milk-vetch at Kingsley Field was enhanced by the ongoing mowing at the airport. The mowing keeps competitive grasses low and prevents the milk-vetch from being shaded out. The USFWS also observed that graveled areas such as road shoulders provided good habitat for the plant on the airport property (ANG 2012a).

Applegate's milk-vetch was discovered in several populations throughout the airport property. During a 2008 survey completed by USFWS, approximately 21,000 plants were documented at 28 distinct sites City of Klamath Falls Airport property (ANG 2012a). Individuals are located primarily on the City Airport's property but also in small patches at Kingsley Field ANGB. During a 2011 follow-up survey, approximately 1,900 individual plants in 22 separate sites were observed at Kingsley Field ANGB (ANG 2012a).

Lost River Sucker (*Deltistes luxatus*) and Shortnose Sucker (*Chasmistes brevirostris*)

Lost River Sucker
Photo by USGS.

Screening level surveys were completed at Kingsley Field ANGB in Summer 2011 to determine the presence of Lost River sucker and shortnose sucker in waterbodies on the installation. Both species are listed as Federally endangered.

Lost River suckers prefer shallow shoreline habitat in both lakes and rivers of the upper Klamath River system, with emergent vegetation that provides cover from predators and invertebrates for food. Preferred shoreline habitat for the shortnose sucker is similar to that of the Lost River sucker, and includes shoreline habitat that is cool in the summer, has

adequate dissolved oxygen, and is moderately alkaline (ANG 2012a). The Lost River sucker typically spawns from late February to May in large tributaries of inhabited lakes. Eggs hatch in about 2–3 weeks, generally in late March to early June. Larvae move downstream to reservoirs; the larval stage typically lasts for 40 to 50 days (ANG 2012a). Spawning of the shortnose sucker typically occurs from early April to early May, also in the tributaries of inhabited lakes, often in shallow rivers with gravel or cobble substrate and moderate flow. Eggs hatch in 2 weeks, often in April to early June. Larvae move downstream toward reservoirs and remain in the larval life stage for 40 to 50 days (ANG 2012a).

During the 2011 survey, one juvenile sucker was identified; juveniles cannot be identified to species (ANG 2012a). The fish survey confirmed limited available fish habitat and the existence of only one endangered sucker within the drainage ditches surveyed on the Base. A small number of Lost River and shortnose suckers have been found in the Lost River Diversion Channel that flows along the southern boundary of the airport property. Although the Diversion Channel does not contain structures (e.g., fish screens) to prevent fish from entering the canal from the Lost River, irrigation canals associated with the Diversion Channel do contain such diversion structures to prevent fish from entering the irrigation canal and airport property. Furthermore, these fish species do not appear to use the diversion canal during irrigation season because the irrigation canals typically lack habitat to support them (Mead & Hunt 2005).

Shortnose Sucker
Photo by USGS.

Migratory Birds

Migratory birds are protected through the Migratory Bird Treaty Act, DoD Migratory Bird Readiness Rule, EO 13186, Bald and Golden Eagle Protection Act (BGEPA), ESA, the National Environmental Policy Act, and the Sikes Act. Federal regulations and EO 13186 provide the framework for regulation of migratory bird take and possession. Federal permits are required to take, possess, transport, and dispose of migratory birds, bird parts, feathers, nests, or eggs. Depredation permits related to take of wildlife species are managed by the Crate Lake-Klamath Airport.

DoD has partnered with the USFWS and state fish and wildlife organizations to implement measures for the conservation of migratory bird species and habitats. A component of conserving migratory species is a base-specific knowledge of which species may be present on an installation, when they are present, and the hazards presented by these species. The DoD Partners in Flight (DoD PIF) program maintains a database of Bird Species of Concern for ANG installations based on a consolidated list of species from eight different priority species lists. A full list of bird species of concern for Kingsley Field can be found at http://www.dodpif.org/resources/bcrmap.php.

In addition to this consolidated list, a DoD PIF Working Group was tasked in 2008 with developing a list of the top 10 species of regional concern. Based on initial lists and meetings, the group produced a final list of bird species on which to focus future DoD avian monitoring efforts; these species are considered mission-sensitive priority species (DoD PIF 2012).

This mission-sensitive priority species list was cross-referenced with the list of species of concern at Kingsley Field to determine mission-sensitive species that have the potential to be found at Kingsley Field ANGB. Mission-sensitive species for Kingsley Field ANGB are listed in Table 5-4.

Table 5-4 Mission-Sensitive Priority Species with the Potential to Occur at Kingsley Field ANGB

Species	Common Name	Conservation Status or Listing	Threats
Haliaeetus leucocephalus	Bald eagle	Federally Delisted, BGEPA	Development, filling of wetlands, habitat loss
Aquila chrysaetos	Golden eagle	Birds of conservation concern, PIF High Regional Priority, BGEPA	Trapping, agriculture, development
Falco mexicanus	Prairie falcon	Birds of conservation concern, PIF High Overall Priority	Development, agriculture, aircraft overflights, military training
Coturnicops noveboracensis	Yellow rail	Birds of conservation concern, PIF High Overall Priority	Habitat loss due to intensive livestock grazing, wetland draining and vegetation changes
Bartramia longicauda	Upland sandpiper	Shorebird Conservation Plan Species of High Concern	Lodgepole pine encroachment on meadows from fire suppression
Numenius americanus	Long-billed curlew	Birds of conservation concern, PIF High Regional Priority, Shorebird Conservation Plan Highly Imperiled Species	Habitat loss, conversion of grassland and agricultural land to other croplands, human disturbance of breeding
Athene cunicularia	Burrowing owl	Birds of conservation concern	Habitat loss, burrow availability, vehicle collisions
Melanerpes lewis	Lewis's woodpecker	Birds of conservation concern, PIF High Overall Priority	Habitat loss and degradation, competition with European starlings (*Sturnus vulgaris*)
Lanius ludovicianus	Loggerhead shrike	Birds of conservation concern	Habitat loss, including loss of sagebrush from high-intensity wildfires
Vireo vicinior	Gray vireo	Birds of conservation concern	Habitat alteration
Spizella breweri	Brewer's sparrow	Birds of conservation concern, PIF High Overall Priority	Cheatgrass invasion in sagebrush, nesting habitat fragmentation
Amphispiza belli	Sage sparrow	Birds of conservation concern, PIF High Overall Priority	Habitat loss, cowbird parasitism
Agelaius tricolor	Tricolored blackbird	Birds of conservation concern, PIF High Overall Priority	Habitat loss and nest colony failure,
Source: DoD PIF 2012; DoD PIF 2017; ODFW 2016; Cornell Lab of Ornithology 2017.			

Mission-sensitive priority species are those that are at a greater threat of being negatively impacted by mission activities. At Kingsley Field ANGB, activities that may impact sensitive species include habitat loss resulting from development or incompatible land management, mission-related activities that result in disturbance to breeding, resting, or foraging.

5.5 WETLANDS AND FLOODPLAINS

5.5.1 Wetlands

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (U.S. Army Corps of Engineers [USACE] 1987). Wetland functions include groundwater recharge/discharge, flood/flow alteration, sediment stabilization, sediment and toxicant retention, nutrient removal and transformation, aquatic and terrestrial diversity and abundance, and uniqueness. In Oregon, activities occurring within a wetland are regulated by both the Oregon Department of State Lands (DSL) and USACE. Wetlands are protected as a subset of the "waters of the United States" under Section 404 of the Clean Water Act (CWA). The term "waters of the United States" has broad meaning under the CWA and incorporates deep water aquatic habitats and special aquatic habitats (including wetlands). Jurisdictional waters of the United States are areas regulated under the CWA and also include coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, vernal pools, and "other" waters that if degraded or destroyed could affect interstate commerce.

Wetland areas are determined using the routine onsite determination method described in the USACE *Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE 2010). The wetland delineation method requires the investigation of three wetland parameters:

- ***Hydrophytic Vegetation***—Classified by the estimated probability of occurrence in wetland versus non-wetland areas throughout its distribution.

- ***Hydric Soils***—Soils that are saturated, flooded, or ponded for sufficient periods during the growing season and that develop anaerobic conditions in their upper layers.

- ***Hydrological Characteristics***—Determined by the frequency of flooding, duration of inundation, and soil saturation.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill materials into the waters of the United States, including wetlands. Therefore, even an inadvertent encroachment into wetlands or other waters of the United States that results in displacement or movement of soil or fill materials has the potential to be viewed as a violation of the CWA if an appropriate permit has not been issued by USACE. In Oregon, areas fall under the jurisdiction of USACE or the DSL. DSL implements the 1989 Wetlands Conservation Act. DSL's staff provide public information about wetlands, help local governments with wetland inventories and planning, sponsor studies, and develop wetland management tools such as wetland evaluation methods. In addition, the staff also assist property owners with wetland determinations and reviews wetland delineations prepared for removal-fill permits and other projects. Wetlands Program materials, including fact

sheets, research reports, and technical documents, are provided for use by local planners, the public, wetland consultants, and other scientists.

Wetlands are also protected under EO 11990, *Protection of Wetlands* (43 Federal Register 6030) (National Archives and Records Administration 1977). The purpose of this EO is to reduce adverse impacts associated with the destruction or modification of wetlands. If impacts to wetlands are anticipated, a Finding of No Practicable Alternative (FONPA) must be submitted to the Major Command Environmental Planning Function (32 CFR 989.14 (g)). The FONPA includes consideration of practicable alternatives that will meet justified program requirements to ensure they are within legal authority of the USAF, meet technology standards, are cost-effective, do not result in unreasonable adverse environmental impacts, and other pertinent factors.

Wetlands were delineated and mapped at Kingsley Field ANGB in 2012, and re-delineated in 2013 to address questions from DSL regarding the presence and absence of waters and wetlands identified in a 2004/2005 delineation (ANG 2014). During the investigation 15 potentially jurisdictional Waters of the United States and wetlands were delineated within the investigation area totaling 1.00 acre. This included 0.30 acre of potentially jurisdictional wetland, 0.2 acre of potentially jurisdictional relatively permanent waterway (RPW), and 0.49 acre of potentially jurisdictional non-relatively permanent waters (non-RPW) (ANG 2014). Of these, 0.3 acre of palustrine emergent wetland and less than 0.01 acre of non-RPW were considered isolated (ANG 2014).

Five palustrine emergent wetlands totaling 0.3 acre were delineated. Table 5-5 outlines the wetlands delineated during the 2013 survey.

The USACE prepared a Preliminary Jurisdictional Determination for Kingsley Field ANGB based on the 2014 wetland delineation. This Preliminary Jurisdictional Determination covers the boundaries of all the features identified in the 2013 surveys, which included 0.3 acre of wetland and 3,931 linear feet of waterways at Kingsley Field (ANG 2014). DSL also reviewed the wetland delineation completed at Kingsley Field for the purposed of applicability of the Oregon State Removal-Fill Law (OAR 141-085-0515[8] & [10]) and concurred with the wetland delineation with some revisions. This included the exemption of 4 of the 10 waterways (KF-5, KF-6, KF-7, and KF-10) from state permit requirements for Removal-Fill (ANG 2014). Approximately 23 acres of wetlands have been filled by implementing the airport's Wildlife Habitat Management Implementation Plan (Mead and Hunt 2005).

Table 5-5 Wetlands and Waters Delineated at Kingsley Field ANGB

Name	Acreage	Description
Wetlands		
KF-8	<0.01	Palustrine emergent depressional wetland that is a portion of a 6.93-acre wetland adjacent to the boundary of Kingsley Field ANGB. Species include Baltic rush (*Juncus balticus*), broadleaf cattail (*Typha latifolia*), and meadow foxtail (*Alopecurus pratensis*).
KF-9	0.06	Palustrine emergent isolated wetland dominated by pauiteweed (*Suaeda calceoliformis*), red top (*Agrostis capillaris*), greasewood (*Sarcobatus vermiculatus*), clasping pepperweed (*Lepidium perfoliatum*), saltgrass (*Distichlis spicata*), and spreading alkaliweed (*Cressa truxillensis*).
KF-16	0.10	Palustrine emergent depressional wetland in the vicinity of an old road berm. Dominant vegetation included Nuttall's alkaligrass (*Puccinellia nuttalliana*) and five-hook bassia (*Bassia hyssopifolia*).
KF-17	0.07	Palustrine emergent isolated depressional wetland dominated by saltgrass.
KF-18	0.06	Palustrine emergent isolated depressional wetland composed solely of by pauiteweed (*Suaeda calceoliformis*).
Waters of the U.S.		
KF-1	<0.01	RPW stormwater swale along the edge of the runway that eventually drains to the Lost River with Baltic rush and hardstem bulrush (*Schoenoplectus acutus*).
KF-5	<0.01	Non-RPW stormwater swale fed by stormwater runoff.
KF-6	0.01	Non-RPW stormwater swale that drains a paved area and flows to KF-5.
KF-7	<0.01	Non-RPW stormwater swale that drains to KF-6.
KF-10	0.01	Non-RPW stormwater swale that drains upland areas and contained wheatgrass (*Elymus hispidus*), foxtail barley (*Hordeum jubatum*), and poverty weed (*Iva axillaris*).
KF-11	0.21	RPW stormwater swale dominated by hydrophytic vegetation including common spikerush (*Eleocharis palustris*), Baltic rush, perennial pepperweed (*Lepidium latifolium*), hardstem bulrush, and common cattail (*Typha latifolia*).
KF-12	0.20	Non-RPW stormwater swale draining upland areas.
KF-13	0.02	Non-RPW stormwater swale dominated by common yarrow (*Achillea millefolium*), saltgrass, Baltic rush, common hareleaf (*Lagophylla ramosissima*), and Kentucky bluegrass (*Poa pratensis*).
KF-14	0.02	Non-RPW stormwater swale that eventually drains to the Lost River. Dominant vegetation observed includes Great Basin wild rye (*Elymus cinerus*), Kentucky bluegrass, and yellow salsify (*Tragopogon dubius*).
KF-15	0.22	Non-RPW stormwater swale that connects to the stormwater system and eventually drains to the Lost River. Vegetation included saltgrass and Nuttall's alkaligrass.
Source: ANG 2014.		

