# Coquille Valley Wildlife Area Management Plan

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Oregon Department of Fish and Wildlife
4034 Fairview Industrial Drive SE
Salem, OR 97302

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# Executive Summary

**Purpose of the Plan**

The following is a management plan for the Coquille Valley Wildlife Area (CVWA) that will be implemented for a five year period and will be used to guide the development of CVWA. As part of this process, the Oregon Department of Fish and Wildlife (ODFW) will accomplish four goals:

-Protect, enhance and restore fish and wildlife habitats on CVWA.
-Develop infrastructure and acquire equipment to facilitate CVWA projects and management.
-Provide fish and wildlife related recreational and educational opportunity for CVWA users.
-Manage habitat for consistency with ODFW's mission and compatibility with neighboring land uses.

Monitoring of fish and wildlife populations and public use will be conducted. The results of monitoring will be used to help direct ODFW activities on CVWA through adaptive management (see page 46). Actions will be implemented throughout the life of the plan and will be subject to personnel and budget availability.

This plan was written using input from a stakeholder committee of neighboring landowners, representatives from sporting groups and other resource management agencies that function in the Coquille Valley. The stakeholder committee met on five occasions to provide input.

**Historical Background**

The CVWA was initiated through land exchange by ODFW in April 2013 with the assistance of The Nature Conservancy. ODFW exchanged its ownership of land located on the east side of Eel Lake for 546.46 acres in two parcels within the lower Coquille River drainage belonging to Bandon Biota LLC. These parcels are Winter Lake Tract and Beaver Slough Tract located between the cities of Coquille and Bandon along Hwy 42 and North Bank Lane. They are both surrounded by private land, a railroad, or travel right-of-ways Additional lands were obtained through purchase from willing landowners in September 2014 (37.21 acres) and December 2015 (4.85 acres). CVWA sits, in its entirety, in Coos County which has a population of approximately 63,000.

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**Winter Lake Tract**

Winter Lake Tract is located south of the intersection of Hwy. 42 and North Bank Lane. This tract is 287.56 acres and lies west of Highway 42. It encompasses a portion of the Coquille River flood plain colloquially called Winter Lake. ODFW intends to conduct fish and wildlife habitat restoration projects on this tract.

**Beaver Slough Tract**
Beaver Slough Tract is located to the north of Winter Lake Tract near the intersection of Hwy 42 and North Bank Lane. It is 300.96 acres and lies on either side of Beaver Slough extending upstream for a distance of about 1.4 miles. Much of this tract has mostly intact fish and wildlife habitat that can be considered a good example of potential habitat for restoration efforts in the Coquille Valley.

# Introduction

**Purpose of the Plan**
This plan was written after ODFW initially acquired the lands that constitute CVWA and before much habitat restoration occurred. As such, this plan will guide management of CVWA for up to the next 5 years during which time restoration projects and public use programs will be implemented. ODFW's 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 CVWA for up to the next 5 years;
- To provide continuity in CVWA management;
- To communicate ODFW's management priorities for CVWA to its neighbors, visitors, and the public;
- To ensure management programs on CVWA are consistent with the original mandate and purpose set when the area was first established;
- To ensure management of CVWA is consistent with various federal, state, and local laws and county land use plans;
- To ensure management activities address conservation priorities and recommendations described in the 2006 Oregon Conservation Strategy
- To provide a basis for budget requests to support CVWA needs for staffing, operations, maintenance, and capital improvements.

**The ODFW Mission and Authority**
"The mission of the Oregon Department of Fish and Wildlife is to protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations." ODFW 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 CVWA

CVWA was initially established in 2013 with two equally important primary objectives; (1) To protect, enhance, and restore fish and wildlife habitats located on CVWA, and (2) to provide a wide variety of wildlife-oriented recreational and educational opportunities to the public.

The majority of lands that compose CVWA were acquired by ODFW as the result of a voluntary land exchange starting in April 2013. Additional lands were obtained through purchase from willing landowners in September 2014 and December 2015. These properties provide significant opportunity to enhance overwintering habitat for fish and migratory birds and increase wildlife related recreation for the public.

The "Original Land Cadastral Survey Notes" from the late 1800s identified over 12,000 acres of wetlands and tidally influenced lands present in the Coquille River Valley (Benner 1992). These highly productive habitat types are known to have contributed to the large numbers of waterfowl, salmon, and steelhead using the Coquille River basin historically. Subsequent to these surveys, waterfowl diversity and abundance in the Coquille Valley is thought to have declined substantially, while salmon and steelhead returns have seen severe reductions. In 1990, there were only about 400 acres of these habitats remaining in the Coquille Valley (Benner 1992). Since 2000, there have been several efforts to reestablish and restore wetlands and tidelands in the Coquille River Valley, resulting in roughly 1,000 acres of these habitats being restored. The current CVWA ownership will protect or enhance an additional 580+ acres of wetland, upland and tidally influenced lands.

ODFW's Coho Conservation Plan (ODFW 2007) lists the primary and secondary limiting factors for Coho Salmon (*Oncorhynchus kisutch*) in Table 4. For the Coquille population, "Stream Complexity" is listed as primary, while "Water Quality" is listed as secondary. Stream Complexity is further defined to explain that high quality over-wintering habitat is most limiting in the Oregon Coast Evolutionary Significant Unit.

High quality overwintering habitat creates shelter for juvenile Coho Salmon during high flow events. This shelter helps prevent them from being flushed down rivers to saltwater environments before they are physiologically prepared to migrate to the ocean. High quality off-channel habitats provide refuge from high water velocities, cover from predators, and productive forage areas. River-connected floodplains, beaver ponds, wetlands, and tidal marshes provide these attributes in areas where stream gradients are low and valleys are broad. The CVWA has the capability of providing these high-quality habitats where tidal connectivity can be restored.

The Coho Conservation Plan's Appendix 2--Table 7 includes the goals for the amount of high-quality habitat miles for each population. In the Coquille, the goal is for a total of 321 miles of high-quality Coho Salmon habitat. Currently the existing high-quality miles are estimated at 108 miles (34 percent of goal).

The Coquille Tribe's Coquille River Sub-basin Plan (Coquille Indian Tribe 2007) describes biological and habitat objectives for a 25-year time horizon (2007-2032), for Coho Salmon, Chinook Salmon (*Oncorhynchus tshawytscha)*, Pacific lamprey (*Entosphenus tridentata*) and other native fishes. Biological Objective 3 calls for restoring passage through all high priority man-made barriers, while Biological Objective 4 calls for improving 167 miles of High Intrinsic Potential (HIP) over-wintering Coho Salmon habitat to high quality condition over that time period. Coho Salmon summer rearing habitat quality (particularly elevated water temperatures) is identified as a secondary limiting factor. Deficient habitat characteristics in the mainstem Coquille River and tributaries of this section are: riparian conifers, large woody debris, substrate fines, water quality (dissolved oxygen and nitrates), sediment, and water temperatures. Restoration actions on the CVWA will focus on improving and/or restoring these high-quality habitat attributes.

The CVWA may contribute an additional 11 to 17 returning adult Coho Salmon per acre per year for restored acreage, based on a review of existing tidal wetland restoration projects (Nickelson 2012). ODFW estimates 3,100 to 4,200 additional returning Coho Salmon adults to the Coquille River each year if restoration plans are implemented fully. Chinook Salmon runs in the Coquille River could also increase by 1,000 returning adult salmon.

Waterfowl use flooded agricultural lands in the Coquille Valley during the fall, winter and spring. The establishment of CVWA and wetland restoration on this land will result in increased habitat diversity. ODFW will use moist soil management practices to enhance moist soil dependent plant communities. As a result of historic wetland conversion, only a few locations have retained moist soil dependent plant communities in the Coquille Valley. Beaver Slough is one of the areas retaining moist soil dependent plant communities. As described in "A Primer on Moist-Soil Management" (Ducks Unlimited, 2015), compared to agricultural lands, moist soil habitats provide more nutrition, offer better cover and support a greater abundance and diversity of species. This document also explains that wetlands with water depth of one to 18 inches will support the greatest diversity of waterfowl and other wildlife.

Wetland plants produce large quantities of seeds that are a valuable food resource for waterfowl and other wildlife. These seeds are highly nutritious because they are resistant to decay and tend to persist as a usable food resource for a long period of time. Invertebrate communities that respond to the creation of wetland habitats provide a diversity of nutrients to wildlife, and therefore help satisfy nutritional requirements for these species. High quality,

diverse food results in waterfowl being better able to build fat reserves in preparation for migration and egg production in the upcoming breeding season (Ducks Unlimited, 2015).

**Implementation Approach**

Led by The Nature Conservancy, the Winter Lake Restoration Project will restore wetland habitat on the Winter Lake Tract beginning in 2016 or 2017. It includes restoring tidal activity, creating channels and planting vegetation to put development of the wetland on a trajectory toward a functioning freshwater tidal wetland.

In addition to habitat restoration, ODFW will continue to develop CVWA for public use. Development has included the construction of a parking area that will serve as the access point for public entrance to CVWA. This access point is located along North Bank Lane next to the bridge that crosses Beaver Slough. A kiosk at this access point lists information on public use rules. In addition, access permits are provided. An access permit is required for any public access including hunting, fishing and other activities. At the end of their outing, those who access CVWA arel be required to record information related to their activities on the permit and put it in a collection box at the access point kiosk.

As ODFW developed this management plan, a stakeholder group was formed comprising neighboring landowners, sporting groups, professionals who work in the Coquille Valley, and people with pertinent knowledge of the area. This group provided ODFW with input from the perspective of user groups of CVWA and those potentially affected by the existence and operation of CVWA. Below is a list of the Stakeholder Committee members:

| | |
|---|---|
| John Knutson | China Camp Creek Gun Club |
| Sharon Waterman | Landowner |
| Charlie Waterman | Coaledo Drainage District |
| Pat Burris | Garden Valley Landowner (deceased) |
| Amy Wilson | Natural Resources Conservation Service (NRCS) |
| Ty Stubblefield | Oregon Hunter's Association |
| Don Chance | Hunter |
| Paul Merz | Commercial Fisher |
| Mindie Wilson | Sport Fisher |
| Craig Cornu | South Slough National Estuarine Research Reserve (SSNERR) |
| Fred Messerle | Beaver Slough Drainage District |
| Stuart Love | ODFW |

To demonstrate the success of the project, monitoring procedures will be devised and implemented to record changes in species diversity, abundance, and their level of use on CVWA. Monitoring procedures will also be implemented to record

changes in aquatic and upland habitat on CVWA. Monitoring programs will also measure public use of CVWA. The frequency of all monitoring is dependent on funding.

ODFW is committed to being a good neighbor, so monitoring will be implemented to record effects on private lands from the project, if any. This information will be used to adjust current and future habitat and public use management activities on CVWA.

The CVWA exists in two drainage districts. As a result, ODFW has become an active member of these drainage districts. The Winter Lake Tract sits in the Beaver Slough Drainage District and the majority of the Beaver Slough Tract sits in the Coaledo Drainage District, with some portions in the Beaver Slough District. ODFW will coordinate activities on CVWA, including restoration efforts with the appropriate drainage district. ODFW will ensure that all restoration activities are conducted according to federal, state, and local laws. Fill and removal activities in wetlands and waterways are under 404 Clean Water Act and Section 10 laws requiring U.S. Army Corps of Engineers and Oregon Department of State Lands permitting.

**Coquille Valley Wildlife Area Vision Statement**
Management of CVWA will protect, enhance, and restore aquatic, riparian and upland habitats in the Coquille Valley in a manner that is compatible with neighboring land use. This will be accomplished on uplands, seasonal wetlands, and historic stream channels on CVWA properties for the benefit of both fish and wildlife resources. This effort is expected to result in public benefit by improving fish and wildlife populations and providing lands where recreational and educational activities related to fish and wildlife will occur. These activities include hunting, fishing, wildlife viewing, research, and education.

## 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 ODFW wants to achieve. Objectives derive from goals and provide the basis for determining strategies, monitoring fish and wildlife area accomplishments, and evaluating the success of strategies. The goals and objectives for the CVWA Area are:

### Goal 1: Protect, enhance, and restore tidally influenced wetlands, riparian lands, aquatic habitats, and uplands in CVWA for the benefit of fish and wildlife consistent with ODFW's mission and compatible with neighboring land uses.

**Objective 1.1:** Restore wetlands, riparian areas, and other aquatic habitats at key locations on the Winter Lake Tract of CVWA to mimic habitats that once

occurred naturally, with emphasis placed on over-wintering habitat for Coho Salmon.

**Objective 1.2:** Protect, enhance, and restore upland habitats within CVWA lands for the benefit of fish and wildlife.

**Goal 2: Build, maintain and enhance CVWA facilities.**

**Objective 2.1:** Develop and maintain CVWA infrastructure to facilitate programs for public use, resource monitoring, and maintenance of habitats.

**Objective 2.2:** Maintain berms and channels in coordination with Beaver Slough Drainage District and Coaledo Drainage District.

**Goal 3: Provide a variety of quality fish and wildlife oriented recreational and educational opportunities to the public.**

**Objective 3.1:** Develop public access to CVWA lands in a way that is compatible with neighboring land use.

**Objective 3.2:** Encourage compliance with CVWA public use program.

**Objective 3.3:** Provide approximately 800 hunting, trapping, and angling use days annually.

**Objective 3.4:** Provide approximately 800 other recreation/interpretation days annually.

**Objective 3.5:** Provide approximately 60 student days annually through class tours, volunteer education/work days, and individual instruction by communicating educational opportunities with local schools and other educational organizations**.**

**Goal 4: Evaluate restoration and management actions to ensure habitat benefits to fish and wildlife are consistent with ODFW's mission and compatible with neighboring land uses.**

**Objective 4.1:** Evaluate effects of restoration within CVWA and on adjacent private property. Adjust activities on CVWA to accomplish desired conditions and to ensure that restoration activities are compatible with neighboring land use.

