FERN RIDGE WILDLIFE AREA MANAGEMENT PLAN

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Oregon Department of Fish and Wildlife
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Purpose of the Plan

This document is a long range plan designed to guide the management of the Fern Ridge Wildlife Area (FRWA) for the next 10 years. The Oregon Department of Fish and Wildlife's (Department) management planning process for wildlife areas involves the development of broad goals for the areas, and formulation of specific objectives and management strategies to achieve those goals. The purposes of this plan are:

- To provide clear direction for management of FRWA;
- To provide long-term continuity in wildlife area management;
- To communicate the Department's management priorities for the FRWA to its neighbors, visitors, and to the public;
- To ensure that management programs on the FRWA are consistent with the original mandate and purpose of the area when it was first established;
- To ensure that management of FRWA is consistent with Federal, State, and local plans;
- To ensure management activities address conservation priorities and recommendations described in the 2016 Oregon Conservation Strategy (OCS), and;
- To provide justification for staffing operations, maintenance, and capital improvement needs on the FRWA.

Historical Background

The FRWA is located primarily within boundaries of the U.S. Army Corps of Engineers (USACE) Fern Ridge Lake Project (Project). The Project contains 12,780 acres either owned in fee title by the federal government or for which flowage or other easement rights have been acquired. The lake is a USACE flood control reservoir with a summer full pool and a winter drawdown to a minimum pool level for flood control. The lake and surrounding land base are divided into nineteen separate management units for administrative reference. The FRWA was created by a licensing agreement signed in 1957 and modified in 1982 and 2008, between the USACE and the then Oregon Game Commission. This agreement authorized the state to "develop, conserve, and manage all wildlife resources on 5,010 acres of land and water within the Fern Ridge Project."

Fern Ridge Lake is located in the southern Willamette Valley and is a significant water body well suited to support indigenous fish and wildlife species including migratory waterfowl. The shallow lake and surrounding wetlands provide habitat for a diverse array of wildlife species and include some remnants of wet prairie vegetation representative of the Willamette Valley before Euro-American settlement. The habitat types found at Fern Ridge Lake are of limited quantity in western Oregon but are of significant size and quality on a landscape scale to support populations of wildlife that are dependent upon these habitat types.

Because of its proximity to the Eugene-Springfield metropolitan area, the FRWA is a popular destination for water-based recreation, angling, hunting, bird watching, hiking, and environmental education.

Planning Approach
This plan revises the long range plan for FRWA adopted by the Oregon Fish and Wildlife Commission (Commission) in 2009.

The 2019 FRWA Management Plan update offers a comprehensive vision and action plan for the next ten years. This plan describes issues and provides actions for addressing them. These actions will be implemented during the life of this plan, but are subject to conditions of the license agreement with USACE, funding and personnel availability. The management plan will be reviewed in 2025 to gauge implementation progress and make necessary changes and then revised in its entirety in 2030. All management activities proposed are within the scope of authorization of the USACE Fern Ridge Master Plan for Resource Use (1987 Fern Ridge Lake – Plan of Management and Development); however, USACE plans to start Master Plan revisions in 2020. It is unknown at this time whether that will require updates to the FRWA Management Plan.

Fern Ridge Wildlife Area Vision
The vision for the FRWA is:

Wetlands, grasslands, and oak woodlands are being preserved and enhanced in the southern Willamette Valley through sound stewardship measures to support waterfowl and a diverse array of plant and animal species, for use and enjoyment by present and future generations.

Wildlife Area Goals
The goals for FRWA are:

Goal 1: Manage habitats to attract and support waterfowl in the southern Willamette Valley.

Goal 2: Protect, enhance, and restore habitat diversity for other wildlife present on the area, compatible with Goal 1.

Goal 3: Provide a variety of recreational and educational opportunities to the public which are compatible with Goals 1 and 2.

For reference, the word “compatible” used in this document is defined in Oregon Revised Statute (ORS) 496.004 which states in “Article (3): “Compatible” means capable of existing in harmony so as to minimize conflict.”

Specific objectives and strategies to implement each goal, as well as detailed rationale are provided on pages 42 to 54.

Implementation Approach
Primary wildlife management actions on FRWA are designed to augment and preserve the range of habitat types that historically occurred in the southern Willamette Valley. FRWA staff will use a combination of strategies to restore ecological processes (e.g., hydrology and fire) that drive structure and function in key habitat types. These actions may range from intensive management of hydrology and plants in impounded wetlands to controlled burns on remnant wet prairie habitats, and low level monitoring and control of invasive species.

Wetland habitats on FRWA occur in both actively managed and passively managed units. Actively managed wetland units are usually bordered by dikes with water control structures that provide mechanism for controlled habitat management. Wildlife use of FRWA wetlands depends on both natural, and numerous man-made semi-natural habitats.

Upland prairie, wet prairie, and oak woodland habitats on FRWA are also both actively and passively managed. Once common in the Willamette valley, remnants of these habitats found on the Fern Ridge project now represent some of the last remaining portions of these important native habitat types. Preservation and management of these critical habitats at FRWA benefits many wildlife and plant species and is consistent with guidance provided in the OCS.

Benefits to wildlife from habitat management on FRWA vary between species. Different species or guilds (group of species with similar habitat requirements) will see higher benefits at different times of year, dependent on many life cycle variables, including migration, production and weather patterns. Recreational opportunities on FRWA will also vary through time. Specific recreational uses when balanced with resource needs, will not be maximized in all cases and will be monitored for compatibility with primary wildlife management goals. Monitoring will include a range of specific data collection and observational evaluations to establish trends that will help guide management decisions. For example, daily hunt permits are used to provide hunter use and harvest information that is evaluated annually as part of the regulatory process. A strategy is identified in this plan to develop a methodology for improved tabulation of other forms of outdoor recreation hosted on the wildlife area. This type of information will be used as baseline data to evaluate levels and types of public use as related to habitat integrity and wildlife disturbance.

Priority habitat related strategies on the FRWA include:

- Establishing and maintaining semi-permanent, seasonal wetlands, and moist soil management units using a combination of water level management and periodic soil disturbance;
- Planting and establishing a variety of wildlife food crops for forage and cover;
- Maintenance, enhancement, and protection of critical native habitats;
- Providing wildlife sanctuary during important life cycle time periods;
- Reduction of invasive vegetation species consistent with the OCS.

Current management direction is to provide specific habitat types or features on FRWA according to the identified goals and objectives of this plan in an attempt to meet life-history needs of a wide array of wildlife species or guilds.

Introduction

Purpose of the Plan

This document is a long range plan designed to guide the management of the Fern Ridge Wildlife Area (FRWA) for the next 10 years. The Oregon Department of Fish and Wildlife's (Department) management planning process for wildlife areas involves the development of broad goals for the areas, and formulation of specific objectives and management strategies to achieve those goals. The purposes of this plan are:

- To provide clear direction for management of FRWA;
- To provide long-term continuity in wildlife area management;
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- To ensure that management programs on the FRWA are consistent with the original mandate and purpose of the area when it was first established;
- To ensure that management of FRWA is consistent with Federal, State, and local plans;
- To ensure management activities address conservation priorities and recommendations described in the 2016 Oregon Conservation Strategy (OCS), and;
- To provide justification for staffing operations, maintenance, and capital improvement needs on the FRWA.

Oregon Department of Fish and Wildlife Mission and Authority

The mission of the Department is to protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations. Oregon Department of Fish and Wildlife is the only state agency charged exclusively with protecting Oregon's fish and wildlife resources. The state Wildlife Policy (ORS 496.012) and Food Fish Management Policy (ORS 506.109) are the primary statutes that govern management of fish and wildlife resources.

Purpose and Need of Fern Ridge Wildlife Area

FRWA is located in the southern Willamette Valley near Eugene and primarily falls within boundaries of the USACE Fern Ridge Lake Project. All land and water areas of the project are owned by the USACE. The FRWA was created by a licensing agreement signed in 1957 between the USACE and the then Oregon Game Commission authorizing the state to "develop, conserve, and manage all wildlife resources on 5,010 acres of land and water within the Fern Ridge Project." The license was modified in 1982 and 2008 between the USACE and ODFW. The license agreements are based on a 25 year period and the most recent license agreement will expire on September 30, 2033.

On October 27, 2008 a revised license was adopted that included logistical adjustments to unit boundaries that more closely align with habitat types, unit boundaries, and natural land features. With the purchase of the South Coyote and Northeast Coyote

units by the Willamette Wildlife Mitigation Program (WWMP), the total revised acreage for the entire FRWA is now approximately 5,831 acres.

In originally establishing the wildlife area and its management goals, the Department gave priority to management of wetland habitats and associated uplands for the benefit of numerous wildlife species, with an emphasis on waterfowl. Public recreation opportunities were also deemed a priority. In recent years progressive management of wetlands has become a focus. Wetlands have special significance for Oregon's biodiversity. Although limited in their distribution, they are among the most biologically productive and species-rich habitats in Oregon. Wetlands also play key roles in major ecological processes and provide a number of important ecosystem services, regulating water flows, reducing flooding, and improving water quality, among other functions.

Historically one of the dominant habitat types in the Willamette Valley, wetlands have been one of the biggest casualties of the region's urban and agricultural development. An estimated 87 percent of the region's wetland and riparian habitats have been converted to non-native habitats. Most of the valley's seasonal wetlands have been drained, and flood control modifications have left the Willamette River largely disconnected from the braided channels, oxbows and sloughs that marked most of its historic floodplain. Only a few small fragments remain of the valley's formerly abundant wet prairies, but they harbor an impressive number of native species. Remaining areas with large blocks of wetland habitats are critical to the region's wildlife populations, particularly migratory birds. More than 30 species of ducks, geese, and swans, and a diverse assemblage of shorebirds and wading birds use the wetlands in the valley on a regular basis. Remnant riparian forests, grassland-savanna, and oak woodlands provide important habitat for more than 100 breeding migratory land bird species. The largest blocks of wetlands are found in a chain of state and federal wildlife areas and refuges, including the FRWA, that extend along the western side of the valley, and in floodplain areas along the Willamette River and its major tributaries.

The FRWA is administered by the West Region as a component of the South Willamette Watershed District Habitat Program, and is one of 17 larger wildlife areas managed by the Department. Project coordination is provided by the Wildlife Division to integrate wildlife area management activities with larger scale landscape planning including intergovernmental agreements, flyway plans, habitat joint ventures, the 2016 OCS, and individual species plans. Management of the wildlife area is carried out according to guidelines detailed in the management plan and supports the agency mission to “protect and enhance Oregon’s fish and wildlife and their habitats for use and enjoyment by present and future generations”. Management activities on the wildlife area are also within approved guidelines of the USACE Upper Willamette Valley Projects Fern Ridge Lake Master Plan for Resource Use. Management and development on the wildlife area is funded primarily through the Federal Aid in Wildlife Restoration Act, also known as the Pittman-Robertson (P-R) program. These funds have been essential in improving wildlife habitat and providing for hunting and wildlife viewing opportunities on the area. The location of this area in proximity to the Eugene- Springfield metropolitan area makes it a popular destination for water-based recreation, angling, hunting, wildlife

viewing, and environmental education.
Since the 1980s an increased demand for non-hunting, trapping or angling activities (wildlife viewing, photography, hiking, etc.) has occurred. This comprehensive plan acknowledges shifts in demands and management emphasis over the past twenty-five years on FRWA. The plan also recognizes the need to provide continued opportunities for the hunting public which remains the primary funding source for development and management actions on the wildlife area.

The OCS is the Department's overarching strategy for conserving fish and wildlife to help ensure that Oregon's natural treasures are passed on to future generations. FRWA is located in the Willamette Valley Ecoregion and contains strategy habitats including oak woodlands, upland prairie, wet prairie, wetlands, riparian, and aquatic habitats. The entire lake and surrounding wildlife area are classified as Conservation Opportunity Areas in the OCS. Many habitat management activities occurring at FRWA address conservation actions recommended in the OCS and these will be identified throughout this management plan.

Statutory direction contained in the State Wildlife Policy provides the purpose and need for the Department's actions and efforts on FRWA. Background information, objectives, strategies, rationale and monitoring to meet and measure progress toward goals is provided in this document. The diversity of habitats and management strategies used in the past on FRWA have contributed to a biologically diverse association of wildlife which includes at least 289 species of birds, 49 species of mammals, 19 species of fish and 22 species of reptiles and amphibians.

Fern Ridge Wildlife Area Vision Statement

The vision for FRWA is as follows:

Wetlands, grasslands, and oak woodlands are being preserved and enhanced in the southern Willamette Valley through sound stewardship measures to support waterfowl and a diverse array of plant and animal species, for use and enjoyment by present and future generations.

Wildlife Area Goals and Objectives

Wildlife Area goals are broad, open-ended statements of desired future conditions that convey a purpose but do not define measurable units. In contrast, objectives are more concise statements of what the Department wants to achieve, how much the Department wants to achieve, when and where to achieve it, and who will be responsible for the work. Objectives derive from goals and provide the basis for determining strategies, monitoring wildlife area accomplishments, and evaluating the success of strategies.

The goals and objectives for the FRWA are:

Goal 1: Manage habitats to attract and support waterfowl in the southern Willamette Valley.

Objective 1.1: Manage 900 acres of wetland impoundments to create habitats needed by migratory waterfowl during the non-breeding season. A balance of habitats includes early successional seasonal wetlands (40-80%), semi-permanent and permanent wetlands (10-40%) and planted agricultural crops (5-20%).

Objective 1.2: Designate 15-30% of managed wetlands as sanctuary for waterfowl.

Objective 1.3: Maintain approximately 1,000 acres of upland prairie, within 0.5 miles of wetland habitats, for dabbling ducks to provide suitable nesting habitat in association with brood rearing habitat (semi-permanent and permanent wetlands).

Objective 1.4: In cooperation with USACE, maintain approximately 1,000 acres of lakebed area that alternates between summer "full pool" condition of open water, submergent, and emergent vegetation zone and winter drawdown mudflat zone.

Goal 2: Protect, enhance, and restore habitat diversity for other wildlife present on the area, compatible with Goal 1.

Objective 2.1: Protect and enhance 414 acres of wet prairie.

Objective 2.2: Protect and enhance 945 acres of oak woodlands.

Objective 2.3: Protect and enhance 764 acres of upland prairie.

Goal 3: Provide a variety of recreational and educational opportunities to the public which are compatible with Goals 1 and 2.

Objective 3.1: Provide hunting, trapping, and angling opportunities in a manner compatible with habitat management objectives.

Objective 3.2: Provide wildlife viewing and education/interpretation opportunities compatible with Objective 3.1 and habitat management objectives.

Objective 3.3: Maintain and enhance wildlife area facilities, structures, and equipment used to conduct habitat management and public use projects on the wildlife area.

The acreage amounts used in the habitat focused objectives refer to existing acreage. It is the department's intent to improve the quality of these habitats to benefit wildlife, in particular waterfowl. Specific objectives and strategies to implement each goal, as well as detailed rationale are provided on pages 42 to 54.

Wildlife Area Establishment

The FRWA was created by a licensing agreement signed in 1957 between the USACE and the Oregon Game Commission which authorized the state to “develop, conserve, and manage all wildlife resources on 5,010 acres of land and water within the Fern Ridge Project.” The license was modified in 1982 and amended in 1995 following completion of a cooperative wetland enhancement project in the Fisher Butte unit. A parcel of 115 acres within three impoundments was removed from the original license agreement and placed under a supplemental license agreement for a 50 year period from September 2, 1994 to September 1, 2044. This amendment was made according to conditions of a cooperative habitat restoration project completed under Section 1135 of the Water Resources Development Act.

The 25 year license agreement for the remainder of the Project was revised in 2008 covering approximately 5,261 acres. The reason for the word “approximately” in this context is that many of the management units border Fern Ridge Lake. The unit boundaries are generally based on the emergent vegetation line as the terrestrial marsh interfaces with the lake. Over the course of years, this line may slightly shift based on plant response to hydrology or other factors, therefore slightly shifting the unit boundaries adjacent to the lake.

The USACE Fern Ridge Project is divided into 19 separate management units, including 18 land units and one unit covering the lake area itself. The boundaries of these units are based on physical, administrative and operational characteristics. Within this larger project area, the Department license includes all or part of nine management units around the lake (**Table 1**). For a detailed description of each management unit and each unit’s habitat objectives see **Appendix D**.

The FRWA also contains 5 additional Department owned parcels which are outside of the USACE license area. A 37 acre parcel, adjacent to the Amazon Dike #2 unit, was conveyed by Quitclaim Deed to the State of Oregon on January 31, 1952 by the U.S. General Services Administration for wildlife conservation purposes as authorized under Public Law 537. A 15 acre parcel located adjacent to the E. Coyote unit was acquired fee simple by ODFW on July 14, 1975 and a 4.22 acre parcel located adjacent to the Applegate unit was acquired fee simple by ODFW on October 15, 1980. The South Coyote unit was purchased with funds made available by the WWMP in March 2013 “for the purposes of protecting Coyote Creek and its riparian corridor, and restoring Willamette Valley habitats for the benefit of native fish, wildlife and plants”. South Coyote was designated a new administrative unit (**Table 1**) with unique management goals outlined in the Coyote Creek South Management Plan (**Appendix E**). The Northeast Coyote unit was also purchased with funds made available by the WWMP in August 2015 for the purposes of conserving and restoring wetland and grassland habitats for a variety of wildlife including grassland birds, amphibians, reptiles, raptors, and waterfowl. Northeast Coyote was also designated as a new administrative unit (**Table 1**) with unique management goals outlined in the Coyote Creek Northeast Management Plan (**Appendix F**).

Table 1. Fern Ridge Management Units.

Unit Name	Acres
East Coyote	424
West Coyote	454
South Coyote	309
Northeast Coyote	190
Fisher Butte	1,100
Royal Amazon	922
Amazon Dike #2 – USACE	489
Amazon Dike #2 – Department / GSA	37
South Marsh	343
Applegate	841
Jean's Peninsula	57
Kirk Park unit	156
Lake area (Amazon Dike #2 and Royal Amazon unit interface)	509
Fern Ridge Wildlife Area total	**5,831**

Description and Environment

Physical Resources

Location

FRWA is located in western Oregon in the southern Willamette Valley, in Lane County. The wildlife area is comprised of several parcels of land and marsh on the perimeter of Fern Ridge Lake, located approximately 5 miles west of the Eugene-Springfield metropolitan area. State Highway 126 transverses the area on the south. The wildlife area headquarters is located on the southern border of the West Coyote Unit, at 26969 Cantrell Road.

The Fern Ridge Lake Project was constructed in 1941 as one of 13 multi-purpose USACE reservoirs in the Willamette River basin. Current primary purposes for Fern Ridge Lake are flood control and irrigation, with secondary purposes for recreation, fish and wildlife and water quality. The USACE administers 12,780 acres at the Fern Ridge Lake Project comprised of lake surface and surrounding low elevation terrain. The lake is drawn down in the winter to a minimum conservation pool level for flood control purposes. The lake transforms from approximately 9,000 surface acres of open water in the summer months to an average winter pool of 1,500 surface acres.

FRWA is a jurisdictional overlay that covers approximately half of the Fern Ridge Lake Project. Within the project area, the wildlife area is divided into nine separate management units (East Coyote, West Coyote, Fisher Butte, Royal-Amazon, Amazon Dike #2, South Marsh, Applegate, Jean's Peninsula, and Kirk Park) (**Figure 1**). The

ODFW acquired two additional management units in 2013 and 2015, South Coyote and Northeast Coyote, respectively. These units were added to the wildlife area but lie outside the boundary of the USACE Fern Ridge Lake Project.

Climate

The south end of the Willamette Valley is in a temperate zone in which summers are warm and dry, while winters are mild and wet. Temperatures range from average summer highs in the 90ºs (F) to lows in the 20ºs. Annual precipitation for Fern Ridge Lake is about 55 inches, with about 70 percent falling between October and February. Less than 3 percent falls during July and August. Runoff follows a similar pattern, with high winter flows and low summer flows. Snow and freezing temperatures are generally absent in the winter or present for short durations. Conversely, hot days during summer months are moderated by cooler evening temperatures.

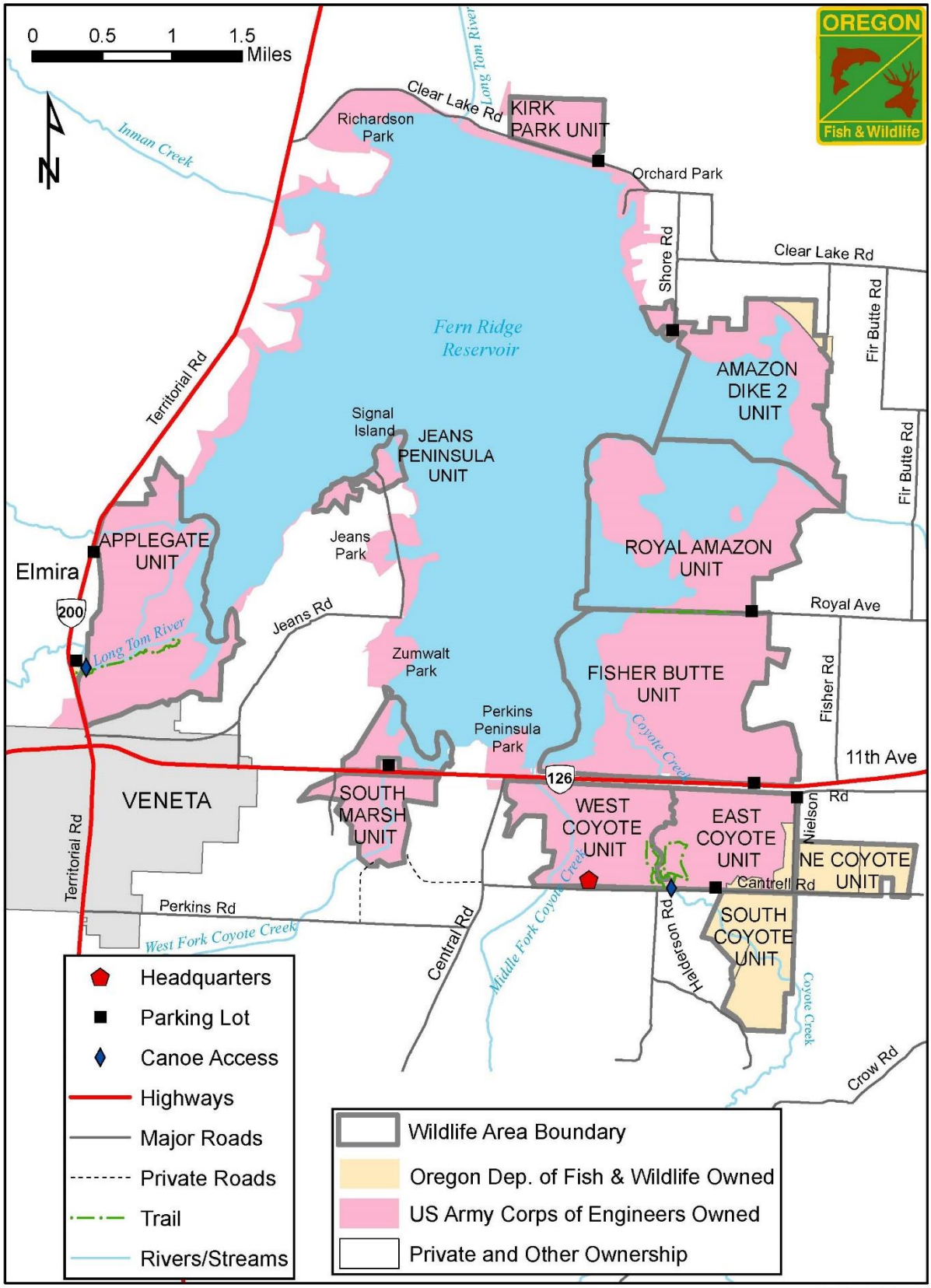
Topography and Soils

The floor of the Willamette Valley in the vicinity of the wildlife area is composed primarily of alluvial deposits. Topography of the Fern Ridge basin is very flat with gradual elevation rise to the west and south into the Coast Range foothills. Elevations range from 350 to 400 feet above sea level.

Soil types vary significantly in the different units surrounding the lake. Primary soil types on the southeast portion of the wildlife area where most field management activity occurs include Natroy, Veneta, Noti, Linslaw, Dayton, Pengra, and Salkum loam and silty clay loams (USACE, 1988). These soils are generally poorly drained with a clay substratum and are subject to high water tables and inundation during winter months. The high clay content and capability to hold water provides a tenacious medium for agricultural operations; however this substrate is a generally favorable feature for wetland management. Soil types in the Northeast portion of the wildlife area consist of Noti, Nekoma, Natroy, Salkum, Dayton, and Linslaw loams and silty clay loams. Soil types in the western wildlife area units include Noti, Linslaw, Veneta, Salkum, McBee, Wapato, and Dayton loams and silty clay loams.

Many of the soils have moderate to severe limitations for land management due to high seasonal water tables, wet or clayey surface layers, erodability, or slow percolation. Noti and Wapato soils have good suitability for wetland habitat management but are poorly suited for other habitat management purposes. Veneta, Salkum, Linslaw and McBee soils have fair to good suitability for management of most types of habitat elements except wetlands. More specific information about soils and topography is also contained in the individual unit descriptions in **Appendix D**.

Figure 1: Fern Ridge Wildlife Area Features and Ownership



Habitat Types

There are five habitat types found within the borders of the FRWA: wetlands (include emergent and submergent aquatic plants), wet prairie (lowland grasses), oak and mixed woodlands (coniferous and deciduous trees and woody shrubs), upland prairie and freshwater aquatic (open water and potholes). These habitat types and the amount of acres of each type are listed in detail in **Table 2**.

Table 2. Fern Ridge Wildlife Area Habitat Types by Management Unit.

Unit Name	Habitat Type	Sum/Acres
Amazon Dike #2	Coniferous Trees	5.4
	Deciduous Trees	76.5
	Emergent Aquatic Plants	124.1
	Wet Prairie	78.3
	Open Water	0.1
	Potholes	0.2
	Submerged and/or Emergent Plants	141.5
	Upland Prairie	60.8
	Woody Shrubs	1.7
	Total	**488.4**
Applegate	Coniferous Trees	31.9
	Deciduous Trees	362.6
	Disturbed Areas	0.5
	Emergent Aquatic Plants	221.7
	Wet Prairie	63.7
	Open Water	10.4
	Submerged Aquatic Plants	40.5
	Submerged and/or Emergent Plants	95.0
	Upland Prairie	5.9
	Woody Shrubs	9.0
	Total	**841.0**
East Coyote	Deciduous Trees	64.8
	Disturbed Areas	2.1
	Wet Prairie	61.2
	Managed Impoundment	260.5
	Open Water	16.1
	Woody Shrubs	19.3
	Total	**424.0**
Fisher Butte	Deciduous Trees	22.1
	Emergent Aquatic Plants	47.4
	Wet Prairie	328.3
	Managed Impoundment	446.3
	Open Water	9.7

Table 2. Continued		
Unit Name	**Habitat Type**	**Sum/Acres**
Fisher Butte	Potholes	35.1
	Submerged and/or Emergent Plants	209.3
	Woody Shrubs	2.3
	Total	**1,100.4**
Jean's Peninsula	Coniferous Trees	23.3
	Deciduous Trees	17.2
	Emergent Aquatic Plants	2.9
	Wet Prairie	2.5
	Submerged and/or Emergent Plants	8.4
	Woody Shrubs	2.9
	Total	**57.1**
Kirk Park	Deciduous Trees	67.7
	Disturbed Areas	3.1
	Emergent Aquatic Plants	2.7
	Wet Prairie	21.2
	Open Water	2.6
	Submerged Aquatic Plants	38.5
	Upland Prairie	7.3
	Woody Shrubs	13.2
	Total	**156.4**
Northeast Coyote	Agriculture	188.9
	Woody Shrubs	1.4
	Total	**190.3**
Royal Amazon	Coniferous Trees	7.7
	Deciduous Trees	2.5
	Emergent Aquatic Plants	373.7
	Wet Prairie	183.4
	Open Water	3.0
	Potholes	7.7
	Submerged Aquatic Plants	8.6
	Submerged and/or Emergent Plants	278.2
	Upland Prairie	13.5
	Woody Shrubs	43.9
	Total	**922.2**
South Coyote	Agriculture	31.9
	Deciduous Trees	51.9
	Disturbed	1.0
	Wet Prairie	188.7
	Upland Prairie	3.5
	Open Water	2.1
	Coyote Creek	10.4

Table 2. Continued		
Unit Name	**Habitat Type**	**Sum/Acres**
South Coyote	Submergent/Emergent Wetland	19.5
	Total	**309.0**
South Marsh	Coniferous Trees	13.8
	Deciduous Trees	42.5
	Emergent Aquatic Plants	27.9
	Wet Prairie	142.0
	Open Water	25.1
	Submerged and/or Emergent Plants	55.3
	Upland Prairie	14.9
	Woody Shrubs	21.6
	Total	**343.1**
West Coyote	Coniferous Trees	5.2
	Deciduous Trees	118.3
	Disturbed Areas	0.7
	Emergent Aquatic Plants	50.3
	Wet Prairie	117.2
	Managed Impoundment	154.5
	Upland Prairie	4.0
	Woody Shrubs	3.5
	Total	**453.7**
Lake Area	Fern Ridge Lake Open Water	**509.3**
	TOTAL	**5,831.9**

Emergent aquatic vegetation is the dominant plant form present at Fern Ridge Lake and covers approximately 2,500 acres of lake bed and shoreline. This vegetation is most abundant along the southern and eastern shorelines near the inflows of the Long Tom River and Coyote Creek. Although dominated by reed canarygrass (*Phalaris arundinacea*), the lake's emergent marsh includes hundreds of acres of hardstem bulrush (*Schoenoplectus acutus*) and cattail (*Typha latifolia*). Wapato (*Sagitaria latifolia*), smartweed (e.g., *Persicaria lapathifolia*), and other native wetland plant species also occur within these areas. Under normal filling and operation of the reservoir, these marshlands are flooded in early April and remain flooded typically through mid-October. Because this lake level management is opposite of the natural hydroperiod of Willamette Valley wetlands, this greatly complicates and constrains the Department's wetland management ability.