5.5.2 Floodplains

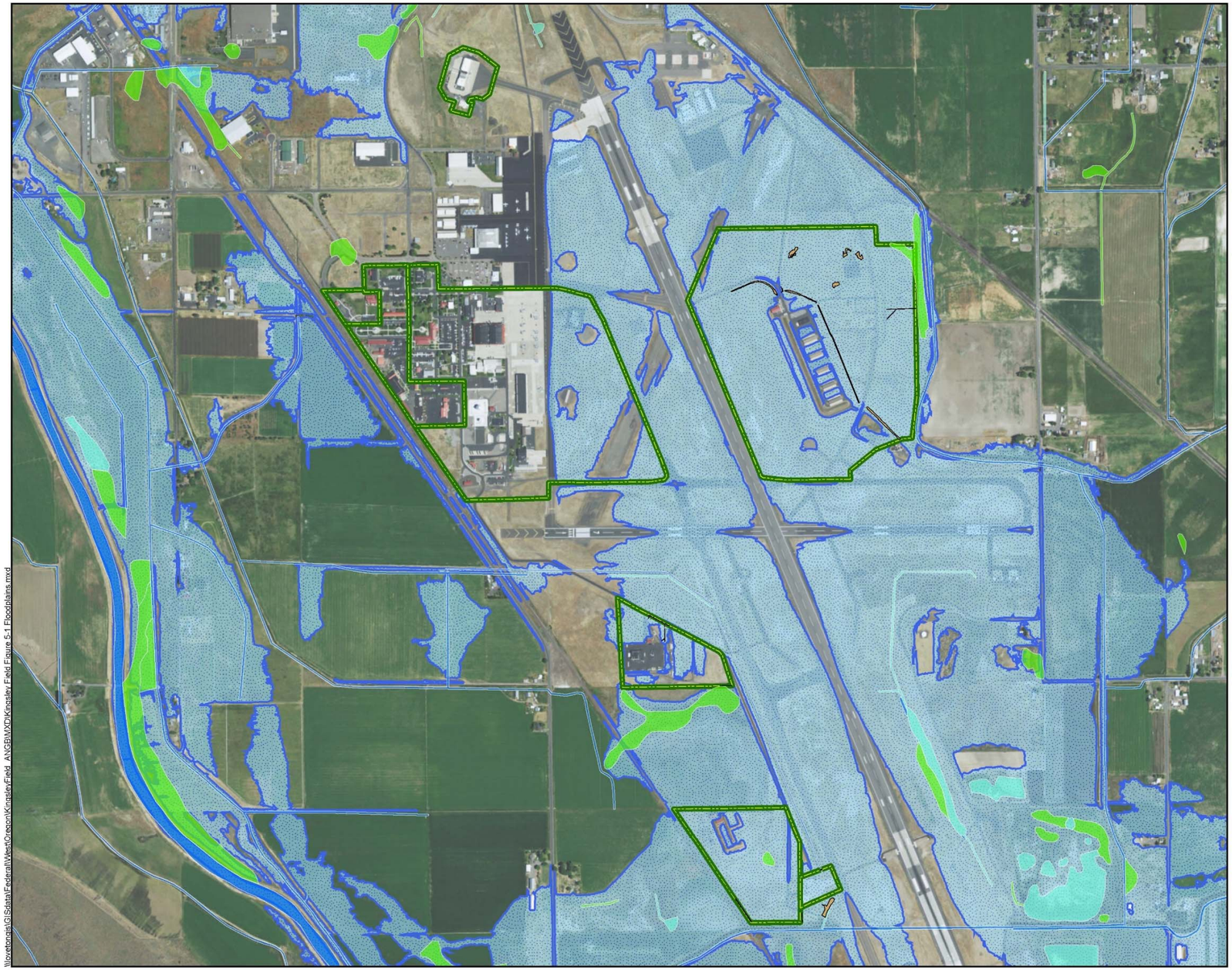
EO 11988, *Floodplain Management,* issued 24 May 1977, requires all federal agencies to provide leadership and take action to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of federal lands. EO 11988 is implemented through the CWA and 44 CFR Part 9, *Floodplain Management and Protection*

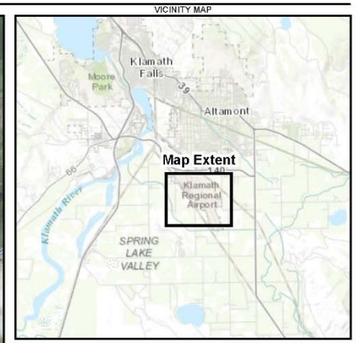
of Wetlands. Floodplains are defined in this EO as "the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands including, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year." Flooding in the 100-year floodplain is expected to occur from a flood that has a 1 percent probability of occurring in any given year; therefore, the 100-year floodplain has an annual probability of exceedance of 1 percent.

All developed portions of Kingsley Field are located outside any floodplains identified by the Federal Emergency Management Agency (FEMA), though the airfield is within the 100-year floodplain (Figure 5-1). These areas are designated as FEMA Zone C, defined as outside the 1 percent-annual-chance floodplain, areas of 1 percent annual chance of sheet-flow flooding, where average depths are less than 1 ft; areas of 1 percent annual chance of stream flooding, where the contributing drainage area is less than 1 square mile; or areas protected from the 1 percent annual chance of flooding by levees. No base flood elevations or depths are shown within this zone. Flood insurance is not required in these zones. Extensive modifications of natural drainage patterns at the airport and in its vicinity have been implemented to preclude flooding (ORANG 1998).

5.6 OTHER NATURAL RESOURCE INFORMATION

Currently, no other biological inventories and surveys have been conducted on the installation that provide information applicable to natural resources program management.





Legend

- Installation Boundary
- 100 yr Floodplain
- Freshwater Pond
- Riverine
- Freshwater Emergent Wetland
- Wetland Boundary from 2014 Survey

Map Date: 9/22/2017
Data Sources: ESRI 2016, FEMA 2014, USFWS 2017, Kingsley ANGB 2017
Projection: WGS 1984 UTM 10N Meter

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\\loveelongis\GIS\data\Federal\West\Oregon\KingsleyField_ANGB\MXD\Kingsley Field Figure 5-1 Floodplains.mxd

Figure 5-1
Floodplains
Klamath County, Oregon

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6. MISSION IMPACTS ON NATURAL RESOURCES

6.1 NATURAL RESOURCES CONSTRAINTS TO MISSIONS AND MISSION PLANNING

The Sikes Act requires that INRMPs provide for "…no net loss in the capability of military installation lands to support the military mission of the installation" (16 U.S.C. §670 et seq.). The INRMP enables the installation to meet the requirements of the military mission within the limitations and legal restrictions of the baseline natural resources at Kingsley Field ANGB.

Environmental constraints, such as the presence of endangered species, dictate where and when certain types of activities can occur to ensure regulatory compliance and long-term sustainability of natural resources on the installation. Kingsley Field ANGB will manage environmental constraints during training and mission activities. Natural resources that have the ability to limit activity on the installation are shown in Figure 6-1. Activities in and around wetland areas are limited because impacts such as filling, modifying, draining, or construction may require federal, state, and local permits, and mitigation to offset permitted impacts. Any new training within these areas should be coordinated with the installation's environmental staff to ensure that actions are in compliance with all applicable laws. However, various maintenance activities occur within wetland areas for consistency with the BASH program. Maintenance activities include mowing of airfield grasses and herbaceous habitat within the wetlands in proximity to the airfield. There is also recurring maintenance of the existing stormwater conveyance systems that transverse wetlands that require routine maintenance to protect property and prevent increases in wildlife hazard attractant concerns under the BASH program. Construction within the 100-year floodplain should be avoided or minimized to prevent future damage to installation property.

6.2 LAND USE

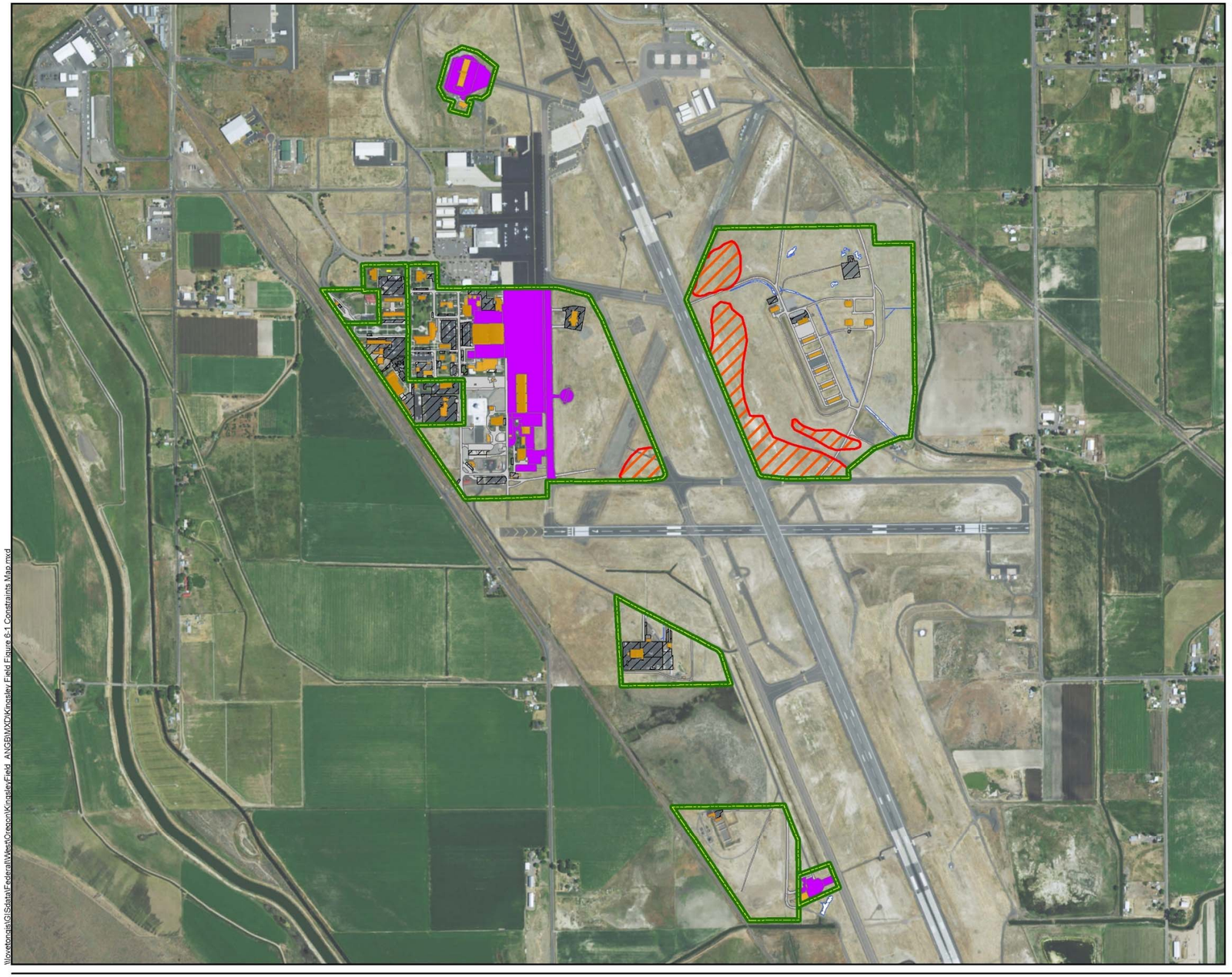
The 173 FW is located at Kingsley Field ANGB and comprises 313.87 acres of exclusive use, as well as acres under joint use with the airport. The majority of the land is owned by the City, and small parcels that belong to the USAF and the Bureau of Reclamation are leased to the ORANG. The 173 FW Master Plan guides development at the installation and has established eight zoning classifications: safety zones and airfield clearance areas, airfield pavement areas, aircraft operations, maintenance facilities, industrial facilities, command and support facilities, special categories, and open space. The majority of the joint use land at the installation is open space surrounding the runways. Kingsley Field ANGB is divided into several uses, including the Main Cantonment Area where Command and Support is located, the former Alert Facility (located in the northern section of the airport boundary), the 500 Area (munitions) and ground control approach turntable, the Southeast parcel, and the Munitions Storage Area.

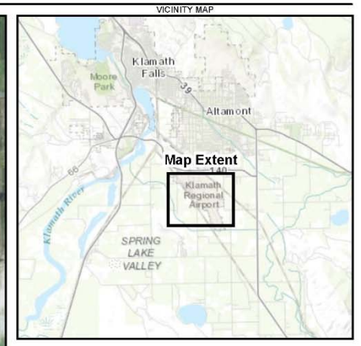
Of these areas, open space and industrial are the most prevalent land-use classifications. Open space includes permanent open space and temporary open space reserved for future development. Industrial encompasses the Base Civil Engineering facility; shops and storage; Base Supply; Petroleum, Oils, and Lubricants Complex; parking; motor pool; and tenant activities.

Land use on the installation can be divided into three general categories: improved, semi-improved, and unimproved. Improved lands include all areas occupied by buildings, other structures, and intensely maintained lawns/landscaping. Semi-improved grounds include lawns/landscaped areas where periodic maintenance occurs. Unimproved grounds are more natural areas that are not maintained such as forested areas. Table 6-1 further describes the land use categories at Kingsley Field ANGB.

Table 6-1 Land Use Categories on Kingsley Field ANGB

Land Use Category	Description	Land Cover
Improved	Improved or developed lands that are highly disturbed. Includes land occupied by buildings and other structures as well as lawns and landscaping which receive intensive maintenance activities. Improved grounds include the main cantonment area, former Alert Facility, the 500 Area (munitions), the ground control approach turntable, the Southeast parcel, and the Munitions Storage Area.	Highly disturbed and developed landscape
Semi-Improved	Areas with open space that contain roads, small buildings, and other minor improvements. A majority of the area surrounding the runways is considered open space, and would fall under this category. Semi-improved land at Kingsley Field ANGB includes areas reserved for future development.	Open space with minor improvements





Legend

- Installation Boundary
- Airfield Surface
- Athletic Court and Field
- Building
- Parking Area
- Road
- Wetland Boundary from 2014 Survey
- Applegate's Milk-vetch Zone

Map Date: 9/22/2017
Data Sources: ESRI 2016, Kingsley ANGB 2017
Projection: WGS 1984 UTM 10N Meter

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0 1,000 2,000
Feet

Figure 6-1
Kingsley Field ANGB
Constraints Map
Klamath County, Oregon

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6.3 CURRENT MAJOR IMPACTS

Kingsley Field ANGB is home to the 173 FW, with a mission to "Produce the Best Air-to-Air Combat Pilots, Intelligence Specialists, and Healthcare Professionals and Serve Our State and Nation in Times of Peace and War." As part of that mission, the installation provides a broad range of services and capabilities to both Oregon and the nation.