**Objective 4.2:** Design and implement monitoring programs for fish and wildlife populations on CVWA.

**Objective 4.3:** Evaluate and prioritize control of invasive plant, fish and terrestrial animal species found on CVWA based on the risk they pose to native species, habitats, and neighboring land use.

### CVWA Establishment

The establishment of CVWA was initiated with a land trade between ODFW and Bandon Biota LLC in April 2013. ODFW traded 607 acres of timberland adjacent to Eel Lake near Lakeside, Oregon for 546.46 acres of primarily wetlands and converted wetland/ag lands in two land parcels. Then in September 2014, The Nature Conservancy transferred an additional 37.21 acres of land located along North Bank Lane to ODFW to improve public access. Finally, in December 2015, The Nature Conservancy transferred an additional 4.85 acres of land south of North Bank Lane to ODFW to further improve public access. These actions created CVWA, which currently is 588.52 acres in size.

The CVWA was created because wetland habitats in the Coquille Valley had a higher potential for providing ODFW with opportunities to undertake projects to restore critical fish and wildlife habitats. Wetlands are identified as Key Habitats of the Coquille Valley in the Oregon Conservation Strategy (ODFW, 2006). These habitats in the Coquille Valley provide winter refugia for fingerling Coho Salmon before they migrate to the ocean. Loss of winter refugia has been identified as one of the most significant limiting factors for Coho Salmon in Oregon coastal stream systems (Coho Conservation Plan, ODFW 2007). The Coquille estuary is also considered to be extremely important for wintering water birds, based on water bird inventories done by the U.S. Fish and Wildlife Service (USFWS). (Lowe, Pers. Comm). ODFW also considers lands in the Coquille Valley to have a higher potential value for providing fish and wildlife related recreation opportunities than the timberlands it owned at Eel Lake.

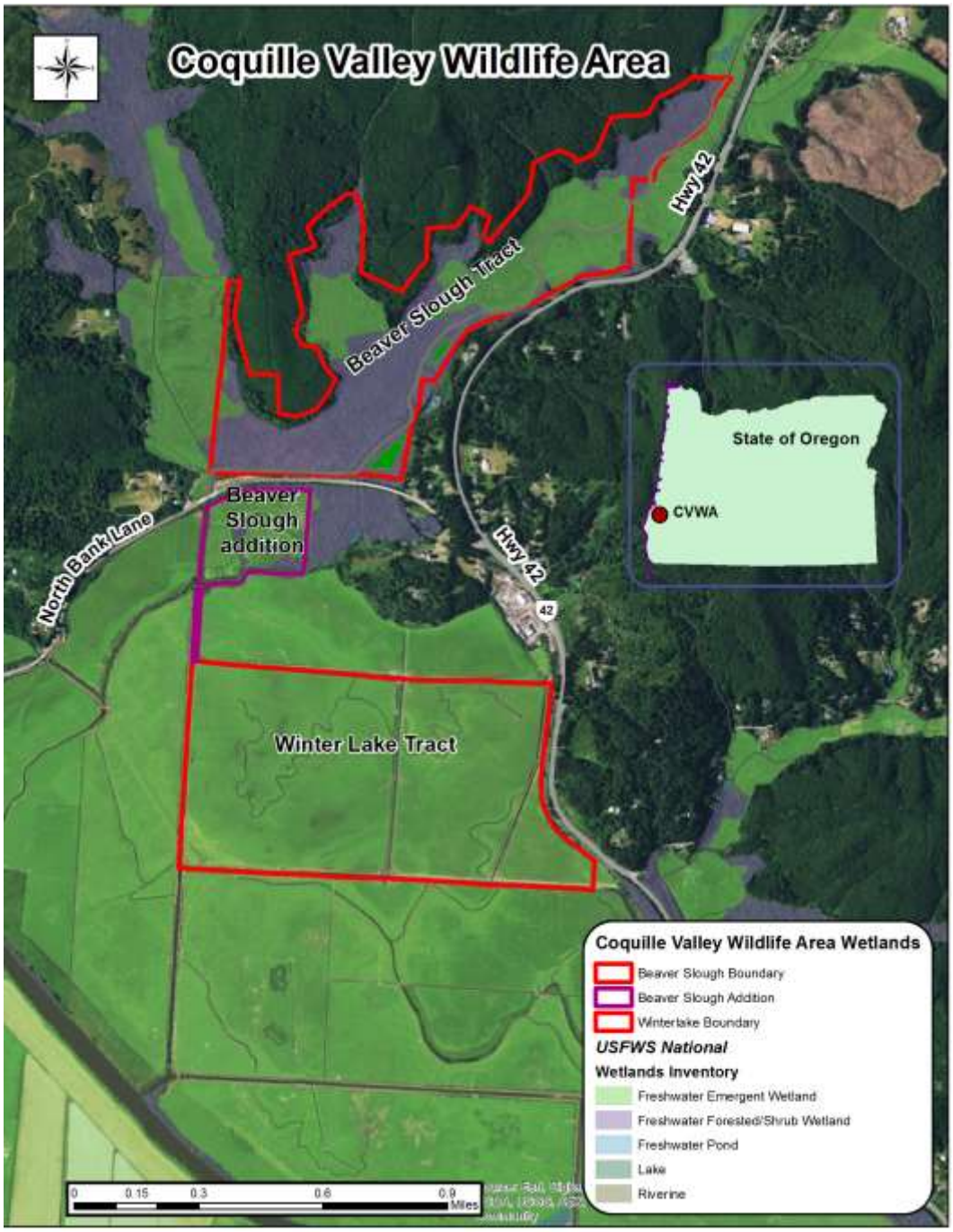
## Description and Environment

### Physical Resources and Historical Background

### Location

The CVWA is located in the Coquille River Valley approximately 3.5 miles downstream from the town of Coquille and in the portion of Beaver Slough adjacent to Hwy. 42 near Coaledo. The area consists of two tracts: the Winter Lake Tract and the Beaver Slough Tract. Figure 1 depicts the location of these tracts.

**Figure 1. Coquille Valley Wildlife Area, including wetland habitat designation from USFWS National Wetlands Inventory.**



**Climate**

Coos County has a mild and humid marine climate which results from the moderating influences of the Pacific Ocean and from rainfall induced by the Coast Range. According to the Coos County Multi-Jurisdictional Natural Hazard Mitigation Plan, average January temperatures are 44.2 F, and average July temperatures are 60.9 F. Average annual rainfall in Coos County is 56.8 inches. Rainfall amounts vary depending on the location. Along the lower coastal elevations, rainfall averages between 60 and 95 inches per year, while areas on the higher west slopes of the Coast Range may reach 200 inches. Although Coos County's climate is generally considered temperate, there are exceptions. In most winters, storms bring strong and sometimes damaging winds to the coastal areas, and in some years the accompanying heavy rains cause extensive flooding. Coastal storms are often slowed or stopped at the Coast Range peaks and may drop considerable amounts of precipitation in short periods of time (Partnership for Disaster Resilience, 2010).

The average flow rates for the Coquille River range from 8,250 cfs in February to 130 cfs in September (Partnership for Disaster Resilience, 2010).

**Topography, Geology, and Soils**

Coos County is located in southwest coastal Oregon and encompasses 1,629 square miles. The county is bounded to the north and east by Douglas County, to the south by Curry County, and to the west by the Pacific Ocean. Coos County has a diverse geography. The terrain along the coast and in the river valleys is relatively flat, while the Coast Range, which runs through the majority of the county, gives the inland areas a mountainous topography. The county's highest elevation is Mt. Bolivar at 4,319 feet, located in the southern portion of the county. Elevations in the Blue Ridge area in the north part of the county are somewhat lower, averaging 1,600 feet. Major rivers in Coos County include the Coquille River and its tributaries in the south and the Coos River and its tributaries in the north.

The Coquille Basin was formed in geologic times by interactions between the ocean and continental crustal plates. The drainage areas of the North, East, and Middle Forks of the Coquille River were part of the ocean floor until recent geologic times. This portion of the basin formed through deposition of shallow sea floor basalts, alternated with accumulations of shore-originated and sea sediments. The sources of these sediments were the ancestral Klamath Mountains, as well as undersea volcanoes. About 10 million years ago, regional uplift caused the land to rise above sea level, and subsequent glacial periods shaped the landscape.

The geology of the South Fork Coquille has a different origin. This land is part of the Rogue formation, is volcanic in origin and was at one time an island. The regional uplift created a land bridge which connected this island with the northern area. Subsequently, the Coquille Basin has two stream substrate types: the South Fork has hard rock geology, while the remainder of the basin (including the CVWA) has a sandstone composition.

Stream gradients are steep in the upper reaches of the basin, but flatten as they enter the valley floor near Myrtle Point. The upper reach of tidewater influence is approximately 40 miles from the mouth of the Coquille River. Below this point, where the valley floor is much wider, the average stream gradient is about one foot per mile (Partnership for Disaster Resilience, 2010). Located at river mile 21, CVWA is in the reach where the valley flattens and is well within the zone of tidal influence.

**Habitat Types and Associated Fish and Wildlife**

As described in the Original Land Surveys (Benner 1992), the lower main valley of the Coquille River was once a large, forested wetland and tidal marsh. These habitats, once estimated to be 9,000 to 12,000 acres, were disconnected from the river channel by dikes and drained for pasture formation, which probably started in the 1850s. By 1990, only an estimated 400 acres (three to four percent) of these former habitats remained.

The vegetated, braided channels in this valley historically provided prime rearing habitat for the juvenile salmonids that were the product of spawning in higher gradient stream reaches in the basin. Historic habitat conditions would have provided forage production, suitable water temperatures, habitat complexity, nutrient settling, hiding cover, velocity refuge, and other attributes for salmonids far beyond today's conditions. The Beaver Slough drainage has habitat that is probably similar to historic natural habitat.

Presently, much of the Coquille Valley floor is used for agricultural purposes. Agricultural interests include grazing cattle, sheep, and goats, and growing grass for hay production. Much of the habitat encountered in Original Land Surveys (Benner 1992), including stands of willows, ash, and wetland dependent plants, have been lost due to drainage of these lands. In addition, many of the braided channels were filled in to produce a more uniform landscape which increased agricultural productivity.

The Coquille River Valley is one of the largest river valleys in the Oregon portion of the Coast Mountain Range. This valley floods annually during the rainy season. The rainy season generally begins in November and extends through March. When flooding occurs, large portions of the valley floor become inundated with standing or slow moving water. Much of the water inundating Coquille Valley is less than two feet deep and provides feeding opportunities for waterfowl.

Due to the size of the valley and the extent of flooding, the valley is an important attraction for migrating waterfowl. Thousands of waterfowl congregate here as they migrate south to the central valleys of California in fall. Congregations occur again in spring as these birds move north towards nesting areas. In addition, a substantial population of waterfowl winter in the Coquille River Valley. Some nesting occurs in the valley during spring and summer, but nesting habitat is likely limited compared to historic habits described by Benner (1992) because the Coquille River and tributaries are channelized and much of the land management practices have resulted in conversion of wetland to intensively managed agricultural pasture.

In addition to waterfowl, many other species of wildlife use the Coquille Valley including resident and migratory passerine birds, wading birds and shore birds. Big game exists in the valley at moderate levels. Black-tailed deer (*Odocoileus hemionus columbianus)* and Roosevelt elk (*Cervus elephus roosevelti)* move to the valley fringe in winter from surrounding forested areas and some are resident year round. Black bear (*Ursus americanus)* are present in the forested area and probably move to the valley when food resources such as blackberries (*Rubus sp.)* are present. Water ways in Coquille Valley have populations of furbearing wildlife such as beaver (*Castor Canadensis*), river otter (*Lontra canadensis*) and muskrat (*Ondatra zibethicus*). There are populations of amphibians such as rough skinned newt (*Taricha granulosa*) and red-legged frogs (*Rana aurora*) and reptiles such as Western pond turtles (*Clemmys marmorata*) and garter snakes (*Thamnophis spp*.).

As a result of this diversity of species, the Coquille Valley is currently a significant location for wildlife viewers. Many of these species benefit most from upland habitats. For the purposes of this plan, uplands will be defined as those lands that are not inundated by water under tidal influence. As flooding occurs during the rainy season many of the uplands on CVWA are inundated by water. Appendix II is a list of fish and wildlife species found in the Coquille Valley.

The Coquille River system supports runs of Coho Salmon, Chinook Salmon, steelhead (*Oncorhynchus mykiss*), resident and sea-run Cutthroat Trout (*Oncorhynchus clarkii*), and Pacificamprey runs. Channeling of the Coquille River, diking/draining of tidelands, and conversion of wetlands to pasture has substantially reduced suitable habitat for these species.

There are five habitat types found within the borders of the CVWA (Figures 1-3, Table 1): freshwater emergent wetlands, freshwater forested/shrub wetlands, upland Douglas fir/cedar, upland shrub/forest, and riverine. The freshwater wetland habitat is behind tidegates. These habitat types and the amount of acres of each type are listed in Table 1. Freshwater wetlands are identified as Key Habitats of the Coquille Valley in the Oregon Conservation Strategy (ODFW, 2006).