The emergent marsh transitions from the lake into low grasslands, wet prairie, and mixed scrub/shrub within wetlands. Riparian corridors along Coyote Creek and the Long Tom River contain mature forest canopy. Wet prairie grasslands merge into upland sites.

Wetlands

The Fern Ridge Lake Project contains a large percentage of the total area of inland marshes in Lane County and, as such, is extremely important for wildlife. The gradual slopes of the lake shoreline provide extensive areas of shallow fresh water marsh that are well suited for support of a wide variety of wetland wildlife species.

Patches of cattail marsh are located intermittently along the edges of the lake. Bulrushes dominate deeper water emergent zones as large patches and circular clones extending out into lake open water. Other prominent species in these marshes are spikerush (*Eleocharis* spp.), sedges (*Carex* spp.), tapered rush (*Juncus acuminatus*), birdsfoot trefoil (*Lotus corniculatus*), marsh speedwell (*Veronica scutellata*), self-heal (*Prunella vulgaris*), and pennyroyal (*Mentha pulegium*).

Until recent years, large expanses of reed canarygrass marshland covered over 2,000 acres of shallow waters of the lake, particularly along the east shoreline and in the inlets created by the Long Tom River, Coyote Creek, Amazon Creek, and other smaller drainages. This area is subject to an annual cycle of de-watering or inundation due to USACE water level management. Project operation for flood control purposes provides hydrologic environment that reverses natural cycles (e.g., summer flooding and winter drawdown). This hydrologic cycle favors establishment of invasive reed canarygrass that out competes and displaces native marsh plant communities. Over the past 30 years, substantial efforts have gone into constructing and managing over 900 acres of impoundments to provide for management that can mimic a more natural hydrologic regime. With this infrastructure in place, water level management can be used in combination with other habitat management techniques to reclaim and restore native wetlands and achieve canarygrass control over large areas.

Grasslands

Of an estimated one million acres of grasslands found in the Willamette Valley in historic times, less than 1% remains. Extensive grassland habitats are located near the eastern shore of Fern Ridge; adjacent to Kirk Pond; Gibson Island; and in the Applegate Units. Most of these grasslands can be considered upland prairie or wet prairie.

Upland Prairies

Upland prairies at Fern Ridge are dominated by exotic grasses such as tall oatgrass (*Arrhenatherum elatius*) and bentgrass (*Agrostis* spp.), but they support important remnants of native grassland vegetation including California oatgrass (*Danthonia californica*) and forbs such as dwarf checkermallow (*Sidalcea virgata*) and wild strawberry (*Fragaria* spp.). These sites support federally listed species as well: Kincaid's lupine (*Lupinus oreganus*) is listed threatened. This lupine is the host of the endangered Fender's blue butterfly (*Icaricia icarioides fenderi*). The lupine-butterfly system at Fern Ridge is the focus of continuing restoration and recovery efforts which will improve habitat for all grassland dependent species.

Wet Prairies

Wet prairies are dominated by tufted hairgrass (*Deschampsia cespitosa*). Soils are hydric, and are inundated for much of the rainy season due to sheet flow and an

impermeable clay layer below the surface. These sites support over 200 other plant species, including native bentgrass (*Agrostis exarata)*, American sloughgrass (*Beckmannia syzigachne*), and many forb species. Of the wet prairie forbs, two are presently listed as federally endangered: Bradshaw's desert parsley (*Lomatium bradshawii*) and Willamette Valley daisy (*Erigeron decumbens* ssp. *decumbens*). Native wet prairies are considered a Strategy Habitat as defined in the Department's 2016 OCS. All but about 30 acres of the Fern Ridge wet prairie habitat is included in the Fern Ridge Research Natural Area (RNA) discussed below.

These tracts of grassland are among the last remnants of this habitat in the Willamette Valley. Their importance is emphasized by the presence of rare species, the establishment of the RNA, and the inclusion of most upland and wetland prairie in the 2006 designation of Critical Habitat for Fender's blue butterfly, Kincaid's lupine, and Willamette Valley daisy.

Oak Woodlands

Areas around Fern Ridge Lake contain both deciduous and coniferous forest habitat types. Primary hardwood tree species include Oregon white oak (*Quercus garryana*), California black oak (*Quercus kellogii*), Oregon ash (*Fraxinus latifolia*), big-leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), black cottonwood (*Populus trichocarpa*), and eight different willow (*Salix*) species. Conifer trees present include, Douglas fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), Pacific yew (*Taxus brevifolia*), and Ponderosa pine (*Pinus ponderosa)*. The woodland understory is thick with forbs, shrubs and grasses.

Diverse shrub communities and forested marsh characterize the Long Tom River and Coyote Creek riparian zones, between the marshland and upland forests. Snags are prominent at the mouth of the river and in several other places around the lake.

Himalayan blackberry (*Rubus bifrons*), evergreen blackberry (*Rubus laciniatus*), several species of rose (*Rosa* spp.), and hawthorn (*Crataegus spp.*) create thickets that occupy many open meadow areas as the woodlands transition into prairie. Blackberries are vigorous and invasive in many areas; however, the acreage is limited and generally linear. The thick thorny vegetation does provide a dense barrier protecting birds, small mammals, and other species from predators and human impacts. Young fir and hardwood trees are often found in these areas forming a structurally diverse and ecologically dynamic habitat. Control of invasive species including blackberries in and adjacent to woodland habitats is included as a management strategy to improve habitat quality and integrity. Removal of Douglas fir trees in predominantly oak woodlands is also identified as a management option where feasible as a measure to reduce canopy competition for native oaks.

The Oregon ash dominated wetland forest around Coyote Creek is a riparian habitat representative of the forest that once lined the banks of the Willamette River system. This forest supports rare plant species including thin-leaved pea vine (*Lathyrus holochlorus*), a federal Species of concern (SOC), Willamette Valley larkspur

(*Delphinium oreganum*), a state Candidate species and federal SOC, and Howell's montia (*Montia howellii*), a state Candidate. These species are scattered throughout the understory. Management of this habitat includes surveying for rare plants prior to disturbance, maintaining trails to contain foot traffic, invasive species management, and looking out for Emerald Ash Borer (EAB), which has potential to kill the trees. While the current range of EAB extends only as far west as Colorado, the USDA ranks the Willamette Valley as having high risk of infestation.

Appendix A contains a list of trees, shrubs, forbs and grasses found on the FRWA.

Description of Management Units

The FRWA is divided into eleven separate habitat management units (HMUs), shown in **Figure 1**. The boundaries of the management units are based on physical, administrative, and operational characteristics. **Appendix D** describes these management units in further detail.

The wetlands on the FRWA receive water from a variety of sources including ground water; abundant winter rainfall; flow from incoming waterways including primarily the Long Tom River, Coyote Creek, and Amazon Creek; and from lake water backed up by Fern Ridge dam. The important limiting factor that affects area water management is the annual fluctuating level of Fern Ridge Lake. Most pump sites on the wildlife area are without a source of water from early October through April each year as a result of winter pool management of the lake for flood control purposes. This seasonal water availability presents a logistic and management constraint that limits capability for fall flooding of impoundments. Timing of pumping has to be closely monitored in relationship to lake levels at pump sites and assessment of vegetation growth stages within impoundments scheduled for flooding. The descriptions of HMUs include a discussion of the sources of water in each unit. Wetland cells within a HMU in some areas are located in series so that one cell must be filled before water will move into another. In these cases, management actions in the upper cells affect adjacent or "downstream" cells. In other cases, cells have independent in and out flow capability and may be managed with complete independence from adjacent cells within the same HMU.

<u>Fern Ridge Reservoir Operations and Wildlife Area Inter-relationship</u>

Fern Ridge Lake is a wide, shallow, multi-purpose reservoir. The shoreline is irregularly shaped with shallow sloped banks ranging from 0 to 7%. A large peninsula divides the lake on the south shoreline between its two major tributaries, the Long Tom River and Coyote Creek. At maximum summer conservation pool (elevation 373.5 feet), the lake is about 5.5 miles long, 5 miles wide, has a shoreline length of about 32 miles and a surface area of about 8,600 acres. At this elevation, the lake is about 25 feet deep at its deepest point, with an average depth of about 7 feet. At maximum pool elevation of 375.1 feet (maximum flood storage), the lake has about 9,000 surface acres. At minimum winter pool (elevation 353 feet), the lake has about 1,500 surface acres.

The lake impounds the Long Tom River and its major tributary, Coyote Creek, which

together drain over 300 square miles of the eastern Coast Range Mountains. The lake also receives flows from Amazon Creek and several minor streams.

Beginning in early October and continuing through spring, Fern Ridge Lake is drawn down to a conservation pool level for flood control purposes. Water level of the lake is managed according to a carefully coordinated rule curve guide administered by USACE. This gradual lowering of the lake each year exposes several hundred acres of lakebed mudflats. The remaining minimum pool of approximately 2000 acres of open water fluctuates up and down significantly during the winter as periods of heavy rainfall arrive. The exposed mudflats provide excellent habitat and sanctuary for wintering waterfowl, shorebirds, wading birds, and raptors.

Wildlife use of this lakebed area is very dynamic during the winter. Thousands of shorebirds use this habitat type directly for foraging and concentrations of wading birds and waterfowl utilize the mudflats and shallow lake transition area for forage, rest and evening sanctuary. Raptors including bald eagles (*Haliaeetus leucocephalus*) benefit from the available prey base and safe haven is provided by the physical isolation and difficult access across the soft substrate. Mudflats such as these are recognized as an important habitat stage in the OCS plan along with vernal pools and related habitats.

Management of adjacent wetlands is dependent upon the close proximity of this supportive habitat base. The annually fluctuating water levels of the lake create a unique situation that provides important spring and summer habitat for waterfowl and other wetland bird nesting and brood rearing. This same footprint of real estate also provides significant acreage of winter lake and mudflat habitat that supports abundant waterfowl and shorebirds.

Although only a portion of the lakebed area is actually included as part of the wildlife area, the inseparable influence of this adjoining important and dynamic habitat binds together the surrounding wildlife area management units.

Recognition of the adjacent proximity of this lake and mudflat area to the wildlife area and acknowledgement of the essential habitat functions of this “passively managed” area highlights the importance of this operational area. This recognition will provide continuity of protection and a basis for support that emphasizes wildlife considerations and interrelationships for future lake-wide management decisions.

Managed Impoundments, cropland, moist soil units

Twenty-two impoundments have been developed in the East Coyote, West Coyote, and Fisher Butte units. The impoundment banks are earthen levee structures that provide a range of water depth that has an average maximum of 2 ½ feet. In addition, three low water levees were constructed on Fern Ridge Lake that impound shallow water during winter months. During the summer when the lake is at full pool, these three levees are completely inundated by lake water.

The impoundments are managed to provide habitat and sanctuary for wildlife, with an

emphasis on attracting and holding wintering waterfowl. This has been accomplished by using a combination of moist soil management techniques, maintenance of semi-permanent marsh, control of invasive plants, and draining selected impoundments in the spring and summer to plant cereal grains for wildlife food crops.

Moist soil management techniques utilized on the wildlife area employ a combination of water level control, periodic soil disturbance, and timed drawdown and inundation to promote early successional growth of desirable wetland vegetation. The target management prescription for FRWA is to maintain a rotational balance of planted food crops and moist soil management within the 900 acres of managed impoundments. This scenario provides forage over a longer period of time than either practice used alone and as a result provides benefits to a wider array of wildlife species. Descriptions of impoundment management are included in the individual management unit descriptions below.

Research Natural Area

A Research Natural Area (RNA) was established in several wet prairie parcels to protect these unique valley prairie communities in support of the interagency Pacific Northwest RNA Program. The RNA is maintained for the historical perspective of the native Willamette Valley grasslands and for conducting research about the biology of unique grassland species. The USACE is actively involved in management of the RNA parcels and utilize periodic controlled burns and woody and invasive vegetation removal as measures to protect integrity of the grassland dominated habitat.

The Nature Conservancy completed threatened and endangered plant surveys for the USACE Master Plan in 1987. Several candidate plants species were documented and since that time three of these candidate species have been federally listed as threatened or endangered: Bradshaw's desert parsley, Willamette Valley daisy, and Kincaid's lupine. These plant species are considered Strategy Species as defined in the 2016 OCS.

Biological Resources

Currently 378 species of wildlife have been documented on the FRWA, including 289 species of birds, 49 species of mammals, 19 species of fish, and 22 species of amphibians and reptiles (**Appendix B**). Of the birds present, 121 species are confirmed breeders. Occurrence and abundance of invertebrates is unknown, however invertebrates are a significant forage resource for FRWA fish and wildlife as well as in important diversity index for the ecosystem. Within the invertebrate population, eleven species of dragonflies have been documented using the Fern Ridge area.

Birds

Birds are the most important and dominant wildlife component at FRWA in terms of abundance and species diversity. Many of the management activities and habitat improvement projects designed for waterfowl have provided auxiliary benefits for shorebirds, rails, gulls, herons, pelicans, eagles, osprey (*Pandion haliaetus*), and purple martins (*Progne subis*).

Fern Ridge Wildlife Area plays an important and balanced role in meeting life-cycle needs for a wide variety of species that cannot be met on surrounding developed lands in the valley. Raptors are commonly seen on the wildlife area, attracted to the diversity of habitats, concentrations of prey species, and lower disturbance on wildlife area lands relative to surrounding developed areas. Upland gamebirds are present on the wildlife area in limited numbers commensurate with the availability of suitable nesting habitat and access to larger scale blocks of associated unfragmented grassland habitats. Other species that are uncommon in western Oregon can be found regularly at Fern Ridge (e.g. yellow-headed blackbirds (*Xanthocephalus xanthocephalus*), white-tailed kites (*Elanus leucurus*), black terns (*Chlidonias niger*), black-necked stilts (*Himantopus mexicanus*), red-shouldered hawks (*Buteo lineatus*) and redheads (*Aythya americana*)).

Waterfowl

FRWA provides extensive wintering habitat for ducks, geese, and swans. Duck species wintering on the area include large numbers of mallard (*Anas platyrhynchos*), green-winged teal (*Anas crecca*), northern shoveler (*Spatula clypeata*), American wigeon (*Mareca americana*), and northern pintail (*Anas acuta*). A comprehensive list of waterfowl can be found in **Appendix B**.

Seven subspecies of white-cheeked geese (Canada and cackling) utilize FRWA including resident western Canada geese (*Branta canadensis moffitti*) which nest on the wildlife area. Winter migratory residents include the abundant minima cackling goose (*Branta hutchinsii minima*), Taverner's cackling goose (*Branta hutchinsii taverneri*), lesser Canada goose (*Branta canadensis parvipes*), and dusky Canada goose (*Branta canadensis occidentalis*). Two other subspecies that have been documented on the wildlife area include the Aleutian cackling goose (*Branta hutchinsii leucopareia*) and Vancouver Canada goose (*Branta canadensis fulva*).

An overall increase in wintering goose numbers in the Willamette Valley during the last several decades has resulted in a corresponding increase of geese wintering in the vicinity of Fern Ridge Lake. At night, many of these geese use Fern Ridge Lake as a roost, with some estimates exceeding 50,000 birds, though no rigorous estimates have been made. The majority of the birds are minima cackling geese and they depart shortly after daybreak to forage on the wildlife area and surrounding agricultural fields or exchange with federal wildlife refuges further north in the valley. The primary attracting feature for wintering geese in the area is the relatively undisturbed, large nighttime roost site of Fern Ridge Lake and surrounding mudflats during the winter. The entire Fern Ridge project area is closed to goose hunting during the winter period to reduce harvest of wintering dusky Canada geese and reduce disturbance to other wintering geese in an attempt to encourage them to forage the wildlife area instead of private agricultural lands. The lake and surrounding units remain open for duck hunting; however, the inaccessible nature of this expansive area benefits geese by providing functional wildlife sanctuary over an area of several square miles.

In addition to Canada geese, several hundred tundra swans (*Cygnus columbianus*) spend part of the winter roosting on the lakebed and forage on the wildlife area and in

surrounding agricultural fields and wetlands.

Although primarily important as wintering habitat, the wildlife area also provides breeding habitat for western Canada geese, wood duck (*Aix sponsa*), mallard, cinnamon teal (*Spatula cyanoptera*), blue-winged teal (*Spatula discors*) gadwall (*Mareca strepera*), redhead, hooded merganser (*Lophodytes cucullatus*), ruddy duck (*Oxyura jamaicensis*) and northern shoveler. Nesting has not yet been confirmed for blue-winged teal, though territorial pairs are usually present in May and June. Additionally, although blue-winged teal (*Anas discors*) broods may be present they are very difficult to distinguish from the more common cinnamon teal. Northern shoveler likely breed in very small numbers at FRWA, though not annually.

Marsh Birds

Wildlife habitat development efforts at FRWA during the past three decades have improved conditions for support of several wetland dependent wildlife species. Marsh bird species established on the area include pied-billed grebe (*Podilymbus podiceps*), western grebe (*Aechmophorus occidentalis*), Clarks grebe (*Aechmophorus clarkii*), American bittern (*Botaurus lentiginosus*), Virginia rail (*Rallus limicola*), sora (*Porzana carolina*), American coot (*Fulica americana*), and black tern (*Chlidonias niger*).

An estimated 25 pair of black terns breed at Fern Ridge Lake and are often observed in the units along the southeastern shoreline of the lake. The terns arrive in early May, and nest in loose colonies on floating platforms of hardstem bulrush, cattail, sedge, and rush species present in the marsh.

During recent years a flock of up to 140 American white pelicans (*Pelecanus erythrorhynchos*) have established summer residence at Fern Ridge. The birds utilize the lake and flooded impoundments to forage and rest. Although this is not yet a documented breeding colony, historic records indicate pelicans once nested at Fern Ridge Lake.

During the winter of 2007 a one-acre nesting island was constructed by the USACE near the southeast shoreline of the lake to provide nesting habitat for Caspian terns (*Hydroprogne caspia*). This project is a component of the effort to redistribute Caspian terns from the Columbia River estuary where concentrations of terns prey on native salmonids. This island was constructed as an experimental effort along with similar efforts at Summer Lake Wildlife Area, Crump Lake in southeast Oregon, and San Francisco Bay, California. No nesting attempts have been documented at FRWA but the USACE continues to manage for vegetation free habitat.

Shorebirds

Fern Ridge Lake and Wildlife Area provides essential habitat for many species of shorebirds throughout the year. The freshwater habitat is important for several species that typically do not occur in large flocks, such as solitary sandpiper (*Tringa solitaria*) and spotted sandpiper (*Actitis macularius*), and for smaller numbers of species such as western sandpiper (*Calidris mauri*). During certain times of year, thousands of

shorebirds can be found at Fern Ridge, including wintering dunlin (*Calidris alpina*) flocks numbering up to 20,000 birds. The Fern Ridge area was designated an Important Bird Area by the National Audubon Society partly because of the essential shorebird habitat provided at the lake and wildlife area.

Ten species of shorebirds are found in good numbers at Fern Ridge Lake and Wildlife Area at various times of the year. These include black-bellied plover (*Pluvialis squatarola*), semipalmated plover (*Charadrius semipalmatus*), killdeer (*Charadrius vociferus*), greater yellowlegs (*Tringa melanoleuca*), spotted sandpiper*,* Western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*)*,* dunlin*,* long-billed dowitcher (*Limnodromus scolopaceus*) and Wilson's snipe (*Gallinago delicate*). Seven more regularly occurring species found in low numbers include black-necked stilt, solitary sandpiper, Baird's sandpiper (*Calidris bairdii*), pectoral sandpiper (*Calidris melanotos*), Wilson's phalarope (*Phalaropus tricolor*), red necked phalarope (*Phalaropus lobatus*), and lesser yellowlegs (*Tringa flavipes*). An additional 21 species of rare or accidental shorebirds have been documented and include American golden-plover (*Pluvialis dominica*), western snowy plover (*Charadrius alexandrinus nivosus*), American avocet (*Recurvirostra americana*), willet (*Tringa semipalmata*), whimbrel (*Numenius phaeopus*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), sanderling (*Calidris alba*), semipalmated sandpiper (*Calidris pusilla*), sharp-tailed sandpiper (*Calidris acuminata*), stilt sandpiper (*Calidris himantopus*), buff-breasted sandpiper (*Tryngites subruficollis*), wood sandpiper (*Tringa glareola*), ruff (*Philomachus pugnax*), short-billed dowitcher (*Limnodromus griseus*), pacific golden-plover (*Pluvialis fulva*), Hudsonian godwit (*Limosa haemastica*), ruddy turnstone (*Arenaria interpres*), red knot (*Calidris canutus*), spotted redshank (*Tringa erythropus*), and red phalarope (*Phalaropus fulicarius*).

During winter, the extensive mudflats created at low pool of Fern Ridge Lake provide habitat for several species, including killdeer, long-billed dowitcher, least sandpiper, and tens of thousands of dunlin. Smaller numbers of greater yellowlegs, black-bellied plover, and western sandpiper are present through the winter months.

Beginning in late March and continuing until early June, spring migrants congregate around the edges of the lake and marshy areas in the Royal Amazon, Fisher Butte, and East and West Coyote units. Several species remain to breed, including killdeer, black-necked stilt, Wilson's snipe, and Wilson's phalarope.

Receding water levels in late July, August, September, and early October provide constant fresh habitat as new mudflats are exposed, mostly around the southern and eastern edges of the lake and in managed impoundments. Usually the water level does not start dropping quickly until early October, so shorebird habitat is somewhat limited until then. The shoreline near Gibson Island, the area adjacent to Highway 126 east of Perkins Peninsula, and managed impoundments have the highest shorebird use during fall. As fall migration tapers off in October, shorebird diversity subsides and the wintering species return. Peregrine falcons (*Falco peregrinus*) and merlin (*Falco columbarius*) take advantage of the shorebird migration and are frequently seen hunting

the mudflats in September and October.

Grassland Birds

Many grassland birds occupy FRWA including the streaked horned lark (*Eremophila alpestris strigata*), vesper sparrow (*Pooecetes gramineus*), western meadowlark (*Sturnella neglecta*), savannah sparrow (*Passerculus sandwichensis*) and many others. Significant grassland habitats occur in the Amazon Dike#2, Royal Amazon, Fisher Butte, West Coyote and South Marsh units. Upland habitats are maintained primarily with the use of fire and mechanical mastication to remove encroaching trees and shrubs.

Sightings of streaked horned larks have increased in recent years. Restoration activities in the South Coyote unit and farming activities in the East Coyote unit have attracted larks as they prefer open, sparsely vegetated habitats. Successful nesting attempts were documented in 2017, 2018 and 2019.

Upland Game Birds

Upland birds at the FRWA primarily include ring-necked pheasant (*Phasianus colchicus*), wild turkey (*Meleagris gallopavo*) and California quail (*Callipepla californica*) while mountain quail (*Oreortyx pictus*), and ruffed grouse (*Bonasa umbellus*) have been infrequently documented in upland habitats.

Since 1990, approximately 1,000 rooster pheasants have been released annually on the wildlife area for the Western Oregon Fee Pheasant Hunt Program. Prior to this time, occasional releases of hens and roosters occurred to bolster wild populations. This was largely unsuccessful due to low over-winter survival rates for the released birds. It is believed that high winter rainfall and frequent flooding limit the amount of area suitable for pheasant populations to thrive. California quail and ruffed grouse nest and reside on the wildlife area and around project lands in upland and shrub/scrub woodland fringe habitats.

Mammals

A variety of mammals inhabit the woodlands, grasslands, and marsh habitats of the wildlife area (**Appendix B**).

Furbearers present include red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), mink (*Neovison vison*), muskrat (*Ondatra zibethicus*), American beaver (*Castor canadensis*), river otter (*Lontra canadensis)* and raccoon (*Procyon lotor*). Small mammals include brush rabbits (*Sylvilagus bachmani*), black-tailed jack rabbit (*Lepus californicus*), western gray squirrel (*Sciurus griseus*), porcupine (*Erethizon dorsatum*), long-tailed weasel (*Mustela frenata*), ermine (*Mustela erminea*), dusky-footed woodrat (*Neotoma fuscipes*), bushy-tailed woodrat (*Neotoma cinerea*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), western spotted skunk (*Spilogale* gracilis), bats, various shrews, voles, moles, gophers, chipmunks, and ground squirrels.

Black-tailed deer (*Odocoileus hemionus*) and Roosevelt elk (*Cervus canadensis roosevelti*) are the principal resident big game species, with rare occasional sightings of black bear (*Ursus americanus*) and cougar (*Puma concolor*).

Small rodents, mice, and other small microtines are found in the drier, grassy areas of the project while larger mammals, such as raccoons and non-native opossums (*Didelphis virginiana*) inhabit the upland and transition zones between the upland and wetland habitats. Non-native nutria (*Myocastor coypus*) are present on the area and are considered to be a nuisance species because of their tendency to damage dikes and levees by burrowing. Trapping has been successfully used to control nutria and populations are at minimal levels compared to the past. The Fern Ridge project also provides foraging and roosting habitat for several bat species.

Amphibians and Reptiles

Amphibian and reptile species present include northwestern salamander (*Ambystoma gracile*), Pacific chorus frog (*Pseudacris regilla*), non-native bullfrog (*Lithobates catesbeianus*), non-native red-eared slider (*Trachemys scripta elegans*) rough-skinned newt (*Taricha granulosa*), western fence lizard (*Sceloporus occidentalis*), western skink (*Plestiodon skiltonianus*), rubber boa (*Charina bottae*), racer (*Coluber constrictor*), gopher snake (*Pituophis catenifer*), ring-necked snake (*Diadophis punctatus*), and garter snakes (*Thamnophis* spp.). The wildlife area supports significant populations of two federal species of concern, western pond turtle (*Actinemys marmorata*), and northern red-legged frog (*Rana aurora*) (**Appendix B**).

Fish

The shallow, warm water of Fern Ridge Lake provides an environment suitable to warm water fish (**Appendix B**). Fish access to the full lake habitat and emergent vegetation zone is limited to the summer months when the lake is maintained at full pool. During winter months, the 9,000 acre reservoir is reduced to an approximately 1,500 acre winter pool devoid of significant fish habitat structure. Elevated summer water temperatures with low dissolved oxygen, high turbidity, and large water level fluctuations combine to reduce water quality thus limiting potential for salmonids. Cutthroat trout (*Oncorhynchus clarkii*) native to the Long Tom River system appear to be an exception. Following construction of the dam, a unique adfluvial (migrating between the river and lake) cutthroat trout population developed in the upper Long Tom River. The population was historically fluvial (exclusively river-dwelling) prior to dam construction, but now makes spawning runs upstream and out of the reservoir during late summer each year. These migrants are often greater than 12 inches in length and retain a silver coloration similar to searun cutthroat trout. In addition to cutthroat trout other native fish include largescale sucker (*Catostomus macrocheilus*), sculpin (*Cottus* spp.), northern pikeminnow (*Ptychocheilus oregonensis*), and redside shiner (*Richardsonius balteatus*).

Fern Ridge Lake supports naturally reproducing populations of introduced warm water species such as bluegill (*Lepomis macrochirus*), black crappie (*Pomoxis nigromaculatus*), white crappie (*Pomoxis annularis*), brown bullhead (*Ameiurus*

nebulosus), yellow bullhead (*Ameiurus natalis*), common carp (*Cyprinus carpio*), largemouth bass (*Micropterus salmoides*), warmouth bass (*Lepomis gulosus),* western mosquitofish (*Gambusia affinis*) pumpkinseed (*Lepomis gibbosus*) and goldfish (*Carassius auratus*). These species are non-native animals, however there is no lake-wide plan to control or regulate these species at this time.

Fisheries management potential is not high in the Long Tom River or in streams running through the wildlife area because of the seasonally fluctuating lake levels associated with USACE reservoir management for flood control. Waterways that are deep and slow running during the summer are low in the winter, with periods of high water and swift current during extended periods of rainfall. Fish entrapment in impoundment areas during flood events is possible and measures by department staff are taken to prevent this occurrence. All pump intake sources are screened to prevent fish access and rock "fish filters" are in place in several waterways to prevent fish access. During flood events, when water from Coyote Creek overtops levee banks, there is a potential for fish stranding. In years where flood events occur, the management strategy is to drain impoundment areas by mid-May to prevent fish entrapment.

Species of Conservation Concern

Federally-listed and state sensitive species that occur at FRWA or in close proximity include Bradshaw's desert parsley, Willamette Valley daisy, Kincaid's lupine, streaked horned lark and Fender's blue butterfly (**Table 3**) (ODFW, 2018). These species are also classified in the OCS as strategy species. In November 2019, the USFWS proposed de-listing Bradshaw's desert parsley due to the plant's successful recovery.

Table 3. Federal or State-listed Endangered, Threatened, Candidate and Species of Concern animals and plants known to occur or potentially present on the Fern Ridge Wildlife Area.