Authorized personnel levels at the 173 FW totaled 800 personnel with drill weekend training conducted once a month. Full-time personnel totaled approximately 226 active guard reserves and technicians. Total personnel associated with the 173 FW also include traditional guardsmen (248 personnel), full-time federal service technicians (Title 32) (255 personnel), and State Employees (71 personnel). ORANG's 270th Air Traffic Control Squadron (270 ATCS) and the Oregon Army National Guard's 182d Calvary Infantry are tenant organizations of the 173 FW (ORANG 2017). The Base is home to nine additional tenants, including the Army Guard, Army and Air Force Exchange Service, STARBASE, First Community Credit Union, Freedom Cuts, Boeing, Lockheed Martin, Civil Air Patrol, and the U.S. Department of Agriculture (USDA). The primary aircraft assigned to the Base is F-15 Eagle (ORANG 2017).

The following discussion focuses on Kingsley Field ANGB current impacts to the local environment, including hazardous materials/wastes, noise, air quality, fire management, and pest management.

Hazardous Materials and Hazardous Wastes

Hazardous materials are those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended, and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA). In general, hazardous materials include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, could present substantial danger to public health or welfare or the environment when released. The operation of aircraft, vehicles, and equipment requires the use of various hazardous materials including fuels, solvents, and lubricants. If released, these materials have the potential to harm the environment by impacting air, soil, and water quality.

In support of its primary missions, Kingsley Field ANGB has stored and used various kinds of hazardous materials during its history, including fuels, oils, paints, and solvents. Hazardous materials are used at Kingsley Field ANGB in association with aircraft maintenance and other aspects of the mission. To minimize additional, avoidable releases of hazardous materials into the environment, the Base has implemented safeguards in the storage, use, and disposal of hazardous materials. Kingsley Field holds a Hazardous Waste permit from ODEQ, and is recognized as a small quantity generator. The site includes several small waste storage areas and a central accumulation point. ODEQ has a Green Permit program to recognize superior environmental performance by governmental facilities and businesses regulated by ODEQ; Kingsley Field ANGB has held a Green Environmental Management Systems Leader Permit (Tier III) since 2000 (ORANG 2011).

Hazardous materials stored and used at Kingsley Field ANGB include solvents, compressed gases, herbicides, fertilizers, pesticides, paint, disinfectants, lubricant oils, antifreeze, de-icing fluids, cleaning supplies, paints, adhesives, brake/hydraulic fluids, batteries, grease, corrosion products, chemicals, and miscellaneous materials. A survey conducted in 2006 also found the presence of asbestos-containing material at Kingsley Field ANGB. Most of this material has been removed, and an Asbestos Management Plan is used by the 173 FW to remain compliant with applicable requirements during construction and demolition (ORANG 2011).

The Installation Restoration Program (IRP) is designed to identify, investigate, and clean up contamination associated with past activities at installations. IRP activities are conducted in accordance with the requirements of either the Federal Superfund Cleanup Process or the RCRA corrective action process, as appropriate. The IRP cleanup process closely follows the requirements of the National Contingency Plan as promulgated under CERCLA, as amended. The IRP seeks to minimize public health and environmental hazards associated with contaminated sites. The ANG began conducting environmental restoration activities to address environmental site contamination at Kingsley Field ANGB in 1982. Twelve potential Environmental Restoration Program sites were identified, and three additional sites were identified by USEPA in 1992 (ODEQ 2017). To date, the ANG and ODEQ have been working corporately to address the state regulator's specific environmental requirements at the Base. Several areas of concern have been recommended for a No Further Action (NFA) as a result of cleanup efforts. An NFA was issued in 2013 for the former skeet range and shotgun firing platform, and Kingsley Field ANGB obtained NFAs for five additional sites in 2014 (ODEQ 2017).

Noise

Noise is perhaps the most identifiable environmental problem associated with aircraft operations, and is often singled out for special attention and criticism by local communities. Kingsley Field does not currently have an Air Installation Compatible Use Zone Report. Typical training at Kingsley Field includes two exercise periods per day, conducted between the hours of 0900 and 1100, and again between 1300 and 1500, and generally consists of between eight and twelve aircraft (Matrix Design Group 2016).

As the only F-15 Formal Training Unit in the USAF, the primary mission of the 173 FW is to train pilots for air-to-air combat for the ANG and USAF. During training, pilots from the ANG Air Superiority Fighter and USAF Combat units are trained by the 173 FW to fly F-15 aircraft in two primary courses: (1) the Basic Course, a 6-month program designed for pilots with no fighter experience; and (2) the Transition Course, lasting about 3 months, geared toward fighter pilots that are new to the F-15 aircraft. During both courses, student pilots learn to employ the F-15 through all phases of flight from take-off and landing to advanced air-to air tactics. The unit is currently allotted 6,200 flight hours, resulting in approximately 4,770 annual sorties and an average sortie duration of 1.3 hours. A sortie represents a single takeoff, performance of a mission, and landing. An operation is defined as a subset of a sortie that accounts for an individual flying activity within an individual piece of training airspace. There can be multiple operations per sortie (ORANG 2017).

Training requirements for active-duty and reserve components of the USAF are set forth in the Ready Aircraft Program; this includes requirements for F-15 pilots in Advanced Handling Characteristics, Air Combat Maneuvering, Air Combat Tactics, Basic Fighter Maneuvering, Low Air-to-Air, Low Altitude Navigation, Low/Slow Visual Identification, Slow Shadow Training, and Tactical Intercepts (ORANG 2017). Training by the 173 FW is conducted predominantly in the Goose, Juniper, and Hart MOAs.

The significant noise sources at Kingsley Field ANGB include aircraft warm-up, maintenance and testing, taxiing, takeoff, approach, and landing. Day-night average sound level is a noise metric that averages A-weighted sound levels (a weighted sound measurement that emphasizes sounds most audible to the human ear) over a 24-hour period, with an additional 10-decibel penalty added to noise events occurring between 2200 and 0700 hours (ORANG 2011). This penalty is intended to compensate for generally lower background noise levels at night and the additional annoyance of nighttime noise events. Acreages of land associated with the noise contours for Kingsley Field are provided in Table 6-2.

Table 6-2 Noise Contour Acreages Associated with Kingsley Field ANGB

Noise Level (L_{dn})	Total Acreage	Acreage Beyond Airport Boundary
65-69	1,588.7	1,419.8
70-74	539.1	312.2
75-79	291.8	56.8
80-84	499.0	13.4
Total >65	2,981.6	1,802.2

Source: ORANG 2011.

Note: L_{dn} = Day-night average sound level.

Although the noise generated from low-altitude military overflights can be initially startling to wildlife, habituation to jet aircraft noise occurs with most wildlife and domestic species. Species-specific responses to low-altitude overflights vary considerably, and responses from individual animals could have the potential to cause injury. Variations in responses also have been documented among homogeneous species under similar environmental conditions (USDA 1992). However, animal responses to aircraft noise depend on numerous factors, including the physical features of the environment and the animals' own physiological attributes. Wildlife populations usually are affected only when a variety of factors combine to affect them (e.g., declines or fluctuations in the availability of a food source, habitat destruction or alteration, predation, hunting, trapping, poaching, disease, or inclement weather) rather than noise alone. Normally, it would be unrealistic to predict or attribute any wildlife population decline to a single stressor, such as noise. In addition, no published scientific evidence was identified that indicated harm might occur to wildlife as a result of exposure to the levels of noise generated by military aircraft using Kingsley Field ANGB.

Air Quality

In accordance with Federal Clean Air Act requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The significance of a pollutant concentration is determined by comparison with federal or state air quality standards. These standards represent the maximum allowable concentrations of specified pollutants and are established to protect public health and welfare with a reasonable margin of safety.

The release of air pollutants is regulated under both federal and Oregon statutes. The National Ambient Air Quality Standards (NAAQS) are federal standards established by the USEPA. USEPA has given attainment status (in compliance) or nonattainment status (out of compliance) to county areas for designated criteria pollutants including ozone, carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM10), sulfur dioxide, nitrogen oxides, and volatile organic compounds.

Klamath County contains non-attainment areas for particulate matter less than 2.5 microns in diameter (PM2.5), and is considered a maintenance area for PM10 and CO. Maintenance areas have associated maintenance plans to ensure continued compliance with pollutant standards (ORANG 2017). Kingsley Field ANGB is within the Klamath Falls PM2.5 Nonattainment Area, as well as the Klamath Falls Urban Growth Boundary Maintenance Area for CO and PM10. The primary emissions resulting in the PM2.5 non-attainment area are a result of woodstoves, but combustion resulting from aircraft activities contributes to CO emissions. In the Klamath Falls area, facilities are considered to be large-quantity generators, and would require special operating permits under the Clean Air Act Title V program, if potential stationary emissions of any NAAQS-regulated criteria pollutant exceeded 100 tons per year. Based on an emissions inventory conducted for the 173 FW at Kingsley Field in calendar year 2007, emissions for stationary source air emissions did not exceed the 100-tons-per-year threshold limit and no Title V operating permits are required for the 173 FW (ORANG 2011).

Pest Management

Pest management programs at Kingsley Field have the potential to benefit natural resources. Some pest species require the use of invasive management protocols. Use of insecticides, herbicides, rodenticides, and fungicides to control indigenous pest populations is carefully managed. Many pesticides are inherently toxic to most biological systems and, as such, have no natural degradation pathways and can persist for long periods in the environment. The presence of such compounds can degrade the quality of soil, surface water, and groundwater. Wildlife and human life could be detrimentally affected by any inadvertent contact with pest management chemicals.

The DoD Armed Forces Pest Management Board establishes policy for installation IPM programs, based on IPM principles, including judicious use of pesticides in controlling pests. The Pest Management Program incorporates the provisions of DoDI 4150.07. The instruction states that it is DoD policy to establish and maintain safe, effective, and environmentally sound IPM programs to prevent or control pests and disease vectors that might adversely impact

readiness or military operations by affecting the health of personnel or damaging structures, material, or property.

IPM should use mechanical, physical, cultural, biological, and educational methods to maintain pests at populations low enough to prevent undesirable damage or annoyance. In addition, application of the least toxic chemical should be used as a last resort.

The Kingsley Field Pest Management Plan meets DoD policy requirements, including those outlined in DoDI 4150.7, *DoD Integrated Pest Management Program*. Control measures for species that may be detrimental to the health and welfare of installation personnel and property are part of the plan, including rats and mice; mosquitos; bees, hornets, and wasps; spiders; ants; stored product pests; European starlings; feral cats and dogs; lawn and landscape pests; undesirable plants; and Canada geese (ORANG 2010).

6.4 POTENTIAL FUTURE IMPACTS

Construction of new buildings and facilities will continue on Kingsley Field ANGB, in support of its current missions and demands of modernization. The discrete and cumulative impacts on the local environment must be continually evaluated.

6.5 NATURAL RESOURCES NEEDED TO SUPPORT THE MILITARY MISSION

The primary purpose of the natural resources management at Kingsley Field ANGB is to support the military mission by maintaining sustainable natural resources as a critical asset upon which to accomplish the mission of Kingsley Field ANGB. Overall goals of natural resource management include:

- No net loss in the capacity of the installation lands to support existing and future military operations at Kingsley Field ANGB

- Ensure military operations are not interrupted due to non-compliance with applicable laws.

This INRMP integrates the various aspects of natural resources management into the military mission, and is the primary tool for ecosystem management at Kingsley Field ANGB while ensuring the successful, efficient accomplishment of the military mission. A multiple-use approach will be implemented through the INRMP to accommodate the presence of mission-oriented activities and provide for good stewardship, thereby maintaining and improving the quality, aesthetic values, and ecological relationships of the environment. Implementation of this INRMP will promote stewardship practices that protect and enhance natural resources for multiple use and biological integrity, while supporting the military mission. Mission activities at Kingsley Field ANGB consist primarily of installation operation and maintenance. The mission of Kingsley Field ANGB does not require consumption or use of natural resources on the installation.

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7. NATURAL RESOURCES PROGRAM MANAGEMENT

7.1 NATURAL RESOURCES PROGRAM MANAGEMENT

The INRMP Program has been organized to ensure the implementation of year-round, cost-effective management activities and projects that meet the requirements of Kingsley Field ANGB. The Sikes Act requires that INRMPs provide for no net loss in the capability of military installation lands to support the military mission of the installation. Professionally trained natural resources management staff and natural resources enforcement are required to implement this INRMP. The Sikes Act Improvement Act Section 670g defines a "professional" as one who has an undergraduate degree or graduate degree in a natural resources-related science. As defined in paragraph 2.10 of AFI 32-7064, "installations will use professionally trained natural resources management personnel to develop, implement and enforce their INRMPs." Kingsley Field ANGB does not have a Natural Resources Manager, but natural resources issues at the installation are handled by a variety of sources, including the Environmental Officer for Kingsley Field ANGB, installation personnel, the airport, and government contractors. USDA Wildlife Services (USDA-WS) personnel also support the INRMP Program as necessary under the BASH program. In addition to NGB/A4AM, Kingsley Field ANGB, and government-contracted personnel, ORANG personnel will be required to implement this plan. The Sikes Act also states that if an installation cannot retain a professional natural resources staff, related federal or state agencies be given the opportunity to assume these tasks. Responsibilities of the various organizations on Kingsley Field ANGB for the implementation of the INRMP are described below.

- **INRMP Working Group**—The INRMP Working Group will be a subgroup of the Environment, Safety, and Occupational Health Council (ESOHC), and will be responsible for the overall implementation of the INRMP. The INRMP Working Group will be made up of the key installation personnel from Kingsley Field ANGB, and will assume an oversight role to ensure the effective implementation of this plan. The Environmental Officer or other appropriate personnel shall chair this organization, and shall establish subcommittees composed of installation personnel and outside agencies to focus on high-level priority natural resources management issues such as threatened and endangered species, erosion and sedimentation, and fish and wildlife management. Top- and middle-level management representation, as well as representation from several individuals with day-to-day on-installation field experience, will provide the INRMP Working Group with the leadership and structure necessary for the successful implementation of this INRMP. Working group meetings will take place every 4 to 6 months or as needed, and the implementation of issues in this plan that pertain to the BASH Reduction Program will be discussed in Airfield Management and Wing Safety Office meetings.

- **Kingsley Field ANGB Personnel**—A number of Kingsley Field ANGB personnel have provided expertise vital to the creation of this interdisciplinary, ecosystem-based natural resources management plan. A coordinated effort of on-base organizations and personnel will be required to implement the INRMP. These organizations will also play a vital role in the yearly review of the management objective and natural resources topics of concern

presented in this plan. Organizations in addition to the ones identified above may be solicited to aid in the 5-year evaluation and revision of this plan as required by the Sikes Act if additional expertise is required. Table 7-1 summarizes the management roles and responsibilities of key organizations on Kingsley Field ANGB. All personnel working on the Base have a personal responsibility to exercise good stewardship of base natural resources in day-to-day activities.