Freshwater Emergent Wetland

There are approximately 368 acres of Freshwater Emergent wetland on the CVWA (73.6% of the Beaver Slough Tract; 28.3% of the Beaver Slough Addition; and 92.4% of the Winter Lake Tract) (Table 1). There are a number of subtypes, largely related to whether the habitat was formed by diking or occurred solely due to natural topographic features. Freshwater Emergent Wetland habitats are typified by having salinities <0.5 ppt. Vegetation is a mixture of erect, rooted, herbaceous hydrophytes and species such as slough sedge (*Carex_obnupta*), spike rush (*Eleocharis palustris*), smooth rush (*Juncus effusus*), small fruited bulrush (*Scirpus microcarpus*), and a number of other species that are able to grow with the seasonal flooding conditions. Some of the Freshwater Emergent Wetland habitat land area on the Winter Lake Tract and Beaver Slough Addition is dominated by non-native reed canary grass (*Phalaris arundinacea*).



Freshwater Forested Shrub Wetland

There are approximately 122 acres of Freshwater Forested Wetland habitats within the boundaries of the CVWA (Table 1). Similar to Emergent wetlands, this type of wetland habitat is typified by having salinities <0.5 ppt. The vegetation is defined by shrubby species less than 20 ft. in height and trees that are short due to excessive water preventing normal growth rates. The CVWA has approximately 119 acres of Forested Wetland in the Beaver Slough Tract, approximately 3 acres in the Beaver Slough Addition, and zero acres within the Winter Lake Tract boundary. Species common within the CVWA Freshwater Forested Habitats include several species of willow (*Salix spp.),* Oregon Ash (*Fraxinus latifolia),* red alder (*Alnus rubra*), red-stemmed ceanothus (*Ceanothus sanguineus*), and several other species.

Douglas Fir/Cedar Upland

There are approximately 63 acres of Douglas Fir/Cedar upland habitat type within the CVWA (Table 1). This habitat type is dominated by Douglas fir (*Pseudotsuga menziesii*) and associated species such as western red cedar (*Thuja plicata*) or Sitka spruce (*Picea sitchensis).* This habitat type is located entirely within the Beaver Slough Tract of the CVWA.

Shrub/Forest Upland

These locations account for approximately 24 acres within the CVWA (Table 1). These areas would have a plant community similar to the Douglas Fir/Cedar habitats. However, due to lower elevation they are flooded sufficiently during the wetter months to eliminate fir and cedar. Drainage in the summer months allows soils to dry where deeper rooted shrubs and short deciduous trees would dominate the plant community if the locations were allowed to progress to climax conditions. Much of the Shrub/Forest Upland habitat within the CVWA is related to areas where filling and or dike construction has occurred increasing the elevation above the level where Freshwater Emergent wetland plant communities would dominate.

Riverine

There are 11.7 acres of Riverine Habitat type within the CVWA (Table 1). By definition these habitats have fine substrates that exceed 25% and vegetation that is <30%. This habitat type includes all the canals, streams, and interior channels on the CVWA that are permanently flooded and have flowing water.

**Table 1. Habitat composition on the Coquille Valley Wildlife Area. Acreage estimated using Coos County Assessor's map and USFWS National Wetlands Inventory.**

| Habitat Type | Approximate Acres |
|---|---|
| Freshwater Emergent Wetland | 368 |
| Freshwater Forested Shrub Wetland | 122 |
| Douglas Fir/Cedar Upland | 63 |
| Shrub/Forest Upland | 24 |
| Riverine | 12 |
| **Total** | **589** |

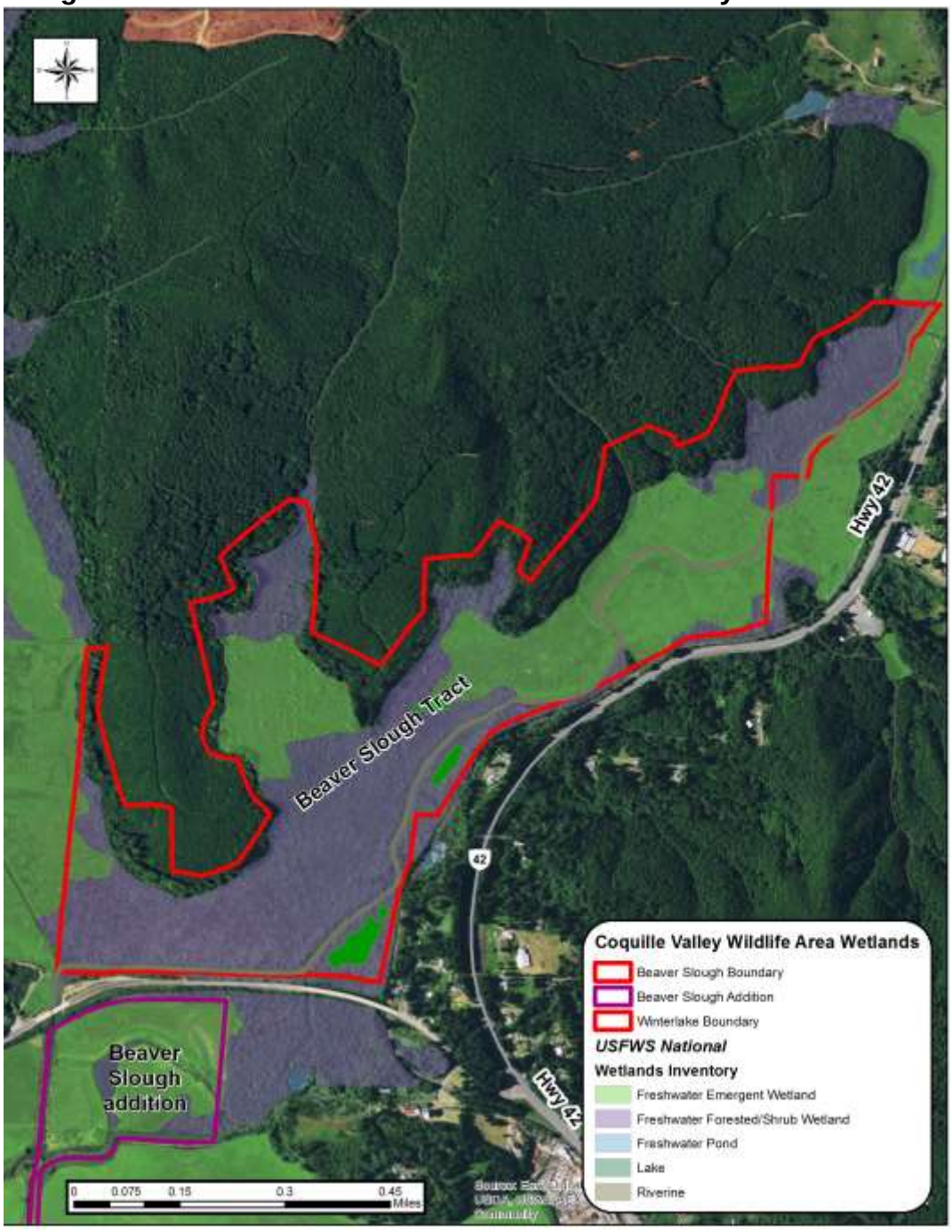
**Description of Management Units**

CVWA consists of two tracts; the Winter Lake Tract, 287.56 acres, and the Beaver Slough Tract, 300.96 acres. The Winter Lake Tract is situated west of Hwy. 42 between mile markers 7 and 8. The property is in an area where the lowest elevations of Winter Lake exist, making it ideal for restoration of salmonid habitat (Figure 2.). Thus, this is the area where most of the restoration work will be conducted on CVWA.

**Figure 2. Winter Lake Tract, CVWA, including wetland habitat designation from USFWS National Wetlands Inventory**

Beaver Slough Tract is situated on either side of Beaver Slough. A small portion of the tract is south of North Bank Lane, with the majority extending upstream for about 1.4 miles, ending near the Hwy. 42 bridge over Beaver Creek (Figure 3). This bridge is located just south of mile post 5. This tract is heavily vegetated and will require little in the way of restoration.

**Figure 3. Beaver Slough Tract, CVWA, including wetland habitat designation from USFWS National Wetlands Inventory.**



## Biological Resources

The CVWA provides valuable habitat for a variety of wildlife species due in part to its location in the Coquille Valley and the presence of extensive seasonal wetlands on the Beaver Slough Tract. There is great potential for extensive wetland and aquatic habitat restoration in the Winter Lake Tract because it is close to the Coquille River and much of the tract is just 2.5 to 4.5 feet above mean sea level (Slater et al., August 15, 2013). The potential for upland restoration also exists. As many as 50 bird species, 8 herptile species, (Oregon Watershed Enhancement Board 2010) and 52 mammal species (Verts and Carraway 1984) are believed to exist in the Coquille Valley. See Appendix II, III, and IIIb, respectively for a list of species.

The Coquille Valley is considered a critically important wintering area for waterfowl on the Pacific Coast. There are also many other wetland dependent species that use the Coquille Valley during all or part of the year. Some of these include great blue herons, great egrets, and a host of mammalian, reptilian, and amphibious species.

Appendix III and IIIb list fish species found in the Coquille River drainage. Species captured on the CVWA during 2013 spring monitoring are also listed in Appendix III. These species include a mix of native salmonid and non-game fish, as well as non-native fish.

Populations of Coho Salmon and Chinook Salmon, winter run steelhead, Cutthroat Trout, and Pacific Lamprey are produced by and spend a portion of their life cycle in the Coquille River. ODFW estimates 20,000 to 25,000 adult Coho Salmon return to the Coquille River presently. However, historic abundance may have been as high as 400,000 returning adult Coho Salmon (Lawson2004)

Appendix IV lists plant species found on Bandon Marsh National Wildlife Refuge located in the lower Coquille River near the city of Bandon. Some or all of the species listed will be found in other parts of the Coquille Valley including CVWA.

The Oregon Conservation Strategy (ODFW 2006) is a broad, over-arching document that is designed to bring attention to Oregon's native fish, wildlife and plant species (Strategy Species) and their habitats (Strategy Habitats) that are either in decline or are indicative of habitats that are threatened with decline. This document stratifies Oregon in to eight ecoregions, including the Coast Range Ecoregion where the CVWA is located. Within this ecoregion, eight Strategy Habitats occur, four of which are represented on CVWA. Those are

estuaries, freshwater wetlands, riparian habitats and wetlands. The Coast Range Ecoregion has nine mammal, eight amphibian and reptile, 16 bird and 10 fish species listed as Strategy Species that occur there (ODFW 2006). The following is more specific information on fish and wildlife species that occur on CVWA:

**Birds**

Of the 16 Strategy Species of birds listed in the Oregon Conservation Strategy, six are either likely to use CVWA based on habitat requirements for that species described in this document or they have been documented there in surveys conducted by ODFW. Those species are Aleutian Canada goose (*Branta hutchinsii leucopareia*), American bald eagle (*Haliaeetus leucocephalus*), American peregrine falcon (*Falco peregrinus*), band-tailed pigeon (*Patagioenas fasciata*), Caspian tern (*Sterna caspia*) and olive-sided flycatcher (*Contopus cooperi*)

Waterfowl

Management of the CVWA will be primarily directed towards preserving and enhancing tidally influenced wetland habitat. This will result in a variety of benefits to wintering and migrating waterfowl. Vegetation will be managed to mimic wetland plant communities historically found in the basin. It is expected that habitat manipulation will increase nesting habitat for waterfowl.

Marsh Breeding Birds

It is likely the Coquille River Valley provided extensive habitat for marsh birds such as marsh wren (*Cistothorus palustris*) and Virginia rail (*Rallus limicola*) when wetland and flooded woodland habitats were present in large quantities. Currently only a small amount of natural wetland or flooded woodland habitat exists. In 1990, it was estimated that 400 acres of the historic 12,000 acres of these habitats were in existence (Benner 1992). This has likely had a negative influence on nesting and reproduction for marsh birds. Restoration of tidally influenced wetland habitats will benefit these species.

Shorebirds

Shore birds, which feed in mud flats, are expected to benefit from restoration of tidal activity on CVWA. Tidal restoration will result in more mud flats being exposed in the tidal inundated areas at low tide. Bird species such as least sandpipers (*Calidris minutilla)*, black-bellied plovers (*Pluvialis squatarola*) and greater yellow legs (*Tringa melanoleuca)* feed in intertidal areas where mud flats are exposed during low tides. While least sandpipers tend to use salt marshes, they also use fresh water coastal wetlands along the margin of freshwater reach. Black-bellied plovers can be found in small flocks using mud flats and estuaries. Greater yellowlegs often feed by running through swallow water with their bills open attempting to catch small fish. They also feed in soft mud, probing with their bill for invertebrates including insects, mollusks and others. (Richards, 1988)

Shorebirds observed using the Winter Lake Tract of CVWA during wildlife surveys conducted by ODFW between December 2013 and November 2014 include greater yellowlegs, killdeer (*Charadrius vociferous*), Wilson's snipe (*Gallinago gallinago*), and blackbellied plover.

**Mammals**

A variety of mammal species feed, rear their young, and find cover from predators in wetlands with established vegetation. Mink (*Mustela vison*) distribution is associated with wetlands and prey such as birds (Arnold and Fritzell 1990). Wildlife density and diversity is high in vegetated wetlands (Ducks Unlimited 2015). "It appears the key to habitat that is intensely used is a dependable food source," (Novak, M et.al. 1987). Protection and restoration of wetland habitats would be beneficial to mink. (Halter 1976, Dunstone and Birks 1983). The intertidal zone has the potential to be very beneficial to mink based on relatively high population densities in areas with intertidal zones in Alaska (Harbo 1958). Based on this, mammalian species are expected to increase in population size as a result of restoration activities on the Winter Lake Tract of CVWA. On Beaver Slough Tract, where restoration is not going to be done but wetland will be maintained, habitat currently exists for mammals that are dependent on wetlands.