(Federal Status: E–Endangered; T–Threatened; SOC–Species of Concern
State Status: E – Endangered; T – Threatened; S – Sensitive Species; OCS Strategy species present – X)

Common Name	Scientific Name	Federal Status	State Status	OCS
Dusky Canada goose	*Branta Canadensis occidentalis*		S	X
Western meadowlark	*Sturnella neglecta*		S	X
Streaked horned lark	*Eremophila alpestris strigata*	T	S	X
Northern goshawk	*Accipiter gentilis*	SOC	S	X
Common nighthawk	*Chordeiles minor*		S	X
Olive-sided flycatcher	*Contopus cooperi*	SOC	S	X
Yellow-breasted chat	*Icteria virens*	SOC	S	X
Acorn woodpecker	*Melanerpes formicivorus*	SOC	S	X
Lewis's woodpecker	*Melanerpes lewis*	SOC	S	X

Oregon vesper sparrow	*Pooecetes gramineus affinis*	SOC	S	X
Common Name	**Scientific Name**	**Federal Status**	**State Status**	**OCS**
Purple martin	*Progne subis*	SOC	S	X
Fringed myotis	*Myotis thysanodes*	SOC	S	X
Long-legged myotis	*Myotis volans*	SOC	S	X
Western pond turtle	*Actinemys marmorata marmorata*		S	X
Western rattlesnake	*Crotalus oreganus*		S	X
Northern red- legged frog	*Rana aurora aurora*	SOC	S	X
Fender's blue butterfly	*Icaricia icarioides fenderi*	E		X
Bradshaw's desert parsley	*Lomatium bradshawii*	E	E	X
Willamette Valley daisy	*Erigeron decumbens*	E	E	X
Kincaid's lupine	*Lupinus sulphureus kincaidii*	T	T	X
White-topped aster	*Sericocarpus rigidus*	SOC	T	X
Shaggy horkelia	*Horkelia congesta*	SOC		
Thin-leaved peavine	*Lathyrus holochlorus*	SOC		

Fender's blue butterfly and Kincaid's lupine are present on uplands adjacent to the lake. Fender's blue butterfly occupy stands of Kincaid's lupine in the Shore Lane, Fisher Butte and Amazon Dike #2 management units. USACE biologists have monitored Fender's blue butterfly since discovery in 1993, and the population has increased dramatically. The population remained under 100 adults from 1993 to 2000. Beginning in the late 1990's USACE implemented extensive restoration and lupine plantings at 13 patches of prairie. The butterfly population now ranges from 2,000 – 9,000 adults making Fern Ridge one of the larger networks contributing to the butterfly's recovery.

Bradshaw's desert parsley and Willamette Valley daisy are present on managed wet prairie sites adjacent to the lake. Management for Bradshaw's desert parsley includes prescribed fire and invasive species removal.

Streaked horned larks have recently occupied multiple units where restoration and farming activities have exposed soils or reduced vegetation densities. Nesting pairs and individual nests were documented in 2017, 2018 and 2019. Individuals are present year-round and a greater number of observations occur in the spring.

Western pond turtles can be found in all wetland impoundments although they are most commonly seen in Kirk Pond. A large turtle nesting area has been identified in the Kirk Park unit which has been fenced and signed to reduce human disturbance and destruction of the site. USACE staff monitors survival of adults, nest success, protects nests from predation and removes competing invasive red-eared sliders from the pond

and nesting area. The USFWS was petitioned in July 2015 to include the western pond turtle on the endangered species list. A decision is expected September 2021.
The FRWA and Fern Ridge Project host a large number of purple martin. Recent research has indicated that FRWA plays a vital role in annual movements. While the purple martin population is geographically widespread, a majority of the population spends some time each year at FRWA. FRWA volunteers and staff construct purple martin nest boxes and USACE staff install and monitor boxes and nest success annually.

There also are several federal species of concern present on the wildlife area or within their identified home range, including black tern, purple martin, yellow-breasted chat (*Icteria virens*), acorn woodpecker (*Melanerpes formicivorus*), Lewis's woodpecker (*Melanepres lewis*), Oregon vesper sparrow, long-eared myotis (*Myotis evotis*), Yuma myotis (*Myotis yumanensis*), fringed myotis (*Myotis thysanodes*), western pond turtle, and northern red-legged frog.

In response to the documented presence of listed plant species, an RNA was established by the USACE in several grassland parcels to protect these unique valley prairie communities and to conduct botanical research and observation. These parcels are also of significant importance for ground nesting birds including grasshopper sparrow (*Ammodramus savannarum*) and western meadowlark. The grasslands also serve as important hunting grounds for white-tailed kites and short-eared owls (*Asio flammeus*).

Native wet lowland prairie habitats remaining around Fern Ridge Lake support a number of forbs that are designated or candidates for State or Federal designation. Of significant note are endangered Bradshaw's desert parsley, Willamette Valley daisy and Kincaid's lupine which are regional endemics. Once common to the Willamette Valley prairie, these plants now exist only at a few known sites. One federal Candidate plant species, Oregon timwort (*Cicendia quadrangularis*) and several Federal Species of Concern occur in the same lowland prairie habitats, including white-topped aster (*Sericocarpus rigidus*), shaggy horkelia (*Horkelia congesta*) and thin-leaved peavine.

Diverse native plant communities are established at Fern Ridge Lake with many occurrences just in or out of the jurisdictional overlap of the wildlife area license boundary. For example, the face of Fern Ridge dam at one time supported an array of species typical of the local wet prairie. These include masses of camas (*Camassia quamash*) and abundant Oregon saxifrage (*Micranthes oregana*), dwarf checkermallow (*Sidalcea virgata*), and meadow checkermallow (*Sidalcea campestris*). Other native species such as bigleaf lupine (*Lupinus polyphyllus*) contribute to the ecological diversity and importance of these sites.

While none of these species are listed as threatened, endangered, or sensitive by agencies or conservation groups, they are all characteristic of the imperiled Willamette Valley wet prairie. Several of the species are important nectar sources for the endangered Fender's blue butterfly. The presence of specific habitat blocks that support

these species are important as well as surrounding habitats that, while not presently containing these species, provide buffer and potential for expansion of the populations. Most of the plant and animal species described in this section have also been defined as Strategy Species in the OCS. This strategy describes many conservation activities which can be implemented to contribute to the overall conservation of these species. FRWA's diverse habitat management actions and protective measures contribute to conservation of OCS species in the Willamette Valley Ecoregion.

Non-Native Species

Non-native wildlife on the FRWA include nutria, Virginia opossum, European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), Eurasian collared dove (*Streptopelia decaocto*) and bullfrog. Occasional sightings of fox squirrels are documented. Ring-necked pheasant, wild turkey, and California quail that are technically classified as non-native species are also resident on the wildlife area in relatively low numbers. Feral cats (*Felis catus*) are present and primarily affect wildlife as predators of native birds and other species such as the common house mouse (*Mus musculus*). Red swamp crayfish (*Procambarus clarkii*), red-eared slider turtles (*Trachemys scripta elegans*) and several introduced fish species are also present in wildlife area wetlands and waterways.

The most prolific non-native and invasive plant present in abundance at FRWA is reed canarygrass. The thick sod mat created by the grass chokes out native vegetation and the buildup of roots and stem mass eventually fills in open water areas of wetlands. Research and control measures have been ongoing at FRWA during the past several years to develop effective control techniques using heavy equipment, flooding, controlled burns, herbicides, shading, and other techniques based on timing and frequency of application. Recent success has been demonstrated on large tracts of old growth reed canarygrass using mowing, repeated heavy disking, followed by deep water flooding. Late summer mowing, or burning, followed by fall herbicide (glyphosate) application has also proven to be an effective control technique.

Several other non-native plant species have been documented on the project. Purple loosestrife (*Lythrum salicaria*) has been found on the wildlife area and control measures were immediately undertaken to eliminate plants and to monitor for further establishment. Scotch broom (*Cytisus scoparius*) is found on a more frequent basis on upland areas around the wildlife area boundary as colonization of surrounding private lands is increasing. Eurasian watermilfoil (*Myriopylum spicatum*) has been observed in Fern Ridge Lake, Kirk Pond, and in the Long Tom River and Coyote Creek. This plant is a nuisance aquatic macrophyte which effectively out-competes other desirable plant species. Non-native tall oatgrass is present in isolated areas and is actively controlled on grassland restoration sites. Himalayan blackberry and evergreen blackberry are present as invasives in limited areas around the project. Tansy ragwort (*Senecio jacobaea*) is also present as a persistent invasive that is occasionally interspersed in grasslands and along earthen levees. Meadow knapweed (*Centaurea xpratensis*) threatens to overrun several important grassland sites, and appears to be increasing, often dispersed by road maintenance equipment. Active efforts to control knapweed

continue, especially in the RNA.

Many non-native plant species appear to be beneficial as forage or cover as evidenced by wildlife use and do not appear to have serious deleterious effects on overall landscape scale habitat quality. While many of these plant species serve as functional wildlife habitat, their presence is often at the expense of displacing native plant species. Generally, invasive plant species are opportunistic and present a challenge to effectively eradicate. The science of understanding the composition and dynamics of Willamette Valley prairie and wetland habitats is complex relating to control efforts, population trends, reproductive biology, and interactions with other species. An adaptive management approach in line with recommendations of the OCS will continue to be used to balance acceptance of invasive species in limited areas and to aggressively control, prevent establishment and limit expansion of the invasive species where feasible.

Monitoring

Monitoring of all management activities will be conducted by wildlife area staff in coordination with Department regional and headquarters staff. The USACE monitors public use on the project and also takes the lead role in monitoring plant species on all project lands with emphasis on listed plants and RNA grasslands.

USACE also conducts monitoring of several wildlife species including Fender's blue butterfly, marsh bird surveys, western pond turtle monitoring, and tracking population status of purple martins, osprey, migrant passerines, overall bird species presence and abundance, and bat species.

Other monitoring occurs periodically on the area, for example bird banding, dusky goose collar observations, and testing for Avian Influenza, aquatic organism sampling (USGS, Institute for Applied Ecology), and plant species monitoring for wetland restoration seed collection (City of Eugene, BLM, consultant groups).

Plants

Plant species monitoring will range from detailed botanical stem count surveys and recording species composition and trends to more rudimentary general habitat condition assessment and overall evaluations of cover types and condition. The purpose of the monitoring will be to identify species presence and abundance, and to guide management decisions based on management objectives of a particular parcel, determination of highest and best use, and wildlife and habitat interrelations. USACE monitors populations of Bradshaw's desert parsley, Willamette Daisy, and Kincaid's lupine in coordination with USFWS and local working groups. USACE also monitors sensitive species and species composition at many sites.

Wildlife

Wildlife population monitoring of various species consists of aerial census for white geese and swans, and nest checks or general surveys of Fender's blue butterfly, bald eagles, shore birds, purple martin, western pond turtles, and grebes. Monitoring of

vegetation is also conducted to determine response to management techniques.

Pre-season waterfowl banding at FRWA is conducted on an intermittent basis as part of a coordinated Pacific Flyway banding project. Band recovery data, especially from mallards, is used by the Flyways and the USFWS to inform population models which guide waterfowl hunting frameworks in the Flyway. Monitoring and reporting of neck-collared waterfowl and band encounter/recovery data are collected and reported by wildlife area and watershed district personnel.

Fish

Fish populations are monitored through angler creel checks and stream surveys by Oregon State Police (OSP) and Department staff. Monitoring will be conducted opportunistically and/or as scheduled by regional district fisheries personnel. USACE fisheries biologists also monitor fish populations associated with Fern Ridge Lake and tributaries as part of a cooperative management interrelationship.

Wildlife Diseases

West Nile Virus

West Nile virus is a disease found in birds and is transmitted to other birds and mammals, including humans, via certain species of mosquito. The Department coordinates with Lane County Department of Health for trapping and sampling mosquito species on the area for West Nile Virus testing.

The mosquito-borne virus first reached the United States in 1999 and began moving westward, reaching Oregon in 2004. Lane County began testing mosquitoes for the virus in 2004. The Oregon Department of Human Services reported 2 human cases of West Nile virus in Oregon in 2018, down from 73 cases in 2006.

Avian Influenza

Beginning in 2006, the Department began testing waterfowl on the FRWA for the Avian Influenza virus in association with the waterfowl banding program. Samples are now acquired by Department staff and the U.S. Department of Agriculture (USDA) personnel via hunter harvested birds during the fall and winter. This testing follows recently developed statewide and national virus testing protocols.

Ongoing morbidity and mortality surveys are conducted on the wildlife area to monitor potential die-off events and protocol is in place to coordinate with the Department's wildlife veterinarian staff for status determination and subsequent disease testing of sick or deceased wildlife as necessary.

Water Use

Water use for irrigation, moist soil management, and flooding is monitored and documented according to water use reports submitted annually to the Department's Engineering Section and to Oregon Water Resources Department.

Water Quality
Water quality and quantity in Fern Ridge Lake and wildlife area impoundments varies between summer and winter. Water in the project area is strongly influenced by reservoir operation, which keeps water (pool) levels high in the summer with little fluctuation, and water levels low with large fluctuations in the winter. Turbidity increases in summer as recreational activities in the lake disturb clay sediments and as algae growth increases. Backwater portions of the Amazon channel and Coyote Creek have yielded high fecal *Coliform* counts due to urban and agricultural runoff.

The high population of common carp, an introduced bottom-feeding fish, also contributes to high lake turbidity. High phosphorus and moderate nitrogen loads are contributed to the lake from the watershed via tributaries. Rooted wetland plants utilize some of these nutrients, helping to keep them out of the lake. Water quality declines in the winter, reflecting winter storm runoff. Suspended sediments, bacteria, and nutrients are substantially higher in the winter (USACE, 1988). Inflow from the Long Tom River and tributaries on the west side of the lake are of higher water quality in comparison to more turbid inflow from Coyote Creek on the south and Amazon Creek on the east that flows through the city of Eugene.

Public Use
Hunter use and harvest data are monitored by the Department via hunt permits. USACE monitors public use of the Fern Ridge project using car counters at various access points and use determination of water based and park area recreation. An objective has been identified in this plan to develop a monitoring program specific to wildlife area use. This has been an ongoing challenge at the Fern Ridge project, which receives an estimated 800,000 visitor use days annually. A portion of the recreational use overlaps with wildlife area land and water areas, and visitors are attracted to the lake area by presence of wildlife and opportunities for open space enjoyment and wildlife viewing.

Cultural Resources
The Fern Ridge Lake area has a long history of human use. The peoples who inhabited the Upper Willamette Valley at the time of Euro-American settlement are collectively known as the Kalapuya. It is generally assumed that these Native Americans were descendants of the prehistoric people of the Upper Willamette Valley. The Chemala or Long Tom Band occupied an area west of Eugene including the drainage of the Long Tom River. Historically, the Native Americans who ceded this area are documented under the treaty by the Confederated Bands of the Willamette Valley signed on January 22, 1855. Their descendants are included in the modern Confederated Tribes of the Grand Ronde and the Confederated Tribes of the Siletz Indians. The travel route used by early explorers to access furs in the Umpqua Valley and northern California passed through now-inundated portions of the reservoir. Settlers homesteaded along the travel route, and eventually the suitable area was converted to agriculture.

The USACE is the lead agency responsible for monitoring and protecting project lands as well as known sites of archeological significance. Licensed wildlife area lands are

afforded protection according to federal regulations. All of the sites within the project boundaries including wildlife area lands could be considered potentially eligible for the National Register of Historic Places. To minimize impacts to undocumented cultural resources, undertaking conducted in the Fern Ridge Lake area must comply with the National Historic Preservation Act.

Social Environment

Demographics

The FRWA is located approximately five miles west of the Eugene/Springfield metropolitan area, in Lane County, approximately 50 miles from the Oregon Coast.

The Eugene/Springfield metropolitan area is growing rapidly. Urban development is spreading outward at a steady pace from the city into outlying rural areas. Eugene's population in 2017 was approximately 168,916 residents, with a gain of 3,251 residents in the previous year. Springfield added 936 people during the same time period to its current size of 62,353 while Veneta grew by 123 citizens. Lane County's population grew by 1.7% during 2017 with the overall state growth calculated at 1.4%.

Land Use

Agriculture and grazing remain the prominent uses of the area surrounding Fern Ridge Lake, although rural residential uses are steadily displacing agrarian uses. The FRWA lands are zoned as Parks and Recreational Land. Small acreage farms and urban commuter ranches are increasingly being developed towards the wildlife area boundary. Eugene Airport is located within five miles and the towns of Veneta and Elmira border the wildlife area on the west. A group of 17 organizations, collectively known as the Rivers to Ridges partnership, own or hold conservation easements on 23,968 acres of land within the Eugene/Springfield area. Property within the USACE Fern Ridge Project boundary that is not within the Department's license provides an adjacent resource buffer for wildlife, habitat and open space protection.

Infrastructure

Developments/Facilities

Beginning in 1979, the Department launched a four phase development program at Fern Ridge with the goal of improving waterfowl distribution in the southern Willamette Valley. A series of impoundments were constructed over several years that would provide infrastructure needed to intensively manage wetlands. Pumps and pipelines were installed and provisions were made to plant foodcrops for wildlife and to manage wetland habitats within the water control impoundments. Combined with initially restrictive regulations, waterfowl numbers increased in direct response to the provision of food, water, and sanctuary. Continuing management efforts have provided stable wintering and year-round populations of waterfowl as well as providing habitat benefits for a variety of wildlife species.

The wildlife area headquarters site development was initiated in 1983. Prior to this time, wildlife area habitat management activities were completed as part of the Department's Northwest Region Habitat Program using a crew based out of the Department's Corvallis office. A headquarters building, a manager's residence, and storage buildings were constructed along with associated roadways, landscaping, and utility infrastructure. The wildlife area headquarters is located at 26969 Cantrell Road on the south border of the wildlife area.

Public access to the wildlife area is readily available by adjacent access from state Highway 126 along with a series of secondary county roadways that provide access around the perimeter of the lake. Twelve parking areas provide access at various locations around the wildlife area. Nature trails are available for foot traffic in the East Coyote, West Coyote, Fisher Butte, and Applegate units as well as wildlife viewing areas in the South Marsh and Fisher Butte units. Canoe access sites are available for Coyote Creek, the Long Tom River and Fern Ridge Lake. Numerous other access points are available around the Fern Ridge Project via county roads, parks, picnic areas, and lake boating access sites.

Water Rights

Water rights for the FRWA are administered through the U.S. Department of Interior, Bureau of Reclamation under a Willamette Basin Project Water Service Contract (#1-07-10-W0414). This contract was executed October 1, 1981 between the Department and the Federal government to provide up to 559 acre-feet of Project water for the irrigation of 260 acres. The contract was amended on February 25,1982 to reflect a correction and addition to the legal description of lands to receive water and an additional point of diversion.

A second amendment was executed on April 27, 1983 to reflect a correction to the legal description and the amounts of lands to be irrigated. A third amendment was executed on June 11, 1984 to include additional lands to receive irrigation water service.

The Oregon Water Resources Department issued a water right allowing for the storage of 105 acre-feet of water on November 26, 2018 for the South Coyote unit. Wetland cells adjacent to Coyote Creek are permitted to capture rain runoff from adjacent lands.

As a result, 522.65 acres are eligible to receive, not to exceed, 1,282.54 acre-feet of stored water annually (**Appendix G**). Water use is monitored by wildlife area staff and reported annually to Department Engineering Section and Oregon Water Resources Department.

Easements/Access Agreements

There is currently an easement through the Fisher Butte unit of the wildlife area connecting Fisher Butte (private) with Highway 126 via an existing gravel road to an abandoned rock quarry. An easement is provided through the NE Coyote and South Coyote units to access the power line right of way (ROW). Bonneville Power Administration (BPA) also holds a conservation easement on these two properties

(Appendix I). There may be additional easements granted for power line ROW'S in the Kirk Park and South Marsh units of the wildlife area. All associated easements on the Fern Ridge project are administered by USACE. The USACE will provide a comprehensive list of all project easements at a future date.

Land Acquisition and Adjustment

It is the policy of the Department to only acquire land or interests in lands, including easements and leases, from willing sellers consistent with statutory authority and the Department's mission. Acquisitions and adjustments must be for the conservation of fish and wildlife and their habitats and to provide fish and wildlife oriented public use for educational and recreational purposes. Land adjustments would allow for the sale, trade or exchange of land with willing landowners to enable the Department to consolidate wildlife area boundaries.

There are three categories of lands that may be considered for acquisition. These include: 1) Significant or unique habitats, especially those beneficial to threatened or endangered species; 2) Sites, or access to sites that provide wildlife related recreational opportunities; and, 3) Properties to facilitate the performance of the Department's mandated duties (e.g., storage and warehouse, feeding barns, etc.).

Lands adjacent to or within current wildlife area boundaries that may become available and would enhance FRWA operations or management capabilities will be considered on an individual basis. Land acquisitions and adjustments are summarized in appendix H.

Public Use

Public Access

The majority of FRWA remains open to all public access year-round. Seasonal access restrictions are in place on five units to provide sanctuary for wintering waterfowl. Visitor use of the wildlife area is difficult to accurately quantify because of the large number of public access sites available around the wildlife area and lake project. The USACE estimates over 800,000 visitor use days at Fern Ridge Lake annually. Boaters, hikers, birdwatchers, anglers, trappers and hunters often cross wildlife area license lands in the course of general project visitation. A self-service hunter permit program is in effect to document hunting activity on the wildlife area. This provides baseline data for monitoring hunter participation and harvest. However, it does not capture the full spectrum of recreational use of the wildlife area. Wildlife viewing use is difficult to accurately assess due to the numerous points of entry and the lack of a permit or registration program.

Recreational use of the wildlife area is weighted consistent with funding. The Department supports hunting on state wildlife areas; however, there is also significant effort underway at FRWA to continue to expand facilities and opportunities to accommodate and highlight non-hunting and non-angling uses. Partnerships will continue to be pursued to improve facilities for other compatible recreational

opportunities on the wildlife area, in line with balancing resource protection and public use. In close proximity to the wildlife area, several developed parks are available, in addition to Fern Ridge Lake, to provide year-round access for many forms of outdoor recreation. The goals of the wildlife area are to prioritize wildlife and wildlife habitats in balance with other uses. There are several parks available within the project area to meet recreational needs of western Lane County.

Hunting, Trapping, and Angling

Hunting regulations are subject to change on an annual basis dependent upon Federal frameworks for the hunting of migratory game birds and a variety of social, habitat and wildlife population assessments. Hunting regulations have remained stable for a number of years, with slight modifications made each year to accommodate variables that affect management objectives.

Based on the hunt regulation framework in place for the 2019-2020 season, all lands owned or controlled by the Department and USACE in and around Fern Ridge Lake are open to hunting during all authorized game bird and game mammal seasons according to the restrictions described below for specific units. Hunting is not allowed in established recreation areas including Richardson, Orchard, Zumwalt and Perkins parks. The area is closed to all goose hunting after the September Canada goose season.

Daily hunt permits are required for all hunting units. Permits are free and are available at eight self-service check stations located at designated access points. It is estimated that approximately 5,000 visitor use days annually are attributed to the various hunting opportunities provided on the area.

Hunt programs that occur on the wildlife area allow the take of the following during general seasons:

- Big game (deer, elk, bear, cougar)
- Upland game birds (pheasant, quail, turkey)
- Migratory game birds (dove, ducks, geese, merganser)

Several special hunting opportunities also occur including:

- September Canada Goose Season (Fern Ridge area closed to goose hunting during other Western Oregon goose seasons)
- Youth Hunts
- Western Oregon Fee Pheasant Hunt Program
- Reservation Waterfowl Hunt – East and West Coyote units

The FRWA and reservoir are open to hunting during all authorized seasons between May 1 and the week prior to the start of duck season, at which time specific unit regulations outlined below apply. Changes in regulation frameworks have been adopted during past years to separate waterfowl and upland bird hunt season dates on the wildlife area. This has been effective in separating the different types of hunting activities, for example duck and pheasant hunting, and has helped to reduce hunter

conflicts as well as reducing disturbance for waterfowl during early fall staging periods.

Hunting regulations for FRWA were modified beginning with the 2006-07 season to provide increased periods of sanctuary during and after duck season. Sanctuary as used in this document is defined as “a place of wildlife protection”. The additional protection was accomplished by regulating hunting and public access seasonally in five management units. The majority of the area including Fern Ridge Lake remains open seven days per week for hunting during all authorized seasons.

Regulations for the 2008-09 season extended seasonal closures of four units to provide increased post-season wildlife sanctuary to attract and hold wintering geese on the wildlife area. This change in regulation provides additional sanctuary for concentrations of wintering geese on public land as part of the effort to minimize agricultural crop depredation by geese on surrounding private lands. FRWA serves an important role in the effort to minimize crop depredation in the South Willamette Valley by providing support for large concentrations of wintering geese through the October – April time period.

While the majority of the wintering geese primarily utilize the lakebed area that is outside of the wildlife area boundary, the cropland and moist soil management units on the wildlife area contribute significantly as a forage and rest area to support all species of waterfowl including wintering geese. Access to this food source and habitat base reduces goose movement off of the area to nearby private agricultural lands.

The four units with seasonal access restrictions comprise approximately 25% of the wildlife area and provide wildlife sanctuary from early October through April 30. The East Coyote, West Coyote, Fisher Butte, and Royal Amazon units have various limited entry and closure dates to provide wildlife sanctuary, even during hunting seasons. For example, during duck season, the Fisher Butte and Royal Amazon units close to hunting each day at 1 PM and are closed to public access at 2 PM. The reservation waterfowl hunt program provides a month of sanctuary during the early duck season and then authorizes hunting access only three mornings each week for the remainder of the season. These types of regulatory provisions provide regular and predictable wildlife sanctuary for wintering birds each day. Every afternoon the birds have a designated safe and undisturbed area to rest and forage. Sanctuary closures are also in effect after the end of waterfowl season in selected units to provide continuity for wildlife use.

When hunting for the day ends at 1 PM, an influx of birds is regularly observed returning to the units that were hunted in the morning. This demonstrates the compatibility of providing both hunting and sanctuary in the same units and supports the concept of providing partial-day sanctuary closures in association with managed hunt programs.

Waterfowl including geese and other wetland dependent species benefit from crop and moist soil management practices on the wildlife area. The forage and rest areas provided in the impoundments serve as a significant attractant to hold geese, in line with the primary management goal of the wildlife area. The sanctuary closures support a

sizeable portion of the wintering Willamette Valley goose flock.

Due to the large number of geese present on the Fern Ridge project, a strategy has been identified to collaborate at the Flyway level and locally with agriculture interests, other agencies, Eugene Airport, and Department staff to seek options and opportunities to address goose depredation and public safety in the South Willamette Valley.

Four units (East and West Coyote, Fisher Butte, and Royal-Amazon) are closed to public access for approximately a week between the end of the Western Oregon Fee Pheasant Hunt Program and the start of duck season to provide sanctuary for waterfowl.

Concurrent with duck season, the Fisher Butte and Royal-Amazon units are open to hunting seven days per week until 1 pm for hunting with a 2 pm closure for public access. The exception is Royal Avenue and the trails to the Fisher Butte Unit viewing platforms which remain open daily and are not subject to the 2pm closure.

Concurrent with duck season the East and West Coyote units are only open on Mon-Wed-Sat. until 1pm for the Reservation Waterfowl Hunt Program.

From the end of duck season until April 30, the East and West Coyote, Fisher Butte, and Royal-Amazon units remain closed for wildlife sanctuary except for Saturdays, when birdwatching and non-firearm recreation is allowed.

Trapping is allowed on FRWA by permit from the Department. Trapping on portions of the Fern Ridge Project, outside of the license (wildlife area), is allowed by permit issued from USACE. Trapping is retained as a management option for habitat and infrastructure protection and to maintain a sustainable balance of species. Trapping on the wildlife area is generally limited to removal of nutria that damage earthen levees by aggressive burrowing.

Angling access on the wildlife area is provided by trails on the Long Tom River, Coyote Creek, Amazon Creek, and along the lakeshore. Several boat launch locations on Fern Ridge Lake provide access to the entire lake for angling and other forms of water based recreation. A courtesy fishing pier is available in Kirk Park. The rip-rap toe slope of Fern Ridge dam is a mile-long rock-faced structure that provides year-round fish habitat and angler access.

Wildlife Viewing

The USACE estimates 800,000 visitor days annually to Fern Ridge Lake. A sizeable percentage of these visitors benefit from direct access or proximity to the wildlife area. Accurate documentation of a specific wildlife area visitor number has been difficult to attain because of the large number of visitors who access the adjacent or overlapping wildlife area lands via rural roads, through parks, and the lake area. A strategy under Objective 3.2 has been identified to more accurately tabulate the number of destination wildlife area visitors.

Educational/Interpretive

Local schools use the wildlife area for various classroom activities and field trips. Department personnel participate to the extent possible and provide accommodation and access as compatible with wildlife protection and other ongoing public use activities on the wildlife area. Student intern and cooperative education programs are administered by FRWA staff involving students and institutions ranging from elementary school through the university level. Internship programs have been implemented through Lane Community College, University of Oregon, and Oregon State University to provide resource based field experience for college level students. Real-life work experiences and job shadow opportunities have been provided in conjunction with academic coursework to better orient students to careers in wildlife management and natural resource stewardship. The close proximity of FRWA to the West Eugene Wetland complex provides an important link with potential for expanded wetland study and interpretive opportunities.

Objectives and Strategies

Objectives and Strategies

As stated previously, objectives are concise statements of what the Department wants to achieve, how much the Department wants to achieve, when and where to achieve it and who will be responsible for the work. Objectives derive from goals and provide the basis for determining strategies. Strategies describe the specific actions, tools, techniques or a combination of these elements used to meet an objective.

The following objectives and strategies are based on the three goals described on page 4. They identify the management activities and priorities of the FRWA Management Plan:

Goal 1: Manage habitats to attract and support waterfowl in the southern Willamette Valley.

Objective 1.1: Manage 900 acres of wetland impoundments to create habitats needed by migratory waterfowl during the non-breeding season. A balance of habitats includes early successional seasonal wetlands (40-80%), semi-permanent and permanent wetlands (10-40%) and planted agricultural crops (5-20%).