- **Other Agencies**—The USFWS and the state agencies may provide technical assistance to Kingsley Field ANGB. To date, state agencies providing assistance have included ODFW. As cooperating agencies to this plan, these agencies should alert the Kingsley Field ANGB environmental manager whenever new species that might inhabit the Base are added to the federal or state endangered species lists. These agencies should support Kingsley Field ANGB personnel during scheduled wildlife and vegetation surveys. The USFWS and state agencies also will support the development of operational component plans to be developed in conjunction with implementation of this INRMP.

Offices in addition to the ones identified above can be solicited to aid in the 5-year evaluation and rewrite of this plan as required by the Sikes Act, should additional personnel and expertise be required.

Table 7-1 INRMP Management Roles and Responsibilities of Key Organizations at Kingsley Field ANGB

Group	Squadron	Flight/Staff	Responsibilities
Wing Staff	173rd Fighter Wing (173 FW)	Commander	• Chairman, ESOHC
	173 FW	Judge Advocate	• Regulatory Interpretation Off-Base Dispute/ Complaint Resolution • Legal Representation
	173 FW	Flight Safety	• BASH Monitoring and Minimization (on and off base)
Medical Group	173 FW	Bioenvironmental Engineer	• Drinking Water Quality Monitoring
	173 FW	Military Public Health	• Zoonosis Monitoring • Mosquito and tick surveillance
Operations Group	Operations Support	Airfield Management	• Airfield Grounds Maintenance BASH Monitoring and Minimization • Organize and conduct Bird Hazard ESOHC (Bird Hazard Working Group) and hold required meetings
Support Group	Civil Engineering	Base Civil Engineer - Planning	• Installation Development Plan
	Civil Engineering	Base Civil Engineer – Engineering	• Stormwater/Erosion Control and Landscaping • Specification for New Construction
	Civil Engineering	Operations	• Oil/Water Separator Maintenance • General Grounds Maintenance • Pest Management (including airfield animal dispersal and control)

Table 7-1 INRMP Management Roles and Responsibilities of Key Organizations at Kingsley Field ANGB

Group	Squadron	Flight/Staff	Responsibilities
	Civil Engineering	Environmental	• INRMP • Wildlife Management • Hazardous Waste Management • Environmental Restoration Program • Air Quality Monitoring/Compliance • Water Quality Compliance • Environmental Impact Assessment Process • Wetland Issues • Pollution Prevention • NPDES Stormwater Quality Monitoring
	Security Police	Operations	• Wildlife removal from airfield
	Services	Outdoor Recreation	• Nature Education/Outdoor Recreation Activities • Outdoor Recreation Equipment Rental/Check Out

7.2 FISH AND WILDLIFE MANAGEMENT

Wildlife management is defined as manipulation of the environment and wildlife populations to produce desired objectives. Management can be performed in a manner that enhances biodiversity through the reestablishment of native habitats. Conversely, habitat management could be required to decrease the abundance of certain wildlife species to reduce animal damage or bird strike hazards. Traditionally, wildlife management was confined to large tracts of naturally vegetated land. ANG determined that Kingsley Field ANGB has habitat that warrants the preparation of this INRMP.

The State of Oregon has developed a wildlife action plan, entitled the Oregon Conservation Strategy. The Strategy provides a non-regulatory approach to species and habitat conservation. The Oregon Conservation Strategy contains information on species and habitats most in need of conservation action, the issues and problems affecting them, and key conservation actions, research, and monitoring needed to address those issues. It also presents ideas for expanding and improving voluntary conservation tools; briefly discusses education, tourism, and other ways to engage citizens in conservation; and describes many successful cooperative conservation projects (ODFW 2016). The systematic approach to wildlife management advocated by this INRMP will help to meet the goals of the State Wildlife Action Plan by implementing inventory, monitoring, modeling, management, and assessment of wildlife at Kingsley Field. Specific topics of interest and actions in this INRMP are consistent with the Oregon Conservation Strategy.

Wildlife population and habitat management on Kingsley Field ANGB will attempt to deter animals from foraging or roosting near or adjacent to areas where they would conflict with ANG missions and actions, or where they present a risk to safety or operations. Management actions include attracting wildlife away from these areas to more suitable locations, and protecting and conserving threatened and endangered species through habitat conservation at selected locations at the installation. Kingsley Field ANGB does not encourage the population growth of prey species because of their incompatibility with flying operations. This approach has been chosen

owing to the near impossible scenario of excluding all wildlife species that pose a significant threat to the safety of the flying mission from the Base.

The day-to-day management of fish and wildlife resources and enforcement of applicable laws and policies at Kingsley Field ANGB are the responsibility of the Installation Commander. Hunting and fishing is not permitted at Kingsley Field. Natural resources, including fish and wildlife, are managed in partnership with the City of Klamath Falls, which operates the Crater Lake-Klamath Regional Airport. Nuisance species (e.g., deer, small mammals, coyotes, and birds) are managed due to BASH issues. A contractor from the USDA-WS is responsible for management of fish and wildlife issues at Kingsley Field ANGB and the airport; all permits for depredation are held by the contractor.

7.3 OUTDOOR RECREATION AND PUBLIC ACCESS TO NATURAL RESOURCES

Due to inherent dangers associated with the Base mission and the size of the installation, limited outdoor recreation opportunities exist at Kingsley Field ANGB. Maintaining a quality outdoor recreation program is dependent on proper management of natural resources and efficient program administration and oversight. People and social uses/needs are an integral part of ecosystem management. The outdoor recreation program is based on providing quality experiences while sustaining ecosystem integrity. Activities that have a direct effect on species populations, such as soil erosion from hiking trails, will be monitored to determine effects, and adaptive management (i.e., water bars on trails) will be incorporated to mitigate negative effects. Special consideration will be given to protecting critical areas from negative effects of outdoor recreation or ecosystem management activities.

Currently, recreational activities on the Base consist of the use of roads for running, walking, and jogging. There is no hunting or fishing program on the installation. Fishing does occur immediately adjacent to the Base in the ditches outside of the fence line.

7.4 CONSERVATION LAW ENFORCEMENT

DoDI 5525.17, *Conservation Law Enforcement Program*, states that a Conservation Law Enforcement Program ensures that installations remain in compliance with appropriate environmental, natural, and cultural resource laws and regulations (Section 1(b)). There are no conservation law enforcement officers at Kingsley Field ANGB, as no hunting or fishing opportunities exist at the installation. Waterfowl hunting does occur outside of the fence in the ditches surrounding the installation. Currently, no Memorandum of Understanding (MOU) is in place to allow ODFW or the appropriate conservation law enforcement agency to gain access to the Base for regulatory or enforcement needs.

7.5 MANAGEMENT OF THREATENED AND ENDANGERED SPECIES AND HABITATS

An Endangered Species Survey was completed in 2012 at Kingsley Field ANGB to confirm the presence/absence and habitat extent of three federally listed species. During this survey,

approximately 1,900 individuals of Applegate's milk-vetch, a federally endangered plant species, were found at 22 distinct sites at Kingsley Field ANGB. Management recommendations provided as part of the 2012 Endangered Species Survey for the protection of Applegate's milk-vetch include continuing mowing of areas where this species is known to occur; continued monitoring of current populations; and limiting development of property where the species is known to occur (ANG 2012a). Section 5.4 provides additional detail on Applegate's milk-vetch.

During the Endangered Species Survey, one juvenile sucker was identified at Kingsley Field ANGB. Juvenile suckers cannot be identified to species, but given the location of the observed individual, the juvenile was determined to be either a Lost River or shortnose sucker. Both species are federally endangered. No other suckers were found during sampling events, and the use of waterbodies on the installation was determined to be very low. As a result, recommendations for management include the continued use of best management practices (BMPs) and continued consultation with the USFWS and ODFW on future work or development projects in close proximity to potential fish habitat (ANG 2012a). Additional information on the biology, location, and behavior of the Lost River and shortnose sucker is provided in Section 5.4.

7.6 WATER RESOURCES PROTECTION

Stormwater conveyance ditch

In order to effectively manage the watersheds of Kingsley Field ANGB, installation personnel and the Base Environmental Manager must understand ecosystem dynamics within the watershed in an effort to prevent or respond to threats to its integrity. Water resources protection is important to natural resources management because it directly affects surface water quality and the value of aquatic habitats.

Kingsley Field ANGB currently protects its water resources through compliance with a number of federal, state, local, and USAF environmental regulations that require the Base to have detailed spill control and response procedures and to implement stormwater pollution prevention BMPs. The objective of these regulations is to prevent pollutants (e.g., fuels, solvents, de-icing compounds, sediments) from entering the watershed. Specific watershed protection measures used by the Base include spill cleanup equipment at industrial locations, IPM, and reduction of fertilizer applications. One of the primary concerns relating to water quality at Kingsley Field ANGB is the deposition of sediment in the installation's waterways.

Kingsley Field is located within the Lost River drainage basin, but surface hydrology at Kingsley Field has been heavily modified by the development of the airfield and drainage ditch system. This stormwater drainage system and Kingsley Field ANGB are managed in accordance with the City of Klamath Falls-Klamath Falls Airport NPDES permit, general permit number 1200-Z (ORANG 2011). One of the primary concerns relating to water quality at Kingsley Field ANGB is the deposition of sediment in the installation's waterways. Land-disturbing activities on the installation are causing erosion and sedimentation. During site preparation (e.g., grading) and

construction, soils are temporarily exposed to compaction, which impedes drainage and reduces water infiltration rates. Consequently, increased runoff sometimes carries abnormally large amounts of sediment into surface water and stormwater systems and ultimately to regional streams during precipitation events. Kinsley Field ANGB does not have a standalone Erosion and Sediment Control Manual; daily activities at the Base reference the ODEQ Erosion and Sediment Control Manual. Daily operations are also conducted under the requirements of the Kingsley Field ANGB SWPPP. This document provides engineering and management strategies designed to improve the quality of stormwater runoff from the installation (ORANG 2011).

7.7 WATERS OF THE U.S./WETLAND PROTECTION

Wetlands have been formerly delineated at Kingsley Field ANGB in 2012, and again in 2013. Approximately 0.3 acre of wetland and 0.69 acre of Waters of the United States were delineated and approved in a Preliminary Jurisdictional Determination by USACE (ANG 2014). Oregon DSL concurred with the delineation for wetlands, but exempted 4 of the 10 delineated waterways from state Removal-Fill permit requirements (ANG 2014). Some wetland areas are managed for BASH, and some wetland areas adjacent to runways that presented BASH concerns were filled in to mitigate these impacts (Mead and Hunt 2005).

The major goal in wetland management is to minimize the impact that the Kingsley Field ANGB missions have on wetlands. The ANG strives to enhance healthy, functional wetlands that can sustain minor operational influences outside indirect infringement of wetlands. When possible, the goal is set to enhance wetland functions to create wetlands that maximize the values that wetlands have within the ecosystem and to society. It is also the goal to maximize floral diversity of wetland communities that, in turn, maximize the faunal diversity of the ecosystem.

7.8 GROUNDS MAINTENANCE

The Kingsley Field ANGB Operations and Maintenance personnel are responsible for grounds maintenance activities on the installation, often in partnership with personnel from the airport. Some maintenance activities include mowing, maintaining stormwater features, and managing pest species.

7.9 FOREST MANAGEMENT

There is no income-generating forestry program at Kingsley Field, and no managed forests on the installation. Therefore, this program element does not apply to Kingsley Field ANGB.

7.10 WILDLAND FIRE MANAGEMENT

There is no wildland fire management program at Kingsley Field ANGB, and no Wildland Fire Management Plan, though a fire department is located on the installation. No open burning of grass or garbage is allowed at Kingsley Field. Due to local air quality regulations and restrictions, no open burning or wildland fire management is likely to be undertaken. As a result, the wildland fire management program element does not apply to Kingsley Field ANGB.

7.11 AGRICULTURAL OUTLEASING

The Agricultural Outleasing Program element does not apply to Kingsley Field ANGB.

7.12 INTEGRATED PEST MANAGEMENT PROGRAM

The IPM Plan for Kingsley Field ANGB was updated in 2010 (Appendix E). The IPM Plan is a comprehensive document used by Kingsley Field ANGB personnel. This document ensures that the installation is in compliance with federal and state regulations governing pest management.

Kingsley Field ANGB has implemented an IPM Program. This method of pest management involves four primary control strategies: mechanical and physical control (physical removal or exclusion of pests), cultural control (altering the environment to make it less suitable or attractive to the pest), biological control (use of other organisms that control the pest), and chemical control (use of pesticides and herbicides). AFI 32-1053, *Integrated Pest Management Program*, is a policy to conduct effective pest management programs, and establishes responsibilities and procedures for pest management at USAF Installations. Per AFI 32-1053, a "pest" is defined as arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds, or other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

Pest management objectives at Kingsley Field ANGB include the protection of real estate, control of potential disease vectors or animals of other medical importance, control of undesirable or nuisance plants and animals (including insects), and prevention of damage to natural resources. In addition, the presence of several zoonotics (e.g., Lyme disease and encephalitis) on the Base, and the potential threat to human health and safety (i.e., transmission of disease) cannot be underestimated.

Examples of IPM strategies at Kingsley Field ANGB include nonchemical methods such as the use of mouse and ant traps, and the use of cultural controls, such as using a vacuum cleaner to remove spiders and other insects from inside offices and buildings and properly storing food and other items that may attract rodents. Examples of mechanical and physical control methods are harborage elimination through caulking or filling voids, screening, and other barriers to prevent entry into buildings. A base-wide mulching program was put in place at Kingsley Field as a physical control method to minimize weeds and invasive species in ornamental beds and turf areas (ORANG 2010). Table 7-2 includes a list of pests that are present on the installation. IPM strategies have been developed for each of the pests/categories of pests.

Table 7-2 Potential Pests at Kingsley Field ANGB

Category	Pests
Public Health Related Pests	• Rats and Mice • Mosquitoes • Bees, Hornets, and Wasps • Spiders • Ants
Pests Found in and Around Buildings	• Stored Product Pests
Structural Pests	• None
Noxious or Invasive Plants and Animals	• European Starlings • Feral Cats and Dogs • Lawn and Landscaping Pests
Undesirable Vegetation	• Vegetative Overgrowth • Broadleaf Weeds
Quarantine and Regulated Pests	• None
Vertebrate Pests	• Birds • Canada Goose
Source: ORANG 2010.	

7.13 BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD

Kingsley Field ANGB currently has a BASH Plan, which is implemented and controlled by the 173 FW Safety Office (Appendix F). The purpose of the BASH Plan is to provide an active program to minimize bird and other wildlife strikes to aircraft. The plan is based on hazards from both resident and seasonal bird species as well as other species of wildlife. Daily and seasonal bird movements create various hazardous conditions. This plan establishes procedures to minimize the hazard to ORANG aircraft at the installation and in their operating areas.