Restoration activities may result in increased beaver and muskrat populations. ODFW will consider control actions if their abundance and activities become incompatible with neighboring land use.

Of the nine Strategy Species of mammals listed in the Oregon Conservation Strategy, eight are likely to use CVWA based on habitat requirements for those species described in this document. Six of these species are bats: California myotis (*Myotis californicus*), fringed myotis (*Myotis thysanodes*), hoary bat (*lasiurus cinereus*), long-legged myotis (*Myotis vloans*), silver-haired bat (*Lasionycteris noctivagans*) and Townsend's big-eared bat (*Corynorhinus townsendii*). Many of these bats may only use CVWA during annual migration, but diverse habitats in or around the Coquille Valley likely provide habitat for all these species. The remaining two mammalian Strategy Species in the area are American marten (*Martes Americana*) and red tree vole (*Arborimus longicaudus*). They may use the fringe of forested habitat within CVWA around the periphery of Beaver Slough Tract.

**Amphibians and Reptiles**

CVWA provides an interesting opportunity to evaluate response of amphibians that are found in the Coquille Valley. Beaver Slough Tract represents relatively intact wetland habitat, much like historic habitats as described by Benner (1992). In contrast, Winter Lake Tract represents a wetland that has been altered considerably through diking and draining for agricultural benefits. However, Winter Lake Tract is where ODFW will concentrate efforts to restore wetland habitats. As such, ODFW has the opportunity to document amphibian

populations on Beaver Slough Tract and to describe the potential condition for Winter Lake Tract. To accomplish this monitoring, ODFW intends to work in cooperation with other entities such as Oregon State University.

Habitats on CVWA currently support red-legged frog (*Rana aurora*). Red-legged frogs have been observed on both tracts of CVWA (personal experience of the writer). The range of spotted frog (*Rana pretiosa*) includes the Coquille Valley, and habitats on Beaver Slough Tract are similar to those described as being preferred by spotted frogs (Peterson Field Guide 1985). Components described include cool permanent water with coniferous forests. Based on this, spotted frogs likely occur there. With habitat restoration on Winter Lake, habitat components that will be attractive to these two species should be increased.

Seventeen species of amphibians are listed in the Oregon Conservation Strategy as Strategy Species. Seven are Strategy Species for the Coast Range Ecoregion, and one, Western toad (*Bufo boreas*), is likely to occur on CVWA based on habitat requirements described in the Oregon Conservation Strategy (ODFW 2006). This species has not been detected in monitoring fish or wildlife surveys to date but it is expected that they occur on CVWA based on habitats available there.

One reptile species that has been detected by ODFW in wildlife surveys conducted on CVWA is the Western pond turtle (*Clemmys marmorata*). Several individuals have been seen in Beaver Slough Tract. Large woody debris in the slough, complex vegetation along the shoreline of this stream course and muddy substrate found there provide good year round habitat for Western pond turtles. Based on the description of good Western pond turtle habitat in the Final Report on Western Pond Turtle Project by Holland (1994), Beaver Slough Tract provides good year round habitat for them.

Western pond turtles are listed as a Strategy Species in the Oregon Conservation Strategy (ODFW 2006). This document lists five reptiles as Strategy Species, but the Western pond turtle is the only one listed in the Coast Range Ecosystem.

Since tidal influence will decrease progressively between those areas at lowest elevations and those at highest elevations on Winter Lake Tract, benefits to herptiles will vary in terms of habitat type and quality. Habitat types for these species will range from locations with continuous water inundation to upland areas.

**Fish**

Fish species known to occur in the Coquille Basin in the vicinity of CVWA include native and non-native species, game fish, non-game fish, and species with special State or Federal status (Appendix IIIb). Species such as anadromous salmonids (e.g. Coho Salmon, Chinook Salmon, steelhead) may be found in the

main Coquille River seasonally migrating to spawning grounds, rearing and foraging when river conditions are favorable (i.e. low velocity, high clarity, and cold water temperatures), and moving to tributaries, off-channel areas, or side sloughs during inhospitable water conditions. Table 2 shows the last ten years of spawning escapement estimates for Coho and Chinook Salmon in the Coquille Basin, and the last six years of winter steelhead redd counts for the Mid-South Coast strata.

Fall Chinook Salmon begin moving into the Coquille River in August and continue into November. Coho Salmon run primarily from September through January. There is also a small run of spring Chinook Salmon that return to the basin during April through June. Steelhead begin running in November and continue well into the spring months. Pacific Lamprey are thought to enter the river in the summer and fall. These fish over-winter and spawn the following spring from May to June.

Coho Salmon primarily exhibit what is referred to as a yearling smolt life history, spending their first year in fresh water and over-wintering before migrating to the ocean. This life history pattern contrasts with fall Chinook Salmon which migrate to the ocean in their first summer. Historic low gradient habitats provided by braided, vegetated, floodplain channels would have been highly beneficial for Coho Salmon over-wintering and preparing for out-migration. These habitats would have also benefited fall Chinook Salmon as a temporary feeding grounds prior to entering the ocean. Cutthroat Trout thrive in areas with abundant woody cover and undercut banks, which would have been abundant in historic habitat.

Spring Chinook Salmon are considered a “remnant” population today due to inhospitable summer habitat conditions in the upper basin. They typically exhibit the “stream-type” or yearling smolt life history and will benefit from a productive, low gradient, valley habitat as Coho Salmon would.

Chum Salmon (*Oncorhynchus keta*) spawn in low-gradient streams a short distance from tidewater. Fry move through estuaries to the ocean within a short time after emergence, and off-channel foraging areas that provide growth during this migration should benefit their survival. The Coquille Basin is near the southern end of Chum Salmon distribution along the Pacific Coast, and they occur in relatively low numbers in this area. However, early commercial fishery records and historical accounts indicate that Chum Salmon were much more abundant than today.

Winter steelhead have a lengthened freshwater residence time, with smolts migrating to the ocean at one to three years of age. Productive freshwater stream and wetland rearing areas with significant cover will provide protection and growth for rearing steelhead parr.

**Table 2. Annual estimates of spawning escapement[1] for the Coquille Basin.**

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Average |
|---|---|---|---|---|---|---|---|---|---|---|
| Fall Chinook | 2,801 | 2,098 | 5,081 | 12,308 | 32,318 | 16,745 | 9,300 | 5,836 | 10,418 | 10,767 |
| Coho | 28,577 | 13,968 | 8,791 | 22,286 | 23,564 | 55,667 | 5,911 | 23,637 | 41,660 | 24,896 |
| Winter Steelhead[2] | 19,550 | 24,312 | 18,806 | 9,136 | 19,927 | 9,504 | 7,414 | 15,423 | 10,877 | 14,994 |

[1] Number of spawning adult fish for coho and fall Chinook.
[2] Winter steelhead abundance is monitored by coastal strata and by redd numbers; not by individual basin spawner numbers. Number shown is redd abundance for the entire Mid-South Coast strata.

Native, non-salmonid species that would likely have thrived in the historic flooded woodland and wetland habitat in the Coquille Valley include Pacific Lamprey and Western Brook Lamprey (*Lampetra richardsoni*), Three-spined Stickleback (*Gasterosteus aculeatus*), and Staghorn Sculpin (*Leptocottus armatus*). These species find favorable habitat where water velocities are slower and substrates are finer with more sediment. Riparian vegetation and in-water wood/vegetation would have provided hiding cover, shade, insect production, and organic ecosystem inputs benefiting these species. All of these species are present today in the Coquille mainstem and tributaries, although at a reduced number from the historic condition.

Non-native fish species are favored by existing habitats with warmer temperatures, reduced flow and tidal interchange, and reduced hiding cover. This allows for predation on native fish species as well as competition for available food resources.

Ten individual species of fish are listed in the Oregon Conservation Strategy as Strategy Species for the Coast Range Ecoregion. Of these, four have been documented on CVWA during fish population monitoring surveys conducted by ODFW in 2013 (Appendix III). These are Chinook Salmon, Coastal Cutthroat Trout, Coho Salmon and Pacific Lamprey.

### Native Plants

Native plants will be encouraged through cultivation, restoration, and maintenance to promote habitat diversity. Native plant communities are expected to suppress invasive plant establishment and spread.

### Non-Native Species

Non-native plants are widespread and persistent. A list of non-native plants expected be present is shown in Appendix V. Non-native species often colonize areas of disturbance, or areas with fire suppression, thatch accumulation, and lack of biological control organisms. Noxious weed control will be a high priority

on CVWA. There are several weed species that have become established in the Coquille Valley. Some of them are aquatic in nature, such as purple loosestrife (*Lythrum salicaria*). Other non-native plants common on the CVWA include reed canarygrass (*Phalaris arundinacea*) and Scotch broom (*Cytisus scoparius)*.

ODFW will monitor for weed infestation during normal activities on the area and, as appropriate, specific surveys will be conducted annually to accomplish early detection of infestations. ODFW will treat weed infestations on CVWA using an integrated weed management approach. The agency will coordinate with the Coos County Weed Board or OSU Agricultural Extension to ensure that updated techniques are employed.

The presence of non-native fish species in the mainstem Coquille River and other streams, channels, and wetlands on the CVWA is a concern, as these species can directly or indirectly compete for food and habitat with native species. Additionally, non-native fish species (e.g. Brown Bullhead (*Ameiurus nebulosus*) and Largemouth Bass (*Micropterus salmoides*)) can prey on native fishes. Appendix V includes a list of the non-native species in the Coquille that were well-established in the local area by the mid-1900s. Black Crappie (*Pomoxis nigromaculatus*) were recently introduced and Smallmouth Bass (*Micropterus dolomieu*) were reported to have been illegally introduced in the last few years. ODFW verified Smallmouth bass presence in the South Fork Coquille River in 2011, and in the mainstem of the Coquille River near the city of Coquille as recently as 2014.

Although cold water riverine and tributary streams are not favorable to the non-native “warmwater” species such as Black Crappie, Bluegill (*Lepomis macrochirus*), Largemouth Bass, and Brown Bullhead, these species can thrive in slough or pond habitats. Some isolated ponds off the main river channel produce these warmwater species and are the source of fish found in the main river following floods that connected the ponds to the river. Yellow Perch (*Perca flavescens*) are present in Johnson Mill Pond and near river mile 29 and have recently been reported to ODFW in the mainstem Coquille River by anglers. Johnson Mill Pond is commonly connected to the river when floodwaters over-top the dike. Some of the smaller, non-native species, such as Mosquitofish (*Gambusia affinis*), can play an important role in controlling mosquito populations.

Non-native, invasive, wildlife present on the CVWA include but are not limited to nutria (*Myocastor coypus)*, Virginia opossum (*Didelphis virginiana*) and European starlings (*Sturnus vulgarus*). Specifically, nutria were first reported in the Coquille River Basin between 2005 and 2009 and are of particular management concern. ODFW will work with USDA Wildlife Services and the public to manage nutria and other invasive non-native species population levels that are consistent with management objectives set for the CVWA.

ODFW will prioritize monitoring and control of invasive species based on the extent of infestation and the likelihood that the infestation will have an adverse impact on habitats on CVWA or neighboring lands. Where appropriate, ODFW will coordinate with neighboring landowners in control efforts.

## Monitoring

Monitoring fish and wildlife use of CVWA will be the responsibility of ODFW's Umpqua Watershed District (UWD) and will be conducted as time and resources allow. To improve efficiency, ODFW may work with volunteers or other agencies to conduct some monitoring activities. For example, surveys to assess wildlife species diversity and relative abundance using CVWA will, at times be conducted with assistance of private individuals, USFWS, or members of non-governmental organizations such an the Audubon Society.

### Fish

ODFW will explore options to develop and implement scientific studies evaluating both habitat change and fish response to restoration efforts. A fish and fish habitat monitoring plan is under development, with input/guidance provided by OSU Extension and ODFW's Aquatic Inventory and Oregon Plan Monitoring program.

Objectives of fish surveys include:

- Determine fish species composition in the two CVWA tracts, and differences between the tracts;
- Determine general time of use by fish;
- Develop an index of fish population abundance;
- Monitor fish ingress/egress through tag arrays (PIT, acoustic, etc.)

Although yet to be finalized, fish monitoring methods may include deployment of fish traps, seines, electrofishing, mark/recapture techniques, and detection arrays (e.g. PIT tags or acoustic tags). It will be important to collect physical habitat data concurrently with fish data to monitor changes in fish use/abundance over time as restoration progresses.

Groundwater monitoring stations have been established in the Winter Lake area on CVWA and on some neighboring properties of the Beaver Slough Drainage District, with assistance from ODFW. The UWD will monitor and analyze data downloaded from stations on the CVWA. For a more detailed summary of monitoring plans and priorities see Appendix IX.

To establish baseline information, monitoring of fish use began before the Winter Lake Restoration Project was initiated. Monitoring will continue after habitat restoration occurs in Winter Lake Tract, and will continue for the life of this plan. This monitoring will characterize and quantify changes in fish use and abundance. Monitoring in CVWA water bodies will be done primarily in late

winter and spring (early December through May). Monitoring will provide a better understanding of migration patterns through and within CVWA, abundance, changes to fish species composition over time and the quality of habitat.

Although the fish monitoring plan is not yet finalized, the following is a list of parameters that will likely be monitored:

- water temperature,
- dissolved oxygen (DO),
- water velocity,
- riparian shading,
- pool availability,
- large wood availability,
- fish passage,
- relative fish abundance,
- species composition.