Rationale: The Willamette Valley is an important region for migrating and wintering waterfowl in the Pacific Flyway. Food is thought to be to the factor most limiting waterfowl survival and condition during winter. As a result, wintering area Habitat Joint Ventures organized under The North American Waterfowl Management Plan have developed programs that operate under the basic premise that, if food abundance is increased, demographic performance (e.g., survival) or the physiological condition (e.g. body fat) of wintering waterfowl will improve. Joint ventures are based on a cooperative

approach to conservation by forming broad partnerships consisting of individuals, corporations, conservation organizations, and local, state, provincial, and federal agencies. These groups work together to protect, restore, and enhance wetlands and associated upland habitats in specific geographic regions. The FRWA is an important area for wintering birds in the Willamette Valley which occurs in the boundaries of the Pacific Birds Habitat Joint Venture. Therefore, focusing on producing foods in managed wetland impoundments at FRWA is consistent with regional and national waterfowl management objectives and objectives for the area established by the Department.

Waterfowl undergo a series of life history events during fall and winter (migration, molt, pair formation, pre migration fat storage) and no single habitat type can meet the needs of each species during every life-history stage. Consequently, it is important to provide a complex of wetlands that includes a mix of habitat types. Historically, habitat management at FRWA emphasized agricultural crops (corn, sudangrass, millet, wild rice). Agricultural grains provide the most energy per acre because they are easily digestible and high in carbohydrates. However, grains are nutritionally imbalanced and research has shown that ducks cannot survive on a diet of strictly agricultural grains. Additionally, other than a few duck and goose species, comparatively few wetland species use agricultural foods. Seasonal wetlands on the other hand can produce large amounts of natural foods in the form of seeds, tubers and invertebrates that provide a diverse diet for waterfowl and other species of wetland birds. Semi-permanent wetlands provide similar types of foods, but not in the same balance and they are not as productive as seasonal wetlands. However, semi-permanent wetlands may meet needs that seasonal wetlands do not (e.g. brood rearing habitat).

Given that food is thought to limit wintering waterfowl, and seasonal wetlands produce the greatest abundance of natural foods that benefit the most species, FRWA staff will emphasize this habitat type in managed impoundments. Agricultural crops are still important foods during periods of cold weather in the winter and farming operations assist with management of wetland impoundments. For example, it may be desired to set back the succession of a wetland which could include drying the area for a period of time and manipulating the vegetation. An agricultural crop could be a component of the manipulation. Consequently, agriculture remains an important component to sound wetland habitat management at the FRWA.

Strategy 1. Utilize moist soil management in all impoundment areas to produce abundant wetland food sources for waterfowl and other wetland dependent species. Work will entail water level manipulation and periodic soil disturbance on an annual or longer term interval using disking, plowing, or in combination with agricultural practices on a rotational basis as a vegetation setback mechanism.

Strategy 2. Maintain critical infrastructure including earthen levees, overflow/drain culverts and flashboard risers, rock spillways, and water channels on 900 acres of wetland habitat within current 22 separate impoundments. Work will include using heavy equipment to stabilize erosion damage, replace damaged culverts, replace and repair flashboard riser structures, grade dike

tops, mow vegetation, and maintain overflow spillways.

Strategy 3. Maintain critical infrastructure necessary for water delivery for flood and irrigation purposes including pump houses, pump sites, screened pump intakes, and underground flood and irrigation pipelines. Work will include mechanical maintenance of pumps and associated electric service, underground pipeline repair, and maintenance of water outlet structures.

Strategy 4. Plant and maintain up to 180 acres of traditional food plots (corn, sudangrass, millet, sunflowers, wild rice, and other small grains) annually as a food crop for waterfowl use. Work will include soil preparation, planting, cultivation, and irrigation of food crops.

Strategy 5. To provide additional forage for geese, maintain several acres of upland prairie on Gibson Island. Work will entail clearing brush (e.g. invasive woody plants), herbicide applications, seeding native grasses, and fall mowing to provide spring green-up for goose browse.

Strategy 6. Monitor and maintain water channels, lake area, and marsh shoreline areas for optimum watershed function, brood habitat, passage access, drainage, and flow accessibility to pumps and intakes. Maintain creek banks and earthen slopes to stabilize erosion and reduce sediment runoff.

Strategy 7. Utilize mowing, disking, flooding, herbicides, or controlled burning to control reed canarygrass and other invasive plant species.

Strategy 8. Manage impoundments and coordinate drawdowns to minimize fish entrapment with an emphasis on providing fish passage in the East Coyote unit that is subject to annual flood events associated with adjacent Coyote Creek.

Strategy 9. Collaborate at the Flyway level and locally with agriculture interests, other agencies, Eugene Airport, and Department staff to seek options and opportunities to address goose depredation and public safety in the South Willamette Valley.

Strategy 10. Conduct waterfowl census and monitor wildlife population levels, distribution, and use patterns. Maintain database for comparative analysis. Conduct periodic wildlife surveys including annual Canada goose surveys and other department/USFWS/Pacific Flyway Council coordinated inventories.

Strategy 11. Explore research opportunities (i.e. OSU) to address wetland productivity and supporting bird numbers in impoundments, using predictive models, to integrate population and habitat efforts.

Objective 1.2: Designate 15-30% of managed wetlands as sanctuary for waterfowl.

Rationale: A fundamental consideration for management of any wildlife species is to provide food, water, and sanctuary with sanctuary defined as “a place of wildlife protection”. This is particularly important for waterfowl, both “resident” and migrating populations. The physical demands of waterfowl during migration and during daily movements within the wintering areas require that waterfowl have access to suitable locations for food and rest. Waterfowl that do not have access to sanctuary areas during critical time periods are subject to a variety of disturbances that increase energetic costs, change distribution, and prevent use of important habitats. Reduction of wetland habitat throughout the country has increased the spatial distribution of available sites for waterfowl sanctuary and has raised the importance of providing sanctuary on designated waterfowl management areas. Providing areas of sanctuary on the wildlife area will provide direct benefit to waterfowl utilizing the sites as well as providing close proximity to managed wetlands for access to food resources.

Strategy 1. Designate selected impoundments and/or habitat blocks as seasonal or year-round sanctuary for protection of wildlife. Sites will be selected based on suitability to support waterfowl as well as logistical and operational considerations.

Strategy 2. Post boundary of designated sanctuary areas with Department signage as deemed appropriate and engage regulation process to provide regulatory protection.

Strategy 3. Designate sanctuary boundaries on wildlife area maps for distribution to hunters and other visitors.

Strategy 4. Manage habitats within designated sanctuary areas to maximize benefits for waterfowl using a combination of active and passive management methods including moist soil management (mowing, disking, water level management), agricultural plantings, fencing, and control of invasive vegetation.

Objective 1.3: In cooperation with USACE, maintain approximately 1,000 acres of upland prairie, within 0.5 miles of wetland habitats, for dabbling ducks to provide suitable nesting habitat in association with brood rearing habitat (semi-permanent and permanent wetlands).

Rationale: Many waterfowl species rely upon slightly higher elevation habitats adjacent to wetlands for essential life functions including nesting and escape cover. Upland prairies in close proximity to wetlands can provide cover and substrate ideal for many waterfowl species. Maintenance of these plant communities during spring nesting season is important both from a standpoint of habitat structure requirements and protection from predation and disturbance. Recognizing the value of this adjacent upland habitat will help guide management to maintain proper plant composition and to prevent disturbance to waterfowl during critical life history stages.

Strategy 1. Provide protection of upland grasslands during spring and summer nesting periods by posting informational signage, regulating human activities (e.g. wildlife viewing and hiking), and continuing to require that dogs be on leash except when hunting.

Strategy 2. Maintain upland grasslands adjacent to wetland habitats using a combination of management techniques including fencing, mowing, removal of encroaching woody vegetation, and control of invasive plant species.

Strategy 3. Limit mechanical disturbance to uplands during the spring and summer nesting period; for example, timing brush removal, mowing or other habitat management activities until mid-July or later.

Objective 1.4: In cooperation with USACE, maintain approximately 1,000 acres of lakebed area that alternates between summer "full pool" condition of open water, submergent, and emergent vegetation zone and winter drawdown mudflat zone.

Rationale: Fern Ridge Lake is an USACE flood control project that is managed with a summer full pool of approximately 9,000 acres followed by a fall and winter drawdown to provide flood storage capacity. The winter drawdown reduces open water area to a minimum 1,500 acres that dramatically fluctuates up and down from inflows from winter rains. This seasonal drawdown exposes several square miles of lakebed mudflats that serve as a valuable habitat stage for waterfowl and other wildlife. A portion of the lakebed area is included within the wildlife area boundary. Proximity of the wildlife area to the larger lake and winter mudflat area provides critical association with this important landscape scale habitat feature.

The habitat types associated with the lake during summer include open water and freshwater marsh submergent and emergent vegetation zones. Importantly, a large portion of this same habitat footprint becomes mudflats during reservoir drawdown in the winter. As such, critical waterfowl and shorebird habitat is provided, as well as a degree of sanctuary created by the largely inaccessible fringe of the shallow lake edge.

From mid-March through early October, Fern Ridge Lake remains at or near full pool with a 32 mile shoreline and shallow lake gradation that provides extensive zones of open water interspersed with hardstem bulrush, cattail and other aquatic vegetation. The lake area in this condition supports a wide variety of wetland dependent wildlife species. However, active management of the Department licensed wildlife area portion of the lake surface is very limited because of USACE regulated reservoir operations. Still, the wildlife values supported by the lake habitats are significant on a landscape scale and their proximity to adjacent wetlands is integral to the successful management of associated species.

Beginning in early October and continuing through spring, the lake is drawn down for flood control which exposes expansive mudflats. Mudflats are recognized as an

important habitat stage in the OCS along with vernal pools and related habitats. Wildlife use of these areas is very dynamic during the winter, as thousands of shorebirds use it for foraging and concentrations of waterfowl utilize the mudflats and shallow lake zones for rest and evening sanctuary. Raptors, including bald eagles, feed on the available prey base and use the area as a safe haven because of its physical isolation and difficult access.

Management of FRWA's adjacent, intensively managed wetlands cannot be disassociated with the lake; rather it capitalizes on the close proximity of the mudflat habitat. The lake's annual fluctuations create a unique situation that provides important spring and summer habitat for waterfowl and other wetland bird nesting and brood rearing. This significant mudflat habitat supports an abundance of waterfowl and shorebirds during the winter.

It is essential to recognize and acknowledge the necessary functions that this "passively managed" area provides to the actively managed sites on the wildlife area. Future lakewide management decisions must incorporate a good understanding of this important mudflat zone. Since the majority of the lake mudflat area is outside of the wildlife area boundary, it is important for the Department to maintain a close consultation role with USACE relating to reservoir resource and public use management.

Strategy 1. Continue to document waterfowl use of the lake and winter lakebed mudflat areas using aerial census in collaboration with USACE, USFWS, and local birding groups.

Strategy 2. Provide recommendations on USACE lakewide operations that benefit or impact waterfowl resources.

Strategy 3. Monitor other wildlife use of the lake and mudflat areas with an emphasis on Sensitive, Threatened, and Endangered species.

Strategy 4. Post appropriate Department signage and recommend regulatory protections that balance wildlife protection, hunting, and public access.

Goal 2: Protect, enhance, and restore habitat diversity for other wildlife present on the area, compatible with Goal 1.

Objective 2.1: Protect and enhance 414 acres of wet prairie.

Rationale: Wildlife habitat in the Willamette Valley has been significantly impacted since the advent of modern agriculture and urbanization. Few intact remnant parcels of native habitat remain valley wide, yet a significant representation of these irreplaceable habitats is present around Fern Ridge Lake. Many of these native habitat types including wet prairie, grasslands, and oak woodlands are defined as Strategy Habitats in the OCS.

These diverse habitats, from a landscape perspective, provide a large resource base to support a wide variety of wildlife in the southern Willamette Valley. The wildlife area's location and relationship to other important habitats such as Finley, Basket Slough and Ankeny National Wildlife Refuges make it a critical link in ensuring the continued protection of plant and wildlife species.

Once a common habitat type, few areas of native wet prairie remain in the Willamette Valley thus the wet prairie habitat found on FRWA is given high priority for conservation activities. Protective measures and sound stewardship processes are imperative for continued presence and health of these habitat types and the wildlife species they support.

As part of the interagency Pacific Northwest RNA Program, a RNA was established in several wet prairie parcels to protect these unique valley plant communities.

Many of the strategies listed below describe active management to address noxious weeds or invasive species. For the purposes of this plan, the following definitions have been used: a "noxious weed" is defined by laws as being especially undesirable, troublesome and difficult to control. An "invasive plant" is a plant that invades habitat beyond where it was planted. Invasive weeds are usually nonnative (exotic). "Native" is generally used to refer to species that arrived and persisted in our region without (and generally prior to) the intervention of humans of European descent in contrast with the terms "alien", "exotic", or "introduced". Most exotics arrive and thrive only due to transport and disturbance provided by people. Many exotics are benign, but some invade relatively intact native ecosystems, and may even threaten those ecosystems; these would be termed "invasive".

As described earlier in this plan, some wildlife species can be exotic and/or invasive, such as starlings and nutria.

Strategy 1. In cooperation with USACE, manage designated RNA wet prairie sites by maintaining fences, vegetation monitoring and control (tree, shrub and reed canarygrass removal), maintenance of firebreaks, use of controlled burns and by natural drainage protection and/or enhancement. Monitoring will be conducted to determine species presence and abundance to be used as a baseline indicator to guide management decisions.

Strategy 2. Control invasive plant and animal species utilizing management techniques that enhance and restore wet prairie habitat including disking, planting, mowing, pesticide use, and trapping of nuisance species (e.g. nutria).

Strategy 3. Monitor and control noxious weeds on wildlife area lands according to state and federal guidelines. Work will include herbicide applications and mechanical control. Monitoring will be conducted to determine species presence and abundance to be used as a baseline indicator to guide management

decisions.

Strategy 4. Establish partnerships with other resource protection entities to ensure long term sound stewardship of sensitive and unique species and habitats. Potential partners for exchange of technical expertise and resources include Oregon State University, Ducks Unlimited, Audubon Society, Izaak Walton League, and Rivers 2 Ridges Partners.

Strategy 5. Seek partnerships and cooperative funding from USACE and other agencies to benefit threatened, endangered, and sensitive plant and animal species.

Objective 2.2: Protect and enhance 945 acres of oak woodlands.

Rationale: Oak woodlands are defined as Strategy Habitats in the OCS and as such are considered to be of high conservation priority, especially in light of the pressure in the Willamette Valley to develop oak woodlands. Recommended conservation actions include conserving and/or restoring oak woodland habitats to conserve ecological values. Oak woodlands as well as grasslands provide important habitat for more than 100 breeding migratory bird species.

While many of the remnant oak woodlands include a mixed plant species composition, the oak species component can be improved with proper management techniques such as conifer removal and thinning.

Strategy 1. In cooperation with USACE, manage oak woodlands to promote natural oak succession using methods such as conifer removal, thinning and plantings.

Strategy 2. Continue adaptive management to maintain and improve woodland habitats using techniques including periodic fire, manual removal of invasive species and woody vegetation (i.e. Himalayan blackberry), inter-planting of native species, herbicide application, and/or mechanical soil cultivation.

Strategy 3. Maintain interconnected blocks of woodlands to reduce habitat fragmentation. This includes maintaining the integrity of riparian vegetation throughout the project with emphasis on corridors along Coyote Creek and the Long Tom River. Plant and establish trees and maintain fencing to exclude livestock.

Strategy 4. Control invasive plant and animal species utilizing management techniques that enhance and restore native habitats including disking, planting, mowing, pesticide use, and trapping of nuisance species (e.g. nutria).

Strategy 5. Establish partnerships with other resource protection entities to ensure long term sound stewardship of sensitive and unique habitats. Potential

partners for exchange of technical expertise and resources include Oregon State University, The Nature Conservancy, USFWS, USACE, Audubon Society, Izaak Walton League, West Eugene Wetlands staff and Bureau of Land Management.

Objective 2.3: Protect and enhance 764 acres of upland prairie.

Rationale: Remnants of native grasslands exist in significant amounts at Fern Ridge Lake, primarily as upland prairies. Some of the forb species found within the FRWA grasslands are presently federally listed as threatened or endangered and these include: Bradshaw's desert parsley, Willamette Valley daisy, and Kincaid's lupine. Since 1987, as part of the USACE Master Plan, the USACE and partners complete threatened and endangered plant surveys and continue to be actively involved in the management of these plant species on the FRWA. Currently the RNA is also maintained to support native Willamette Valley grasslands and to conduct research on the biology of unique grassland species.

Strategy 1. Continue adaptive management to maintain and improve grassland habitats using techniques including periodic fire, successional mowing, manual removal of invasive species and woody vegetation, inter-planting of native species, herbicide application, and/or mechanical soil cultivation.

Strategy 2. In cooperation with USACE, manage habitat and structure to benefit western pond turtles. Work may include fencing of nesting areas to exclude predators and reduce human disturbance, maintenance and placement of stumps and logs for basking and escape cover, grading steep stream banks that restrict turtle movement, and control of invasive vegetation on upland nesting sites.

Strategy 3. Monitor and control invasive plants and noxious weeds using management techniques that include disking, planting, mowing and herbicides. Monitoring will be conducted to determine species presence and abundance to be used as a baseline indicator to guide management decisions.

Strategy 4. Establish partnerships with other resource protection entities to ensure long term sound stewardship of grasslands. Potential partners for exchange of technical expertise and resources include The Nature Conservancy, Oregon State University, USFWS, USACE, Audubon Society, Izaak Walton League, West Eugene Wetlands staff and Bureau of Land Management.

Strategy 5. Coordinate with OCS staff to pursue funding opportunities and to implement management activities related to native habitat restoration and enhancement.

Goal 3: Provide a variety of recreational and educational opportunities to the public which are compatible with Goals 1 and 2.

Objective 3.1: Provide hunting, trapping, and angling opportunities in a manner compatible with habitat management objectives.

Rationale
The close proximity to the growing Eugene-Springfield metropolitan area increases the importance of protecting and managing this area for wildlife use while providing a destination for hunters, trappers and anglers. As the amount of public access and wildlife habitat decreases in the southern Willamette Valley, the wildlife area continues to provide hunting opportunities that are very important for preserving the hunting legacy for future generations of the citizens of this state.

Hunting programs at FRWA have been modified over the years to accommodate different types of hunting. For example, season dates were rearranged to eliminate overlap of pheasant and duck hunting programs. Seasonal access restrictions have been used in the more intensively managed units as a way to provide quality hunting (reservation waterfowl hunt) versus maximum opportunity (wide open hunting areas). In 2006, hunting regulation changes in selected units shifted from three-day/week during duck season to seven-day/week hunting that ends daily at 1 PM in an effort to provide stable, predictable use patterns and sanctuary areas for wintering waterfowl.

The hunting program framework also takes into consideration other types of public use to provide balance between hunters and non-hunting visitors. Regulations will continue to be modified as needed to find a balance that prioritizes the biological needs of waterfowl while accommodating a diverse array of hunting opportunities.

Angling is also an important activity at Fern Ridge Lake. While most of the open water region of the lake is outside the wildlife area boundary, access is available across and adjacent to wildlife area lands. Trails along the Long Tom River, Coyote Creek, Amazon Creek, and the lake shore provide access for anglers. A courtesy fishing pier in Kirk Park also provides angler access. Boating access to Fern Ridge Lake provides access to over 9,000 surface acres of water for angling.

Strategy 1. Administer hunt programs that include archery/shotgun deer, mourning dove, snipe, pheasant, quail, grouse, youth upland bird hunting, Western Oregon Fee Pheasant hunt and waterfowl hunting (e.g. September Canada goose, general duck season, youth waterfowl hunt, and reservation waterfowl hunt program).

Strategy 2. Provide access for angling across wildlife area lands as compatible with seasonal waterfowl sanctuary closures by maintaining trails for river, creek, and lakeshore access and maintain canoe access sites for angler access to waterways.

Strategy 3. Explore options and opportunities to improve angling access by installing piers, walkways, or launch sites for small watercraft. Continue coordination with USACE and Oregon Marine Board to develop and maintain boating and angler access to Fern Ridge Lake and associated tributaries.

Strategy 4. Continue to partner with OSP on enforcement issues (e.g. hunting

and angling compliance).

Strategy 5. Maintain critical access roads, parking areas, signs, information kiosks, hunter check stations, nature trails, fencing, designated wildlife viewing areas, canoe access sites, and other public access sites.

Strategy 6. Expand internship programs with colleges and universities to support education, management, inventory, interpretive, and monitoring needs.

Strategy 7. Continue to provide access and area information to the public through web page postings, brochures, maps, signs and hunting regulation booklets.

Strategy 8. Provide disabled hunter access opportunities consistent with Department guidelines.

Strategy 9. Continue hunter permit system for tracking hunter use and success on the wildlife area.

Strategy 10. Develop and maintain relationships with constituent groups and organizations that support wildlife area hunting programs.

Strategy 11. Continue to assess furbearer populations and conduct trapping by permit to maintain balance of species and for administrative purposes (e.g. to remove nutria to protect earthen levees).

Strategy 12. Explore angling or access restrictions, educational outreach, or other strategies to minimize user impacts to western pond turtles.

Objective 3.2: Provide wildlife viewing and education/interpretation opportunities compatible with Objective 3.1.

Rationale: The policy of the Department calls for Oregon's wildlife to be "…managed to prevent serious depletion of any indigenous species and to provide the optimum recreational and aesthetic benefits for present and future generations of the citizens of this state." Recreational activities such as wildlife viewing and natural resource educational opportunities are highly sought out by the general public. To meet this demand management actions on the FRWA are designed to provide public use opportunities and provide a "living classroom" for teachers, students, civic groups and others when such activities are compatible with the primary goal of the wildlife area.

A permit system is currently in place to monitor hunter use of the wildlife area and the USACE currently monitors public use of the entire Fern Ridge Project (approximately 800,000 visitor use days annually). Wildlife viewing use by the public specifically on the FRWA has been difficult to determine; therefore, area staff will develop methods to estimate visitor use days.

Strategy 1. Evaluate possibilities for expanding internship programs with

colleges and universities to support education, recreation, inventory, and monitoring needs. Place particular emphasis on documenting existing and potential habitats for threatened, endangered, and sensitive wildlife and the monitoring of other species (e.g. bald eagles, neotropical passerines).

Strategy 2. Maintain web page with wildlife area information, maps, bird checklist, viewing opportunities, regulations, and species backgrounders.

Strategy 3. Maintain interpretive kiosks and post wildlife area identification boundary and regulatory signs.

Strategy 4. Provide access, guidance, and support for educational institutions including schools, civic groups, conservation entities and state/federal agencies.

Strategy 5. Collaborate with local community educational organizations and the USACE to develop interpretive displays, information kiosks, and signing highlighting wildlife management principles and unique features of the wildlife area.

Strategy 7. Develop process to monitor wildlife area public use. Methodology will be developed for the wildlife area portion of Fern Ridge Lake to more accurately document public use including angling, boating, hiking, birdwatching, and other outdoor pursuits.

Strategy 8. Provide access for wildlife viewing and other compatible uses of the area that are not in conflict with the biological needs of wildlife and the area's hunting programs.

Strategy 9. Explore/seek additional wildlife viewing opportunities through collaboration and partnerships consistent with hunting and wildlife management objectives.

Objective 3.3: Maintain and enhance wildlife area facilities, structures, and equipment used to conduct habitat management and public use projects on the wildlife area.

Rationale

Facilities, structures, and equipment are integral to the overall operation of the FRWA. The infrastructure and equipment must be maintained and kept in good working condition to accomplish habitat and wildlife management projects and to provide public use opportunities. Infrastructure includes the wildlife area's headquarters and associated buildings, pump houses, pipeline systems, an extensive series of earthen levees, water control structures, access roads, parking lots, hunter check stations and interpretive kiosks. Equipment includes tractors, agricultural implements, heavy machinery, vehicles, ATVs, trailers, boats and shop tools.

Strategy 1. Maintain current headquarters facilities including nine buildings, one residence site and associated utility infrastructure. Work will include carpentry and repair work, structural maintenance of all buildings and accoutrements, landscape maintenance, and general facility structural maintenance and improvement.

Strategy 2. Conduct annual inventories and maintain operational integrity of facilities, structures, equipment, vehicles and technological assets. Work will include scheduled maintenance of all equipment and vehicles and completing repair and upgrades as needed.

Strategy 3. Operate and maintain fish screens on irrigation ditches annually by maintaining screen structures at pump intakes.

Strategy 4. Continue irrigation and water management practices within authorization of FRWA water rights and according to annual water usage reporting requirements.

Strategy 5. Maintain structures for wildlife including osprey nest poles/platforms, waterfowl nest structures, songbird houses, bat houses, and purple martin nest colonies. Work will include construction and installation of species-specific structures and maintenance by annual inspection, with replacement as needed.

Strategy 6. Work with OSP and other local law enforcement agencies to decrease theft and vandalism on the wildlife area.

Plan Implementation

Funding

Since its inception in 1959, funding for the operation and maintenance of the FRWA has been accomplished through an annual federal grant under the Federal Aid to Wildlife Restoration (WR) Program. This program was created with the passage of the Pittman-Robertson (PR) Act in 1937. The PR Act authorizes the U.S. Fish and Wildlife Service to cooperate with the States, through their respective State fish and wildlife departments, to fund wildlife restoration projects. Eligible types of projects include restoration, conservation, management, and enhancement of wild birds, wild mammals and their habitats, and providing for public use and benefit from these resources.

Funding for WR is derived from a federal excise tax on the sale of firearms, ammunition, and archery equipment. Funding is then apportioned to states based on a mathematical formula of area of the state in square miles (50%) and total number of hunting licenses sold annually (50%). Under the program no state may receive more than 5%, nor less than 0.5% of the total money available.

To be eligible, States must have assented to the provisions of the PR Act and passed laws for the conservation of wildlife that include a prohibition against the diversion of

license fees paid by hunters for any other purpose than the administration of the State fish and wildlife department. Another major requirement is that states have to contribute 25% of the total grant cost since federal participation is limited to 75% of eligible costs incurred under a grant. The Department provides its 25% cost share from annual license and tag revenues.

Over the past five years, funding for the operation and maintenance of the FRWA has averaged approximately $390,000 annually. To implement many of the management actions and achieve the objectives and goals of this management plan, the Department will need additional funding and staff to undertake the following types of projects: upgrades of existing facilities, reed-canarygrass control, a more robust farming program, and species and habitat monitoring.

Staffing/Organization

In total, the Department manages 17 wildlife areas statewide. The wildlife areas encompass approximately 200,000 acres and are found in both Department administrative regions; the Fern Ridge Wildlife Area is located in the West Region. The wildlife area is staffed by two full time employees and one 6 month Wildlife Technician.

A dedicated and reliable volunteer crew has been contributing to wildlife area operations for over twenty years. On an average year, over 2,200 hours of additional labor and support are provided by this capable team of sportsmen and wildlife supporters. A wider scope of management activities could be undertaken if the wildlife area was allocated additional operational funding and manpower.

Compliance Requirements

This management plan was developed to comply with all Federal and State laws, Oregon Revised Statutes (ORSs), Oregon Administrative Rules (OARs), and Department policies. Full implementation of all components of this plan will require compliance with the laws, regulations, rules, and policies listed in Appendix C.

FRWA management activities are authorized and regulated under all applicable local, state, and federal laws and guidelines. Under the USFWS Pittman-Robertson funding process, all management actions on FRWA must comply with Section 7 of the federal Endangered Species Act, National Environmental Policy Act (NEPA) and National Historic Preservation Act (SHPO).

An annual management plan is submitted to the USACE as a license requirement which provides another level of federal review. USACE also coordinates with USFWS and complies with Section 7 requirements for all applicable management actions at Fern Ridge. FRWA and USACE staff participates in ongoing coordination relating to all management activities regarding T&E species on the wildlife area.

Partnerships

A number of other state, federal, and local agencies and interest groups assist with management activities on the FRWA. These partners play an important role helping the

department achieve its mission and the FRWA goals. The Department will continue to rely on these and other partners in the future to help implement this plan and provide input for future updates. This plan identifies projects that provide new opportunities for existing or new partners. There is a great potential for more public participation and assistance in the management of the wildlife area given its proximity to the USACE Fern Ridge Lake project, Eugene/Springfield metropolitan area and the West Eugene Wetlands. The Department welcomes and encourages public participation in the administration of the wildlife area.

Adaptive Management

This plan provides for adaptive management of the wildlife area. Adaptive management is a flexible approach to long-term management of resources that is directed by the results of ongoing monitoring activities and latest data. Management techniques and strategies are regularly evaluated in light of monitoring results, new scientific understanding, and other new information. These periodic evaluations are used over time to adapt both management techniques and strategies to better achieve the area goals.

Monitoring is an essential component of adaptive management in general, and of this plan in particular; specific monitoring strategies have been integrated into the goals and objectives described in this plan whenever possible. Where possible, habitat management activities will be monitored to assess whether the desired effects on wildlife and habitat components have been achieved. Monitoring of wildlife, habitats and public use is used to identify trends and occurrences that factor into decision making and sound management recommendations.

Plan Amendment and Revision

Wildlife area management plans are meant to evolve with each individual area, and as such each plan will be formally revisited after five years and updated every ten years. In the meantime, however, the Department will be reviewing and updating this plan periodically (at least as often as every five years) based on the results of the adaptive management program. This plan will also be informally reviewed by area staff while preparing annual work plans. It may also be reviewed during routine inspections or programmatic evaluations. Results of any or all of these reviews may indicate a need to modify the plan. The goals and objectives described in this plan will not change until they are re-evaluated as part of the formal plan revision process. However, the strategies may be revised to better address changing circumstances or due to increased knowledge of the resources on the area. If changes are required, the level of public involvement and associated compliance requirements will be determined by the Department.