The plan is designed to:

- Establish a Bird Hazard Working Group and designate responsibilities to its members;
- Establish procedures to identify and report hazardous bird activity situations and to aid supervisors and aircrews in altering or discounting flying operation when required;
- Establish aircraft and airfield operating procedures to avoid high-hazard situations;
- Provide for disseminating information to all assigned and transient aircrews on bird hazards and procedures for bird avoidance;
- Establish guidelines to decrease airfield attractiveness to birds;
- Provide guidelines for dispersing birds and other wildlife when they are present on the airfield;
- Identify organizations/Office of Primary Responsibility with authority to upgrade, initiate, or downgrade Bird Watch Conditions; and

- Provide guidelines to maintain the working relationship with the Klamath Falls Airport staff.

According to BASH data, 61 reported bird strikes occurred between 1986 and 2005 at, or in the immediate vicinity of, Kingsley Field ANGB. Most of the reported strikes were from the airfield environment. Strikes involved barn swallows, cliff swallows, tree swallows, killdeer, horned larks, northern shovelers, mallards, a herring gull, red-tailed hawk, turkey vulture, great horned owl, great egret, mourning dove, American robin, song sparrow, cedar waxwing, several other small passerines, and a silver-haired bat (ORANG 2008). Appendix F includes a list of the most hazardous birds identified in the vicinity of Kingsley Field ANGB.

Several actions have been implemented under the BASH plan that have reduced the BASH hazard at Kingsley Field ANGB. Airfield habitat management, bird control, removal of other wildlife, bird dispersal activities, and communications with the control tower have all occurred in the past and have served to reduce the hazards at the airfield. Bird control includes elimination of roost sites specifically for blackbirds, starlings, and crows. Trees are pruned to reduce the number of perches available or trees are removed entirely. In addition, active harassment techniques for blackbirds, starlings, and crows are implemented when necessary. USDA Wildlife Services conduct or assist in roost dispersal operations and harassment. Birds such as pigeons, starlings, and house sparrows are removed from buildings and hangars by shooting with pellet guns, trapping/removing, and through use of bird control chemicals. Bird control chemicals include Avitrol, Starlicides, or other avicides and are coordinated with the USDA Wildlife Services. Large cages are used to trap birds; these birds are then either released away from buildings and hangars or are killed. Other species such as deer, fox, and coyote may be removed by shooting with assistance from USDA if they pose a BASH threat.

Habitat management on the airfield and most of the bird dispersal and control efforts are primarily carried out by airport, while Kingsley Field ANGB personnel carry out mowing operations and assist with bird control as needed. Pyrotechnics and depredation were the most common dispersal and control techniques used by the airport and ANG (ORANG 2008).

Red-tailed hawk.
Photo by Audubon Guide to Birds.

Habitats on and in the vicinity of the airfield are maintained as grass-covered so that they are less attractive to wildlife. Bare areas, weedy patches and brush, wetlands, and water features are potentially attractive to a variety of bird species. Wetland areas and areas of standing water within the airfield and surrounding areas provide ideal habitat to wildlife for feeding and cover, and can serve to attract birds and mammals onto the airfield. In addition, areas surrounding Kingsley Field ANGB contain numerous water features that attract wildlife. The Klamath River, Lake Ewauna, Klamath Lake, Tingley Lake, Lost River Diversion Canal, and numerous small ponds near the

airport attract large numbers of a variety of bird species to the area. Wildlife refuges as well as agricultural fields in the vicinity of Klamath Falls also serve to attract birds to the region. Birds moving between these resources necessarily transit the airport or its surrounding airspace. Large populations of duck and geese are known to congregate in open fields near Kingsley Field ANGB, particularly during migratory periods. The airfield is managed to make it as unattractive as possible so birds will avoid using it. Some of the efforts undertaken to reduce the attractiveness of the airfield to wildlife include mowing regimes that do not promote wildlife habitat, reducing the number of bare areas on the installation and airfield, reducing puddling, standing water, and aquatic areas on and near the airfield (ORANG 2008). According to the USFWS, the greatest risk of bird-aircraft collisions at Kingsley Field ANGB may come from white-fronted (*Anser albifrons*), snow (*Chen caerulescens*), and Ross's geese (*Chen rossii*) that spend about 2 months in the Klamath Falls area during March and April. These birds graze in fields around the airport and fly low between fields and adjacent water bodies.

7.14 COASTAL ZONE AND MARINE RESOURCES MANAGEMENT

There is no coastal or marine habitat at Kingsley Field ANGB; as such, this program element does not apply to the Base.

7.15 CULTURAL RESOURCES PROTECTION

Kingsley Field ANGB currently has an ICRMP. According to the ICRMP, an archaeological survey and an inventory of all existing buildings and structures was conducted from 2000 to 2002 (ANG 2012b). Most of the installation's land was observed to be heavily disturbed, resulting in low potential for containing shallow archaeological sites. The installation does, however, exhibit potential to contain deeply buried (greater than 8 ft below the surface) Pleistocene-era paleontological resources and/or archaeological remains from the contemporaneous Paleoindian stage. No further archaeological surface surveys were recommended for the 173 FW, but construction activities requiring excavation greater than 8 ft in depth should be monitored by a paleontologist and/or an archaeologist (ANG 2012b).

Built resources were also monitored from 2000 to 2002, including the recordation and evaluation of 71 built resources constructed between 1941 and 1999. At the time of the publication of the most recent ICRMP in 2012, Building 400, the Alert Hanger, was not yet 50 years of age. This building was recommended potentially eligible for listing in the National Register of Historic Places, and therefore requires management and maintenance as a historic property. Other built resources investigated were not considered eligible either as individual resources or a historic district (ANG 2012b). As buildings become 50 years old, they should be evaluated for National Register eligibility, in consultation with the Oregon State Historic Preservation Office.

The installation's ICRMP identifies goals and objectives for cultural resource management (Component Plan A). The overall goal of the program includes planning and integration of cultural resource management with installation plans, projects, and programs and in support of military missions.

7.16 PUBLIC OUTREACH

Public outreach is coordinated between the Base Public Affairs Office and ESOHC. Currently, Kingsley Field ANGB hosts a large training exercise. The installation also hosts an open house where the community is invited onto the installation for activities and tours. In addition, fifth-grade students are given tours of Kingsley Field as part of the STARBASE program. The STARBASE program is run by the DoD; students are encouraged to explore science, technology, engineering, and mathematics, and interact with military personnel through a hands-on and real-world curriculum, provided at DoD facilities.

Kingsley Field ANGB maintains a public website (https://www.173fw.ang.af.mil/) and other social media outlets including Facebook, Twitter, and Instagram. These websites and social media, in addition to coordination with local media outlets, are used for news releases to share applicable information with the public.

7.17 GEOGRAPHIC INFORMATION SYSTEM

The DoD/USAF standardized requirement for geographic information systems (GIS) follows the guidance provided in these links:

https://www.sdsfieonline.org/Components/USAF
http://www.sdsfieonline.org/Downloads/geospatial_guidancememo041409.pdf

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8. MANAGEMENT GOALS AND OBJECTIVES

Specific management objectives and strategies have been identified in a number of subject areas that affect the natural resources present on and immediately adjacent to Kingsley Field ANGB. This chapter lists the goals and objectives for future natural resources management on the installation. Each goal is supported by one or more objectives. An objective indicates a management initiative or strategy that will be used to achieve the stated goal. Projects or tasks are the individual component actions required to achieve an objective. Project statements describe the specific methods and procedures that will be used to achieve the objective supported.

Management objectives established in this INRMP were initially developed during the evaluation of the natural resources present on Kingsley Field ANGB in accordance with AFI 32-7064. The revision of this INRMP involved a complete review of the original subject areas and management alternatives accomplished during the 5 years since the 2011 INRMP revision. This revised section presents the preferred management alternatives based on the professional opinions of the Kingsley Field ANGB Environmental Manager, USFWS, ODFW, and Kingsley Field ANGB Task Force. Through these evaluations, the original natural resources planning and management goals have been reevaluated to ensure they represent the most current theories on adaptive ecosystem-based planning. Selection of these management goals has been tempered with the fact that the operational mission at Kingsley Field ANGB takes primacy over natural resources management. However, through the multiple-use adaptive paradigms used, sound ecological management on the installation should supplement the operational effectiveness and safety of the military missions. Ecosystem management provides a means for the USAF to conserve biodiversity and to provide high-quality military readiness. The INRMP is a mechanism through which Kingsley Field ANGB can maintain sustainable land use through ecosystem management.

8.1 NATURAL RESOURCES PROGRAM MANAGEMENT

The ecosystem at Kingsley Field has been largely altered by human activity. It is therefore a priority for the remaining natural resources areas to be managed with the goal of conservation.

NRP GOAL 1: NATURAL RESOURCES MANAGEMENT TRAINING

- **NRP OBJECTIVE 1.1:** Environmental and/or Natural Resource managers/personnel shall attend the DoD course titled "Natural Resources Compliance" within 18 months of hire.

  — **PROJECT 1.1.1:** The Natural Resources Compliance course is available through the Navy's Civil Engineer Corps Officers School at http://www.netc.navy.mil/centers/esfe/cecos.

  — **PROJECT 1.1.2:** Environmental and/or Natural Resource Managers/personnel may attend when feasible other applicable environmental management courses offered by the Air Force Institute of Technology, the USFWS, and the Bureau of Land

Management. Once Kingsley Field ANGB personnel have attended training courses on natural resource management and local ecosystems, designate the appropriate personnel as a Natural Resources Manager. The Natural Resources Manager will effectively coordinate base natural resource issues with the appropriate federal, state, and local natural resource agencies, as needed

— **PROJECT 1.1.3:** Environmental and/or Natural Resource Managers should attend the annual National Military Fish and Wildlife Association Training Workshop held in March. This meeting includes a discussion of all facets of natural resource management on military installations. Information concerning the National Military Fish and Wildlife Association can be found at http://www.nmfwa.net/. Contact the ANG Natural Resources Program Manager to gain approval for the annual training.

NRP GOAL 2: CONDUCT ANNUAL REVIEW OF THE INRMP

- **NRP OBJECTIVE 2.1:** Coordinate with installation organizations to ensure there is an understanding of management goals and actions developed in the INRMP and to ensure that management actions developed in the INRMP are consistent with current management instructions and plans.

  — **PROJECT 2.1.1:** Conduct annual internal stakeholder meeting to discuss the operation and management of the INRMP to ensure goals and objectives are understood and to identify changes deemed necessary.

  — **PROJECT 2.1.2:** Document in writing the items discussed during the meeting and send to attendees to confirm in writing what was discussed and what was agreed to.

- **NRP OBJECTIVE 2.2:** Conduct external stakeholder annual review and update the INRMP as needed based on pertinent review findings.

  — **PROJECT 2.2.1:** Conduct annual external stakeholder meeting to include the USFWS and ODFW to discuss progress in regard to projects completed in the preceding year, discuss the need for any updates to goals and objectives and to identify projects to be completed in the coming year.

  — **PROJECT 2.2.2:** Document in writing the items discussed during the meeting and send to attendees to confirm in writing what was discussed and what was agreed to.

  — **PROJECT 2.2.3:** Utilize internal and external stakeholder comments to update the INRMP goals and objectives.

8.2 FISH AND WILDLIFE MANAGEMENT

The primary goal of fish and wildlife management at Kingsley Field ANGB is to restore and maintain wildlife diversity in areas where practicable conservation measures are implemented so that they are not in direct conflict with the military mission.

FWM GOAL 1: COMPLETE BIOLOGICAL SURVEYS TO DETERMINE WILDLIFE RESOURCES PRESENT ON THE INSTALLATION

- **FWM OBJECTIVE 1.1:** Conduct flora and fauna surveys at Kingsley Field ANGB to assess, at a minimum, avian, mammalian, herpetofauna, and insect species and populations. A planning level survey will ensure that viable populations of native species found in the ecosystem (including rare, threatened, and endangered species and species of concern) are protected, restored, and maintained in accordance with state and federal laws and regulations.

  — **PROJECT 1.1.1:** Conduct reconnaissance-level wildlife surveys including:

    – Waterfowl and raptors, particularly movement patterns during migration;
    – Medium-sized and large mammals;
    – Reptiles, including snakes and lizards; and
    – Fish, including onsite ponds, ditches, and adjacent irrigation canal.

  These surveys should be conducted in conjunction with an assessment and mapping of the Base's current vegetative cover with USFWS and ODFW protocols.

  — **PROJECT 1.1.2:** Conduct baseline surveys to gauge wildlife abundance. Abundance should be included as part of a reconnaissance-level flora and fauna survey. A bat survey was completed in 2009 and the information discussed therein should be used as a baseline for the updated survey and report.

  — **PROJECT 1.1.3:** Complete a determination of populations of both resident and migratory species that are present on Kingsley Field ANGB during the year. Mission-sensitive migratory bird species potentially present at Kingsley Field ANGB should be studied, and information on these species should be routinely updated.

- **FWM OBJECTIVE 1.2:** Information on wildlife present at Kingsley Field ANGB should be disseminated to Base personnel and visiting units.

  — **PROJECT 1.2.1:** Upon completion of biological surveys, develop an information document such as a poster to identify the species found during the surveys for the purpose of providing a guide to persons working on and visiting the installation.

FWM GOAL 2: CONTINUE WILDLIFE MANAGEMENT ACTIVITIES INCLUDING DEPREDATION AND ANIMAL CONTROL

- **FWM OBJECTIVE 2.1:** Continue maintenance of nuisance wildlife through the use of a joint partnership with the airport. A large portion of the trapping, tagging, and relocation of nuisance species is accomplished at Kingsley Field ANGB in partnership with the airport. Work is completed by a contractor from the USDA-WS. The USDA Wildlife Services maintains the depredation and animal control permits.

— **PROJECT 2.1.1:** Continue the working partnership with the USDA Wildlife Services and the airport. As part of this joint partnership, Kingsley Field ANGB pays part of the salary for a USDA contractor.

FWM GOAL 3: ENHANCEMENT OF HABITAT OPTIONS FOR WILDLIFE

- **FWM OBJECTIVE 3.1:** Upon completion of biological surveys, determine where habitat needs are in an effort to enhance and maintain natural wildlife habitat while ensuring the efforts will not impact the mission.

8.3 OUTDOOR RECREATION AND PUBLIC ACCESS TO NATURAL RESOURCES

Due to the inherent dangers associated with the Base mission, limited public outdoor recreation opportunities exist at Kingsley Field ANGB.