Fish biologists have established index sites for evaluating fish use based on habitat types and will establish basic monitoring protocols. Continued monitoring efforts will be overseen by UWD. Fish habitat parameters such as water quality and dissolved oxygen can be monitored using passive data loggers. These have been deployed and are periodically downloaded by UWD.
Fish use and presence is monitored through a variety of collection methods, depending on the sites selected and effectiveness of techniques. Methods have included (and likely will continue to include) the following; electrofishing, beach seines, fyke traps, hoop traps, or other nets/traps. Some of the work may be conducted by contractors, graduate students, researchers, or other entities like watershed councils. ODFW is seeking funding and outside expertise to develop and implement scientific studies evaluating both habitat change and fish response to restoration efforts.

**Plants**
Vegetation photo points are useful for documenting vegetative response to restoration activities. Photo points have been established in Winter Lake Tract to document the progress of restoration activities. Measurements of tree height in areas of vegetative plantings may be established to monitor seedling establishment and survival of willow, ash and other tree and shrubs. These photo points and surveys may also be used to identify exotic plants and direct removal efforts.

**Wildlife**
Shortly after CVWA lands were acquired by ODFW, wildlife surveys were initiated to begin documenting species and relative abundance of individuals using CVWA lands. These surveys were point count surveys of wildlife species along specific survey routes. These surveys will continue for the life of this plan on a quarterly basis. (See Appendix 1)

Ground-based point count surveys along two transects (one in Beaver Slough and one in Winter Lake) will be conducted to document water bird and other wildlife use of the project area. During these surveys, we will record wildlife species and approximate number of individuals seen. Twelve surveys will be conducted in different months to represent wildlife use during all seasons of the year. After each monthly representative survey has been accomplished, these surveys will continue as quarterly surveys to monitor wildlife response to habitat restoration efforts. Wildlife surveys began before the initiation of restoration activities in Winter Lake Tract and will continue through the life of this plan.

Burrowing and feeding activities by some wildlife (beaver and muskrat) can damage berms, and tree and shrub plantings as well as neighboring private property. Beaver and muskrat populations will be monitored as part of a population management program.

**Wildlife Diseases**

ODFW will cooperate with the Coos County Health Department and the USFWS to monitor wildlife diseases. Animals showing signs of disease may be tested as they are reported by the public or ODFW depending on the suspected disease involved. Wildlife diseases that may occur in the project area include West Nile Virus (*Flavivrus sp*.), Avian Influenza (*Influenza*), Avian Botulism (*Clostridium botilinum*), Avian Cholera (*Pasturella multocida*), Deer Hair Loss Syndrome and others. ODFW district bioloigsts will coordinate as appropriate with the ODFW veterinarian to respond appropriately to disease issues that arise.

**Mosquitoes**

Restoration and management of the CVWA are being planned to minimize the possibility of enhancing mosquito populations. ODFW and our restoration partners have consulted with mosquito experts who indicate that proposed management should not create an abundance of salt marsh mosquito (*Aedes sp*.). However, some mosquitoes may respond to the restoration of aquatic habitats on the CVWA. If mosquitos do become an issue, we will follow the ODFW Vector Control Guidance for Sensitive Areas (February 13, 2014).

Engineering of the restoration project will ensure that all lands inundated with tide water will either drain on each tide cycle or will be connected daily with water in the channel on Winter Lake Tract where fish populations exist. This will cause mosquito larvae to be accessible by fish and other predators. Three-spined Stickleback and Mosquitofish populations exist in the waters of CVWA, and these fish are known to effectively reduce mosquito production. If any disconnected water bodies are inadvertently created during the restoration project, ODFW will connect these areas hydrologically in an effort to allow natural predators of mosquitos to access mosquito larvae. If this is not effective for controlling mosquitoes or if hydrologic connection is not possible for some reason, ODFW

will release fish, such as Three-spined Stickleback, into these water bodies to prey on mosquito larvae.

Methods that have been successful in controlling mosquitoes at Bandon Marsh National Wildlife Refuge include the use of *Bacillus thuringiensis isreaelensis* (BTI) and controlling tidal inundation and connectivity in areas where mosquito reproduction is likely to occur. (William Bridgeland, USFWS Pers. Comm). BTI is a bacteria that kills mosquito larvae living in water bodies. Also, the ability to control the extent of tidal inundation on land can be useful in creating a situation that is not advantageous for mosquito reproduction (Dr. Daniel Markowski, Pers. Comm). ODFW intends to explore employing these techniques on CVWA to control mosquito reproduction and plans to monitor effectiveness through trapping mosquito adults and sampling larvae throughout the reproductive season on Winter Lake Tract as appropriate. Depending on need, ODFW may progressively use more aggressive means to control mosquitos.

**Water Distribution**
Water distribution will be monitored using wells, hydrographs, and water height gages placed in key locations. With neighboring landowner approval and coordination, monitoring sites may include neighboring lands.

## Cultural Resources

The Coquille Valley is an area where a significant amount of historic and prehistoric human activity has occurred. Radio carbon dating of archeological sites found in the Coquille Valley indicates Native Americans were present and subsisting in the area at least as far back as 140 A.D. to 420 AD. Middens, or locations where shells and remains of wildlife used for human subsistence have been uncovered in the Coquille Valley, indicate that these people relied on the river, associated wetlands and estuary to find food. During the development of the Ni-les'tun Unit of Bandon Marsh National Wildlife Refuge, many significant archeological sites and objects were found which were related to the history of Native American people stretching far back into prehistory. ODFW is sensitive to the significance of these findings and is committed to preserving and protecting any archeological sites on CVWA. To detect and appropriately protect these sites, ODFW and project contractors will coordinate and consult with the Coquille Indian Tribe, the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, and the Oregon State Historic Preservation Office.

**European Settlement of the Coquille Valley**
According to the book *A Guide to the Oregon South Coast History* (Douthit 1999), the first Europeans to settle the Coquille Valley did so in the late 1850s for the purpose of establishing small farms that produced a variety of crops. One of the major crops was hay with livestock such as cattle (*Boss sp*.) and pigs (*Sus sp*.) also being important products. Douthit noted, "By the mid-1890s, dairying had become next in importance to crop production." Douthit also state that "By

the mid-twentieth century, the value of dairy farming, beef and sheep production had far exceeded the value of other activities," (Douthit 1999). Much of the existing dikes, fences, and other infrastructure related to agricultural production can be attributed to these people or their descendants.

As time went on, it was recognized that the Coquille River provided a very useful travel route for boat traffic, including cargo-carrying ships and ferries. There were many boats that regularly moved up and down the river, stopping at several riverside communities to pick up or unload people and products. This allowed agricultural and timber products to be moved to markets located some distance from the Coquille River Valley. Coal was discovered in the vicinity of the Coquille River, which resulted in significant industrial activity beginning in the mid-1890s. The ability to transport coal by boat was a great advantage to this industry.

Commercial fishing in the Coquille River was a large industry up until the mid-1950s, when commercial harvest of salmon was made illegal on Oregon coastal rivers. Information on commercial fishing on the lower Coquille River is available from at least as far back as 1889. The commercial catch of "Silver" salmon (Coho Salmon) from the Coquille River from 1923 to 1949 ranged from 74,500 to nearly 673,000 pounds annually (Oregon Fish Commission, 1951). Several canneries once existed along the Coquille River. However, little evidence of their presence exists today. Wooden pilings still present along the river channel indicate a large amount of industry in this area, some of which was related to salmon fisheries.

## Social Environment

### Demographics

CVWA is situated in Coos County between the towns of Coquille and Bandon in the Coquille River Valley. Figures from the 2010 census indicate that 63,043 people lived in the county. The city of Coquille is the nearest incorporated city to CVWA, and its population in 2010 was 4,184. Much of the Coquille River Valley at the lowest elevations is in private ownership. These lands are managed primarily for agricultural commodities including cattle, sheep (*Ovis sp*.) and goats (*Capra sp*.) and growing hay. At middle and higher elevations, private lands are managed for timber production.

During the rainy season (November through March), the Coquille River floods the valley, which creates Winter Lake. Many private land owners charge a fee for access to hunt waterfowl on their flooded lands. Private duck clubs lease private properties and require membership, thus limiting access. As such, members of the public who want to hunt in this area but are not willing or able to pay a fee to hunt private land have limited opportunity. Prior to the development of the CVWA, the only public land hunting opportunity in the Coquille Valley was at Bandon Marsh National Wildlife Refuge.

**Land use**
Much of the Coquille Valley is managed for agriculture. To accomplish this, some lands were ditched and drained to create conditions that encourage growth of grass and other forage. The Winter Lake Tract has been managed this way. While this management scenario has provided benefits to wildlife, ODFW believes restoring tidal influence and developing this tract to promote natural attributes will contribute to more diversity of habitats.

Local residents recall that Beaver Slough was drained and diked in the past. However, the majority of this tract currently exhibits a more natural state. ODFW intends to conserve the natural attributes of this tract.

# Infrastructure

## Developments/Facilities

### Fencing

A perimeter fence will be constructed and maintained around all of the Winter Lake Tract and portions of Beaver Slough Tract to delineate property boundaries and to protect neighboring landowners from unwanted public access. This fence will also protect the CVWA from trespass livestock. This fence will be posted at appropriate spacing with CVWA boundary signs using the standard form for ODFW boundary signs.

Any interior fencing that is constructed will be temporary to direct grazing activity as needed to accomplish ODFW's objectives for fish and wildlife habitat enhancement. Interior fences will likely be electric fences that are easily constructed and removed as needed.

### Parking/Access/Easements

Initially, ODFW constructed one parking area and access point on the Beaver Slough Tract. This access point will be developed to allow access to both Beaver Slough Tract and Winter Lake Tract. The parking area has a kiosk that was constructed to be an information point, as well as the location where hunting/access permits are available. It may be necessary for ODFW to acquire access easements for public access to Winter Lake Tract. The parking and access point will be maintained to provide a point of entry for the public to enter CVWA by foot or in small water craft. Other than wheelchair access for disabled public, motor vehicle or heavy equipment access will be allowed for administrative purposes only.

## Garbage/Dumping

Parking and access points will be maintained in such a way that they promote use of CVWA. Typically, access points become focal areas for noxious weed control and garbage clean-up. Garbage cans and portable public restrooms may be provided and maintained during anticipated peak public use time periods.

## Vegetation Control

Grazing can be a very effective tool for removing grass and brush growth and it can be useful in controlling unwanted non-native vegetation. ODFW intends to use grazing to control the amount of grass and brush growth as part of an integrated weed management approach. It will be considered a potential tool to control or manipulate vegetation, and to maintain infrastructure such as berms or to maintain or improve habitat for the benefit of fish and wildlife. As an alternative to grazing, ODFW may use mechanical means such as mowing or herbicide application to manipulate vegetation in key areas. It is anticipated vegetation control will be needed on public access routes for CVWA, in certain areas where non-native vegetation such as reed-canary grass will need to be controlled, and in locations of noxious weed infestation.

## Water Distribution and Control

A significant aspect of habitat restoration on CVWA will be the restoration of tidal influence to the Winter Lake Tract. This will be accomplished by the Beaver Slough Drainage District (BSDD) using tidegates fitted with muted tidal regulators (MTR). MTRs allow control of the amount of tidal influence. Water movement will be monitored at key locations using hydrographs and gauges. The MTR will be adjusted by BSDD based on their Water Management Plan. This plan allows for adjustments to tidal inundation in BSDD's Unit 2 where Winter Lake exists.

ODFW recognizes the proposal for reintroducing tidal inundation on parts of Winter lake Tract has caused concern ffrom some neighboring landowners. The appropriate level of tide inundation will be determined through carefully controlled experimentation and monitoring. Through coordination with BSDD, tidal inundation will start at a very low level in Winter Lake Tract (Unit 2) and can be increased incrementally. Effects of inundation will be monitored with hydrographs by BSDD, and staff gauges by ODFW. These efforts will document hydrologic effects on Winter Lake Tract and to neighboring lands. The MTR can then be adjusted to control these effects. The incremental increase in inundation level will occur over a long period of time to ensure that any effects from this will be recognized and addressed.

## Facilities Maintenance

Minor maintenance activities will mostly involve perimeter berms, fences, parking areas, access points, and restroom facilities. Specific maintenance activities ODFW will conduct include mowing parking areas, repairing damaged kiosks, and replacing fence posts and fencing used to control public access. Restrooms will be provided by a local company that can place and maintain portable toilets as needed by ODFW.

The BSDD is responsible for maintaining major dikes and ditches essential to the operation of the drainage district. Since heavy equipment will not likely be assigned to or stored at CVWA, local companies will be called upon in emergency situations to provide heavy equipment. A retainer contract may be developed to address repairs that will be needed. These companies must be able to respond to breaks or leaks in the existing berm quickly enough to prevent further damage to the berm itself or neighboring private properties.

## Water Rights

Based on input from the Oregon Water Resources Department (OWRD), it is not anticipated that any water rights will be needed for proposed activities on CVWA. To ensure unexpected issues are addressed, coordination will be maintained with OWRD as plans for restoration and development are implemented.

## Fish Passage/Screening

Fish Passage: The CVWA properties will encompass portions of several streams that have native migratory Cutthroat Trout, Coho Salmon, winter steelhead, and fall Chinook Salmon, in their juvenile and adult life stages. Other native migratory fish are present at different times during the year. Stream crossings and water control structures on lands within the CVWA will be inspected to ensure that they meet or exceed ODFW's Fish Passage Criteria (OAR 635-412). Structures that fail to meet fish passage standards will be upgraded in order of importance to migratory fish, as funding is available. Specific tidegate adjustments by the BSDD may require consideration of flow volumes and engineering design criteria from ODFW

Fish Screening: The Coquille River Valley receives substantial rain during spring, fall, and winter months. In the summer, groundwater levels are generally adequately near the surface to sub-irrigate the valley pastures. Therefore, it is not expected that irrigation will be needed to meet management objectives. As such, fish screening will not be needed.