Accomplishments

Since the 2009 FRWA Management Plan adoption, there have been some major accomplishments that are summarized in this section:

Capital equipment was purchased either to replace aging inventory or to improve WA

operations including: skid steer (2011), large wetland disk (2012), equipment trailer (2012), irrigators (2014), backhoe (2016), tractor (2018), ATV (2019) and mower (2019).

Several structures were built to replace aging infrastructure, to enhance the experience of WA users, or to assist in storage and operations. We built a viewing platform in the East Coyote Unit (2009), a new storage building (2011), a dumpster enclosure (2013), storage shed lean-to (2014), 4 wildlife area kiosks (2017-2018), 5 new check station boxes (2018), replaced the pump house roofs (2011) and the managers residence (2012), repaired and replaced many hunting blinds and blind lids, and we remodeled the WA office (2018).

We replaced several items related to our irrigation and water storage infrastructure. We installed low pressure soft start systems in our irrigation pump houses to prevent pipe ruptures (2014). We replaced rotten culverts in the West Coyote (2017) and Fisher Butte units (2016).

We completed a major project in the East Coyote Unit that replaced all water control structures and associated culverts, regraded drainage swales, constructed new swales, and completed repairs to some levees (2018).

Trails in West and East Coyote Units were re-opened after a major effort to clear brush and remove fallen trees (2016).

We hosted an average of 4,024 hunters annually who participated in at least 1 of 7 different hunts that occur on the WA.

The WWMP purchased two new properties, Coyote Creek South (2013) and Coyote Creek Northeast (2015), adding 534 acres to the WA.

We implemented the wildlife area parking permit program in 2013.

We re-initiated waterfowl banding efforts in 2017.

WA rules were changed to clarify dog use and to require a hunting permit for all units (2018).

We coordinated with BLM to conduct a 54 acre controlled burn in the West Coyote unit to control invasive trees and shrubs and reduce reed-canarygrass thatch (2018).

Since 2015 we have been reducing tree densities in the West Coyote Unit. We are removing non-native cherry trees on upland sites and many native trees that are encroaching on wet prairie habitat types. The project is ongoing.

Another ongoing project is the control of reed canarygrass within wetland cells. The Fisher Butte field #4 was restored in 2016, #5 in 2017, and #6 in 2019. Other cells receiving treatment include West Coyote #1 (2016 and 2018), East Coyote 4b (2017

and 2018), Fisher Butte #1 (2017, 2019), #2 (2019), #3 (2019) and many other unnamed fields where reed canarygrass is the dominant vegetation type.

Gibson Island is mowed annually to reduce tree densities, maintain a central open meadow area, and reduce blackberry and scotch broom densities. This project is ongoing.

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U.S. Army Corps of Engineers (USACE) *Upper Willamette Valley Master Plan for Resource Use – Part 2A* Fern Ridge Lake Plan of Management and Development

Appendices

Appendix A. Plant Species Known to Occur on the Fern Ridge Wildlife Area

FERN RIDGE WILDLIFE AREA PLANT LIST

This vascular plant species list was compiled by USACE staff from various sources, including published reports; Masters theses; personal observation; and collections and field notes on file. New reports, additions, and corrections are welcomed. The list is maintained and updated by USACE botany staff, Willamette Valley Projects. A new updated list is currently in production but unavailable at the time this plan was completed (Jan. 2020).

"Family" per Hitchcock & Cronquist	*Genus*	*Species*	Common Name	Origin: N = Native I = Introduced
ACERACEAE	*Acer*	*circinatum*	vine maple	N
ACERACEAE	*Acer*	*macrophyllum*	big leaf maple	N
ALISMATACEAE	*Alisma*	*gramineum*	narrowleaf water plantain	N
ALISMATACEAE	*Alisma*	*lanceolatum*	lanceleaf water plantain	I
ALISMATACEAE	*Alisma*	*triviale*	Northern water plantain	N
ALISMATACEAE	*Sagitaria*	*latifolia*	wapato, arrowhead	N
ANACARDIACEAE	*Toxicodendron*	*diversiloba*	poison oak	N
APIACEAE	*Daucus*	*carota*	wild carrot	I
APIACEAE	*Eryngium*	*petiolatum*	coyote thistle	N
APIACEAE	*Heracleum*	*lanatum*	cow parsnip	N
APIACEAE	*Hydrocotyle*	*ranunculoides*	marsh pennywort	N
APIACEAE	*Lomatium*	*bradshawii*	Bradshaw's desert parsley	N
APIACEAE	*Lomatium*	*nudicaule*	bare-stem desert parsley	N
APIACEAE	*Lomatium*	*utriculatum*	common lomatium	N
APIACEAE	*Oenanthe*	*sarmentosa*	water parsley	N
APIACEAE	*Osmorhiza*	*chilensis*	sweet cicely	N
APIACEAE	*Perideridia*	*gairdneri*	Gardner's yampah	N
APIACEAE	*Perideridia*	*oregana*	Oregon yampah	N
APIACEAE	*Sanicula*	*crassicaulis*	Pacific snakeroot	N
APIACEAE	*Torilis*	*arvensis*	spreading hedge- parsely	I
APOCYNACEAE	*Apocynum*	*cannibinum*	common dogbane	N
AQUIFOLIACEAE	*Ilex*	*aquifolium*	holly	I
ARALIACEAE	*Hedera*	*helix*	ivy	I
ASTERACEAE	*Achillea*	*millefolium*	yarrow	N

"Family" per Hitchcock & Cronquist	*Genus*	*Species*	Common Name	Origin: N = Native I = Introduced
ASTERACEAE	*Anaphalis*	*margaritaceae*	pearly everlasting	N
ASTERACEAE	*Anthemis*	*cotula*	stinking chamomile	I
ASTERACEAE	*Sericocarpus*	*rigidus*	white-topped aster	N
ASTERACEAE	*Aster*	*hallii*	Hall's aster	N
ASTERACEAE	*Baccharis*	*pilularis*	chaparral broom; coyote brush	N
ASTERACEAE	*Bellis*	*perennis*	English daisy, lawn daisy	I
ASTERACEAE	*Bidens*	*cernua*	nodding beggars-tick	N
ASTERACEAE	*Bidens*	*frondosa*	leafy beggars-tick	N
ASTERACEAE	*Bidens*	*vulgata*	big devils beggartick	N
ASTERACEAE	*Centaurea*	*Xpratensis*	meadow knapweed	I
ASTERACEAE	*Cirsium*	*arvense*	Canada thistle	I
ASTERACEAE	*Cirsium*	*vulgare*	bullthistle	I
ASTERACEAE	*Crepis*	*capillaris*	smooth hawksbeard	I
ASTERACEAE	*Erigeron*	*decumbens*	Willamette valley daisy	N
ASTERACEAE	*Eriophyllum*	*lanatum*	wooly sunflower	N
ASTERACEAE	*Gnaphalium*	*palustre*	lowland cudweed	N
ASTERACEAE	*Gnaphalium*	*pupureum*	purple cudweed	N
ASTERACEAE	*Grindelia*	*integrifolia*	Willamette Valley gumweed	N
ASTERACEAE	*Hypochaeris*	*radicata*	false dandelion	I
ASTERACEAE	*Lactuca*	*serriola*	prickly lettuce	I
ASTERACEAE	*Lasthenia*	*glabberima*	smooth lasthenia	N
ASTERACEAE	*Leontodon*	*taraxacoides*	lesser hawkbit	I
ASTERACEAE	*Leucanthemum*	*vulgare*	oxe-eye daisy	I
ASTERACEAE	*Madia*	*elegans*	showy tarweed	N
ASTERACEAE	*Madia*	*glomerata*	clustered tarweed	N
ASTERACEAE	*Madia*	*sativa*	tarweed	N
ASTERACEAE	*Matricaria*	*discoidea*	pineapple weed	I
ASTERACEAE	*Microseris*	*laciniata*	cut-leaved microseris	N
ASTERACEAE	*Psilocarphus*	*elatior*	tall woollyheads	N
ASTERACEAE	*Pyrrocoma*	*racemosa*	clustered goldenweed	N
ASTERACEAE	*Senecio*	*jacobaea*	tansy ragwort	I

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ASTERACEAE	*Solidago*	*canadensis*	Canada goldenrod	N
ASTERACEAE	*Sonchus*	*asper*	prickly sow thistle	I
ASTERACEAE	*Taraxacum*	*officinale*	common dandelion	I
ASTERACEAE	*Wyethia*	*angustifolia*	narrow-leaf mule's ear	N
AZOLLACEAE	*Azolla*	*filiculoides*	Mexican water fern	N
BERBERIDACEAE	*Berberis*	*aquafolium*	Oregon grape	N
BETULACEAE	*Alnus*	*rubra*	red alder	N
BETULACEAE	*Betula*	*pendula*	European birch	I
BETULACEAE	*Corylus*	*avellana*	common filbert	I
BETULACEAE	*Corylus*	*cornuta*	beaked hazelnut	N
BORAGINACEAE	*Myosotis*	*discolor*	yellow & blue forget- me-not	I
BORAGINACEAE	*Myosotis*	*laxa*	small flowered forget- me-not	N
BORAGINACEAE	*Plagiobothrys*	*figuratus*	fragrant popcorn flower	N
BORAGINACEAE	*Plagiobothrys*	*scouleri*	Scouler's popcorn- flower	N
BRASSICACEAE	*Barbarea*	*orthoceras*	wintercress	N
BRASSICACEAE	*Cardamine*	*nuttallii*	Nuttall's toothword	N
BRASSICACEAE	*Cardamine*	*oligosperma*	little western bittercress	I
BRASSICACEAE	*Cardamine*	*penduliflora*	Willamette Valley bittercress	N
BRASSICACEAE	*Raphanus*	*sativus*	wild radish	I
BRASSICACEAE	*Rorippa*	*curvisiliqua*	curvepod yellowcress	I
BRASSICACEAE	*Rorippa*	*palustris*	western bog yellowcress	I
CALLITRICHACEAE	*Callitriche*	*verna*	spring water-starwort	N
CAMPANULACEAE	*Downingia*	*elegans*	showy downingia	N
CAMPANULACEAE	*Downingia*	*yina*	Willamette downingia	N
CAPRIFOLIACEAE	*Lonicera*	*ciliosa*	orange honeysuckle	N
CAPRIFOLIACEAE	*Lonicera*	*hispidula*	pink honeysuckle	N
CAPRIFOLIACEAE	*Lonicera*	*involucrata*	twinberry	N
CAPRIFOLIACEAE	*Symphoricarpus*	*albus*	snowberry	N
CAPRIFOLIACEAE	*Viburnum*	*ellipticum*	common viburnum	N
CARYOPHYLLACEAE	*Cerastium*	*glomeratum*	chickweed	I

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CARYOPHYLLACEAE	*Dianthus*	*armeria*	Deptford pink	I
CARYOPHYLLACEAE	*Spergula*	*arvensis*	corn spurry	I
CARYOPHYLLACEAE	*Spergularia*	*rubra*	sand spurrey	I
CARYOPHYLLACEAE	*Stellaria*	*media*	chickweed	I
CERATOPHYLLACEA E	*Ceratophyllum*	*demersum*	coontail	N
CHENOPODIACEAE	*Chenopodium*	*ambrosioides*	Mexican tea	I
CONVOLVULACEAE	*Convolvulus*	*arvensis*	field bindweed	I
CONVOLVULACEAE	*Calystegia*	*atriplicifolia*	night blooming morning glory	N
CORNACEAE	*Cornus*	*sericea*	red-twig dogwood	N
CRASSULACEAE	*Crassula*	*aquatica*	water pygmyweed	N
CUCURBITACEAE	*Marah*	*oreganus*	Oregon cucumber	N
CYPERACEAE	*Carex*	*arctata*	drooping woodland sedge	N
CYPERACEAE	*Carex*	*densa*	dense sedge	N
CYPERACEAE	*Carex*	*feta*	green-sheath sedge	N
CYPERACEAE	*Carex*	*leporina*	leporina sedge	N
CYPERACEAE	*Carex*	*obnupta*	slough sedge	N
CYPERACEAE	*Carex*	*pellita*	Woolly sedge	N
CYPERACEAE	*Carex*	*rossii*	Ross' sedge	N
CYPERACEAE	*Carex*	*scoparia*	pointed broom sedge	N
CYPERACEAE	*Carex*	*tumulicola*	Foothill sedge	N
CYPERACEAE	*Carex*	*unilateralis*	one-sided sedge	N
CYPERACEAE	*Cyperus*	*bipartitius*	shining flatsedge	N
CYPERACEAE	*Cyperus*	*erythrorhizos*	red-root flatsedge	N
CYPERACEAE	*Eleocharis*	*acicularis*	needle spike-rush	N
CYPERACEAE	*Eleocharis*	*obtusa*	blunt spike-rush	N
CYPERACEAE	*Eleocharis*	*ovata*	ovate spike-rush	N
CYPERACEAE	*Eleocharis*	*palustris*	common spike-rush	N
CYPERACEAE	*Scirpus*	*microcarpus*	hardstem bullrush	N
CYPERACEAE	*Scirpus*	*tabernaemontan*	tule, softstem bullrush	N
CYPERACEAE	*Schoenoplectus*	*acutus*	hardstem bulrush	N
DENNSTAEDTIACEAE	*Pteridium*	*aquilinum*	bracken fern	N

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DIPSACACEAE	*Dipsacus*	*fullonum*	teasel	I
EQUISETACEAE	*Equisetum*	*arvense*	field horsetail	N
ERICACEAE	*Pyrola*	*asarifolia*	bog wintergreen	N
ERICACEAE	*Vaccinium*	*caespitosum*	dwarf huckleberry	N
ERICACEAE	*Arbutus*	*menziesii*	Pacific madrone	N
FABACEAE	*Cytisus*	*scoparius*	Scot's broom	I
FABACEAE	*Lathyrus*	*aphaca*	yellow pea	I
FABACEAE	*Lathyrus*	*holochlorus*	thin-leaved peavine	N
FABACEAE	*Lathyrus*	*latifolius*	everlasting pea	I
FABACEAE	*Lathyrus*	*nevadensis*	sierra pea	N
FABACEAE	*Lathyrus*	*sphaericus*	grass peavine	I
FABACEAE	*Lotus*	*corniculatus*	birds-foot trefoil	I
FABACEAE	*Lotus*	*formosissimus*	birds-foot trefoil	N
FABACEAE	*Lotus*	*micranthus*	small-flowered deervetch	N
FABACEAE	*Lotus*	*pinnatus*	meadow deervetch	N
FABACEAE	*Lotus*	*purshiana*	Pursh's deervetch	N
FABACEAE	*Lupinus*	*affinus*	fleshy lupine	N
FABACEAE	*Lupinus*	*bicolor*	field lupine	N
FABACEAE	*Lupinus*	*oreganus*	Kincaid’s lupine	N
FABACEAE	*Lupinus*	*polyphyllus*	bigleaf lupine	N
FABACEAE	*Lupinus*	*rivularis*	stream lupine	N
FABACEAE	*Melilotus*	*alba*	white sweet clover	I
FABACEAE	*Thermopsis*	*montana*	mountain goldenbanner	N
FABACEAE	*Trifolium*	*dubium*	least hop clover	I
FABACEAE	*Trifolium*	*repens*	white clover	I
FABACEAE	*Vicia*	*americana*	American vetch	N
FABACEAE	*Vicia*	*hirsuta*	hairy vetch	I
FABACEAE	*Vicia*	*tetrasperma*	slender vetch	I
FABACEAE	*Trifolium*	*pratense*	red clover	I
FABACEAE	*Vicia*	*sativa*	common vetch, tare	I
FAGACEAE	*Quercus*	*garryana*	Oregon white oak	N
FAGACEAE	*Quercus*	*kellogii*	California black oak	N

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FUMARIACEAE	*Dicentra*	*formosa*	bleeding heart	N
GENTIANACEAE	*Centaurium*	*erythrae*	European centaury	I
GENTIANACEAE	*Centaurium*	*muhlenbergii*	Monterey centaury	N
GENTIANACEAE	*Cicendia*	*quadrangularis*	Oregon timwort	N
GENTIANACEAE	*Gentiana*	*sceptrum*	king gentian	N
GERANIACEAE	*Erodium*	*cicutarium*	stork's bill	I
GERANIACEAE	*Geranium*	*lucidum*	shining crane's-bill	I
GROSSULARIACEAE	*Ribes*	*divaricatum*	gooseberry	N
HALORAGACEAE	*Myriophyllum*	*aquaticum*	variable leaf milfoil	I
HALORAGACEAE	*Myriophyllum*	*spicatum*	Eurasian water milfoil	I
HALORAGACEAE	*Myriophyllum*	*verticulatum*	whorled watermilfoil	N
HYDRANGEACEAE	*Philadelphus*	*lewisii*	mock orange	N
HYDROCHARITACEAE	*Elodea*	*canadensis*	common elodea	N
HYDROPHYLLACEAE	*Nemophila*	*menziesii*	baby blue eyes	N
HYDROPHYLLACEAE	*Nemophila*	*parviflora*	small flowered nemophila	N
HYDROPHYLLACEAE	*Phacelia*	*nemoralis*	shade phacelia	N
HYPERICACEAE	*Hypericum*	*anagalloides*	bog or trailing St. John's-wort	N
HYPERICACEAE	*Hypericum*	*perforatum*	St. John's-wort	I
IRIDACEAE	*Iris*	*pseudocorus*	flag iris	I
IRIDACEAE	*Iris*	*tenax*	Oregon iris	N
IRIDACEAE	*Sisyrhinchium*	*idahoense*	Idaho blue-eyed grass	N
IRIDACEAE	*Sisyrinchium*	*californicum*	golden-eyed grass	N
JUNCACEAE	*Juncus*	*acuminatus*	tapered rush	N
JUNCACEAE	*Juncus*	*bolanderi*	Bolander's rush	N
JUNCACEAE	*Juncus*	*bufonius*	toad rush	N
JUNCACEAE	*Juncus*	*effusus*	soft rush	N
JUNCACEAE	*Juncus*	*ensifolius*	daggerleaf rush	N
JUNCACEAE	*Juncus*	*marginatus*	grass-leaf rush	N
JUNCACEAE	*Juncus*	*nevadensis*	Nevada rush	N
JUNCACEAE	*Juncus*	*oxymeris*	pointed rush	N
JUNCACEAE	*Juncus*	*patens*	spreading rush	N

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JUNCACEAE	*Juncus*	*tenuis*	slender rush	I
JUNCACEAE	*Luzula*	*multiflora*	many flowered rush	N
LAMIACEAE	*Glecoma*	*hederaceae*	creeping Charlie	I
LAMIACEAE	*Lamium*	*purpureum*	red dead nettle	N
LAMIACEAE	*Lycopus*	*americanus*	cut-leaved water horehound	N
LAMIACEAE	*Melissa*	*officinalis*	balm	I
LAMIACEAE	*Mentha*	*pulegium*	pennyroyal	I
LAMIACEAE	*Prunella*	*vulgaris*	selfheal	N
LAMIACEAE	*Satureja*	*douglasii*	yerba buena	N
LEMNACEAE	*Lemna*	*minor*	common duckweed	N
LENTIBULARIACEAE	*Utricularia*	*macrorhiza*	common bladderwort	N
LILIACEAE	*Allium*	*amplectens*	slimleaf wild onion	N
LILIACEAE	*Brodiaea*	*coronaria*	harvest brodiaea	N
LILIACEAE	*Calochortus*	*tolmei*	cat's ear	N
LILIACEAE	*Calochortus*	*uniflorus*	Monterey mariposa lily	N
LILIACEAE	*Camassia*	*lechtlinii*	tall camas	N
LILIACEAE	*Camassia*	*quamash*	common camas	N
LILIACEAE	*Dichelostemma*	*congestum*	field cluster lily	N
LILIACEAE	*Erythronium*	*oreganum*	Oregon fawn lily	N
LILIACEAE	*Lilium*	*columbianum*	Columbia lily	N
LILIACEAE	*Trillium*	*albidum*	trillium	N
LILIACEAE	*Trillium*	*ovatum*	western trillium	N
LILIACEAE	*Triteleia*	*hyacinthina*	hyacinth brodiaea	N
LILIACEAE	*Zigadenus*	*venenosus*	death camas	N
LINACEAE	*Linum*	*bienne*	narrow leaved flax	I
LYTHRACEAE	*Lythrum*	*hyssopifolium*	hyssop loosestrife	N
LYTHRACEAE	*Lythrum*	*portula*	spatulaleaf loosestrife	I
LYTHRACEAE	*Lythrum*	*salicaria*	purple loosestrife	I
MALVACEAE	*Sidalcea*	*campestris*	meadow checkermallow	N
MALVACEAE	*Sidalcea*	*cusickii*	Cusick's checkermallow	N
MALVACEAE	*Sidalcea*	*virgata*	dwarf checkermallow	N

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OLEACEAE	*Fraxinus*	*latifolia*	Oregon Ash	N
ONAGRACEAE	*Boisduvalia*	*densiflora*	dense spike primrose	N
ONAGRACEAE	*Epilobium*	*angustifolium*	fireweed	N
ONAGRACEAE	*Epilobium*	*brachycarpum*	autumn willow-herb	N
ONAGRACEAE	*Epilobium*	*cilatum*	hairy willow-herb	N
ONAGRACEAE	*Ludwigia*	*palustris*	false loose-strife	N
ONAGRACEAE	*Oenothera*	*Xerythrosepala*	red-sepal evening primrose	I
OPHIOGLOSSACEAE	*Botrychium*	*multifidum*	leathery grapefern	N
ORCHIDACEAE	*Spiranthes*	*romanzoffiana*	ladies tresses	N
OROBANCHACEAE	*Orobanche*	*californica*	California broomrape	N
PAPAVERACEAE	*Eschscholzia*	*californica*	California poppy	N
PINACEAE	*Abies*	*grandis*	grand fir	N
PINACEAE	*Pinus*	*ponderosa*	Ponderosa pine	N
PINACEAE	*Pseudotsuga*	*menziesii*	Douglas fir	N
PLANTAGINACEAE	*Plantaga*	*major*	common plantain	N
PLANTAGINACEAE	*Plantago*	*lanceolata*	English plantain	I
POACEAE	*Agrostis*	*capillaris*	colonial bentgrass	I
POACEAE	*Agrostis*	*exarata*	spike bentgrass	N
POACEAE	*Agrostis*	*stolonifera*	creeping bentgrass	I
POACEAE	*Aira*	*caryophylla*	European sliver hairgrass	I
POACEAE	*Alopecurus*	*geniculatus*	water foxtail	N
POACEAE	*Anthoxanthum*	*odoratum*	sweet vernal grass	I
POACEAE	*Aristida*	*oligantha*	prairie threeawn	N
POACEAE	*Arrhenatherum*	*elatius*	tall oatgrass	I
POACEAE	*Beckmannia*	*syzigachne*	American sloughgrass	N
POACEAE	*Brachypodium*	*sylvaticum*	tall false-brome	I
POACEAE	*Briza*	*minor*	little quaking grass	N
POACEAE	*Bromus*	*hordeaceus*	Soft chess	N
POACEAE	*Cynosurus*	*echinatus*	hedgehog tail	I
POACEAE	*Danthonia*	*californica*	California oatgrass	N
POACEAE	*Deschampsia*	*cespitosa*	tufted hairgrass	N

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POACEAE	*Echinochloa*	*crus-galli*	barnyard grass	I
POACEAE	*Elymus*	*glaucus*	blue wild rye	N
POACEAE	*Eragrostis*	*hypnoides*	creeping eragrostis	N
POACEAE	*Festuca*	*arundinacea*	tall fescue	I
POACEAE	*Festuca*	*occidentalis*	western fescue	N
POACEAE	*Festuca*	*rubra*	red fescue	I
POACEAE	*Glyceria*	*borealis*	northern mannagrass	N
POACEAE	*Glyceria*	*occidentalis*	western mannagrass	N
POACEAE	*Holcus*	*lanatus*	velvetgrass	N
POACEAE	*Hordeum*	*brachyantherum*	meadow barley	N
POACEAE	*Leersia*	*oryzoides*	rice cutgrass	N
POACEAE	*Panicum*	*acuminatum*	western witchgrass	N
POACEAE	*Panicum*	*capillare*	common witchgrass	N
POACEAE	*Panicum*	*occidentale*	western witchgrass	N
POACEAE	*Paspalum*	*distichum*	knotgrass	I
POACEAE	*Phalaris*	*arundinacea*	reed canary grass	I
POACEAE	*Phleum*	*pratense*	timothy	I
POACEAE	*Poa*	*annua*	annual bluegrass	I
POACEAE	*Poa*	*compressa*	Canada bluegrass	N
POACEAE	*Taeniatherum*	*caput-medusae*	medusa-head	I
POACEAE	*Vulpia*	*myuros*	rat-tailed fescue	I
POLEMONIACEAE	*Navarretia*	*intertexta*	needle leaved navarretia	N
POLYGONACEAE	*Persicaria*	*lapathifolia*	pale smartweed	N
POLYGONACEAE	*Polygonum*	*amphibium*	water knotweed	N
POLYGONACEAE	*Polygonum*	*arenastrum*	oval-leaf knotweed	N
POLYGONACEAE	*Polygonum*	*coccineum*	knotweed	N
POLYGONACEAE	*Polygonum*	*convulvulus*	black bindweed	I
POLYGONACEAE	*Polygonum*	*cuspidatum*	Japanese knotweed	I
POLYGONACEAE	*Polygonum*	*douglasii*	Douglas' knotweed	N
POLYGONACEAE	*Polygonum*	*hydropiperoides*	marshpepper smartweed	N
POLYGONACEAE	*Polygonum*	*lapathifolium*	curlytop knotweed	N
POLYGONACEAE	*Polygonum*	*persicaria*	heartweed	N

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POLYGONACEAE	*Rumex*	*acetosella*	sheep sorrel	I
POLYGONACEAE	*Rumex*	*conglomeratus*	clustered dock	I
POLYGONACEAE	*Rumex*	*crispus*	curly dock	I
POLYGONACEAE	*Rumex*	*maritimus*	golden dock	N
POLYGONACEAE	*Rumex*	*salicifolious*	willow dock	N
POLYPODIACEAE	*Athyrium*	*felix-femina*	lady fern	N
POLYPODIACEAE	*Polypodium*	*glycirriza*	licorice fern	N
POLYPODIACEAE	*Polystichum*	*munitum*	sword fern	N
PORTULACACEAE	*Calandrinia*	*ciliata*	fringed redmaids	I
PORTULACACEAE	*Claytonia*	*perfiolata*	perfiolate miner's lettuce	N
PORTULACACEAE	*Claytonia*	*sibirica*	candy flower	N
PORTULACACEAE	*Montia*	*fontana*	water chickweed	N
PORTULACACEAE	*Montia*	*howellii*	Howell's montia	N
POTAMOGETONACEAE	*Potamageton*	*crispus*	curly pondweed	N
POTAMOGETONACEAE	*Potamageton*	*epihydrus*	ribbon-leaf pondweed	N
POTAMOGETONACEAE	*Potamageton*	*pectinatus*	sago pondweed	N
POTAMOGETONACEAE	*Potamogeton*	*nodosus*	longleaf pondweed	N
POTAMOGETONACEAE	*Potamogeton*	*pusillus*	small pondweed	N
PRIMULACEAE	*Centunculus*	*minimus*	chaffweed	N
PRIMULACEAE	*Dodacatheon*	*pulchellum*	shooting star	N
RANUNCULACEAE	*Anemone*	*lyallii*	little mountain thimbleweed	N
RANUNCULACEAE	*Aquilegia*	*formosa*	columbine	N
RANUNCULACEAE	*Delphinium*	*menziesii*	Menzie's larkspur	N
RANUNCULACEAE	*Delphinium*	*oreganum*	Oregon larkspur	N
RANUNCULACEAE	*Delphinium*	*trollifolium*	Columbia larkspur	N
RANUNCULACEAE	*Ranunculus*	*alismifolius*	water plantain buttercup	N
RANUNCULACEAE	*Ranunculus*	*aquatilis*	white water buttercup	N
RANUNCULACEAE	*Ranunculus*	*longirostris*	longbeak buttercup	N
RANUNCULACEAE	*Ranunculus*	*occidentalis*	western buttercup	N
RANUNCULACEAE	*Ranunculus*	*orthorhynchus*	straight beaked buttercup	N
RANUNCULACEAE	*Ranunculus*	*scleratus*	celeryleaved buttercup	N