OR GOAL 1: PROVIDE QUALITY OUTDOOR RECREATION EXPERIENCES WHILE SUSTAINING ECOSYSTEM INTEGRITY. ENSURE THAT OUTDOOR RECREATION ACTIVITIES ARE NOT IN CONFLICT WITH MISSION PRIORITIES.

- **OR OBJECTIVE 1.1:** Establish a physical training (PT) trail. Running and walking is the primary form of recreation that currently occurs at Kingsley Field ANGB; however, most running and walking currently occurs along the roadways. A PT trail would provide a safe location for recreation and an opportunity to view flora and fauna. This trail could be located near wildlife habitat and include interpretive information on species found at the base or a wildlife viewing area. The trail would also promote physical fitness.

  — **PROJECT 1.1.1:** Obtain funding to design and construct a PT trail in a location that meets PT requirements.

8.4 CONSERVATION LAW ENFORCEMENT

Conservation law enforcement on installations is required when there are hunting and fishing programs in place. Currently there is no hunting or fishing program on the installations and, as such, conservation law enforcement is not required.

8.5 MANAGEMENT OF THREATENED AND ENDANGERED SPECIES AND HABITATS

Threatened and endangered species surveys were conducted in 2011 for the presence of three federally listed species known to occur or potentially occur at Kingsley Field. The three species surveyed for were Applegate's milk-vetch, Lost River and shortnose suckers. Populations of the milk-vetch were found and the habitat for the sucker species is limited. Management actions

need to minimize impacts to listed species, and habitats supporting them need to be protected from impact.

Management actions must minimize impacts to listed species, and habitat should be modified to mitigate impacts. Adherence to the goals set for threatened and endangered species management will ensure that the installation remains in compliance with the ESA and applicable state regulations.

TE GOAL 1: UPDATE THREATENED AND ENDANGERED SPECIES SURVEYS AND IDENTIFY SUPPORTING HABITATS

- **TE OBJECTIVE 1.1:** Obtain current data regarding presence of threatened and endangered species and their habitat.

  — **PROJECT 1.1.1:** Conduct threatened and endangered species survey to update data obtained in 2011.

  — **PROJECT 1.1.2:** Using data obtained in the current survey work, develop a poster showing the species found with information deemed important to share with installation personnel and visitors including but not limited to mowing schedules, time-of-year restrictions, and similar projects.

  — **PROJECT 1.1.3:** Continue working with the Oregon Institute of Technology in regard to propagation and potential relocation of Applegate's milk-vetch.

8.6 WATER RESOURCES PROTECTION

The watershed protection management objectives and actions presented in this INRMP are designed to reduce/control nutrient and sediment inputs into the watershed.

WRP GOAL 1: MANAGE AREAS OF EROSION TO ENSURE COMPLIANCE WITH WATER QUALITY STANDARDS

- **WRP OBJECTIVE 1.1:** Monitor construction projects to ensure erosion and sediment control measures as required by state law are implemented and maintained during all phases of construction.

  — **PROJECT 1.1.1:** Obtain information from Oregon's sediment and erosion control program in regard to how it works, attending training, and obtaining erosion and sediment control inspector certification.

  — **PROJECT 1.1.2:** Determine feasibility of sending environmental personnel to state training courses to obtain erosion and sediment control inspector certification

  — **PROJECT 1.1.3:** If sending personnel to training is determined not to be feasible, identify methods through which the environmental personnel can become familiar

with standard erosion and sediment control measures. This should include what types of measures are used, what time methods are used, and how to ensure implemented measures are maintained throughout all phases of construction.

— **PROJECT 1.1.4:** Ensure the installation's SWPPP, Hazardous Waste and NPDES permits for point source discharge are current and all contain goals and objectives that are consistent.

- **WRP OBJECTIVE 1.2:** Identify locations of erosion on the installation. Determine the level of severity and prioritize areas of repair.

— **PROJECT 1.2.1:** Conduct installation-wide evaluations to identify locations of erosion and identify the level of erosion severity and prioritize areas of repair.

— **PROJECT 1.2.2**: Develop plans to address the areas of erosion found.

— **PROJECT 1.2.3:** Implement erosion and sediment control plans.

8.7 WATERS OF THE U.S./WETLAND PROTECTION

A wetland delineation was completed for the Kingsley Field ANGB in 2013. That delineation identified 0.3 acre of wetland and 0.69 acre of Waters of the U.S. existing on the installation. A Preliminary Jurisdictional Determination was issued by USACE. Oregon DSL concurred with the Jurisdictional Deamination, which exempted 4 of the 10 waterways from Oregon's Removal-Fill permitting requirements (ANG 2014).

WP GOAL 1: ENSURE COMPLIANCE WITH SECTIONS 404 AND 401 OF THE FEDERAL CLEAN WATER ACT

- **WP OBJECTIVE 1.1:** Ensure the Preliminary Jurisdictional Determination issued by USACE remains current.

— **PROJECT 1.1.1:** Obtain written concurrence from USACE that the Preliminary Jurisdictional Determination continues to be accurate every 5 years by the date of the Preliminary Jurisdictional Determination letter from USACE.

— **PROJECT 1.1.2:** Ensure Waters of the U.S. and wetland boundaries are accurately shown on the installation mapping and on project design plans and the information is disseminated to persons responsible for grounds maintenance and to engineers developing site development plans.

— **PROJECT 1.1.3:** Ensure site conditions where Waters of the U.S. and wetlands are located have not been disturbed.

— **PROJECT 1.1.4:** If any disturbances are found, determine what caused the disturbance and how to correct the problem found.

— **PROJECT 1.1.5:** Identify persons/entity responsible for the disturbance and discuss who is going to correct the problem found.

- **WP OBJECTIVE 1.2:** Continue to educate Base personnel regarding Waters of the U.S. including wetlands present on the installation and about permit requirements.

  — **PROJECT 1.2.1:** Develop and disseminate informational materials on the locations of Waters of the U.S. including wetlands.

  — **PROJECT 1.2.2:** Ensure permits required to impact Waters of the U.S. including wetlands are understood by Base personnel and Base leadership and the requirements to mitigate impacts.

  — **PROJECT 1.2.3:** Assist personnel requiring permits to impact Waters of the U.S., including wetlands in the preparation of permit application documents including development of an impact avoidance analysis document.

  — **PROJECT 1.2.4:** Consult with NGB/A4AM Natural Resources Program Manager in regard to permit documents to ensure documents are accurate.

8.8 GROUNDS MAINTENANCE

Because of the highly developed nature of Kingsley Field ANGB, environmentally sensitive landscape planning throughout the main cantonment area is critical for reducing grounds maintenance costs, improving Base aesthetics, reducing pesticide use, saving energy and water, and increasing biodiversity. Base grounds maintenance contractors and Kingsley Field ANGB personnel perform grounds maintenance activities at Kingsley Field ANGB. Grounds maintenance activities performed at the installation consist of lawn care, airfield management, landscaping maintenance, and pest management.

GM GOAL 1: MANAGE GROUNDS ON-BASE TO PROMOTE NATURAL HABITAT AND NATIVE SPECIES

- **GM OBJECTIVE 1.1:** Use regionally native grasses and plant species adapted for growth in the central Oregon area.

  — **PROJECT 1.1.1:** Work with design engineers to ensure construction projects follow the Oregon requirements for erosion and sediment control laws and regulations and include native plant species to reestablish ground cover.

  — **PROJECT 1.1.2:** Identify locations where, when funding is available, native plant species can be planted and non-native species removed. Map the locations of non-natives and prioritize the areas for replanting.

- **GM OBJECTIVE 1.2:** Convert improved grounds to semi-improved grounds where compatible with the mission and BASH outside the airfield.

  — **PROJECT 2.2.1:** Work with operations to identify areas for conversion from improved to semi-improved grounds.

  — **PROJECT 2.2.2:** Manage converted grounds as additional grassland vegetation restoration areas. Conduct mowing operations to effectively control woody vegetation.

8.9 FOREST MANAGEMENT

The Forestry Management program element does not apply to Kingsley Field ANGB.

8.10 WILDLAND FIRE MANAGEMENT

The Wildland Fire Management program element does not apply to Kingsley Field ANGB.

8.11 AGRICULTURAL OUTLEASING

The Agricultural Outleasing program element does not apply to Kingsley Field ANGB.

8.12 INTEGRATED PEST MANAGEMENT PROGRAM

Native plant and animal communities have been adversely impacted by development and the introduction of non-native species. Non-native species are those plants or animal species that were not present during European settlement. Due to aggressive growth habits of many non-native species, the species have become invasive and out-compete the native plants and animals. "An invasive species is defined as a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health" (EO 13112) (USDA 2016). Invasive species put native plants and animals at risk. Invasive plants, which can be both native and non-native, result in the loss of diversity within a local plant community. Table 5-2 includes the noxious weed species that have been identified in Klamath County. Table 7-2 includes pests that have been identified at the installation. Nuisance species generally refers to animals and is a result of the animal's population density.

DoDI 4150.7, *Pest Management Program*, is a DoD policy to establish and maintain safe, effective, and environmentally sound IPM programs to prevent or control pests and disease vectors that could adversely impact readiness or military operations by affecting the health of personnel or damaging structures, material, or property. The policy set Measures of Merit for pest management, which require each installation to develop an IPM Plan, reduce the amount of pesticides used on the installation, and certify all pesticide applicators. A copy of the IPM Plan for Kingsley Field ANGB is located in Appendix E.

At Kingsley Field ANGB, the Installation Commander assumes the overall responsibility of the IPM Program but designates the Base Civil Engineer to ensure the overall implementation of the IPM Plan. The Base Civil Engineer is responsible for development and maintenance of the IPM Plan, providing IPM status to the installation Environmental, Safety, and Occupational Health Council, and coordinating the IPM program among all installation organizations. The Installation Integrated Pest Management Coordinator ensures that all pest management operations performed on the installation are recorded and reports monthly pesticide applications to NGB/A4AM Pest Management Program Coordinator.

IPM GOAL 1: CONTROL NON-NATIVE AND INVASIVE SPECIES THROUGHOUT THE INSTALLATION

- **IPM OBJECTIVE 1.1:** Provide information to the Installation Pest Management Coordinator on the presence and locations of threatened and endangered species of flora and fauna on the Base.

  — **PROJECT 1.1.1:** Review the Base IPM Plan annually to ensure natural resources and other environmental conditions/issues are clearly identified and addressed in the INRMP and its supporting documentation.

  — **PROJECT 1.1.2:** Assist the Integrated Pest Management Coordinator in the management of pest and nuisance species to ensure the requirements of AFI 32-1053, DoDI 4150.07, and DoD Manual 4150.07 are adhered to.

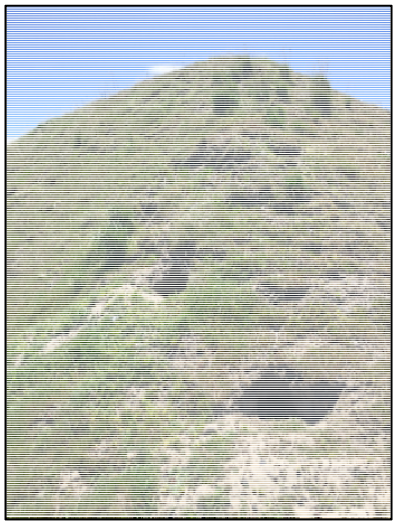
  — **PROJECT 1.1.3:** Participate in the 5-year review and update of the IPM Plan to ensure natural resource and other environmental conditions/issues are addressed in accordance with AFI 32-7064.

- **IPM OBJECTIVE 1.2:** Continue and expand the partnership with the City for management of nuisance species at the airport and Kingsley Field ANGB. Currently, Kingsley Field ANGB partners with the City of Klamath Falls for management of nuisance species.

  — **PROJECT 1.2.1:** Continue to coordinate with the City on the management of nuisance species at the airport and Kingsley Field ANGB.

- **IPM OBJECTIVE 1.3:** Conduct invasive species surveys to include nuisance and noxious species found on the Base.

  — **PROJECT 1.3.1:** Conduct baseline surveys to gauge the presence, locations, and abundance of invasive, nuisance, and noxious species.



Ground squirrel burrows at Kingsley Field ANGB

8.13 BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD

Kingsley Field actively implements a BASH Reduction Plan to reduce the risk of bird/wildlife strikes on the airfield. The BASH program at Kingsley Field ANGB is implemented by the Safety Office. Kingsley Field ANGB does not currently maintain any Depredation Permits to authorize the taking of nuisance species to lessen the danger of bird/wildlife strikes with aircraft. Instead, these permits are held by the airport and are managed using a USDA contractor. However, depredation permits are not required for killing English house sparrows, European starlings, common pigeons, and rock doves. In addition, 50 CFR 21.43 excludes the need for a depredation permit for red-winged blackbirds, rusty blackbirds, brown-headed cowbirds, common grackle, and American crows when connected in such numbers and manner as to constitute a health hazard or other nuisance.

BH GOAL 1: ACTIONS TAKEN TO REDUCE THE RISK OF BIRD/WILDLIFE STRIKES ARE TO BE COORDINATED BETWEEN THE USDA WILDLIFE SPECIALIST, THE INSTALLATION'S ENVIRONMENTAL MANAGER, AND THE INSTALLATION'S SAFETY OFFICE.

- **BH OBJECTIVE 1.1:** The Environmental Manager must ensure all laws and regulations governing threatened and endangered species and the migratory birds are adhered to for all BASH actions.

  - **PROJECT 1.1.1:** The Safety Office and the USDA Wildlife Specialist must ensure the Environmental Manager is invited to all Bird Strike Working Group meetings.

  - **PROJECT 1.1.2:** The USDA Wildlife Specialist must provide monthly depredation permit logs to the Environmental Manager for his/her review.

  - **PROJECT 1.1.3:** Projects identified to reduce bird/wildlife strikes must be identified and discussed in recurring meetings between the Environmental Manager, the USDA Wildlife Specialist, and the Safety Office to determine what projects fall to safety office and which ones can be conducted using natural resource monies.

- **BH OBJECTIVE 1.2:** Continue to work with agencies and adjacent landowners to limit waterfowl populations from entering into the airfield area.

  - **PROJECT 1.2.1:** Work with agencies, including the USFWS, ODFW, and USDA-WS, to determine the resident and migratory populations, area attractants and to identify best management practices to reduce the BASH risk that do not result in the "take" of a large number of bird and bat species.

- **BH OBJECTIVE 1.3:** Update the current BASH Plan to address new issues and concerns and allow for more effective BASH management at Kingsley Field ANGB. Although the current BASH Plan is effective, additional management actions should be added to the BASH Plan to address concerns that have arisen since the current BASH Plan was developed in 2008.