## Easements/Access Agreements

ODFW will seek easements or access agreements and permits as necessary to provide administrative and public access to CVWA lands. Where needed these will be secured from willing landowners or managers before restoration and development begins.

## Land Acquisitions and Adjustments

It is the policy of ODFW to only obtain land or interests in lands, including easements and leases from willing sellers consistent with statutory authority and ODFW's mission. These actions must be for 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 ODFW to consolidate CVWA boundaries.

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

County taxes and fire assessments will be paid on lands included in CVWA. ODFW pays in-lieu of taxes as directed by Oregon Revised Statute (ORS 496.340). The rate paid is equal to the ad valorem taxes that would have been charged against the property if it had been assessed to a private owner. ODFW will also pay fire assessments to the local fire district at twice the rate private landowners would be assessed. (ORS 477.230).

## Public Use

**Public Access**

Currently, public access occurs through one access point located at the parking area along North Bank Lane. An access-by-permit system has been employed to manage the level of public use on CVWA. Hunting/Access permits are required of all users of CVWA. All permit recipients are required to record information on these permits that can be used to identify the user, monitor the number of users, document time spent on CVWA by users and the purpose for their visit. Because the permit is required for users to enter CVWA, availability of permits could be used by ODFW to control the number of users at any specific time.

Access may be allowed to CVWA year-round with the following four exceptions:
(1) specific time periods and locations when it must be restricted to protect the public, such as during some restoration activities.
(2) if there is need to protect ODFW employees, property and interests.
(3) refuge areas within CVWA, where public access is tightly controlled, may be established if ODFW determines it is needed.
(4) in situations where ODFW determines it is needed to protect fish and wildlife resources or the public for other unforeseen reasons.

**Hunting, Trapping, and Angling**
CVWA will be open during all applicable hunting and fishing seasons unless those activities are deemed to be detrimental to sensitive resources. Coos Bay/North Bend is the largest urban area on the Oregon Coast, and is approximately 10 miles from the CVWA. CVWA is about 67 miles from Roseburg, and 134 miles from Eugene. Due in part to its proximity to these urban areas demand for public access is expected to be significant. The most significant use, in terms of the number of users per day, is expected to be waterfowl hunting.

ODFW expects some demand on the part of the public to fish Beaver Slough and other waterways on CVWA. Angling regulations will be aligned with those of the surrounding waters in the basin, unless specific regulations are necessary to meet CVWA goals and objectives. If special regulations are implemented for CVWA, changes will be based on analysis of public use, fish population status, and the anticipated effect on fish populations as a result of the implementation of special fishing regulations.

Trapping may be allowed on CVWA through a permit system so activities can be closely monitored and used to manage furbearer and un-protected mammal populations at levels consistent with CVWA goals. To keep trapping compatible with other public uses of CVWA, ODFW will consider restricting the timing and areas open for trapping activity.

**Public use other than hunting, trapping, and angling**
CVWA is expected to be a significant attraction for birders, photographers and other non-hunting or angling users because it will provide opportunities for encountering large numbers of waterfowl and other wildlife in a natural setting. Interpretive trails and viewpoints may be constructed, if appropriate, to enhance visitors' experience. The goal will be to provide opportunities for a quality experience for these user groups in concert with hunters, trappers, and anglers.

**Educational/Interpretive**
CVWA will be managed to benefit both wildlife and fish resources. As such, it will serve as an example of how coastal river wetlands can be managed to benefit multiple resources and users. Local schools will be encouraged to use the area for education. ODFW will be available, when appropriate, to conduct tours for schools or other groups for educational purposes.

## Water Management

The following is the ODFW Winter Lake Restoration Project/CVWA General Water Management & Fish Use concept:

***Note that this general description of water level management does not refer to water elevations in feet, as that level of detail will be determined in the***

***engineering/design phase of the Restoration Project. These general water management concepts follow the three "water management seasons" as described under the Beaver Slough Drainage District Water Management Plan (DWMP, 2015)***

**Summer**

Water management through the tide gates would be allowed to fill the restoration channels (main channel and secondary channels) up to nearly bankfull, depending on the tidal magnitude. It is desirable to have secondary channels fill for habitat use. The main channel would not drain completely on low tides, however secondary channels may drain. This would allow for interchange of water to allow as much over-summer rearing for native species as possible. Overtopping is not desirable, so as not to create fish stranding/vulnerability episodes. Also, overtopping during the summer months may create habitat advantages for mosquito production. This is a situation ODFW wants to avoid as much as possible.

Currently, fish use in the summer (in major ditches) is limited to high temperature/low DO-tolerant (Dissolved Oxygen) species such as Brown Bullhead. In the new major restoration channels, with twice-daily tidal water interchange, we anticipate improved water quality to allow for summer rearing of native species such as Coho Salmon and Cutthroat Trout. Additionally, there are spring sources on or adjacent to Unit Two lands that may provide thermal refugia. As temperatures warm and the Coquille River flow drops in the late spring/early summer, juvenile salmonids in the main river may be seeking thermal refugia to rear until the following spring. The restoration project may provide this refugia.

**Fall/Winter**

Water management through the tidegates would be allowed to fill the restoration channels (main channel and secondary channels) and exceed bankfull on most high tides. Depending on Coquille River level and rainfall, secondary channels may or may not drain on low tides. "Winter Lake" conditions (standing water on pastures) occur most years due to heavy rainfall and floods overtopping river dikes. Water levels over-topping the floodplain of Unit Two will facilitate over-winter rearing, with high spots remaining exposed.

Ascending to spawning grounds, adult Coho Salmon and winter steelhead may enter the tidegates of Unit Two as a result of being attracted to water coming from Beaver Creek or China Camp Creek. Since China Camp Creek will be run exclusively down the main ditch (existing), attraction of adult fish should be primarily through Unit One's tidegates.

Juvenile salmonids (especially fry) are often transported downstream from their natal stream during late fall/winter. This can occur from major freshets, as they are flushed downstream by high velocity flows, or due to displacement from high

juvenile densities. These fish, coming downstream from upper Beaver and China Camp creeks and from further upriver in the Coquille Basin should enter the restoration project where they could rear in a large expanse of overwinter habitat. This habitat will offer low velocity water, hiding cover, and habitat diversity with increasing production once the project area is planted and vegetation proceeds towards maximum density.

Tidal wetlands provide productive areas for juvenile salmonid rearing, including increased growth that translates into better survival, as opposed to stream-reared fish. Historically, the main Coquille Valley is believed to have provided a very large quantity of overwintering habitat prior to diking and draining for pasture production. Historic accounts described the condition as “timbered, brushy marshland”.

Notable benefits for waterfowl are expected by having tidal influence in the early fall months. Tidal influence will result in shallow inundation of lands in Winter Lake Tract. This will provide waterfowl opportunity for feeding on seed and macroinvertebrates. Inundation of parts of Winter Lake Tract is expected to increase aquatic macroinvertebrate production by having water present in an area typically without water inundation until fall and winter precipitation brings flooding to agricultural lands.

**Spring Drain-out**

Water management through the tidegates would be allowed to fill the restoration channels (main channel and secondary channels) to exceed bankfull in the early spring, with decreasing over-topping events as the spring progresses. The transition from spring drain-out to summer will be a gradual process, rather than an abrupt change. This gradual transition would create conditions that are not advantageous for mosquito production, and drainage of floodplain would be monitored/managed to facilitate outmigration of rearing fish. Main channel and secondary channels would not drain completely on low tides. Secondary channel drainage would occur more frequently as summer approaches.

Juvenile Coho Salmon that entered the restoration project as fry to find thermal refugia in the summer or were displaced from upper basin habitats in the fall/winter would prepare to smolt and migrate to the ocean as the spring progresses. Coho Salmon smolts are typically emigrating in late April through May, and should be in the ocean by mid-June. Young-of-the-year fall Chinook Salmon are produced higher in the basin, in the South, East, Middle, and North forks of the Coquille River. They migrate as a zero-age smolt, reaching the ocean by late August through September. On their way to the ocean, juvenile Chinook Salmon make temporary stops in tidal wetlands, utilizing these productive areas to accelerate growth and increase fitness for survival in the ocean.

For all periods, it is expected that tidal flushing will reduce conditions that currently favor warmwater, non-native fish species. Interchange of cooler Coquille River water as a result of reintroducing tidal exchange is expected to favor coldwater, native species.

## Goals, Objectives and Strategies

As stated previously 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 ODFW wants to achieve. Objectives derive from goals and provide the basis for determining strategies, monitoring fish and wildlife area accomplishments, and evaluating the success of strategies. These strategies are specific projects that may be undertaken to accomplish goals and are based on staffing and funding levels and in some cases accomplished through cooperation with other entities. The strategies listed below are not all-inclusive of work that will be accomplished on CVWA.

### Goal 1: Protect, enhance, and restore tidally influenced wetlands, riparian lands, aquatic habitats, and uplands in CVWA for the benefit of fish and wildlife consistent with ODFW's mission and compatible with neighboring land uses.

**Rationale**

Coquille Valley provides habitat for a wide variety of fish and wildlife species. Habitats presently available are productive for many species. For example, the valley is a significant wintering area for Pacific Flyway waterfowl and other birds. In addition, Coho Salmon populations exist at a level that some fishing opportunity for them in the Coquille basin currently occurs. Several other coastal streams do not have populations healthy enough for harvest opportunity.

Healthy estuaries and tidal marshes provide vital habitat components and diversity for waterfowl and provide over-wintering areas for Coho Salmon and other native fish. Estuaries are identified in the Oregon Conservation Strategy as Strategy Habitats. As such, their restoration is of high priority for ODFW. Reconnection of lands within CVWA will require coordination with drainage districts and neighboring private landowners.

Upland habitat supports a wide variety of game and watchable wildlife as well as several Sensitive Species. Strategies employed by ODFW will support upland conservation actions described in the Oregon Conservation Strategy**.**

**Objective 1.1:** Restore wetlands, riparian areas, and other aquatic habitats at key locations on the Winter Lake Tract of CVWA to mimic habitats that once

occurred naturally, with emphasis placed on over-wintering habitat for Coho Salmon.

**Strategy 1:** Fill in 1.5 miles of existing drainage ditch on the Winter Lake Tract and remove three miles of internal berms to restore hydrology to a portion of Winter Lake.

**Strategy 2:** Reconnect up to 10 miles of remnant stream channels on the Winter Lake Tract to the Coquille River.

**Strategy 4:** Plant up to 41 acres with wetland shrub vegetation on the Winter Lake Tract in such a way that habitat diversity is accomplished. As funds are available, plant additional acres of property with wetland shrubs.

**Strategy 5:** Restore tidal influence to lands on the Winter Lake Tract that were historically tidally influenced, through coordination with BSDD's District Water Management Plan.

**Strategy 6:** Construct and maintain a perimeter fence around the Winter Lake Tract to control livestock ingress and egress to Winter Lake Tract. Post signs to delineate the boundary of Winter Lake Tract.

**Strategy 7:** Control invasive species; see Goal 4 for monitoring.

**Strategy 8:** Protect, enhance and restore aquatic and upland habitats on Beaver Slough Tract by controlling invasive species and encouraging survival of desirable vegetation where appropriate.

**Objective 1.2:** Protect, enhance, and restore upland habitats within CVWA lands for the benefit of fish and wildlife.

**Strategy 1:** Plant and cultivate up to 40 acres of desirable upland vegetative species to promote quality upland habitat.

**Strategy 2:** Control invasive species; see Goal 4, Objective 4.1

**<u>Goal 2, Build, maintain and enhance CVWA facilities.</u>**

**Rationale:**
Maintenance of fences, gates, check stations, parking lots, and viewing areas is necessary to control and enhance public use and ensure public safety. In addition, maintenance, safe storage, and protection of equipment are essential to fulfill the vision of the CVWA.

**Objective 2.1:** Develop and maintain CVWA infrastructure to facilitate programs for public use, resource monitoring and maintenance of habitats.

**Strategy 1**: Develop and maintain access easements with willing adjacent landowners where needed.

**Strategy 2**: Develop and maintain a parking area.

**Strategy 3**: Investigate options to purchase or build a storage facility for equipment on either Winter Lake Tract or Beaver Slough Tract. Secure facility with a fence and structures as appropriate.

**Objective 2.2:** Maintain berms and channels in coordination with Beaver Slough Drainage District and Coaledo Drainage District.

**Strategy 1:** Conduct vegetative control on berms using mechanical vegetative removal, grazing and/or chemical methods.

**Strategy 2:** Maintain berms not maintained by BSDD and Coaledo Drainage District.

**Goal 3: Provide a variety of quality fish and wildlife oriented recreational and educational opportunities to the public.**

**Rationale**

CVWA is situated near the cities of Coos Bay/North Bend, which comprise the largest metropolitan center on the Oregon coast. It is also within a few hours' drive of other large metropolitan areas: the cities of Eugene, Springfield and Roseburg.

While wildlife use of the Coquille Valley is substantial, little access for recreational use of these resources exists due to the prevalence of private land where public access is often restricted. CVWA provides ODFW with the opportunity to provide public access for recreational pursuits such as hunting, fishing and wildlife viewing. The development of wildlife recreational use opportunities can be expected to contribute significantly to local economies (International Association of Fish and Wildlife Agencies, 2002, USFWS 2006).

CVWA also provides ODFW with an opportunity to create partnerships with local schools to help educate children and others in natural resource issues. Both Coquille and Bandon High Schools have committed to incorporating CVWA restoration projects into their environmental education curriculum. In addition, Southwestern Oregon Community College (SWOCC) has recently re-established a Forestry and Natural Resources curricula toward Associate's Degree programs (articulated with OSU), and instructors have expressed interest in utilizing CVWA for field trips).