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RANUNCULACEAE	*Ranunculus*	*uncinatus*	little buttercup	N
RANUNCULACEAE	*Ranunuculus*	*flammula*	creeping buttercup	N
RANUNCULACEAE	*Thalictrum*	*occidentale*	meadow rue	N
RANUNCULACEAE	*Thalictrum*	*polycarpum*	mountain meadow rue	N
RHAMNACEAE	*Rhamnus*	*purshiana*	cascara	N
ROSACEAE	*Amelanchier*	*alnifolia*	serviceberry	N
ROSACEAE	*Cotoneaster*		cotoneaster	I
ROSACEAE	*Crataegus*	*monogyna*	English hawthorn	I
ROSACEAE	*Crataegus*	*monogyna x susdorfii*	AngloAmerican hawthorn	I
ROSACEAE	*Crataegus*	*suksdorfii*	Suksdorf's hawthorn	N
ROSACEAE	*Fragaria*	*vesca*	wild strawberry	N
ROSACEAE	*Fragaria*	*virginiana*	broadpetal strawberry	N
ROSACEAE	*Geum*	*macrophyllum*	Oregon avens	N
ROSACEAE	*Horkelia*	*congesta*	shaggy horkelia	N
ROSACEAE	*Malus*	*× domestica*	domestic apple	I
ROSACEAE	*Malus*	*fusca*	western crabapple	N
ROSACEAE	*Oemleria*	*cerasiformis*	osoberry	N
ROSACEAE	*Physocarpus*	*capitatus*	Pacific ninebark	N
ROSACEAE	*Potentilla*	*gracilis*	slender cinquefoil	N
ROSACEAE	*Prunus*	*avium*	bird cherry	I
ROSACEAE	*Pyracantha*	*coccinea*	firethorn	I
ROSACEAE	*Pyrus*	*communis*	pear	I
ROSACEAE	*Rosa*	*canina*	dog rose	I
ROSACEAE	*Rosa*	*eglanteria*	sweetbriar	I
ROSACEAE	*Rosa*	*multiflora*	multiflora rose	I
ROSACEAE	*Rosa*	*nutkana*	Nootka rose	N
ROSACEAE	*Rubus*	*bifrons*	Himalayan blackberry	I
ROSACEAE	*Rubus*	*laciniatus*	evergreen blackberry	I
ROSACEAE	*Rubus*	*parviflorus*	thimbleberry	N
ROSACEAE	*Rubus*	*ursinus*	creeping blackberry	N
ROSACEAE	*Sanguisorba*	*minor*	small burnet	I

"Family" per Hitchcock & Cronquist	*Genus*	*Species*	Common Name	Origin: N = Native I = Introduced
ROSACEAE	*Sorbus*	*aucuparia*	European mountain ash	I
ROSACEAE	*Spiraea*	*douglasii*	spiraea, hard hack	N
RUBIACEAE	*Galium*	*aparine*	catchweed	I
RUBIACEAE	*Galium*	*parisiense*	wall bedstraw	I
RUBIACEAE	*Galium*	*trifidum*	small bedstraw	N
RUBIACEAE	*Sherardia*	*arvensis*	blue fieldmadder	I
SALICACEAE	*Populus*	*alba*	white poplar	I
SALICACEAE	*Populus*	*trichocarpa*	cottonwood	N
SALICACEAE	*Salix*	*fluviatilis*	Columbia river willow	N
SALICACEAE	*Salix*	*geyeriana*	Geyer's willow	N
SALICACEAE	*Salix*	*lucida*	Pacific Willow	N
SALICACEAE	*Salix*	*piperi*	Piper's willow	N
SALICACEAE	*Salix*	*rigida*	heart-leaved willow	N
SALICACEAE	*Salix*	*scouleriana*	Scouler's willow	N
SALICACEAE	*Salix*	*sessifolia*	northwest willow	N
SALICACEAE	*Salix*	*sitchensis*	Sitka willow	N
SALVINIACEAE	*Salvinia*	*rotundiflora*	common salvinia	unlikely
SANTALACEAE	*Comandra*	*umbellatum*	bastard toadflax	N
SAXIFRAGACEAE	*Lithophragma*	*parviflorum*	small flowered woodland star	N
SAXIFRAGACEAE	*Micranthes*	*oregana*	Oregon saxifrage	N
SAXIFRAGACEAE	*Tellima*	*grandiflora*	fringecup	N
SCROPHULARIACEAE	*Castilleja*	*tenuis*	hairy owl-clover	N
SCROPHULARIACEAE	*Collinsia*	*grandiflora*	giant blue-eyed Mary	N
SCROPHULARIACEAE	*Gratiola*	*ebracteata*	bractless hedge-hyssop	N
SCROPHULARIACEAE	*Limosella*	*aquatica*	water mudwort	N
SCROPHULARIACEAE	*Linaria*	*vulgaris*	yellow toadflax	I
SCROPHULARIACEAE	*Lindernia*	*dubia*	false pimpernel	I
SCROPHULARIACEAE	*Mimulus*	*guttatus*	monkey flower	N
SCROPHULARIACEAE	*Mimulus*	*moschatus*	muskflower	N
SCROPHULARIACEAE	*Orthocarpus*	*bracteosus*	rosy owl-clover	N
SCROPHULARIACEAE	*Parentucellia*	*viscosa*	yellow parentucellia	I

"Family" per Hitchcock & Cronquist	*Genus*	*Species*	Common Name	Origin: N = Native I = Introduced
SCROPHULARIACEAE	*Triphysaria*	*pusilla*	dwarf owl clover	N
SCROPHULARIACEAE	*Veronica*	*americana*	American speedwell	N
SCROPHULARIACEAE	*Veronica*	*peregrina*	purslane speedwell	N
SCROPHULARIACEAE	*Veronica*	*scutellata*	marsh speedwell	N
SCROPHULARIACEAE	*Veronica*	*serpyllifolia*	speedwell	N
SOLANACEAE	*Solanum*	*dulcamara*	climbing nightshade	I
SPARGANIACEAE	*Sparganium*	*angustifolium*	narrowleaf burreed	I
SPARGANIACEAE	*Sparganium*	*emersum*	bur reed	N
TAXACEAE	*Calocedrus*	*decurrens*	incense-cedar	N
TAXACEAE	*Taxus*	*brevifolia*	Pacific yew	N
TAXACEAE	*Thuja*	*plicata*	western red-cedar	N
TYPHACEAE	*Typha*	*angustifolia*	narrow-leaf cattail	I
TYPHACEAE	*Typha*	*latifolia*	cattail	N
URTICACEAE	*Urtica*	*dioica*	stinging nettle	N
VIOLACEAE	*Viola*	*adunca*	western blue violet	N
VIOLACEAE	*Viola*	*glabella*	stream violet	N
VIOLACEAE	*Viola*	*odorata*	evil violet	I

Appendix B. Wildlife Species Known to Occur on the Fern Ridge Wildlife Area.

Birds

Key to monthly abundance

H = Common to abundant
M = Uncommon to common
L = Rare to uncommon
O = Occasional, not found every year
I = individual records of short duration
I* = Individual records of long duration
* = Indicates species known to breed on the Fern Ridge Wildlife Area
(*) = Indicates species suspected of breeding on the Fern Ridge Wildlife Area

	MONTH											
Birds	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Red-throated loon	O	O								O	O	
Pacific loon												I
Common loon	O	O	O	O	O		I			O	O	O
Yellow-billed loon	I											I
Pied-billed grebe*	H	H	H	H	H	H	H	H	H	H	H	H
Clark's grebe*	M	M	O	O	O	O	O	O	O	O	O	M
Horned grebe	L	L	L	L						L	L	L
Red-necked grebe	I	I									I	
Eared grebe				O	O					O	O	
Western grebe	H	H	H	H	L	O	O	O	L	H	H	H
Fork-tailed storm petrel											I	
Leach's storm-petrel											I	
American white pelican					I				I	I	I	I
Brown pelican	I											I
Double-crested cormorant	H	H	M	L	L	L	L	L	L	M	H	H
American bittern*	H	H	H	H	H	H	H	H	H	H	H	H
Least bittern						I						
Great blue heron (*)	H	H	M	M	M	M	M	M	M	H	H	H
Snowy egret								I	I			
Cattle egret				I			I					
Great egret	M	M	L	O	O	O	O	L	M	M	H	M
Green heron (*)	O	O	O	O	L	L	L	L	L	L	O	O
Black-crowned night-heron						I		I		I		
White-faced ibis				O	O	O	I	I	I		I	
Trumpeter swan		I	I		I						I	
Tundra swan	M	M	L							L	M	M
Greater white-fronted goose	O	O	O	M	L			L	M	M	L	O
Emperor goose		I										
Snow goose		I		I					I	I	I	I
Ross's goose	I	I	I	I	I						I	I
Canada goose*	M	M	H	H	M	L	L	L	L	M	M	M
Cackling goose	H	H	H	M					M	M	O	O
Brant	O	O	O							O	O	O
Wood duck*	L	L	M	H	H	H	H	H	H	M	L	L

Birds	J	F	M	A	M	J	J	A	S	O	N	D
Green-winged teal	H	H	H	H	M	L	L	L	M	H	H	H
Mallard*	H	H	H	H	M	M	M	M	M	H	H	H
Northern pintail	H	H	H	M	L	L	L	L	M	H	H	H
Baikal teal												I
Blue-winged teal (*)				O	M	L	L	L	O	O	O	O
Cinnamon teal*	O	O	M	H	H	M	L	L	M	L	L	O
Northern shoveler (*)	H	H	H	H	M		L	L	M	H	H	H
Gadwall*	M	M	M	M	L	L	L	L	L	M	M	M
Falcated duck		I	I									
Eurasian wigeon	O	O	O	O	O				O	O	O	O
American wigeon	H	H	H	M	L	O	O	O	L	H	H	H
Canvasback	L	L	L	L	L	O	O	O			L	L
Redhead*	O	O	O	M	H	H	H	M	L	O	O	O
Ring-necked duck	M	M	M	L	L	L	O			L	M	M
Tufted duck				I								
Greater scaup	L	L	L	L						O		
Lesser scaup	M	M	M	L	O	O	O	O	O	L	M	M
Long-tailed duck												I
Surf scoter												I
White-winged scoter											I	
Common goldeneye	O	O	O	I							O	O
Barrow's goldeneye	I											
Bufflehead	M	M	M	L	L	O	O	O	O	L	M	M
Hooded merganser*	L	L	M	M	M	M	M	M	L	L	L	L
Common merganser	M	M	L	L	L	L	L	L	L	L	M	M
Red-breasted merganser	O	O	O	I						O	O	O
Ruddy duck*	M	M	M	M	M	M	L	L	L	L	M	M
Turkey vulture		L	H	H	H	H	H	H	H	M	L	O
Osprey*			L	M	M	M	M	M	M	L		
White-tailed kite	M	L	L	O		I		O	O	L	M	M
Bald eagle*	L	L	L	L	L	L	L	L	L	L	L	L
Northern harrier*	H	H	H	H	H	M	M	M	H	H	H	H
Sharp-shinned hawk (*)	M	M	M	M	L	L	L	L	L	M	M	M
Cooper's hawk (*)	L	L	L	L	L	O	O	O	O	L	L	L
Northern goshawk	O	O	O	O						O	O	O
Red-shouldered hawk	L	L	L				O	O	O	O	L	L
Swainson's hawk				I								
Red-tailed hawk*	H	H	H	M	M	M	M	M	H	H	H	H
Rough-legged hawk	L	L	L							L	L	L
Golden eagle	O	O	O		I							O
American kestrel*	H	H	H	M	L	L	L	L	M	H	H	H
Merlin	L	L	L	L						L	L	L
Peregrine falcon	O	O	O	O						O	O	O
Gyrfalcon	O											O
Prairie falcon	O	O	O							O	O	O
Ring-necked pheasant*	M	M	M	M	M	M	M	M	M	M	M	M
Ruffed grouse (*)	L	L	L	L	L	L	L	L	L	L	L	L
Wild turkey	L	L	L	L	L	L	L	L	L	L	L	L

Birds	J	F	M	A	M	J	J	A	S	O	N	D
California quail*	M	M	M	M	M	M	M	M	M	M	M	M
Mountain quail (*)	L	L	L	L	L	L	L	L	L	L	L	L
Virginia rail*	M	M	M	H	H	H	H	H	H	M	M	M
Sora*				M	M	M	M	M	M	M		
American coot*	H	H	H	M	M	M	M	M	M	H	H	H
Sandhill crane		O	O	O						O	O	I
Black-bellied plover	L	O	O	O	O				L	M	L	L
American golden –plover							I	I	I	I		
Pacific golden-plover	I					I	I	O	O	O		
Snowy plover				L	L			L	L	L		
Semipalmated plover												
Killdeer*	H	H	H	M	M	M	M	M	M	H	H	H
Black-necked stilt				O								
American avocet				I						I		
Greater yellowlegs	L	L	M	H	M	O	O	L	M	M	M	L
Lesser yellowlegs				O	O			L	L			
Willet					I			I				
Solitary sandpiper				O	O			O	O			
Spotted sandpiper (*)	O	O	O	O	M	L	O	L	M	L	O	O
Whimbrel					I	I		I	I			
Long-billed curlew				I		I			I*			
Marbled godwit											I	
Red knot									I	I		
Sanderling				I	I			O	O		I	
Semipalmated sandpiper								I	I			
Western sandpiper	O	O	O	M	L		L	M	M	M	O	O
Wood sandpiper										I	I	
Least sandpiper	M	M	M	M	L		L	M	M	M	M	M
Baird's sandpiper								L	L			
Pectoral sandpiper								O	O	L		
Sharp-tailed sandpiper										I		
Dunlin	H	H	H	H	L				L	M	H	H
Stilt sandpiper									I			
Buff-breasted sandpiper								I	I			
Ruff								I	I	I	I	
Short-billed dowitcher					I			L	L			
Long-billed dowitcher	M	M	M	M	O		L	M	M	M	M	M
Wilson's snipe*	H	H	H	H	H	M	L	L	M	H	H	H
Wilson's phalarope					O	O						
Red-necked phalarope				O	O			O	O	O		
Red phalarope										O	O	
Pomarine jaeger											I	
Parasitic jaeger									I*	I	I	
Long-tailed jaeger									I*	I	I	
Franklin's gull							O	O	O	O	O	
Bonaparte's gull		I			O	O	I		I	M	H	O
Heermann's gull										I	I	
Mew gull	M	M	L							L	M	M

Birds	J	F	M	A	M	J	J	A	S	O	N	D
Ring-billed gull	H	H	H	M	L	L	M	M	M	M	M	M
California gull	M	M	M	M	L	L	M	M	M	H	H	M
Herring gull	M	M	L							M	M	M
Thayer's gull	L	L	L							L	L	L
Lesser black-backed gull			I									
Western gull	O	O									O	O
Glaucous-winged gull	M	M	L	O	O	O	O	O	O	M	M	M
Glaucous gull												I
Black-legged kittiwake										I	I	I
Sabine's gull									I	I	I	
Caspian tern					L	L	L	L	L			
Common tern									O	O	I	
Forster's tern					O	O	O	O	O			
Black tern					O	O						
Rock pigeon*	M	M	M	M	M	M	M	M	M	M	M	M
Band-tailed pigeon*	O	O	O	M	M	M	M	M	M	L	O	O
Mourning dove*	M	M	H	H	H	H	H	H	H	H	M	M
Eurasian collared dove (*)	M	M	M	H	H	H	H	H	H	M	M	M
Common barn-owl*	H	H	H	M	M	M	M	M	M	H	H	H
Western screech-owl*	H	H	H	H	H	H	H	H	H	H	H	H
Great horned owl*	H	H	H	H	H	H	H	H	H	H	H	H
Snowy owl												I
Northern pygmy-owl	O	O	O							O	O	O
Burrowing owl			I									I
Long-eared owl	O	O	O							O	O	O
Short-eared owl*	L	L	L	O	O	O	O	O	O	L	L	L
Northern saw-whet owl*	H	H	H	L	L	L	L	L	L	H	H	H
Common nighthawk (*)					O	O	O	O	O			
Black swift					O				I			
Vaux's swift (*)				L	H	L	L	L	H	M		
Anna's hummingbird (*)	L	L	L	L	L	L	L	L	L	L	L	L
Costa's hummingbird					I							
Rufous hummingbird *		O	L	H	H	M	M	M	L			
Belted kingfisher*	M	M	M	M	M	M	M	M	M	M	M	M
Lewis' woodpecker	O	O	O	O	O				O	O	O	O
Acorn woodpecker*	M	M	M	M	M	M	M	M	M	M	M	M
Yellow-bellied sapsucker	I										I	
Red-breasted sapsucker*	M	M	M	M	L	L	L	L	L	M	M	M
Downy woodpecker*	H	H	H	H	H	H	H	H	H	H	H	H
Hariy woodpecker*	L	L	L	L	L	L	L	L	L	L	L	L
Northern flicker*	H	H	H	H	L	L	L	L	H	H	H	H
Pileated woodpecker*	L	L	L	L	L	L	L	L	L	L	L	L
Olive-sided flycatcher*				L	M	M	M	M	L			
Western wood-pewee*				L	M	H	H	M	L			
Willow flycatcher*				L	M	H	H	M	L			
Hammond's flycatcher				M	H	O	O	O	O			
Dusky flycatcher				I	I							
Ash-throated flycatcher					I				I			
Pacific-slope flycatcher				M	H	H	H	M	L			

Birds	J	F	M	A	M	J	J	A	S	O	N	D
Black phoebe*	O	O	O	O	O	O	O	O	O	O	O	O
Say's phoebe			O	O						I		I
Western kingbird*				L	M	L	L	L	L			
Eastern kingbird						O						
Horned lark (*)	O	O	O	O	O	O	O	O	O	O	O	O
Purple martin*				L	M	M	M	M	L			
Tree swallow*	L	M	H	H	H	H	H	H	M	L	L	L
Violet-green swallow*		O	M	H	H	H	H	H	M	L		
Northern rough-winged swallow*				L	M	M	L	L	L	L		
Bank swallow									I			
Cliff swallow*			L	M	H	H	H	M	L	O		
Barn swallow*			L	M	H	H	H	H	H	M		
Steller's jay*	M	M	M	L	L	L	L	L	L	M	M	M
Blue jay	I*	I*										
Scrub jay*	H	H	H	H	H	H	H	H	H	H	H	H
American crow*	H	H	H	H	H	H	H	H	H	H	H	H
Common raven	M	M	M	M	L	L	L	L	M	M	M	M
Black-capped chickadee*	H	H	H	H	H	H	H	H	H	H	H	H
Mountain chickadee	I											
Chestnut-backed chickadee*	M	M	M	M	M	M	M	M	M	M	M	M
Bushtit*	M	M	M	M	M	M	M	M	M	M	M	M
Red-breasted nuthatch*	M	M	M	M	M	M	M	M	M	M	M	M
White-breasted nuthatch*	M	M	M	M	M	M	M	M	M	M	M	M
Brown creeper*	M	M	M	M	M	M	M	M	M	M	M	M
Rock wren				I								
Bewick's wren	H	H	H	H	H	H	H	H	H	H	H	H
House wren*				M	H	H	H	H	M			
Winter wren*	H	H	H	H	M	L	L	L	M	H	H	H
Marsh wren*	H	H	H	H	H	H	H	H	H	H	H	H
Golden-crowned kinglet*	H	H	H	H	M	M	M	M	M	H	H	H
Ruby-crowned kinglet	H	H	H	H	M				M	H	H	H
Western bluebird	O	O	O							O	O	O
Mountain bluebird				I								
Townsend's solitaire			O	O	O					O	O	O
Swainson's thrush*				L	H	H	H	H	H	L		
Hermit thrush	M	M	M	L	L					L	M	M
American robin*	H	H	H	H	H	H	H	H	H	H	H	H
Varied thrush	H	H	H	H					H	H	H	H
Wrentit*	M	M	M	M	M	M	M	M	M	M	M	M
Northern mockingbird	I				I							I
Sage thrasher				I		I						
American pipit	M	M	M	H	L	O			M	H	H	M
Cedar waxwing*	I	I	I	I	H	H	H	H	H	M	I	I
Northern shrike	L	L	L		I					L	L	L
Loggerhead shrike		I	I									I
European starling*	H	H	H	H	H	H	H	H	H	H	H	H
Cassin's vireo*				L	H	M	M	M	M			
Hutton's vireo*	M	M	M	M	M	M	M	M	M	M	M	M

Birds	J	F	M	A	M	J	J	A	S	O	N	D
Warbling vireo*				L	M	M	M	M	M			
Red-eyed vireo*						L	L					
Tennessee warbler									I			
Orange-crowned warbler*	O	O	O	H	H	H	H	H	M	L	O	O
Nashville warbler*				M	M	L	L	L	L			
Yellow warbler*				L	H	H	H	H	H	L		
Yellow-rumped warbler	M	M	M	H	M	O	O	O	M	H	M	M
Black-throated gray warbler*				M	H	H	H	H	M	L		
Townsend's warbler	L	L	L	M	M				L	L	L	L
Hermit warbler				O	O		I					
Palm warbler				I						I	I	I
Blackpoll warbler									I			
Northern waterthrush										I		
MacGillivray's warbler*				M	M	M	M	M	M			
Common yellowthroat	O		L	H	H	H	H	H	H	M	L	O
Wilson's warbler*				M	H	M	M	H	H	L		
Yellow-breasted chat*					L	M	M	M	L			
Western tanager*				L	H	M	M	M	M	L		
Black-headed grosbeak*				L	H	H	H	H	L			
Lazuli bunting				L	M	M	M	M	L			
Spotted towhee*	H	H	H	H	H	H	H	H	H	H	H	H
American tree sparrow	I*	I*	I*								I*	I*
Chipping sparrow*	O	O	L	M	M	M	M	M	M	M	O	O
Clay-colored sparrow	I											
Brewer's sparrow					I		I*	I*	I*			
Vesper sparrow*				M	M	M	M	M	M	L	O	
Lark sparrow				I			I	I				
Black-throated sparrow				I								
Sage sparrow				I								
Lark bunting				I								
Savannah sparrow*	L	L	L	H	H	H	H	H	H	H	M	L
Grasshopper sparrow*						O	O	O				
Fox sparrow	H	H	M	L					L	M	H	H
Song sparrow*	H	H	H	H	H	H	H	H	H	H	H	H
Lincoln's sparrow	M	M	M	L	O				L	M	M	M
Swamp sparrow	O	O	O	O						O	O	O
White-throated sparrow	O	O	O	O	O					O	O	O
Golden-crowned sparrow	H	H	H	M	L				L	H	H	H
White-crowned sparrow*	H	H	H	H	H	M	M	M	M	H	H	H
Harris's sparrow	O	O	O	O	O						O	O
Dark-eyed junco*	H	H	H	H	M	M	M	M	M	H	H	H
Lapland longspur												I
Chestnut-collared longspur				I								
Snow bunting											I	
Bobolink					I				I			
Red-winged blackbird*	H	H	H	H	H	H	H	H	H	H	H	H
Tri-colored blackbird	I			I			I	I				

Birds	J	F	M	A	M	J	J	A	S	O	N	D
Western meadowlark*	M	M	M	M	M	M	M	M	M	M	M	M
Yellow-headed blackbird*				L	H	H	H	H	L			
Brewer's blackbird*	H	H	H	H	H	H	H	H	H	H	H	H
Great-tailed grackle						I	I					
Brown-headed cowbird*	L	L	L	M	H	H	H	H	M	L	L	L
Bullock's oriole*				L	M	M	L	L	L			
Baltimore oriole					I	I						
Purple finch*	H	H	H	H	H	H	H	H	H	H	H	H
Cassin's finch	I											
House finch*	H	H	H	H	H	H	H	H	H	H	H	H
Red crossbill	O	O	O	O	O	O	O	O	O	O	O	O
Pine siskin*	M	M	M	H	H	M	M	M	M	M	M	M
Lesser goldfinch*	L	L	L	M	M	M	M	M	M	L	L	L
American goldfinch*	M	M	M	H	H	H	H	H	H	M	M	M
Evening grosbeak	O	O	O	H	H				O	O	O	O
House sparrow	M	M	M	M	M	M	M	M	M	M	M	M

Mammals

Pacific water shrew	*Sorex bendirii*	Camas pocket gopher	*Thomomys bulbivorus*
Vagrant shrew	*Sorex vagrans*	American beaver	*Castor canadensis*
Pacific shrew	*Sorex pacificus*	Dusky-footed woodrat	*Neotoma fuscipes*
Trowbridge's shrew	*Sorex trowbridgii*	Bushy-tailed woodrat	*Neotoma cinerea*
Shrew mole	*Neurotrichus gibbsii*	Gray-tailed vole	*Microtus canicaudus*
Townsend's mole	*Scapanus townsendii*	Townsend's vole	*Microtus townsendii*
Little Brown myotis	*Myotis lucifugus*	Creeping vole	*Microtus oregoni*
Yuma myotis	*Myotis yumanensis*	Muskrat	*Ondatra zibethicus*
Long-eared myotis	*Myotis evotis*	Porcupine	*Erethizon dorsatum*
Fringed myotis	*Myotis thysanodes*	Nutria	*Myocastor coypus*
Long Legged myotis	*Myotis volans*	Coyote	*Canis latrans*
California myotis	*Myotis californicus*	Red fox	*Vulpes vulpes*
Big brown bat	*Eptesicus fuscus*	Gray fox	*Urocyon cinereoargenteus*
Townsend's big-eared bat	*Plecotus townsendii*	Raccoon	*Procyon lotor*
Pallid bat	*Antrozous pallidus*	Virginia opossum	*Didelphis virginiana*
Brush rabbit	*Sylvilagus bachmani*	Long-tailed weasel	*Mustela frenata*
Black-tailed jack rabbit	*Lepus californicus*	Mink	*Neovison vison*
Townsend's chipmunk	*Tamias townsendii*	Ermine	*Mustela erminea*
California ground squirrel	*Spermophilus beecheyi*	Western spotted skunk	*Spilogale gracilis*
Fox squirrel	*Sciurus niger*	Striped skunk	*Mephitis mephitis*
Western gray squirrel	*Sciurus griseus*	River otter	*Lontra canadensis*
Deer mouse	*Peromyscus maniculatus*	Roosevelt elk	*Cervus canadensis roosevelti*
House mouse	*Mus Musculus*	Black-tailed deer	*Odocoileus hemionus*
Pacific jumping mouse	*Zapus trinotatus*	Bobcat	*Lynx rufus*
Douglas' squirrel	*Tamiasciurus douglasii*	Cougar	*Puma concolor*
Feral cat	*Felis catus*	American black bear	*Ursus americanus*

Amphibians and Reptiles

Northwestern salamander	*Ambystoma gracile*	Northern alligator lizard	*Elgaria coerulea*
Ensatina	*Ensatina eschscholtzi*	Southern alligator lizard	*Elgaria multicarinata*
Dunn's salamander	*Plethodon dunni*	Western fence lizard	*Sceloporus occidentalis*
West. redback salamander	*Plethodon vehiculum*	Western skink	*Plestiodon skiltonianus*
Rough-skinned newt	*Taricha granulosa*	Rubber boa	*Charina bottae*
Western toad	*Bufo boreas*	Racer	*Coluber constrictor*
Pacific chorus frog	*Pseudacris regilla*	Ring-necked snake	*Diadophis punctatus*
Red-legged frog	*Rana aurora*	Gopher snake	*Pituophis catenifer*
Bullfrog	*Lithobates catesbeianus*	W. terrestrial garter Snake	*Thamnophis elegans*
Western pond turtle	*Actinemys marmorata*	Northwestern garter snake	*Thamnophis ordinoides*
Red-eared slider	*Trachemys scripta elegans*	Common garter snake	*Thamnophis sirtalis*
Sharptail snake	*Contia tenuis*		

Fish

Cutthroat trout	*Oncorhynchus clarkii*	Common carp	*Cyprinus carpio*
Black crappie	*Pomoxis nigromaculatus*	Dace	*Rhinichthys* spp.
White crappie	*Pomoxis annularis*	Largescale Sucker	*Catostomus macrocheilus*
Bluegill	*Lepomis macrochirus*	Mosquitofish	*Gambusia affinis*
Largemouth bass	*Micropterus salmoides*	Redside shiner	*Richardsonius balteatus*
Warmouth bass	*Lepomis gulosus*	Sculpin	*Cottus* spp.
Pumpkinseed	*Lepomis gibbosus*	Northern Pikeminnow	*Ptychocheilus oregonensis*
Brown bullhead	*Ameiurus nebulosus*	Goldfish	*Carassius auratus*
Yellow bullhead	*Ameiurus natalis*		

Appendix C. Legal Obligations Influencing Management of the Fern Ridge Wildlife Area

Federal Laws

Federal Aid in Wildlife Restoration Act Pittman-Robertson Act of 1937
The Endangered Species Act of 1973, as amended National Historic Preservation Act
National Environmental Policy Act Americans with Disabilities Act

Army Corps of Engineers Regulation and Authorization
As the underlying landowner, the U.S. Army Corps of Engineers has adopted rules and regulations (CFR Title 36) that apply to all Fern Ridge project land and water areas. Federal Title 36 regulations for Parks, Forests, and Public Property apply as guidance to public use programs and developments of Corps water resource projects.

All activities undertaken by the Department on the Fern Ridge Wildlife Area must be compatible with the overall objectives listed in the Army Corps of Engineers' Master Plan and Title 36 regulations. The Master Plan provides many of the planning sideboards and constraints for goals, objectives, and implementation strategies listed in this plan. A new master planning effort began with partner scoping during the winter of 2019–2020 with a new plan expected in 2022.

Below are the sixteen lake-wide objectives from the USACE Master Plan:

1. Continue to safely and efficiently operate and maintain Fern Ridge Lake to provide the levels of flood control and downstream flow regulation for irrigation and navigation authorized by Congress.

2. Manage Fern Ridge Lake and develop and maintain access and support facilities to help fill existing and future needs for a diversity of boating and related water-dependent activities including power-boating, water skiing, sail-boating, sail- boarding, and boat fishing.

3. Develop and maintain project lands and facilities to help meet current and projected study area needs for day-use recreation activities including picnicking, swimming, fishing, sightseeing, hunting, and other activities.

4. Designate trail corridors and develop trails and support facilities to help meet future study area desires for walking and bicycling opportunities.

5. Provide opportunities and support facilities for low density dispersed recreation activities including hunting, fishing, birdwatching, canoeing, and other activities.

6. Maintain and manage Fern Ridge Lake's scenic resources in support of state and county open space and visual resource management goals.

7. Maintain standards of water quality that protect water-contact recreation and warmwater fisheries.

8. Maintain and protect populations of candidate threatened or endangered plant species and establish Research Natural Areas to maintain viable unique valley prairie communities.