— **PROJECT 1.3.1:** Update the BASH Plan to include management objectives for ground wildlife (i.e., non-flying species), including ground squirrels and groundhogs. These species provide a food source for BASH species and should be managed to reduce the BASH hazard.

— **PROJECT 1.3.2:** Determine if a partnership between the City and Kingsley Field ANGB should be developed for responsibility of the BASH Plan and control of nuisance species.

— **PROJECT 1.3.3:** Determine if it is appropriate for Kingsley Field ANGB to work to revise Depredation Permits to give installation personnel the ability to control nuisance species if the USDA-WS contractor is not available.

8.14 COASTAL ZONE AND MARINE RESOURCES MANAGEMENT

The Coastal Zone and Marine Resources Management program element does not apply to Kingsley Field ANGB.

8.15 CULTURAL RESOURCES PROTECTION

Cultural resource protection will be addressed through the ANG Cultural Resources Management Program.

8.16 PUBLIC OUTREACH

Develop and implement community information and involvement strategies to reinforce the positive effect of the present of the installation in the region.

PO GOAL 1: PROVIDE QUALITY PUBLIC OUTREACH EXPERIENCES, WHILE SUSTAINING ECOSYSTEM INTEGRITY. ENSURE THAT PUBLIC OUTREACH OPPORTUNITIES ARE NOT IN CONFLICT WITH MISSION PRIORITIES.

- **PO OBJECTIVE 1.1:** Continue to encourage Base personnel to participate in outreach activities, and continue to promote Kingsley Field ANGB in the community. Public outreach that does not conflict with mission priority should be considered. Base personnel should be encouraged to volunteer in the local community.

  — **PROJECT 1.1.1:** Encourage Base personnel to volunteer for community service events, including outreach for the homeless and community cleanups.

  — **PROJECT 1.1.2:** The INRMP ESOHC should continue to work with the Base Public Affairs Office to determine outreach opportunities and produce information materials that promote Kingsley Field ANGB.

- **PO OBJECTIVE 1.2:** Continue existing community outreach activities and develop new opportunities for community outreach at Kingsley Field ANGB. The public perception of Kingsley Field should be assessed. Ongoing and new outreach programs that do not conflict with mission priority should be considered.

  — **PROJECT 1.2.1:** Continue to host training activities, which include an open house to invite the community on to the installation. The local community is supportive of the installation, and these events should be continued to foster a relationship with the local community.

  — **PROJECT 1.2.2:** Determine if beehives could be introduced at Kingsley Field ANGB for use by community members. These hives would attract pollinators to the Base and engage the local community. The installation should also manage habitat, where feasible, to restore native pollinators.

  — **PROJECT 1.2.3:** Consider outreach opportunities that relate to migratory birds and public access, including participation in International Migratory Bird Day, Endangered Species Day, Earth Day, National Public Lands Day, Breeding Bird Survey, and the Christmas Bird Count.

8.17 GEOGRAPHIC INFORMATION SYSTEM

Base personnel must work with the ANG Readiness Center's GeoBase Office to ensure GIS data for the installation is obtained and correctly uploaded into the system.

9. INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN IMPLEMENTATION

9.1 INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN IMPLEMENTATION

9.1.1 Implementation

The INRMP Program has been organized to ensure the implementation of year-round, cost-effective management activities and projects that meet the requirements of the installation. The various organizations on the installation that are responsible for implementation of the INRMP are described below.

Installation Stakeholders—The INRMP Working Group will be responsible for the overall implementation of the INRMP. The INRMP Working Group will be comprised of key installation personnel from Kingsley Field ANGB, in addition to the NGB/A4AM Natural Resources Program Manager who will provide technical assistance when necessary. Key personnel from the installation should include the Missions Support Group Commander, Civil Engineering Commander, Chief of Safety, Flight Safety Officer, Air Field Manager, Pest Management Program Manager, Civil Engineering Operations Chief, Civil Engineering Pavements and Ground Supervisor, Natural Resource Manager, and Environmental Manager. This INRMP Working Group will assume an oversight role to ensure the effective implementation of this plan.

The Commander of Kingsley Field ANGB will be the official signatory for the INRMP and the annual reviews. The installation's Environmental Officer is responsible for ensuring the activities associated with the implementation of this plan adhere to applicable federal, state, local, and USAF environmental regulations and guidelines. The NGB/A4AM Natural Resources Program Manager tracks DoD and USAF policies, and approves funding for projects and studies identified as a priority in this plan. The NGB/A4AM Natural Resources Program Manager acts as a technical point of contact on all natural resources-related activities. Projects proposed in this plan are reviewed by the installation's Environmental Officer and the NGB/A4AM Natural Resources Program Manager. Deviation from the projects proposed in this plan should be independently reviewed by the NGB/A4AM Natural Resources Program Manager.

External Stakeholders—The USFWS and ODFW can provide technical assistance to the installation. Specifically, these agencies will alert the Environmental Officer whenever new species that have the potential for inhabiting the installation are added to the federal and state endangered species lists. In addition, these agencies will be involved in the annual review of the INRMP and updates to the INRMP determined to be necessary as a result of changes in environmental conditions or the mission. The USDA-WS should also provide technical assistance and review of the document as needed.

9.1.2 Natural Resources Management Staffing

A description of the offices or squadrons responsible for assisting in the portions of the INRMP are described in Section 7.1, Natural Resources Program Management.

9.1.3 Monitoring Integrated Natural Resources Management Plan Implementation

A variety of metrics will be used to measure the extent of INRMP implementation. In general, the Environmental Manager will be responsible for implementing the goals, objectives, and projects described in this INRMP. The following monitoring criteria have been established for each resource management.

- ***Natural Resources Program Management*—**Monitoring criteria will include documented completion of the annual coordination meeting with USFWS and ODFW. When the annual INRMP review is conducted, concurrence from the signatory agencies will be obtained, and the INRMP document will be amended accordingly.

- ***Fish and Wildlife Management***—Monitoring criteria will include accessing habitat and wildlife on the installation to ensure healthy populations. In addition, the perimeter fence line will continually be surveyed for evidence of wildlife entry and breaches.

- ***Outdoor Recreation and Public Access to Natural Resources*—**Monitoring criteria will include developing a physical therapy trail and monitoring use of the trail and other outdoor areas by Base personnel.

- ***Conservation Law Enforcement***—Monitoring criteria will include ensuring that ODFW or the appropriate law enforcement agency has full access to the installation to enforce natural resource laws.

- ***Threatened and Endangered Species and Habitats Management***—Monitoring criteria will include annual updates of the listed rare, threatened, and endangered species or their habitats occurring on the installation. Management actions will be implemented to avoid or minimize impacts to any listed species or habitats, including the three known federally listed species, consistent with permits.

- ***Water Resource Protection***—Monitoring criteria will include regular inspections of stormwater and erosion and sediment control BMPs to ensure proper functioning. These controls and practices are set in place to make sure that impacts to water resources associated with accidental spills and leakage from vehicles and equipment are minimized.

- ***Wetland Protection***—Monitoring criteria for wetlands will include assessing the effectiveness of wetlands management to curtail wetland encroachment. Any unavoidable impacts to wetlands will be fully mitigated and in compliance with regulations.

- ***Grounds Maintenance***—Monitoring criteria will include regular assessment of the use of native species throughout the installation. Erosion and sedimentation resulting from bare ground will also be monitored to ensure that problems do not occur.

- ***Integrated Pest Management***—Monitoring criteria will include ensuring that IPM practices are incorporated into pest management approaches on the installation. After treatment of invasive species and removal of nuisance species, post-monitoring will be implemented to determine the success of the effort.

- ***Bird/Wildlife Aircraft Strike Hazard***—Monitoring criteria will include ensuring that management strategies provided in this INRMP do not result in an increase in BASH. The BASH Plan will be updated based on installation, USFWS, ODFW, and USDA-WS recommendations.

- ***Cultural Resource Protection***—Cultural resources issues will be addressed through the ANG Cultural Resources Management Program.

- ***Public Outreach—***Monitoring criteria will include assessing the overall success of programs offered at the installation.

- ***GIS—***Monitoring will include measuring the effectiveness and accuracy of the Natural Resources GeoBase.

9.2 ANNUAL INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN REVIEW AND COORDINATION REQUIREMENTS

To ensure that this INRMP properly addresses all aspects of the natural resources present on the installation and proposes actions that are in accordance with USAF goals and objectives, this plan and all its components are subject to review by the installation's Environmental Management Office and the NGB/A4AM Natural Resources Program Manager. Similarly, all changes to be incorporated into this plan must be approved by the installation, USFWS, and ODFW.

9.3 INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN UPDATE AND REVISION PROCESS

This INRMP is in effect from the date that all required signatures have been received; however, the Operational Component Plans must be updated annually during preparation of the installation's environmental budgets.

This INRMP should be reviewed internally on an annual basis to assess the recommended management practices in terms of their appropriateness for current conditions at the Kingsley Field ANGB. The INRMP should also be coordinated annually with the USFWS and ODFW. In addition, the INRMP should be updated whenever there is a modification to the installation's missions, or when there is a substantial change to the installation's natural or cultural resources.

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10. ANNUAL WORK PLANS

The purpose of this chapter is to present a road map for the execution of specific actions to achieve management goals and objectives identified in this INRMP.

Under the authority and direction of the Commanding Officer, the Environmental Manager provides staff for implementing the INRMP management actions, and the NGB/A4AM Natural Resources Program Manager provides technical assistance when necessary.

Tables 10-1 through 10-5 summarize the management actions identified in Chapter 8 for Kingsley Field ANGB and propose priorities for their implementation from 2018 through 2022. The actions proposed for this INRMP are aggressive, and might not be accomplished within the established timelines due to a number of factors (e.g., budget and manpower constraints, wartime tasks). However, their importance to the proper management of the installation's natural resources cannot be understated. Therefore, the management actions presented in these tables should be modified as part of the annual review of this INRMP by the INRMP Working Group to ensure that these goals are continually emphasized, and accomplished when practicable.

This INRMP reflects the commitment set forth by Kingsley Field ANGB to conserve, protect, and enhance the natural resources present on the installation. This INRMP is the final plan that will direct the natural resources management at the installation from Fiscal Years 2018 through 2022. An ecosystem approach was used to develop the management measures for each resource area. Implementation of the management measures will maintain, conserve, and enhance the ecological integrity of the installation and the biological communities occurring on the installation. In addition, the natural resources management measures described in this plan will protect the installation's ecosystems and their components from unacceptable damage or degradation and identify and restore previously degraded habitats.

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

Any requirement for the obligation of funds for projects in this INRMP shall be subject to the availability of funds appropriated by Congress, and none of the proposed projects shall be interpreted to require obligation or payment of funds in violation of any applicable federal law. Implementation of the actions and projects described in this INRMP are guided by how budget

priorities are assessed for environmental work on DoD installations. This is described in DoDI 4715.03, *Natural Resources Conservation Program*, which implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under DoD control.

The Office of Management and Budget considers funding for the preparation and implementation of this INRMP, as required by the Sikes Act, to be a high priority; however, the reality is that not all of the projects and programs identified in this INRMP will receive immediate funding. As such, these programs and projects have been placed into four priority-based categories:

- Priority 0 – Day-to-day recurring projects
- Priority 1 – High priority projects
- Priority 2 – Medium importance projects
- Priority 3 – Low importance projects.

The prioritization of the projects is based on need, and need is based on a project's importance in moving the natural resources management program closer toward successfully achieving its goal. DoDI 4715.03 defines recurring and non-recurring conservation requirements as follows:

RECURRING AND NON-RECURRING CONSERVATION REQUIREMENTS

Priority 0: Recurring Natural Resources Conservation Management Requirements
a. Administrative, personnel, and other costs associated with managing the DoD Natural Resources Conservation Program that are necessary to meet applicable compliance requirements in federal and state laws, regulations, EOs, and DoD policies, or in direct support of the military mission. b. DoD components shall give priority to recurring natural resources conservation management requirements associated with the operation of facilities, installations, and deployed weapons systems. These activities include day-to-day costs of sustaining an effective natural resources management program, and annual requirements, including manpower, training, supplies, permits, fees, testing and monitoring, sampling and analysis, reporting and recordkeeping, maintenance of natural resources conservation equipment, and compliance self-assessments.
Priority 1 (High): Non-Recurring Natural Resources Management Requirements. Current Compliance.
Includes installation projects and activities to support: a. Installations currently out of compliance (e.g., received an enforcement action from an authorized federal or state agency or local authority). b. Signed compliance agreement or consent order. c. Meeting requirements with applicable federal and state regulations, standards, EOs, or DoD policies. d. Immediate and essential maintenance of operational integrity or military mission sustainment. e. Projects or activities that will be out of compliance if not implemented in the current program year including the following:

RECURRING AND NON-RECURRING CONSERVATION REQUIREMENTS

Priority 1 (High): Non-Recurring Natural Resources Management Requirements. Current Compliance (continued)

i. Environmental analyses for natural resources conservation projects, and monitoring and studies required to assess and mitigate potential impacts of the military mission on conservation resources.

ii. Planning documentation, master plans, compatible development planning, and INRMPs.

iii. Natural resources planning-level surveys.

iv. Reasonable and prudent measures included in incidental take statements of Biological Opinions; biological assessments; surveys; monitoring; reporting of assessment results; or habitat protection for listed, at-risk, and candidate species so that proposed or continuing actions can be modified in consultation with the USFWS or National Marine Fisheries Service.

v. Mitigation to meet existing regulatory permit conditions or written agreements.

vi. Non-point source pollution or watershed management studies or actions needed to meet compliance dates cited in approved state coastal non-point source pollution control plans, as required to meet consistency determinations consistent with Coastal Zone Management.

vii. Wetlands delineations critical for the prevention of adverse impacts on wetlands, so that continuing actions can be modified to ensure mission continuity.

Compliance with missed deadlines established in DoD-executed agreements.

Priority 2 (Medium): Non-Recurring Natural Resources Management Requirements. Maintenance Requirements.

Includes those projects and activities needed to meet an established deadline beyond the current program year and maintain compliance. Examples include the following:

a. Compliance with future deadlines.

b. Conservation, GIS mapping, and data management to comply with federal, state, and local regulations; EOs; and DoD policy.

c. Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives.

d. Wetlands enhancement to minimize wetlands loss and enhance existing degraded wetlands.

e. Conservation recommendations in biological opinions issued pursuant to the ESA.