**Objective 3.1**: Develop public access to CVWA lands in a way that is compatible with neighboring land use.

**Strategy 1:** Develop access easements with willing adjacent landowners for both tracts.

**Strategy 2:** Develop and maintain a driveway and a parking area.

**Strategy 3:** Build and maintain approximately one mile of trails along dikes.

**Strategy 4:** Provide portable restroom facilities at public access sites during high public use periods, including but not limited to hunting or fishing seasons

**Objective 3.2:** Encourage compliance with CVWA public use program.

**Strategy 1:** Coordinate with Oregon State Police to enforce compliance with CVWA regulations.

**Strategy 2:** Develop and maintain interpretive kiosks and signage for the public access area with information regarding use and key rules of CVWA.

**Strategy 3:** Clearly delineate and sign both Winter Lake and Beaver Slough Tracts.

**Objective 3.3:** Provide approximately 800 hunting, trapping, and angling use days annually.

**Strategy 1:** Implement a system for providing permits to CVWA hunters, fishers and trappers. These users will check in and out of CVWA and provide information related to their activities.

**Strategy 2:** Develop and maintain interpretive kiosks and signage for each public access areas with information related to hunting and fishing use of CVWA.

**Strategy 3:** Develop news releases as needed noting hunting, trapping, angling and viewing opportunities on the CVWA.

**Strategy 4:** Evaluate the need for and possibly implement a regulated public use program.

**Objective 3.4:** Provide approximately 800 other recreation/interpretation use days annually.

**Strategy 1:** Develop and maintain interpretive kiosks for the public access area with information targeting visitors who are not planning on engaging in hunting or fishing.

**Strategy 2:** Develop news releases and use social media to publicize wildlife viewing opportunities on the CVWA.

**Strategy 3:** Develop and distribute wildlife viewing opportunity brochures for CVWA. Distribute to local ODFW Offices, Chambers of Commerce, other agency offices, etc.

**Strategy 4:** As in Objective 3.3; Implement a permit system for recreational users of CVWA other than hunters, trappers, and fishers.

**Objective 3.5** Provide approximately 60 student days annually through class tours, volunteer education/work days, and individual instruction by communicating educational opportunities to local schools and other educational organizations.

**Strategy 1:** Develop and send out news releases, noting viewing and other recreational opportunities on the CVWA.

**Strategy 2:** Develop and foster relationships with local schools and educational groups such as Oregon Stewardship, Audubon Society, and Scouts. Develop a flyer describing wildlife viewing and education opportunities and potential to get involved in restoration work.

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**Strategy 3:** Promote at least 4 class educational trips per year to the CVWA at local schools, emphasizing ODFW educational materials such as Project Wild, Project Aquatic, etc.

**Strategy 4:** Work with schools in Coquille, Bandon, and other communities to incorporate CVWA restoration work into their curriculum. All education levels from grade school through college will be welcome and their participation will be actively pursued by ODFW.

**Goal 4: Evaluate restoration and management actions to ensure habitat benefits for fish and wildlife are consistent with ODFW's mission and compatible with neighboring land uses.**

**Rationale**

The Coquille Valley provides habitat for many species of fish and wildlife. However many acres of these high quality habitats have been lost as a result of human activities such as diking and draining of wetlands and removal of wetland vegetation. ODFW has opportunities to conduct restoration projects on CVWA that will recreate some of the lost habitats or create conditions that are beneficial to native fish and wildlife populations.

Monitoring these populations using habitats on CVWA in their pre-restoration condition will be useful in describing current use from these species. Continued monitoring as restoration projects are conducted and habitat progresses to maturity will be imperative for measuring fish and wildlife response to them.

Populations of beaver and muskrat may increase as a result of wetland restoration. Damage from these animals to infrastructure which makes wetlands restoration possible must be controlled to protect the infrastructure's integrity. Not doing so may result in damage to CVWA, Beaver Slough Drainage District infrastructure, and adjacent private property.

The Coquille River Valley has several invasive species present, including but not limited to: purple loosestrife, Scotch broom, blackberry, various thistles, reed canary grass, Largemouth Bass, *Gambusia (*Mosquitofish), Brown Bullhead, European starlings and nutria. Some of these species exist on CVWA and others may invade CVWA in the future.

**Objective 4.1:** Evaluate effects of restoration within CVWA and on adjacent private property. Adjust activities on CVWA to accomplish desired conditions and to ensure that restoration activities are compatible with neighboring land use.

> **Strategy 1:** Develop and employ monitoring methodology to determine changes in water movement and distribution below ground level by the installation of piezometers in water wells at key locations within and adjacent to (with landowner permission) CVWA before restoration efforts commence to monitor ground water level. Coordinate with BSDD to continue to monitor these water wells after restoration activities are complete for a period of up to five years.
>
> **Strategy 2:** Continue to monitor these water wells after restoration activities are complete for a period of five years.
>
> **Strategy 3:** Develop and employ monitoring methodology to determine changes in water movement and distribution above ground level by using water data loggers placed in key locations.
>
> **Strategy 4:** Develop and employ monitoring methodology to determine changes in vegetation as a result of habitat restoration efforts by conducting upland, wetland and aquatic vegetative surveys periodically on

CVWA. Methods may include but are not limited to the use of photo points, range cages and plot vegetative sampling surveys.

**Strategy 5:** Adjust water inundation level through adjustment of MTR to put the development of vegetative community on a trajectory toward desired conditions.

**Strategy 6:** Adjust management regime on CVWA to benefit fish and wildlife populations based on the results of surveys.

**Strategy 7:** Adjust tidal inundation levels through an agreement with BSDD. Make adjustments using the muted tidal regulators that will be installed as a result of the China Camp Creek Project. Adjustments will be made to enhance fish access to Winter Lake Tract and create attractive habitat for fish and wildlife populations. Water inundation will remain below any level that causes surface or sub-surface inundation of properties outside of Unit 2 as it is defined in Beaver Slough Drainage District water management plan.

**Strategy 8:** Influence plant communities above the inundation area by mowing, grazing and planting desirable plants to accomplish desired condition.

**Strategy 9**: Address damage to infrastructure on CVWA from beaver and muskrat populations that may increase as a result of Winter Lake Restoration Project. Coordinate with U.S. Department of Agriculture, Wildlife Services (USDA Wildlife Services) to address populations of these animals if recreational trapping does not address the populations.

**Objective 4.2:** Design and implement monitoring programs for fish and wildlife populations using the CVWA.

**Strategy 1:** Capture fish, with special emphasis on Coho Salmon, using appropriate traps for identification, enumeration and marking. This will be done pre- and post-habitat restoration.

**Strategy 2:** Install tag monitoring equipment to detect marked fish movement.

**Strategy 3:** Develop wildlife survey transect routes, with special emphasis on water birds, as part of a standardized survey method.

**Strategy 4:** Conduct wildlife surveys as appropriate to monitor the effects of habitat restoration. This will be done pre- and post-habitat restoration.

**Objective 4.3:** Evaluate and prioritize control of invasive plant, fish and terrestrial animal species found on CVWA based on the risk they pose to native species, habitats, and neighboring land use.

**Strategy 1:** Conduct periodic surveys to detect establishment of invasive plant populations and monitor the development of existing populations to determine if species present on CVWA pose a high risk of having a negative impact to fish and wildlife habitats.

**Strategy 2:** Conduct periodic surveys to monitor populations of invasive wildlife.

**Strategy 3:** Control vegetative invasive species determined to be of high priority for an integrated pest management system which may include pesticide application, manual pulling, grazing, haying, burning, biological controls and other methods.

**Strategy 4:** Control mammalian or avian invasive species determined to be of high priority using an integrated pest management system, including but not limited to trapping or shooting. This may include using ODFW and USDA Wildlife Services as well as recreational trappers to remove non-native nutria through trapping and shooting.

## Implementation

### Funding

Initial funding for CVWA implementation and operation will come through funds obtained from the land exchange, since the land and its assets at Eel Lake were of higher value than CVWA. Funds will also be secured from the National Coastal Wetlands Conservation Grant Program administered by the USFWS.

Additional funding is to be determined – Options include the Oregon Watershed Enhancement Board (OWEB), ODFW Fish Restoration and Enhancement Program (R&E), Fish America Foundation, Wild Rivers Coast Alliance, PSC Southern Boundary Fund, Ducks Unlimited, The Nature Conservancy, USFWS Sport Fish Restoration, and Pittman-Robertson funds.

### Staffing/Organization

Direction for managing CVWA will come from the Charleston Field Office of ODFW which is supervised by the UWD manager in Roseburg. The Charleston Field Office and Umpqua Watershed District Office will have current duties revised to accomplish CVWA goals.

## Partnerships

A number of other state, federal, and local agencies and interest groups are anticipated to assist with management activities on the CVWA. Specific organizations and roles are to be determined, but may include: Coquille Watershed Association, The Nature Conservancy, Ducks Unlimited, USFWS, Coquille Indian Tribe, Coquille STEP, Wild Rivers Coast Alliance, Beaver Slough Drainage District, Coaledo Drainage District, OWEB, USDA-Wildlife Services, R&E, Access and Habitat Board, Coquille High School, Bandon High School, and SWOCC.

## Compliance Requirements

This document was developed to comply with all Federal and State laws, Oregon Revised Statutes (ORS), Oregon Administrative Rules (OAR) and ODFW policies. Full implementation of all components of this plan will require compliance with laws, regulations, rules and policies listed in Appendix VI.

## Plan Amendment and Revision

It is ODFW's intention to employ restoration, development and management actions as they are described in this document. Minor alterations to these actions are expected, based on information gained from the monitoring programs. Any proposed major changes to actions will be announced to the public and the stakeholder committee prior to making those changes, in an effort to gain public input related to proposed changes before they occur. These announcements will be made using the appropriate media outlet. Neighboring landowners, the Stakeholder Committee and user groups of CVWA will be the primary targets of this process to provide information before changes are implemented. Public input will be considered by ODFW before any major changes are implemented, and any major changes to the Plan will be reviewed and approved by the Oregon Fish and Wildlife Commission prior to adoption.

## Adaptive Management

### *What is Adaptive Management?*

Governmental entities charged with the task of making natural resource decisions need the ability to move toward overall ecological goals without complete or perfect information. Adaptive management allows for flexibility to adjust a project based on new information. Agencies use a variety of approaches that involve different levels of political concern, historical precedence, data analysis, and evaluation to make decisions. Adaptive management allows for an open line of communication between a management decision and its outcome, and for a response to address the new information.

The two underlying principles of adaptive management are: (1) the views and knowledge of all interested parties are included (or considered), and (2) management must move forward even though leaders are not sure what all the

effects of an action may be. Figure 4 provides a general description of the Adaptive Management process. Table 3 provides a description of the Adaptive Management process, and proposed application at CVWA.

**Figure 4: Adaptive Management 6-Step Process (British Columbia Ministry of Forests and Range. 2012)**


ODFW is committed to being a good neighbor through thoughtful restoration activities and operation of CVWA. Through the use of adaptive management, it is believed that ODFW, with the help of surrounding landowners, can monitor activities, identify opportunities for better management, and adjust operations to capitalize on the identified opportunities.

**Table 3. Adaptive Management six–step process example, CVWA**

| | Water Management | Wildlife Area Access | Hunter Management | Native/Invasive Species Management |
|---|---|---|---|---|
| Assess Problem | Hold regular meetings with Stakeholder Committee to identify and begin assessment of problems. Monitoring water level will reveal the issue. | Periodically interview users regarding quality of their experience on CVWA. Communicate with law enforcement to identify trespass and other violations. | Periodically interview users regarding quality of their experience on CVWA. Communicate with law enforcement to identify trespass and other violations. | Develop a list of expected invasive species and define management actions; solicit input from stakeholders |
| Design | Involve experts to design a solution to water level problem. | Secure legal access/easements to CVWA access point. Post boundaries. | Development of permit system and administrative rules to address problem | Employ conventional methods to design integrated invasive species management system (IISMS). Based on availability of funding |
| Implement | Coordinate with Drainage District to manipulate MTR to attain appropriate inundation. | Ensure that legal access and posting is done before high public use times. | Implement needed changes according to legal authority coordinating with F&W Commission ruling. | Secure funding support from appropriate sources to employ IISMS. |
| Monitor | Monitor effects of water level changes on CVWA and (with permission) neighboring properties. | ODFW and OSP will be a presence at CVWA based on activities. | ODFW and OSP will be a presence at CVWA based on activities | Employ conventional methods to monitor for invasive species establishment. |
| Evaluate | Include monitoring results, fish and wildlife reaction, and input from Steering Committee. | Consult with law enforcement, ODFW personnel and public input. | Consult with law enforcement, ODFW personnel and public input. | Evaluate IISMS in relation to CVWA goals. |
| Adjust | Make adjustments in water level if desired results are not attained. | Make adjustments based on need and legal authority. | Make adjustments based on need and legal authority. | Make adjustments if CVWA goals are not met. |

# References


Arnold, T. W. and E. K. Fritzell. 1990. Habitat use by male mink in relation to wetland characteristic and avian prey abundance. Canadian Journal of Zoology

Audubon Society of Portland. 2015
http://audubonportland.org/local-birding/iba/iba-map/coquille-valley

Beaver Slough Drainage District (BSDD). 2015. District Water Management Plan. Unpublished Report. Adopted by BSDD Board September 23, 2015.

Benner, P. 1992 Historic Reconstruction of the Coquille River and surrounding Landscape. US Forest Service, Northwest Forest and Range Experimental Station, Corvallis Oregon.