9. Maintain and manage supporting populations of unique, threatened, and/or endangered fish and wildlife species.

10. Manage Fern Ridge Lake habitat to maintain and sustain a population of waterfowl at a level of 2.25 million waterfowl use days.

11. Maintain and manage Fern Ridge Lake habitat to support black-tailed deer.

12. Maintain and manage wildlife habitat to ensure retention of species richness and diversity.

13. Maintain and manage habitat to promote self-sustaining populations of upland game birds including ring-necked pheasants, California quail, and mourning dove.

14. Maintain and manage fisheries habitat to support identified target species.

15. Protect and interpret cultural resources sites and materials.

16. Develop a lake-wide interpretive program to promote public understanding of Fern Ridge Lake's natural environment and its relationship to USACE role in development of Willamette Basin water resources.

Hunting Guidelines for U.S. Army Corps of Engineers Lands in the Willamette Valley Project (10/27/08)

All rules and regulations for the public use of USACE lands are described in Title 36, Chapter III, Part 327. The following document provides more detailed information specific to hunting on Willamette Valley Project lands. Hunters should be aware that some of the lands surrounding USACE reservoirs are managed by other County, State, and Federal agencies and different guidelines may apply. Hunters are responsible for recognizing private land boundaries and should not hunt on private land without permission of the landowner. Questions about these guidelines should be directed to the Willamette Valley Project Park Ranger Office at 541-942-5631.

Detailed maps showing USACE boundaries and hunting restrictions at Cottage Grove, Dorena, Dexter, Lookout Point, Fall Creek, Hills Creek, Foster, and Green Peter Reservoirs can be downloaded from the Willamette Valley Project website at: https://www.nwp.usace.army.mil/op/V/home.asp . Information about hunting at Cougar, Blue River, and Detroit Reservoirs should be obtained from local U.S. Forest

Service offices. Specific guidelines and maps for Fern Ridge Wildlife Area can be accessed at:
http://www.dfw.state.or.us/resources/visitors/fern_ridge_wildlife_area/hunting.asp .

The following guidelines apply to all USACE-managed lands within the Willamette Valley Project:

1. All Oregon State hunting regulations should be followed.

2. Hunting is not permitted in developed recreation areas including but not limited to campgrounds, picnic areas, boat launch facilities, and parking lots, even when these recreation areas are closed for the season. The boundaries of these recreation areas can usually be identified by defined mow lines. Hunting in the lakebed near recreation areas is permitted below the high water mark. Shot may not fall into developed recreation areas.

3. Firearms are not permitted within 400 ft. of concrete dam structures or powerhouses.

4. Only shotguns and bow-hunting are permitted. Only federally-approved non-toxic shot may be used, except for deer hunters using slugs or buckshot.

5. Trapping is permitted by special permit only at the following reservoirs: Cottage Grove, Dorena, Fern Ridge, Dexter, Lookout Point, Fall Creek, Hills Creek, Foster, and Green Peter. For trapping permits, contact the USACE Fern Ridge office- 541-688-8147.

6. Target and clay pigeon shooting and “plinking” is prohibited. Air guns, bb guns, and paintball guns are not permitted.

7. Off-road use of motor vehicles is prohibited beyond established roads and barriers.

8. Camping is permitted only in designated areas. Open fires are prohibited except in campground fire rings.

9. All garbage generated during hunting activities (including shotgun shells) should be removed from USACE lands.

Oregon Revised Statutes

ORS 496.012 Oregon’s Wildlife Policy
ORS 496.138 General Duties and Powers; Rulemaking Authority ORS 496.146 Additional Powers of the Commission
ORS 496.162 Establishing seasons, amounts and manner of taking wildlife; rules ORS 496.992 Penalties

Oregon Administrative Rules

Division 008 - Department of Fish and Wildlife Lands
635-008-0015 Agreements to Restrict Motor-propelled Vehicles 635-008-0040 Forage Removal from State Lands
635-008-0050 Fish and Wildlife Commission to Post and Enforce Rules 635-008-0095 Fern Ridge Wildlife Area

Division 011 - Statewide Angling Regulations
635-011-0050 Procedure of Promulgation of Angling Regulations 635-011-0100 General Rule

Division 051 - General Game Bird Regulations 635-051-0000 Purpose and General Information 635-051-0065 State Wildlife Area Regulations

Division 065 - Game Mammal General Seasons and Regulations
635-065-0001 Purpose and General Information
635-065-0625 Regulations on State Wildlife Areas, Refuges and Special Areas

Management and Species Plans

- The North American Waterfowl Management Plan
- Pacific Flyway Council Management Plans:
    - Cackling Canada Goose
    - Pacific Population of Western Canada Geese
    - Pacific Coast Population of Trumpeter Swans
    - Western Population of Tundra Swans
    - Pacific Population of White-fronted Geese
    - Dusky Canada Goose
    - Northwest Oregon/Southwest Washington Canada Goose Agricultural Depredation Control
    - Western Management Unit of Mourning Doves
- The Oregon Conservation Strategy
- Oregon Department of Fish and Wildlife, Wildlife Management Plan for Migratory Game Birds

Appendix D: Description of Management Units

The USACE's Fern Ridge Project is divided into 19 separate management units, including 18 land units and one unit covering the lake area itself. The boundaries of these units are based on physical, administrative and operational characteristics.

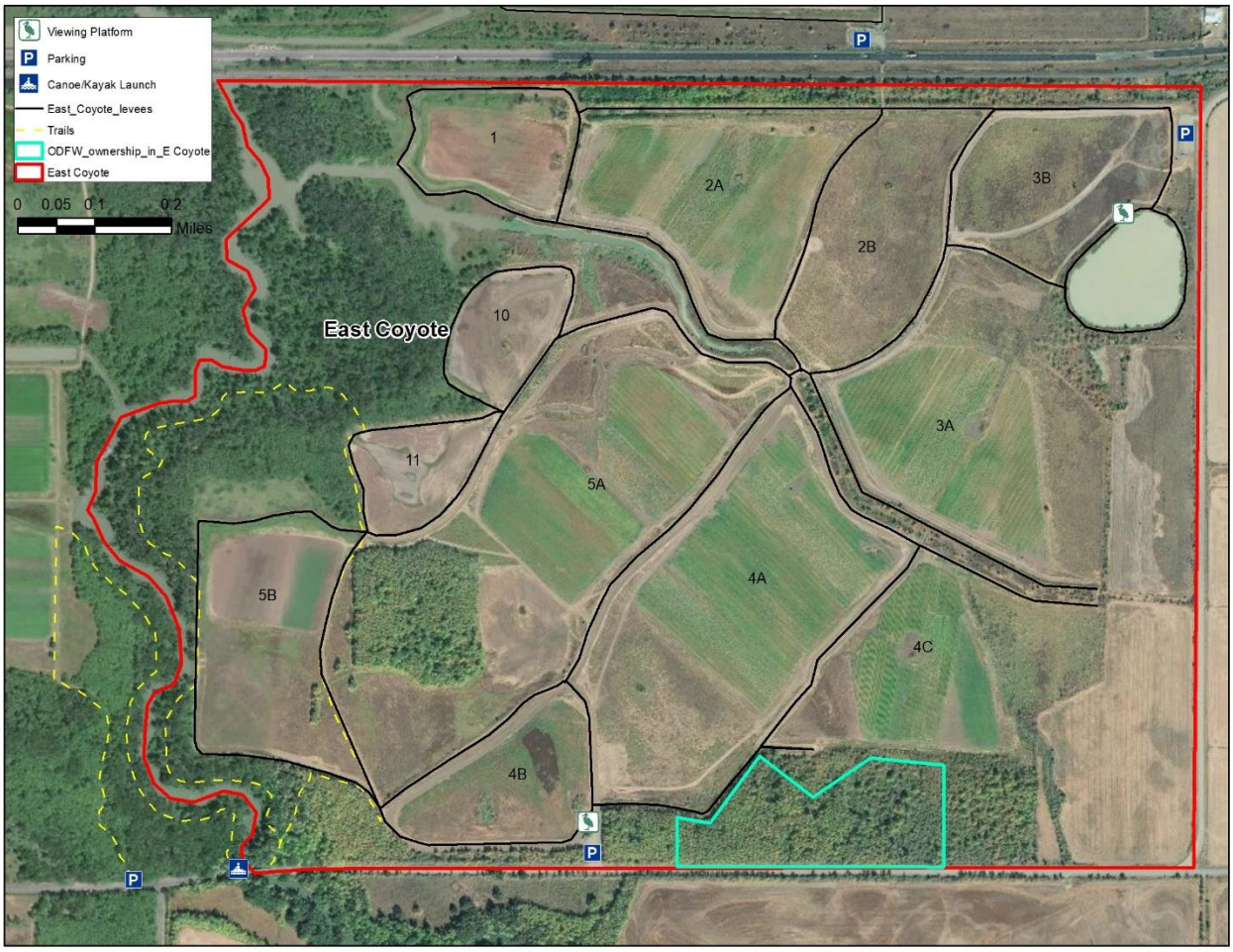
Within this larger project area, the Department license includes all or part of nine management units around the lake, and 2 units owned by the Department, listed below:

Unit Name	Acres
East Coyote	424
West Coyote	454
Fisher Butte	1,100
Royal Amazon	922
Amazon Dike #2 – USACE	489
Amazon Dike #2 – Department / GSA	37
South Marsh	343
Applegate	841
Jean's Peninsula	57
Kirk Park unit	156
South Coyote – Department owned	309
Northeast Coyote – Department owned	190
Lake area (Amazon Dike #2 and Royal Amazon unit interface)	509
Fern Ridge Wildlife Area total	**5,831**

East Coyote Unit

The East Coyote Unit encompasses approximately 390 acres and is located at the southeast corner of Fern Ridge Lake. Highway 126 forms the north boundary. Direct access is provided via parking lots on the east off Nielson Road and on the south off Cantrell Road. A nature trail head is located on the SW corner of the unit adjacent to Coyote Creek. The unit consists of low and flat floodplains and stream-cut terraces along Coyote Creek, which creates its western boundary. This unit is one of three intensively managed units on the wildlife area. In 1979 a series of diked impoundments were constructed with associated water control structures, pumps, and pipelines that would allow for flooding and irrigation.

The majority of the East Coyote Unit is under a moist soil management regime. When the wildlife area management program was intensified in 1980, approximately 400 acres of wildlife food crops were planted, with a significant portion planted in the East Coyote Unit. Cropland acres were converted to moist soil management in recent years



with less than 100 acres of wildlife foodcrops planted each year in all units combined. Crop locations are selected annually on a rotational basis, consisting of sudangrass (*Sorghum bicolor*), millet (*Panicum miliaceum*), corn (*Zea mays* ssp.), sunflowers (*Helianthus annus*), poco barley (*Hordeum* spp.), buckwheat (*Fagopyrum esulentum*) and/or wild rice (*Zizania aquatica*). All field preparation, planting, irrigation, and tending is done by Department staff and all harvest is done by wildlife, with no sharecrop or commercial farming. Irrigation is required to produce a successful corn crop in this soil type and climate. “Big-gun” high pressure irrigation machines are used during the summer to irrigate crops as dictated by weather conditions and rainfall. Sudangrass and millet fields are planted as separate stands or as a 50/50 seed mix. Wild rice is managed on a several-year rotation basis relying on water management, natural seed production and self-regeneration.

The East Coyote Unit is located in the very aggressive Coyote Creek floodplain. Each winter, one to seven high water events can be expected during which the entire unit is flooded to dike top level or higher. During these brief flood periods, adjacent county roads are under water for approximately three miles as well as flooding of several hundred acres of adjacent private farmland. The flood events are generally triggered by periods of sustained rainfall and take from three days to three weeks for water levels to

moderate to normal. The high water flows and periods of 100% inundation of the unit have a detrimental impact on subsequent late season food availability for waterfowl. Impoundment drainage following flood events is conducted by May each year to prevent fish entrapment.

Flexibility to make cropland and moist soil habitats available (i.e., flood them) to waterfowl in fall is complicated at Fern Ridge because of the source and timing of availability of water. Pumps draw water from Coyote Creek, and water levels in the creek are influenced by elevations of Fern Ridge reservoir. The USACE rule curve for the reservoir dictates that lake levels be lowered starting October 1. Consequently, by mid October water levels in Coyote Creek have declined and wildlife area pump intakes are above water level. The problem is most extreme in the East and West Coyote units, less so in the Fisher Butte unit.

Current strategy for water level management in impoundments includes flooding ditches and low field areas by October, prior to reservoir drawdown (when pumping becomes impossible). This starts the process to saturate soils and fills borrow areas, helping the area flood faster with the onset of seasonal rains. Once the winter rains arrive, the impoundment fields flood gradually with water levels moderated by flashboard riser drainage structures. Flooding additional acres early in the season, while providing a level of ready food for waterfowl, would speed food depletion by increasing decomposition of agricultural foods during a period of warm temperatures and relatively low bird use. Depending on the growing season, many plants are not mature early in the fall and hard seed has not set. Flooding these green or immature plants will prevent plant maturity and reduce overall value as a forage crop. Allowing the plants to grow to maturity results in a higher quantity and quality of food that provides benefits later in the season when nutritional demands of wildlife are higher. Furthermore, entirely flooding large impoundments reduces food availability in some portions of the impoundment to a depth that prevents access to foods by dabbling ducks. The current practice of flooding fields in stages, with rainfall dictating the pace and level of flooding, mimics the natural system to which waterfowl are well attuned in their movements and habits.

The concept of early season flooding to attract waterfowl was thoroughly discussed by an advisory group (Department and USACE staff, and wetland specialists from Oregon State University) assembled to review management practices on the wildlife area. Because of the unique water level management constraints at FRWA, the advisory group's recommendation was to continue the current water management regime that had been developed and implemented during the past several years.

Soils in this unit are primarily Natroy silty clay loam with small areas of Noti, Veneta, and Linslaw loam and silty clay loam. The soils show high clay content with characteristic slow percolation. These soils are associated with a high water table, well suited for wetland habitat management and challenging for agricultural operations. The moist soil impoundments are managed to provide a combination of semi-permanent and seasonal wetlands. A balance of timing and duration of summer drawdown is used

with the intent of providing suitable conditions for seed germination and fostering a green zone of desirable vegetation as the field water levels recede.

Expected plant species response under the different drawdown scenarios vary based on interval of periodic soil disturbance by disking or plowing, and time and duration of drawdown. Desirable and dominant plant species colonizing the fields under a typical seasonal hydrologic regime include barnyard grass (*Echinochloa crusgalli*) also known as wild millet, smartweed (*Polygonum* sp.), American slough grass, beggarticks (*Bidens* sp.), water foxtail (*Alopecurus geniculatus*), and water plantain (*Alisma plantago-aquatica*). The irrigated corn and other crop fields also produce a heavy understory of these types of wetland plants that benefit from the summer infusion of irrigation water.

Dike areas and field borders contain native wet prairie plant species including tufted hairgrass (*Deschampsia caespitosa*) that support upland game birds and ground-nesting birds. Several sensitive species persist in these locations including Bradshaw's desert parsley and Howell's montia. The mature oak and ash woodland along Coyote creek provides a seasonally wet woodland component to buffer the unit on the west and supports populations of thin leaved peavine and Oregon larkspur.

The Department purchased 15 acres on the south side of the unit from willing landowners in 1978 (**Appendix H**).

West Coyote Unit

The West Coyote Unit encompasses 469 acres and is located at the south end of the lake. Highway 126 forms the unit's north boundary and Cantrell Road borders on the south. Private land borders the unit on the west and Coyote Creek on the east. As with the East Coyote Unit, a portion of this area is managed intensively for waterfowl via a series of impoundments and associated water control structures, pumps, and pipelines. This unit contains a balance of habitat types evenly split between woodlands, prairie grasslands, and managed wetland impoundments. Dense riparian vegetation consisting of deciduous trees and woody shrubs grow along Coyote Creek on the east and a gradually inclined woodland to the west. Lowland and upland grasses fringe the forested sections including some areas of native wet lowland prairie. Near the center of the unit lie three impoundments that were constructed in 1979 to facilitate waterfowl management. A fourth 107 acre impoundment bordering the northern portion of the unit was completed in 2005.

This unit is managed in concert with the East Coyote Unit using the same general water management techniques outlined above for moist soil management, seasonal marsh, and annual foodcrop planting. A combination of marsh conditions are maintained in the impoundments with a variable season drawdown scenario employed to maintain a balance of vegetation and open water. Wild rice has been established in periodic rotation with cropland plantings that are managed with on a rotational basis generally planted 50% to corn, sudangrass, and/or millet, with a productive understory of moist soil plants serving as a secondary crop.

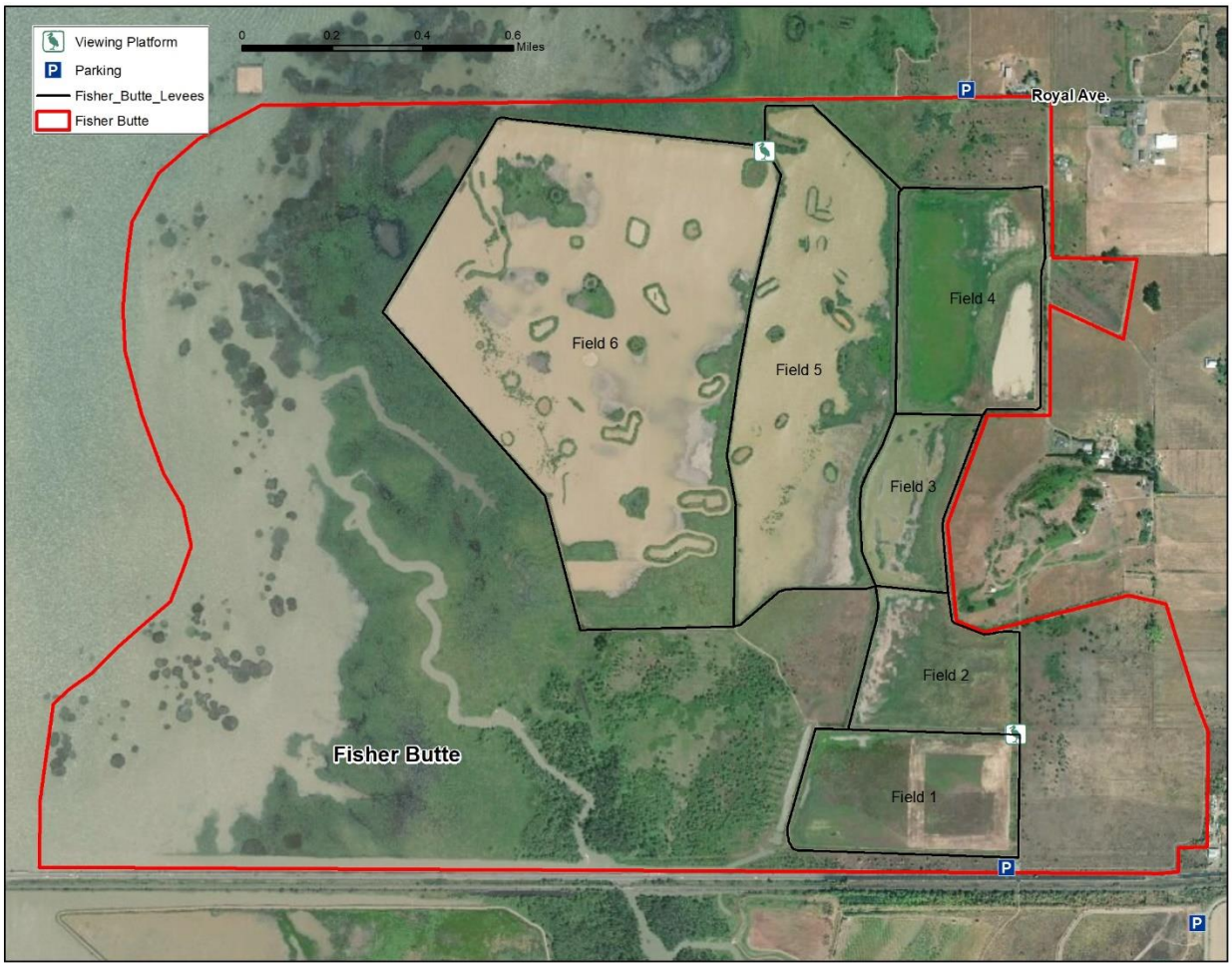
Although adjacent to Coyote Creek, this unit is not subject to the frequent and intense floods that occur in the East Coyote Unit. Soil types are the same as listed for the East Coyote Unit and contain high clay content that are poor for agriculture but well suited for water retention and wetland management.

Fisher Butte Unit

The Fisher Butte Unit encompasses 1,128 acres and is located near the southeast corner of Fern Ridge Lake. Highway 126 forms the south boundary and provides direct vehicle access via a 25 space parking area. Royal Avenue borders the unit on the north and provides access by a parking area at the wildlife area boundary. Private property borders the unit to the east and Fern Ridge Lake forms the western boundary. The unit consists of flat floodplain along Coyote Creek sloping gently upward to the east.

This unit is one of three intensively managed units on the wildlife area. Beginning in 1979, construction of a series of diked impoundments was initiated. The first phase of construction involved building a 40-acre impoundment and installation of approximately 8,000 feet of underground pipeline with a pump station and electric service. In 1982

three additional impoundments were constructed with spillways and flashboard riser water control structures. These four impoundments allowed water management capability on 155 acres of wetland habitat.



Completed in 2000, the most recent additions (Fields 5 and 6) added 320 acres of wetland habitat to the area. These last two impoundments were constructed within the lake inundation zone in an extensive reed canarygrass marsh. Current management efforts in these impoundments focus on disking, water level control, and other treatments to reduce canarygrass and promote native wetland vegetation.

During the 1980s wildlife food crops were planted on a rotational basis in portions of impoundments 1 through 4. Conversion of cropland to moist soil management was initiated in the early 1990s and cropland was reduced to portions of the 40-acre field (#1) in the south end of the unit. Currently all impoundments are managed for moist soil plant species in conjunction with control of reed canarygrass. During the drought of 1987, Fern Ridge Lake did not fill to full pool and upper portions of the Fisher Butte Unit were dry. This provided opportunity for access by heavy equipment to construct more than 40 ponds and potholes with shallow interconnecting waterways. This project

provided openings in the expansive canarygrass flats for nesting and brood habitat, wintering waterfowl, and hunter access.

Soils in the Fisher Butte Unit, above full pool elevation, consist of Natroy, Dayton, Pengra, and Linslaw loam and silty clay loams, all of which have favorable properties for wetland management. The higher slopes adjacent to Fisher Butte include Hazelaire silty clay loam, Ritner cobbly silty clay loam, and Witzel very cobbly loam.

The western portion of the unit contains low marshlands and woodlands along the Coyote Creek channel. The marshlands consist of submergent or emergent vegetation interspersed with small potholes. Above the lake pool, the unit is vegetated by upland and lowland grasses. A 60-acre parcel on the southeast portion of the unit is wet prairie designated as RNA. The site contains one of the largest remaining populations of endangered Willamette daisy and threatened Bradshaw's desert parsley. Kincaid's lupine and Fender's blue butterfly occur in a remnant wet prairie parcel at the north end of the unit. Tufted hairgrass (*Deschampsia caespitosa*) is also present at the site. Occupied rare plant and insect habitat in this unit is included in the 2006 Critical Habitat designation.

Royal-Amazon Unit

The Royal-Amazon Unit encompasses 901 acres and is located along the east shoreline of the lake. Access to the shoreline is available along the city owned Amazon Channel at the north end of the unit, and at Royal Avenue at the south end. A parking area is located at the western end of Royal Avenue at the wildlife area boundary. Gibson Island is accessible only by boat or by foot during drawdown periods.

The wetlands are vegetated with emergent grasses; hence water-related recreation is limited to fishing, wildlife viewing, hunting, trapping, or slow-speed boating activities. The difficult access and expansive nature of this marsh unit contribute favorably to the wildlife habitat values.

The unit consists primarily of large areas of emergent aquatic plants along the shoreline and surrounding Gibson Island. Within the emergent plant zone are numerous small potholes of open water. Upland areas consist of upland grasses fringed by lowland wet prairie grasses. Gibson Island consists of upland grasses, fringed by woody shrubs and small groves of coniferous and deciduous trees. Non-native invasive blackberries have created a perimeter barrier along many sections of the island.

The eastern portion of the Royal Amazon Unit has been designated as a RNA. The RNA contains excellent examples of native tufted hairgrass bottomland prairie with mounds dominated by native forbs and introduced grasses. This prairie area (including portions of the Amazon Dike #2 unit to the north) contain the largest populations of Bradshaw's desert parsley in the Willamette Valley. This prairie area is extremely unusual in that it appears to have some mounded prairie or mima mounds, a habitat type known from the gravel outwash plains of the Puget Trough in Washington, from

the Central Valleys of California and southern Oregon, and from eastern Oregon, but limited to this portion of Lane County in the Willamette Valley. This habitat has some very unusual plants and lichens growing including a huckleberry species (*Vaccinium cespitosum*) which usually occurs in subalpine and montane areas, early blue violet (*Viola odorata)*, common at the coast, and the reindeer lichen (*Cladina* spp) which is common on coastal dunes.

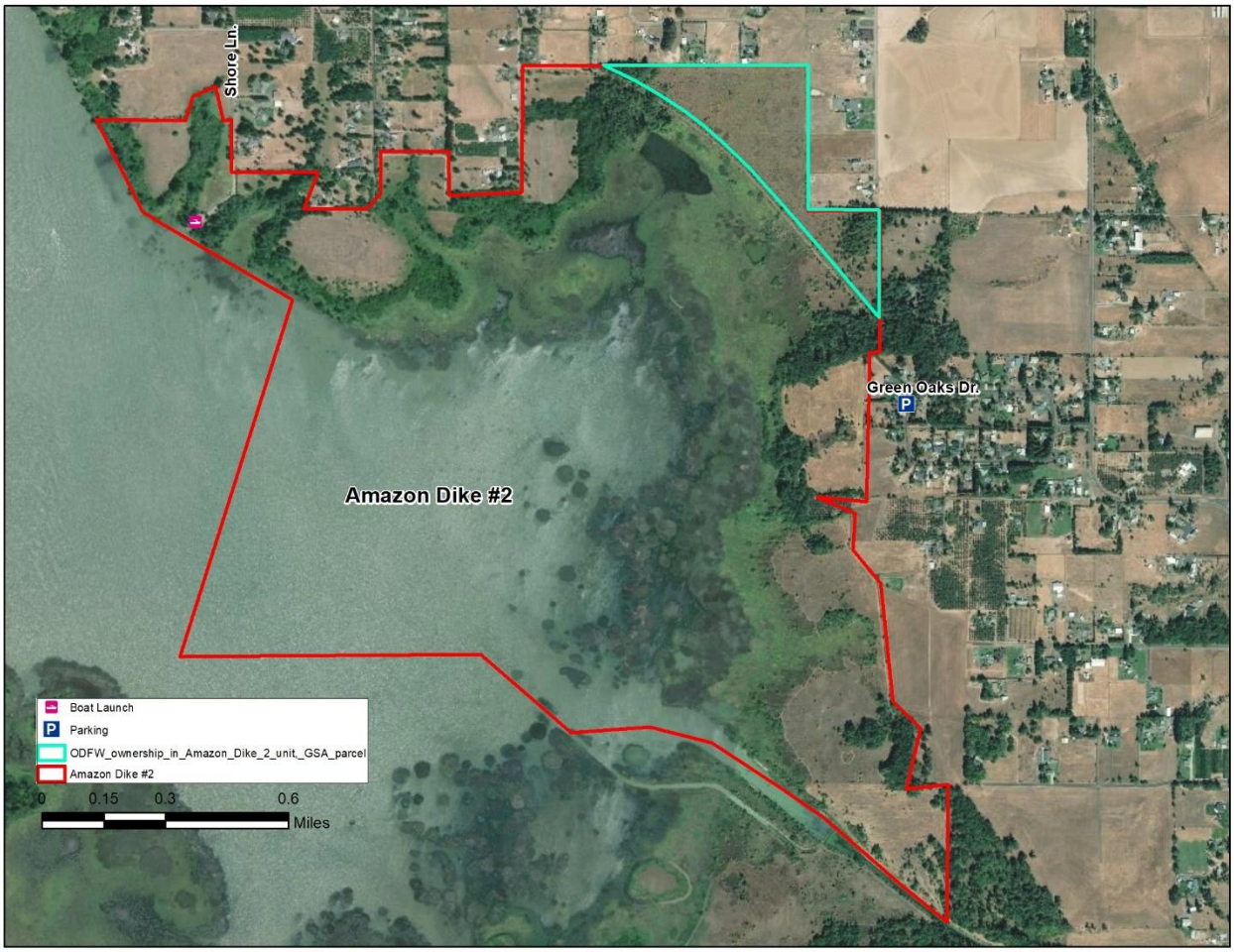
A low water winter marsh was developed in 2001, in the unit on the south side of Gibson Island. During summer months at lake full pool, the dike impoundment is under approximately five feet of water. In the winter, when the lake is drawn down to low pool level, a restored historic roadbed serves as a dike to impound over 80 acres of shallow water ideal for waterfowl, wading birds, shorebirds, and furbearers. The roadbed serves as an access route to Gibson Island for hunters, trappers, hikers, and birdwatchers. Two additional, similarly low-water winter marsh impoundments to the east and northeast of Gibson Island were completed in 2005.

Soils of the unit are diverse. Below full pool elevation, the unit is covered primarily by Natroy, Noti, Veneta, and Linslaw loam and silty clay loam soil. The eastern part of the unit above full pool contains Dayton, Pengra, and Salkum soils. Dayton silt loam occupies level stream terraces and drainageways. The soils range from heavy clay

with ponding tendencies to deep well drained soils on alluvial terraces.