RECURRING AND NON-RECURRING CONSERVATION REQUIREMENTS

Priority 3 (Low): Non-Recurring Natural Resources Management Requirements. Enhancement Actions Beyond Compliance.
Includes those projects and activities that enhance conservation resources or the integrity of the installation's mission, or are needed to address overall environmental goals and objectives, but are not specifically required by law, regulation, or EO, and are not of an immediate nature. Examples include: a. Community outreach activities, such as International Migratory Bird Day, Earth Day, National Public Lands Day, Pollinator Week, and Arbor Day activities. b. Educational and public awareness projects, such as interpretive displays, oral histories, Watchable Wildlife areas, nature trails, wildlife checklists, and conservation teaching materials. c. Restoration or enhancement of natural resources when no specific compliance requirement dictates a course, or timing of action. d. Management and execution of volunteer and partnership programs.

Table 10-1. Summary of Kingsley Field ANGB Management Actions 2018

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Natural Resources Program Management				
NRP – 1.1	**Attend DoD Natural Resources Compliance Course and National Military Fish and Wildlife Association Training Workshop**	2 (Medium)		
NRP – 2.1	**Ensure INRMP Goals Are Consistent with Current Management**	1 (High)		
NRP – 2.2	**Conduct External Stakeholder Review and Update INRMP**	0 (Recurring)		
Fish and Wildlife Management				
FWM – 1.1	**Conduct Flora and Fauna Surveys**	2 (Medium)		
FWM – 1.2	**Disseminate Information on Wildlife at Kingsley Field ANGB to Base Personnel**	2 (Medium)		
FWM – 2.1	**Continue Wildlife Management Including Depredation and Control**	0 (Recurring)		
FWM – 3.1	**Enhance and Maintain Existing Natural Habitats**	3 (Low)		
Management of Threatened and Endangered Species and Habitats				
TE – 1.1	**Obtain Current Threatened and Endangered Species Data**	1 (High)		
Water Resources Protection				
WRP – 1.1	**Monitor Construction Projects to Ensure Erosion and Sediment Controls are Implemented**	0 (Recurring)		
Waters of the U.S./Wetland Protection				
WP – 1.1	**Ensure Jurisdictional Determination Remains Current**	2 (Medium)		
WP – 1.2	**Educate Personnel on Wetland Location and Allowable Activities**	2 (Medium)		
Grounds Maintenance				
GM – 1.1	**Use Native Grass and Plant Species Adapted to Central Oregon**	2 (Medium)		
Integrated Pest Management Program				
IPM – 1.1	**Provide IPM Coordinator Locations of Threatened and Endangered Species on the Installation**	0 (Recurring)		
IPM – 1.1	**Assist IPM Coordinator with Management of Nuisance Species**	2 (Medium)		

Table 10-1. Summary of Kingsley Field ANGB Management Actions 2018

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Bird/Wildlife Aircraft Strike Hazard				
BH – 1.1	**Adhere to All Threatened and Endangered Species and Migratory Bird Laws and Regulations for BASH Actions**	0 (Recurring)		
BH – 1.2	**Continue Working with Agencies and Landowners to Limit Waterfowl Populations and BASH Species**	0 (Recurring)		
BH – 1.3	**Update Current BASH Plan to Address New Issues and Concerns**	1 (High)		
Public Outreach				
PO – 1.1	**Continue to Encourage Base Personnel to Participate in Public Outreach**	3 (Low)		
PO – 1.2	**Continue Existing Community Outreach Activities and Develop New Activities**	3 (Low)		

Table 10-2. Summary of Kingsley Field ANGB Management Actions 2019

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Natural Resources Program Management				
NRP – 1.1	**Attend DoD Natural Resources Compliance Course and National Military Fish and Wildlife Association Training Workshop**	2 (Medium)		
NRP – 2.1	**Ensure INRMP Goals Are Consistent with Current Management**	1 (High)		
NRP – 2.2	**Conduct External Stakeholder Review and Update INRMP**	0 (Recurring)		
Fish and Wildlife Management				
FWM – 1.2	**Disseminate Information on Wildlife at Kingsley Field ANGB to Base Personnel**	2 (Medium)		
FWM – 2.1	**Continue Wildlife Management Including Depredation and Control**	0 (Recurring)		
FWM – 3.1	**Enhance and Maintain Existing Natural Habitats**	3 (Low)		
Management of Threatened and Endangered Species and Habitats				
TE – 1.1	**Develop a Poster with Threatened and Endangered Species on the Installation**	2 (Medium)		
TE – 1.1	**Work with Oregon Institute of Technology for the Propagation and Relocation of Applegate's Milk-Vetch**	2 (Medium)		
Water Resources Protection				
WRP – 1.1	**Monitor Construction Projects to Ensure Erosion and Sediment Controls are Implemented**	0 (Recurring)		
WRP – 1.2	**Identify Locations of Erosion**	2 (Medium)		
Wetland Protection				
WP – 1.1	**Ensure Jurisdictional Determination Remains Current**	2 (Medium)		
WP – 1.2	**Educate Personnel on Wetland Location and Allowable Activities**	2 (Medium)		
Grounds Maintenance				
GM – 1.1	**Use Native Grass and Plant Species Adapted to Central Oregon**	2 (Medium)		
Integrated Pest Management Program				
IPM – 1.1	**Provide IPM Coordinator Locations of Threatened and Endangered Species on the Installation**	0 (Recurring)		
IPM – 1.1	**Assist IPM Coordinator with Management of Nuisance Species**	2 (Medium)		
IPM – 1.2	**Expand Partnership with City for Management of Nuisance Species**	2 (Medium)		

Table 10-2. Summary of Kingsley Field ANGB Management Actions 2019

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Bird/Wildlife Aircraft Strike Hazard				
BH – 1.1	**Adhere to All Threatened and Endangered Species and Migratory Bird Laws and Regulations for BASH Actions**	0 (Recurring)		
BH – 1.2	**Continue Working with Agencies and Landowners to Limit Waterfowl Populations and BASH Species**	0 (Recurring)		
Public Outreach				
PO – 1.1	**Continue to Encourage Base Personnel to Participate in Public Outreach**	3 (Low)		
PO – 1.2	**Continue Existing Community Outreach Activities and Develop New Activities**	3 (Low)		

Table 10-3. Summary of Kingsley Field ANGB Management Actions 2020

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Natural Resources Program Management				
NRP – 1.1	**Attend DoD Natural Resources Compliance Course and National Military Fish and Wildlife Association Training Workshop**	2 (Medium)		
NRP – 2.1	**Ensure INRMP Goals Are Consistent with Current Management**	1 (High)		
NRP – 2.2	**Conduct External Stakeholder Review and Update INRMP**	0 (Recurring)		
Fish and Wildlife Management				
FWM – 1.2	**Disseminate Information on Wildlife at Kingsley Field ANGB to Base Personnel**	2 (Medium)		
FWM – 2.1	**Continue Wildlife Management Including Depredation and Control**	0 (Recurring)		
FWM – 3.1	**Enhance and Maintain Existing Natural Habitats**	3 (Low)		
Management of Threatened and Endangered Species and Habitats				
TE – 1.1	**Work with Oregon Institute of Technology for the Propagation and Relocation of Applegate's Milk-Vetch**	2 (Medium)		
Water Resources Protection				
WRP – 1.1	**Monitor Construction Projects to Ensure Erosion and Sediment Controls are Implemented**	0 (Recurring)		
WRP – 1.2	**Identify Locations of Erosion**	2 (Medium)		
Wetland Protection				
WP – 1.1	**Ensure Jurisdictional Determination Remains Current**	2 (Medium)		
WP – 1.2	**Educate Personnel on Wetland Location and Allowable Activities**	2 (Medium)		
Grounds Maintenance				
GM – 1.1	**Use Native Grass and Plant Species Adapted to Central Oregon**	2 (Medium)		
Integrated Pest Management Program				
IPM – 1.1	**Provide IPM Coordinator Locations of Threatened and Endangered Species on the Installation**	0 (Recurring)		
IPM – 1.1	**Assist IPM Coordinator with Management of Nuisance Species**	2 (Medium)		
IPM – 1.3	**Conduct Invasive Species Surveys**	2 (Medium)		

Table 10-3. Summary of Kingsley Field ANGB Management Actions 2020

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Bird/Wildlife Aircraft Strike Hazard				
BH – 1.1	**Adhere to All Threatened and Endangered Species and Migratory Bird Laws and Regulations for BASH Actions**	0 (Recurring)		
BH – 1.2	**Continue Working with Agencies and Landowners to Limit Waterfowl Populations and BASH Species**	0 (Recurring)		
Public Outreach				
PO – 1.1	**Continue to Encourage Base Personnel to Participate in Public Outreach**	3 (Low)		
PO – 1.2	**Continue Existing Community Outreach Activities and Develop New Activities**	3 (Low)		

Table 10-4. Summary of Kingsley Field ANGB Management Actions 2021

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Natural Resources Program Management				
NRP – 1.1	**Attend DoD Natural Resources Compliance course and National Military Fish and Wildlife Association Training Workshop**	2 (Medium)		
NRP – 2.1	**Ensure INRMP Goals Are Consistent with Current Management**	1 (High)		
NRP – 2.2	**Conduct External Stakeholder Review and Update INRMP**	0 (Recurring)		
Fish and Wildlife Management				
FWM – 1.2	**Disseminate Information on Wildlife at Kingsley Field ANGB to Base Personnel**	2 (Medium)		
FWM – 2.1	**Continue Wildlife Management Including Depredation and Control**	0 (Recurring)		
FWM – 3.1	**Enhance and Maintain Existing Natural Habitats**	3 (Low)		
Management of Threatened and Endangered Species and Habitats				
TE – 1.1	**Work with Oregon Institute of Technology for the Propagation and Relocation of Applegate's Milk-Vetch**	2 (Medium)		
Water Resources Protection				
WRP – 1.1	**Monitor Construction Projects to Ensure Erosion and Sediment Controls are Implemented**	0 (Recurring)		
WRP – 1.2	**Identify Locations of Erosion**	2 (Medium)		
Wetland Protection				
WP – 1.1	**Ensure Jurisdictional Determination Remains Current**	2 (Medium)		
WP – 1.2	**Educate Personnel on Wetland Location and Allowable Activities**	2 (Medium)		
Grounds Maintenance				
GM – 1.1	**Use Native Grass and Plant Species Adapted to Central Oregon**	2 (Medium)		
GM – 1.2	**Convert Improved Grounds to Semi-Improved Acreage, Where Feasible**	3 (Low)		
Integrated Pest Management Program				
IPM – 1.1	**Provide IPM Coordinator Locations of Threatened and Endangered Species on the Installation**	0 (Recurring)		
IPM – 1.1	**Assist IPM Coordinator with Management of Nuisance Species**	2 (Medium)		
IPM-1.1	**Participate in 5-Year Review of IPM Plan**	2 (Medium)		

Table 10-4. Summary of Kingsley Field ANGB Management Actions 2021

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Bird/Wildlife Aircraft Strike Hazard				
BH – 1.1	**Adhere to All Threatened and Endangered Species and Migratory Bird Laws and Regulations for BASH Actions**	0 (Recurring)		
BH – 1.2	**Continue Working with Agencies and Landowners to Limit Waterfowl Populations and BASH Species**	0 (Recurring)		
Public Outreach				
PO – 1.1	**Continue to Encourage Base Personnel to Participate in Public Outreach**	3 (Low)		
PO – 1.2	**Continue Existing Community Outreach Activities and Develop New Activities**	3 (Low)		

Table 10-5. Summary of Kingsley Field ANGB Management Actions 2022

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Natural Resources Program Management				
NRP – 1.1	**Attend DoD Natural Resources Compliance Course and National Military Fish and Wildlife Association Training Workshop**	2 (Medium)		
NRP – 2.1	**Ensure INRMP Goals Are Consistent with Current Management**	1 (High)		
NRP – 2.2	**Conduct External Stakeholder Review and Update INRMP**	0 (Recurring)		
Fish and Wildlife Management				
FWM – 1.2	**Disseminate Information on Wildlife at Kingsley Field ANGB to Base Personnel**	2 (Medium)		
FWM – 2.1	**Continue Wildlife Management Including Depredation and Control**	0 (Recurring)		
FWM – 3.1	**Enhance and Maintain Existing Natural Habitats**	3 (Low)		
Outdoor recreation and Public Access to Natural Resources				
OR – 1.1	**Establish a Physical Training Trail**	3 (Low)		
Management of Threatened and Endangered Species and Habitats				
TE – 1.1	**Obtain Current Threatened and Endangered Species Data**	1 (High)		
TE – 1.1	**Work with Oregon Institute of Technology for the Propagation and Relocation of Applegate's Milk-Vetch**	2 (Medium)		
Water Resources Protection				
WRP – 1.1	**Monitor Construction Projects to Ensure Erosion and Sediment Controls are Implemented**	0 (Recurring)		
WRP – 1.2	**Identify Locations of Erosion**	2 (Medium)		
Wetland Protection				
WP – 1.1	**Ensure Jurisdictional Determination Remains Current**	2 (Medium)		
WP – 1.2	**Educate Personnel on Wetland Location and Allowable Activities**	2 (Medium)		
Grounds Maintenance				
GM – 1.1	**Use Native Grass and Plant Species Adapted to Central Oregon**	2 (Medium)		
GM – 1.2	**Convert Improved Grounds to Semi-Improved Acreage, Where Feasible**	3 (Low)		

Table 10-5. Summary of Kingsley Field ANGB Management Actions 2022

Objective No.	Projects	Priority Level	Completed (Date)	Notes (include actions and dates)
Integrated Pest Management Program				
IPM – 1.1	**Provide IPM Coordinator Locations of Threatened and Endangered Species on the Installation**	0 (Recurring)		
IPM – 1.1	**Assist IPM Coordinator with Management of Nuisance Species**	2 (Medium)		
Bird/Wildlife Aircraft Strike Hazard				
BH – 1.1	**Adhere to All Threatened and Endangered Species and Migratory Bird Laws and Regulations for BASH Actions**	0 (Recurring)		
BH – 1.2	**Continue Working with Agencies and Landowners to Limit Waterfowl Populations and BASH Species**	0 (Recurring)		
Public Outreach				
PO – 1.1	**Continue to Encourage Base Personnel to Participate in Public Outreach**	3 (Low)		
PO – 1.2	**Continue Existing Community Outreach Activities and Develop New Activities**	3 (Low)		

11. APPENDIX

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12. ASSOCIATED AND COMPONENT PLANS

COMPONENT PLAN A: INTEGRATED CULTURAL RESOURCES MANAGEMENT PLAN (ICRMP)

COMPONENT PLAN B: OIL AND HAZARDOUS SUBSTANCES SPILL PREVENTION AND RESPONSE PLAN

COMPONENT PLAN C: STORMWATER POLLUTION PREVENTION PLAN

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All component plans are provided on the accompanying CD.

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