Amazon Dike #2 Unit

The Amazon Dike #2 unit is located at the northeast corner of the lake. The principal feature is Dike #2, which prevents the lake from flowing onto low lying lands to the northeast. Amazon Channel forms the south boundary of the unit and Shore Lane forms the north boundary. In addition to Shore Lane, public access can be obtained via a short public access easement off of Green Oaks Lane. Direct access to the remainder of the unit is only available via lake access or by crossing private roads or lands.



The unit consists of 445 acres, consisting of upland and wet prairie, woodland lake shoreline, and emergent marsh. Soils in the unit consist of Noti, Nekoma, Natroy, Salkum, Dayton, and Linslaw loams and silty clay loams. The entire unit is designated for wildlife management use by the USACE Master Plan with activities focused on endangered species management and maintenance of existing habitat for upland game and waterfowl. The USACE is very active in management of this unit and takes the lead roll in restoration of native meadows and recovery efforts for the federally listed Kincaid's lupine and Fender's blue butterfly. Management activities include

prescribed fire, fall or spring mowing, manual weed treatments, herbicide treatments, and propagation.

This unit is well suited for support of waterfowl, ground nesting birds, and passerines with the relatively inaccessible shoreline and emergent marsh vegetation zone in close proximity to upland grass fields and meadows. The unit supports low-density, dispersed recreation including educational and interpretive study, hunting, fishing and wildlife viewing.

In addition to the USACE property, a 37 acre parcel of grassland on the east side of Amazon Dike #2 is owned by the Department. The property consists of approximately 37 acres that was conveyed to the Oregon Game Commission by quitclaim deed in 1952 under Public Law 537 for the public benefit of wildlife conservation. The parcel has habitat consisting primarily of native grasses including prairie-type plants and native rose hedges along the perimeter which provide food and cover for wildlife. A compliance inspection is conducted on the property in five year intervals by the General Services Administration (GSA) to verify use in accordance with the conveyance documents. The most recent compliance inspection was conducted on September 11, 2019 with conclusions that the site is being utilized in accordance with the Department's application and deed.

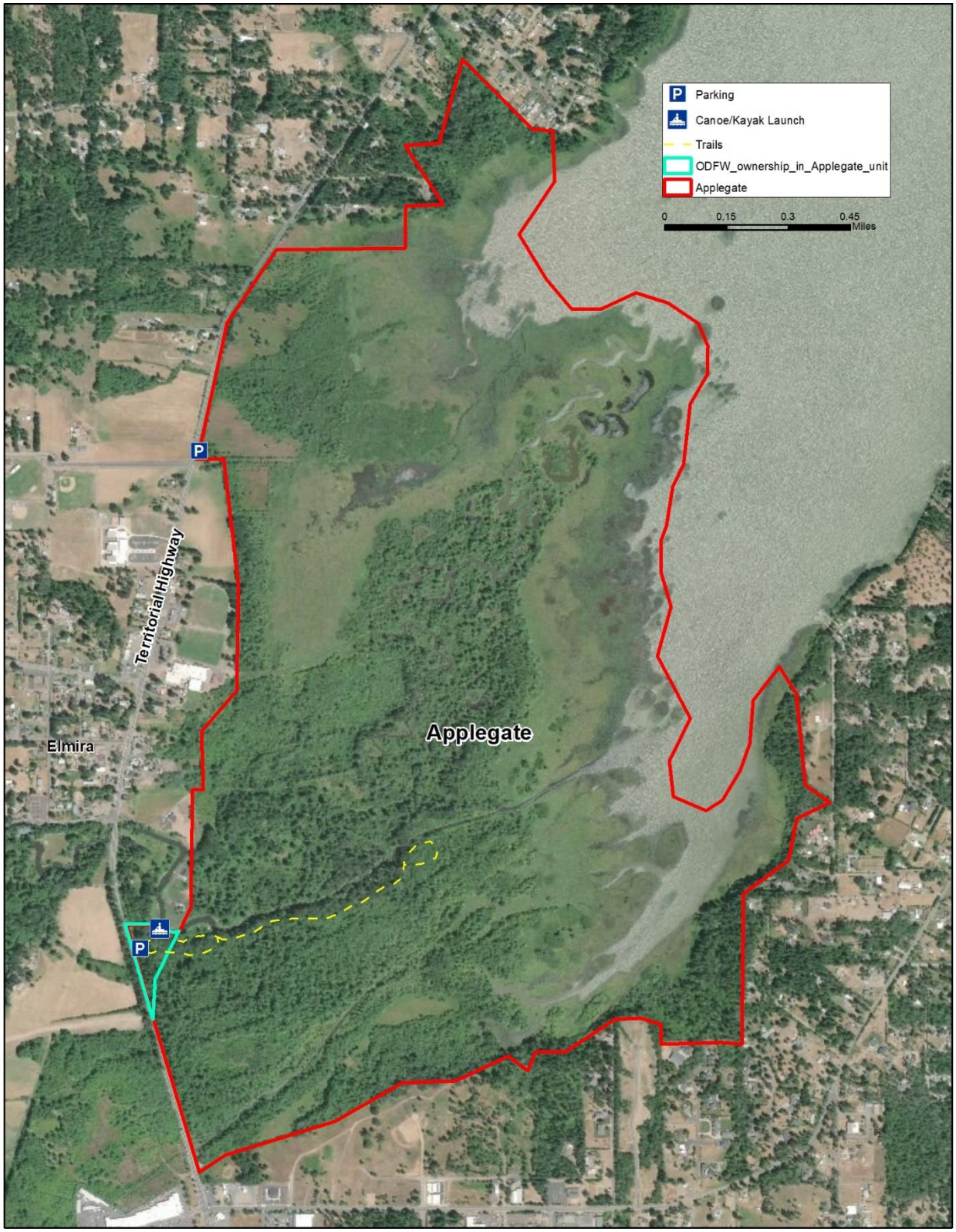
The GSA parcel is bordered on the north, east, and south by private land and borders the wildlife area on the west. A public trail for foot access is available from the south and a long circuitous trail through the wildlife area provides limited access from the north via Shore lane. A private roadway, Eaton Lane, provides vehicle access from the north, however access was restricted by the roadway owner from 1996 through 2008. An agreement is now in place to authorize department and scientist partners access to the unit via Eaton Lane for the purpose of habitat management and monitoring. Public access remains restricted via Eaton Lane.

In the fall of 2008, a grassland restoration project was implemented in the GSA parcel to remove encroaching and invasive trees, shrubs, and blackberries from the unit. Grassland portions were mowed and woody vegetation was manually removed. Remnant native oak trees were released by cutting vegetation below the crowns to reduce competition. A significant stand of Ponderosa pine at the south end of the unit was left in place for the structural habitat value provided at this specific site. The restoration work and renewed access agreement will set the stage for continued management, maintenance, and improvement of this upland prairie parcel.

Applegate Unit

The Applegate Unit encompasses 807 acres and is located along the lake's southwest shoreline where the Long Tom River channels enter Fern Ridge Lake. The unit is a low-lying, mostly forested terraced flood plain. Primary access to the unit is afforded by a parking lot on Territorial Road between Veneta and Elmira. The parking area also provides canoe access to the Long Tom River and the Long Tom Nature Trail. A small parking lot is located on Territorial Road at the north edge of Elmira that provides

access to the northern section of the unit. A secondary remote access is also provided on the west side of the unit off of Moyer Lane.



The thick jungle-like habitat of the woodlands along the old and new channels of the Long Tom River are nearly impenetrable and serve well as wildlife habitat and sanctuary. Several clearings and grasslands are maintained by annual mowing and brush removal to maintain prairie habitats and to prevent encroachment by shrubs and woody vegetation. The lands around the unit are characterized by relatively rapid urban development with much of the unit bordered by rural residences and Elmira Middle School.

Oak, ash, conifer, and black cottonwood woodlands border the Long Tom River. The original “old channel” of the Long Tom River snakes through thick woodland with many deep pools and oxbows filled with woody debris favoring species including an important and significant breeding population of western pond turtles. Large areas of submerged and/or emergent aquatic vegetation grow on the lakeside edge. Soil types include Noti, Linslaw, Veneta, Salkum, McBee, Wapato, and Dayton. Wetland characteristics of the soils favor ponding and support of wetland plant communities.

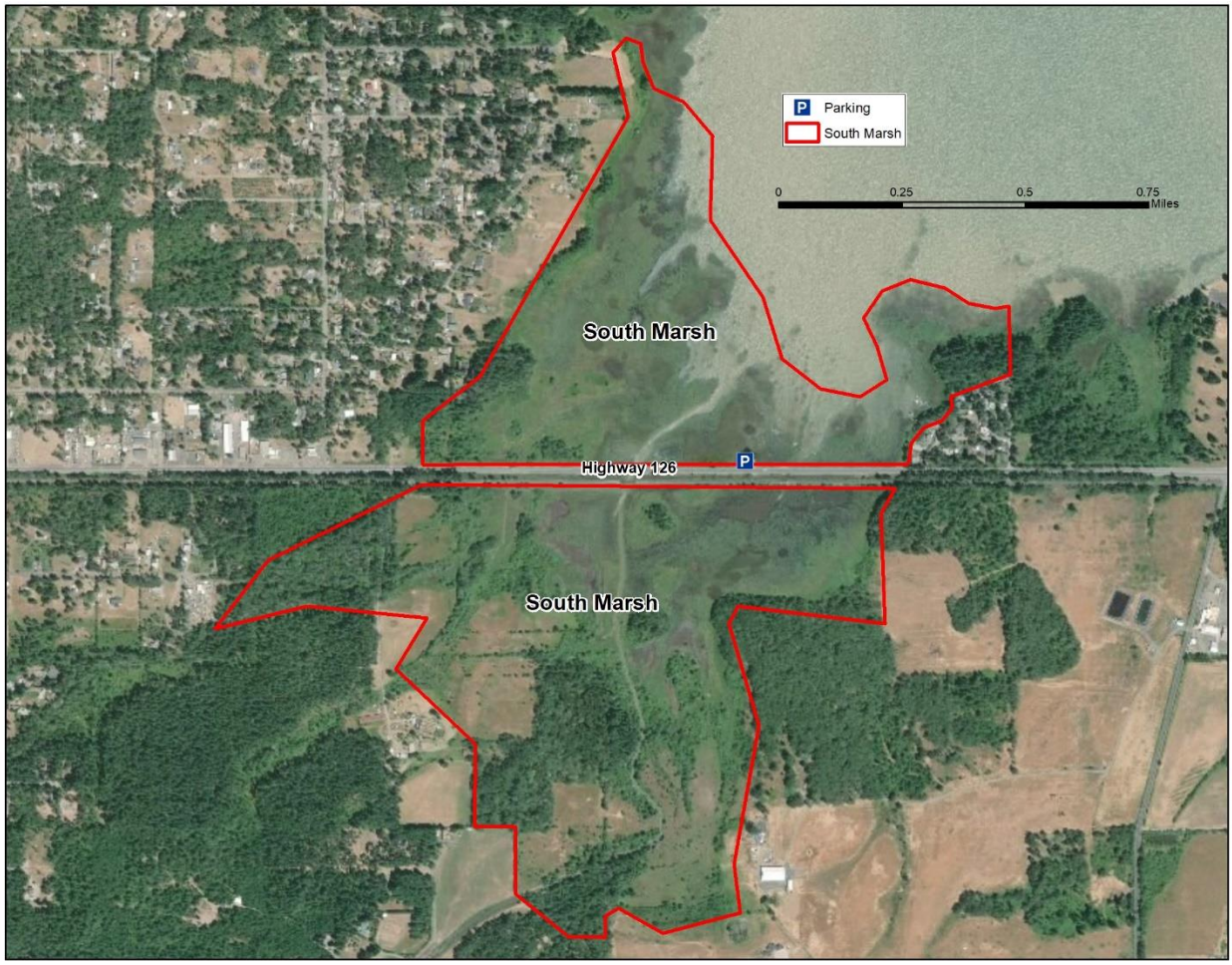
The Department owns a 4 acre parcel on the west side of the unit, purchased from willing landowners in 1980 (**Appendix H**).

South Marsh Unit

The South Marsh Unit encompasses 325 acres, is located on the south end of Fern Ridge Lake and is bisected by Highway 126. The unit encompasses inundated and upland areas along the unnamed Coyote Creek tributary to the west of Perkins Peninsula. The unit is bordered by private land on all sides with the exception of the NE quarter that transitions into the lake. There is a wildlife viewing area parking lot pull-off along Highway 126, however there is no direct public access to the southern portion of the unit. This isolation factor is favorable from a wildlife management perspective by providing sanctuary and relatively undisturbed habitat for indigenous wildlife.

Wetlands and adjacent upland areas are managed to preserve and maintain wetland, grassland, and woodland habitats. Southern borders of the unit have been fenced to prevent grazing encroachments. Meadow and grassland areas are mowed periodically to prevent encroachment of woody vegetation and invasives.

Soils above the full pool elevation include Veneta, Noti, and Linslaw loam and silty clay loam. Vegetation consists primarily of submerged and/or emergent aquatic plants at the south end of Fern Ridge Lake on either side of Highway 126. The fringes of those wetlands are surrounded by a combination of upland and wet prairie, deciduous trees, coniferous trees, and woody shrubs. Since 2011, a restoration project in partnership with USACE and the Long Tom Watershed Council has been in progress. Goals include restoring upland and wet prairie, restoring oak woodlands, establishing a population of Willamette daisy, and replacing reed canarygrass with native willows and other vegetation. An access road and creek crossing were established in 2005 that provided equipment access for a western pond turtle habitat enhancement project. The road and crossing will facilitate equipment access for future habitat improvements.



Kirk Park Unit

The Kirk Park unit is located at the northern end of Fern Ridge Lake immediately below the dam embankment. The unit is accessible via Clear Lake road and is comprised of 228 acres (including 62 acres of water area).

The western 1/3 of the unit is developed parkland with mowed grounds, picnic tables, and paved roads. The eastern 2/3 of the unit is designated for wildlife management and consists of woodland, meadow, marsh, and pond habitat. The wildlife habitat portion of the Kirk Park unit was added to the FRWA during the October 2008 re-license process with USACE. The parkland areas remain under jurisdiction and management by USACE.

The major feature of the Kirk Park unit is Kirk Pond, which is a borrow pond that was created when the dam was constructed. The remainder of the unit is flat floodplain lands of Coyote Creek and the Long Tom River. The BLM owns property to the north of the unit, Clear Lake road borders the unit on the south, and private land borders the unit on the east. Soil types are diverse and include McBee silty clay loam, Wapato silty clay loam, Natroy silty clay and silty clay loam, and Steiwer loam.

The majority of the unit is vegetated by deciduous trees along the Coyote Creek and Long Tom River drainages. There are also significant areas of upland prairie in former agricultural fields. Most of Kirk Pond and other small seasonal impoundments contain submerged aquatic plants and areas of emergent vegetation. Woody shrubs border the meadow areas that transition into woodlands. The grassland areas are maintained by mowing and brush clearing to prevent encroachment by woody vegetation and invasives. These areas also support rare plant populations of white topped aster and clustered goldenweed.

This unit supports one of the few remaining high quality habitats for western pond turtles. Through several years of intensive management and monitoring, the USACE has preserved and enhanced a remarkable breeding population of western pond turtles by completing habitat improvements, removing predators and competitors, and implementing other protective measures. Fenced exclosures are in place to protect turtle nesting sites adjacent to shallow ponds on the eastern portion of the unit. Educational outreach is underway and regulatory restrictions on angling will be considered to protect turtles from incidental hooking by anglers.

The combination of streams, ponds, and diverse plant communities provide a habitat base that is used extensively by a variety of wildlife species. Western pond turtles reproduce here and nest near the eastern shoreline. Waterfowl utilize Kirk Pond year-round for sanctuary and forage. Wading birds including great blue herons and great egrets are frequent inhabitants of the wetlands along with several species of grebes, gulls, ducks, and geese. Woodland birds, upland game, and black-tailed deer reside in the area. Osprey forage in the pond areas and many wetland wildlife species are supported including otter, beaver, and mink.

Kirk Pond is utilized by anglers and hunters have access to the eastern portion of the unit for waterfowl, upland game bird, and deer hunting.

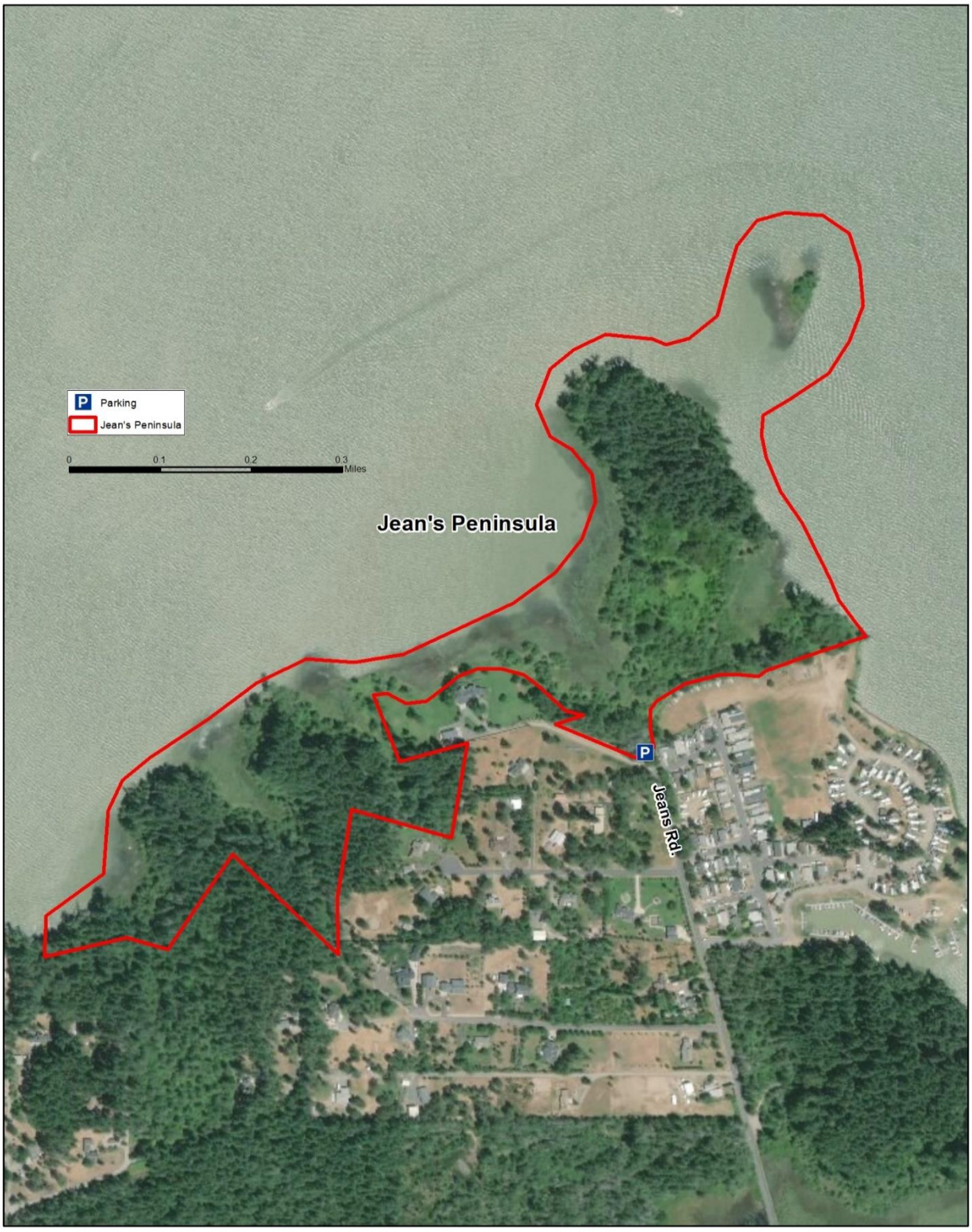
Jean's Peninsula Unit

This unit consists of a parcel of land along the tip and west shoreline of Jean's Peninsula. It is accessible via Jean's Peninsula road and other local roads serving rural residences. The unit also includes the two acre Signal Island just north of the peninsula's tip.

The unit is bordered on the north and west by Fern Ridge Lake and private rural residential land on the east and south. The unit is predominately woodland with a mix of coniferous and deciduous forest interspersed with upland grasses, lowland grass, and woody shrubs. The adjacent lakeshore alternates between open water during summer full pool and low water sandbar type mudflat during the winter months. Soils include Noti and Veneta loams and Salkum silty clay loam.

The unit provides important habitat that supports an abundant and diverse array of wildlife species, particularly birds. A bald eagle nest in the western edge of the unit was active for a number of years. The trees in the vicinity of the former nest tree continue to serve as roost trees, however the site has not been an active nest site for the past 10+ years. Osprey nest in the unit and the island and shoreline provide excellent nesting habitat for yellow-headed blackbirds, Canada geese and duck species.

Active management of the unit is constrained by the type of habitat and terrain and proximity to surrounding residential development. There are numerous rural residences located adjacent to this unit and along the lake shoreline. Protective monitoring is emphasized in this unit to protect existing habitat and to prevent encroachment from surrounding real estate development.


Parking
Jean's Peninsula
0
0.1
0.2
0.3
Miles
Jean's Peninsula
Jeans Rd.

South Coyote Unit

The South Coyote unit is located at the southern end of the Wildlife Area and is bisected by Coyote Creek. The unit is accessible via Cantrell or Halderson roads and is comprised of 309 acres.

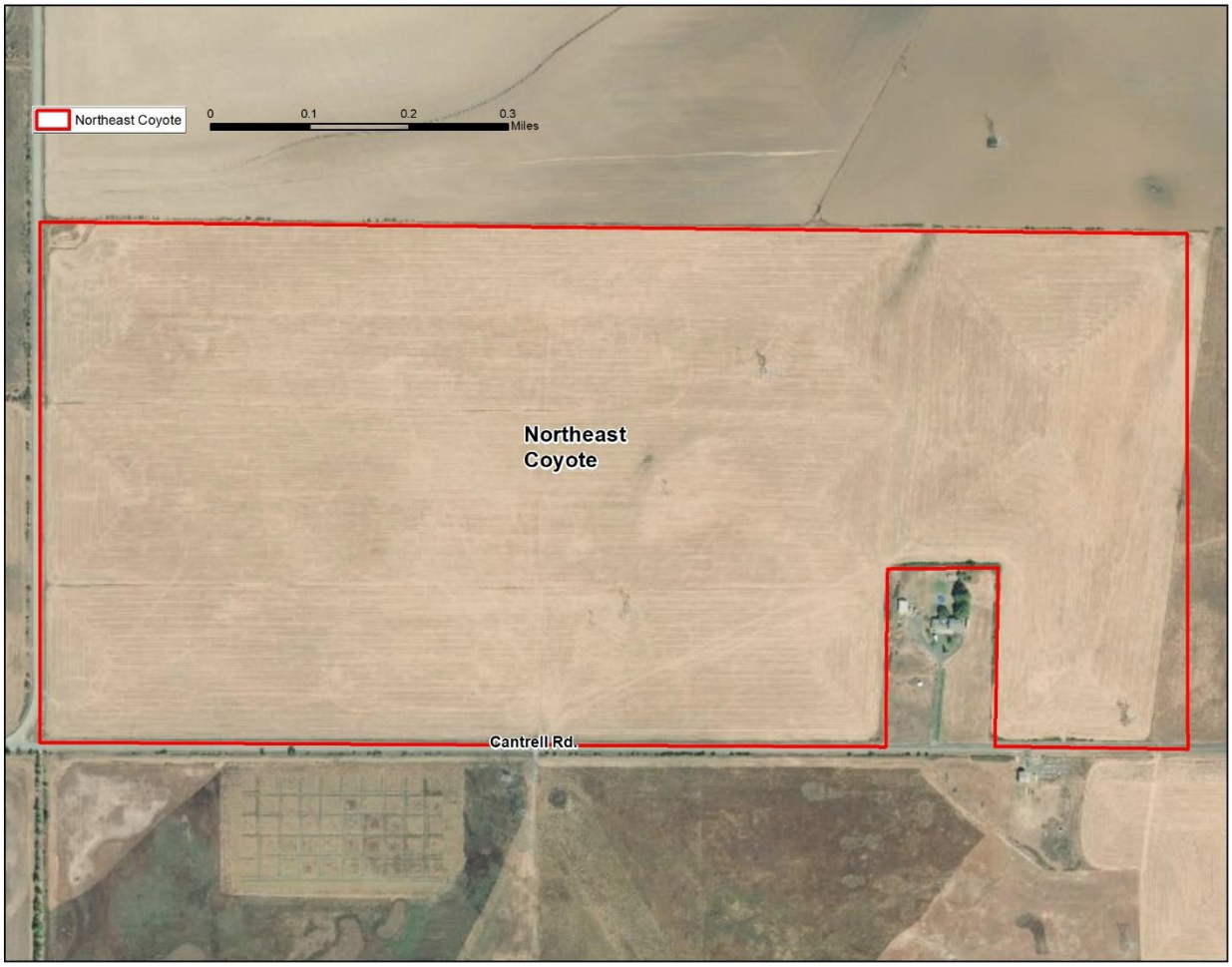
This unit was purchased in March 2013 with funding made available through the WWMP. The land was acquired to benefit fish, wildlife, and habitat conservation efforts. The conservation values of the site include native riparian forests, restorable wet prairie, a western pond turtle population, and restorable habitat for foraging waterfowl, grassland birds, coastal cutthroat trout, ash swales, and grasslands. A management plan for this unit was finalized in 2016 and will inform management action through 2024 (**Appendix E**).

Half of the unit is north of Coyote Creek and is comprised of wet prairie and riparian forest habitats. At the time of purchase, the wet prairie habitat was farmed for both grass seed and hay production. Restoration efforts began in 2014 by eliminating all existing vegetation. Seeding and the creation of vernal pool habitat occurred in 2017. Weed control and monitoring efforts continue.

Half of the unit is south of Coyote Creek. This portion is dominated by agriculture but habitats include ash swale, wet prairie, emergent wetland, riparian forest, and savanna. Restoration of 80 acres of agricultural land began in 2018. Management on the remaining habitats consists primarily of eradicating exotic and invasive plants, enhancement and protection of endangered plants and their habitats, water retention, and addressing public safety concerns. Restoration efforts to convert farmland to native habitats will continue as funding and staff time allow.

The unit is bordered by the E. Coyote unit to the north, the City of Eugene’s Coyote Prairie wetland to the east, and private lands elsewhere. BPA holds a conservation easement on the property and the Lane-Wendson electrical transmission line is a major feature found on site. Soils include Natroy, Waldo, Pengra, Hazelair, Willakenzie and Veneta.


South
Coyote
Parking
South Coyote
0
0.1
0.2
0.3
Miles
Halderson Rd.



Northeast Coyote Unit

The Northeast Coyote Unit is located at the southeastern portion of the wildlife area, immediately East of East Coyote. It is accessible by Cantrell Road to the south and Ken Neilsen Road to the west.

This unit, totaling 225 acres, was purchased in August 2015 with funding made available through the WWMP. The land was acquired “for the purposes of conserving and restoring wetland and grassland habitats for a variety of wildlife including grassland birds, amphibians, reptiles, raptors and waterfowl”. A management plan for this unit was developed in 2017 and will guide management through 2027 (**Appendix F**). The unit is currently leased for agricultural production. Restoration activities are scheduled to begin in 2020 with conversion of farmland to wet prairie, upland prairie and vernal pool habitats.

At the time of acquisition, the property was divided by Ken Neilsen road. Thirty five acres of grass hay production and wet prairie occurred on the west side of the road and 190 acres of agriculture on the east. To improve public access management, the 35 acres west of Ken Neilsen road were administratively included into the E. Coyote Unit. The boundaries of the NE Coyote Unit now totals 190 acres, found completely

east of Ken Neilsen Road.

The unit is bordered by the E. Coyote unit to the West, the City of Eugene's Coyote Prairie wetland to the South and private lands to the North and East. BPA holds a conservation easement on the property and the Lane-Wendson electrical transmission line is a major feature found on site. Soils include Natroy, Panther, Philomath, Hazelair and Dayton.

Appendix E

Coyote Creek South Management Plan

https://www.dfw.state.or.us/wildlife/willamette_wmp/docs/Coyote-Creek-Mgmt-Plan-FINAL_3_31_16.pdf

Appendix F

Coyote Creek Northeast Management Plan

https://www.dfw.state.or.us/wildlife/willamette_wmp/docs/Coyote-Creek-NE_Mgmt-Plan-Nov2017.pdf

Appendix G

Water Rights

No.	Certificate	Permit	Report ID	Total Acre Feet	Quantity
1	0	R 10814		68.77	
			10385		68.77
2	58691	R 8548		30	
			10395		30
3	58692	S 47242		589	
			10382		279.5
			10384		279.5
			10396		30
4	82688	S 49870		489.77	
			10394		122.4
			10383		122.4
			10397		489.77
			63695		122.4
5		R-15371		105	105

Appendix H

Land Acquisitions and Adjustments

Date	Acres	Action	Cooperator
1952	37	Acquired from	U.S. General Services Administration
1957	5,010	License Agreement	U.S. Army Corps of Engineers
1975	15	Acquired from	Fred Stanley estate
1980	4	Acquired from	Barry Brown and Melvin Purvis
2008	251	License Agreement	U.S. Army Corps of Engineers
2013	309	Acquired from	Asghar Sadri, F.I. and Mary Glasser
2015	225	Acquired from	George & Patricia Campbell, Jack Jackson

Appendix I

Easements

Tract Name	Purpose	Principles
Fisher Butte	Access rock quarry/ private lands	USACE to Fisher family
South Coyote	Power transmission lines	BPA
	Conservation	BPA
Northeast Coyote	Power transmission lines	BPA
	Conservation	BPA