Bridgeland, William, Ph. D. USFWS, Personal Communication, June 18, 2015

British Columbia Ministry of Forests and Range. 2012. *Defining Adaptive Management.* [online] URL: http://www.for.gov.bc.ca/hfp/amhome/Admin/index.htm

Brunke, K. and H. Havens. Moist-Soil Management
www.mdwfp.com/media/8829/moist-soillmanagement.pdf

Coquille Indian Tribe, 2007. Coquille River Subbasin Plan. North Bend, OR.

Douthit, Nathan. 1999. A Guide to Oregon South Coast History, Oregon State University Press, Corvallis OR.

Ducks Unlimited, A Primer on Moist-Soil Management,
http://www.ducks.org/printPage.aspx?documentID=9583. April, 29, 2015

Dunstone, N. and J.D.S Birks. 1983. Activity and Habitat Usage by Coastal-Living Mink, Acta Zool. Fennica 174:198-191, 1983

Forstall, R. L., 1990.
http://www.census.gov/population/www/censusdata/cencounts/files/or190090.txt
Population Division, U.S. Bureau of the Census, Washington DC.

Gray, Mike. 2012. Personal communication. District Fish Biologist with Oregon Department of Fish and Wildlife. Charleston, OR.

Halter, D.F. 1976. The Coastal Mink of Vancouver Island, British Columbia, Ph.D. Thesis, University of British Columbia, Vancouver, British Columbia, Canada.

Harbo S.J. 1958. An investigation of Mink in Interior and Southeastern Alaska, Masters Thesis University of Alaska, Fairbanks, AK.

Holland, D.C. 1994. Final Report on the Western Pond Turtle Project, Oregon Diversity Division, Oregon Department of Fish and Wildlife, 31 August 1994.

International Associations of Fish and Wildlife Agencies. Economic Impact of Hunting in America, 444 North Capitol St. NW, Suite 544, Washington D.C. 2001
Johnson, F.A., C.T. Moore, W.L. Kendall, J.A. Dubovsky, D.F. Caithamer, J.T. Kelley, Jr., and B.K. Williams. 1997. *Uncertainty and the management of mallard harvests.* Journal of Wildlife Management 61:202-216.

L. Brophy, Bandon Marsh National Wildlife Refuge, Baseline Vegetation Monitoring, Plant Community Mapping and Soil Analysis. Green Point Consulting, , Corvallis, OR 97330.

Lawson, P. W., E. Bjorkstedt, C. Huntington, T. Nickelson, G.L. Reeves, H.A. Stout, and T.C. Wainwright. 2004. Identification of Historic Populations of Coho Salmon in the Oregon Coast Evolutionary Significant Unit. Corvallis, OR.

Lowe, Roy. 2012. Personal communication. U.S. Fish and Wildlife Service, Oregon Coast Wildlife Refuge Complex. Newport, OR.

Markowski, Daniel, PhD. Vice-President, Vector Disease Control, Inc., Personal Communication October 10, 2013.

Murray, C. and D.R. Marmorek. 2004. Adaptive management: A science-based approach to managing ecosystems in the face of uncertainty. In: N.W.P. Munro, T.B. Herman, K. Beazley and P. Dearden (eds.). *Making Ecosystem-based Management Work: Proceedings of the Fifth International Conference on Science and Management of Protected Areas, Victoria, BC, May, 2003.* Science and Management of Protected Areas Association, Wolfville, Nova Scotia. [online]
http://www.essa.com/downloads/AM_paper_Fifth_International_SAMPAA_Conference.pdf

Nickelson, T. 2012. Future Analysis for Wetlands Restoration in the Coquille River Basin: How Many Adult Coho Salmon Might We Expect to be Produced, A Report to the Nature Conservancy, November 2012.

Oregon Department of Fish and Wildlife (ODFW), 2007. Oregon Coast Coho Conservation Plan for the State of Oregon. Salem, OR.

ODFW, 2014. Oregon Department of Fish and Wildlife Vector Control Guidance for Sensitive Areas.

ODFW. 2006. The Oregon Conservation Strategy. 2006. Salem Oregon.

ODFW. 1992. DRAFT Coquille Basin Fish Management Plan, Salem OR.

Oregon Fish Commission (OFC), 1951. Fisheries Statistics of Oregon. OFC Contribution No. 16. Portland, OR

Oregon Watershed Enhancement Board, application to US Fish and Wildlife Service, National Coastal Wetlands Conservation Act grant program, June 2010.

Partnership for Disaster Resilience, 2010. Coos County Multi-jurisdictional Natural Hazard Mitigation Plan, University of Oregon, Eugene OR.

Peterson Field Guide, Western Reptiles and Amphibians, Houghton Mifflin Company, New York, NY, 1985

Richards, A. 1988. Shorebirds, A Complete guide to their Behavior and Migration. Gallery Books, New York, NY.

Slater, P, T.J. North, and A.H. Rippe. 2013. Geotechnical Investigation Report, China Camp Creek Project, Coquille Oregon, August 15, 2013, Coos Bay, OR

U.S. Fish and Wildlife Service, Bandon Marsh National Wildlife Refuge. 2011. Avian Monitoring at Bandon Marsh National Wildlife Refuge, 2011, Bandon OR.

U.S. Fish and Wildlife Service. 2006. Wildlife and Sport Fish Restoration Program, Wildlife Watching in the U.S. and the Economic Impact on National and State Economies in 2006, Addendum to the 2006 National Survey of Fishing, Hunting and Wildlife-associated Recreation, Arlington, VA.

Verts, B.J. and L. Carraway. 1984. Keys to the Mammals of Oregon. Oregon State University, Department of Fisheries and Wildlife, Corvallis, OR.

Williams, B. K., R. C. Szaro, and C. D. Shapiro. 2009. *Adaptive Management: The U.S. Department of the Interior Technical Guide.* Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC. [online] URL: http://www.doi.gov/initiatives/AdaptiveManagement/documents.html

## Appendix I

### *DRAFT TIMELINE FOR RESTORATION AND DEVELOPMENT*

***Some priorities will be adjusted based on staff availability and timing of restoration project implementation***

Before restoration

ODFW will monitor fish and wildlife use and water movement to establish baseline information.

Year One

a) Public Use, information, education
   i) Identify and begin development of access point.
   ii) Upgrade, repair and/or replace existing fences.
   iii) Determine hunter, angler, and wildlife viewing access level considered compatible with existing infrastructure and other public users.
   iv) Develop and adopt wildlife area regulations.
   v) Post area boundaries.
   vi) Develop a public hunting program with emphasis on waterfowl hunting.
   vii) Evaluate the need for public waste disposal, both garbage and human waste.
   vii) Disseminate information through available media (T.V., newspapers, radio) concerning need, goals, and development timeline for CVWA. Information will also be posted on the ODFW website and ODFW social media sites as appropriate.
   ix) Begin establishing on-site kiosks/information signs providing guidelines and rules for public use of the CVWA.
   x) Determine appropriate hunting and angling regulations for the CVWA.

b) Fish and Wildlife Habitat
   i) Develop plans/designs for fish and wildlife habitat improvements/restoration on the CVWA including:
      (1) Secure necessary permits for habitat improvement/restoration project. Ensure that all restoration activities will be conducted according to federal, state, and local laws, including, but not limited to: Fill and Removal, Oregon Civil Law regarding Doctrine of Drainage, etc.
      (2) Initiate habitat restoration progress monitoring (i.e. photo points; population abundance/diversity monitoring). Pre-project/baseline monitoring prior to restoration actions.
      (3) Initiate control of noxious weeds on all units of the CVWA.
      (4) Develop Sharecrop/Grazing Agreements as a way to control vegetation and noxious weeds.

   ii) Develop grant applications and seek funding for year two implementation of restoration actions.

c) Develop a wildlife area management plan for adoption by the Fish and Wildlife Commission.

(i) Organize a Stakeholder Committee to assist with development of wildlife area management plan.

d) Direct Fish and Wildlife Management and Surveys

(i) Develop plan for management/survey of native and non-native fish and wildlife on the CVWA including:

(1) Fish and wildlife abundance and diversity surveys.

(2) Control of non-native/native wildlife, primarily nutria and monitoring of abundance and impacts.

(3) Strategies for use of livestock and monitoring of livestock use.

<u>Year Two.</u>

a) Public Use, information, education

i) Complete development of access points for all units of the CVWA.

ii) Continue upgrade, repair, and/or replacement of existing fences. Complete development of CVWA regulations.

iii) Complete posting of area boundaries.

iv) Implement hunt program.

(1) Monitor use and harvest.

v) Accommodate hunter, angler, and wildlife viewing access at a level considered compatible with existing infrastructure and other user groups.

vi) Implement public waste disposal, both garbage and human waste as is deemed necessary in year one.

vii) Continue dissemination of information on goals, regulations, and restoration of CVWA to media (T.V., newspapers, radio), and post on ODFW website and ODFW social media sites as appropriate.

viii) Complete establishment of on-site kiosks/information signs providing guidelines and rules for public use and species found on the CVWA.

b) Fish and Wildlife Habitat

(Work with local volunteer organizations and watershed councils to assist with restoration projects)

i) Initiate implementation of fish habitat improvements/restoration on the CVWA including:

(1) Begin restoration of tidal regimes to the greatest extent possible on applicable units of the CVWA properties considering constraints

(2) Begin reestablishment of native site upland plant communities to the extent that they contribute to CVWA goals

(3) Begin reconstruction/restoration of natural tidal channels to the extent possible for applicable units of the CVWA considering constraints such as adjacent landowners; historical condition/site potential; etc.

(4) Begin restoration of native riparian plant communities to the extent possible on all units of the CVWA.
(5) Continue fish habitat restoration progress monitoring (i.e. photo points; population abundance/diversity monitoring). Complete baseline/pre-implementation monitoring.
(6) Control noxious weeds on all units of the CVWA.
(7) Continue to employ Sharecrop/Grazing Agreements with neighboring or adjoining landowners as a way to control vegetation and noxious weeds during restoration phase.

c) Direct Fish and Wildlife Management and Surveys
(i) Implement plan for management/survey of native and non-native fish and wildlife on the CVWA including:
(1) Continue with, and adapt as necessary, the fish and wildlife abundance and diversity surveys to be consistent with improved habitat.
(2) Implement control of non-native and native wildlife, (primarily nutria) and beaver as needed. Implement monitoring of abundance and impacts of species in need of control.
(3) Implement strategies identified in plan for use of livestock.

Year Three

Continue Restoration actions; initiate post-restoration monitoring, depending on action progress.

Year Four and five

Continue Restoration actions; continue post-restoration monitoring, depending on action progress.

Year five—

Compile five-year progress report and plan review/update. Some actions will be adjusted to reflect new information from monitoring that dictates appropriate changes. Revisit and revise management prospectus as needed.

Year six

Develop a long range management plan for adoption by the Fish and Wildlife Commission.

## Appendix II

## Wildlife Species that may be found on the Coquille Valley Wildlife Area (as taken from Oregon Watershed Enhancement Board, 2010)

**WATERFOWL**

| | |
|---|---|
| Mallard | *Anas platyrhynchos* |
| Gadwall | *Anas strepera* |
| American Wigeon | *Anas americana* |
| Green-winged teal | *Anas crecca* |
| Northern Shoveler | *Anas clypeata* |
| Northern pintail | *Anas acuta* |
| Cinnamon teal | *Anas cyanoptera* |
| Canvasback | *Aythya valisineria* |
| Greater Scaup | *Aythya marila* |
| Lesser Scaup | *Aythya affinis* |
| Common Goldeneye | *Bucephala clangula* |
| Bufflehead | *Bucephala albeola* |
| Western Canada goose | *Branta canadensis* |
| Tundra swans | *Cygnus columbianus* |

**RAPTORS AND OWLS**

| | |
|---|---|
| Bald eagle | *Haliaeetus leucocephalus* |
| Peregrine falcon | *Falco peregrinus* |
| Red-shouldered hawk | *Buteo lineatus* |
| Cooper's hawk | *Accipiter cooperii* |
| Northern goshawk | *Accipiter gentilis* |
| Northern harrier | *Circus cyaneus* |
| Short-eared owl | *Asio flammeus* |
| Merlin | *Falco columbarius* |

**HERONS AND EGRETS**

| | |
|---|---|
| Great blue heron | *Ardea herodias* |
| Snowy egret | *Egretta thula* |

**SHOREBIRDS**

| | |
|---|---|
| Black-bellied plover | *Pluvialis squatarola* |
| Killdeer | *Charadrius vociferus* |
| Greater yellowlegs | *Tringa melanoleuca* |
| Western sandpiper | *Calidris mauri* |
| Long-billed curlew | *Numenius americanus* |

**LANDBIRDS**

| | |
|---|---|
| Willow flycatcher | *Empidonax trailii* |
| Ash-throated flycatcher | *Myiarchus cinerascens* |
| Purple martin | *Progne subis* |

| | |
|---|---|
| Tree swallow | *Tachycineta bicolor* |
| Black-capped chickadee | *Parus atricapillus* |
| Chestnut-backed chickadee | *Parus rufescens* |

**LANDBIRDS (CONT'D)**

| | |
|---|---|
| White-breasted nuthatch | *Sitta carolinensis* |
| Bewick's wren | *Thryomanes bewickii* |
| Marsh wren | *Cistothorus palustris* |
| Swainson's thrush | *Catharus ustulatus* |
| Varied thrush | *Ixoreus naevius* |
| Hutton's vireo | *Vireo huttoni* |
| Orange-crowned warbler | *Vermivora celata* |
| Yellow warbler | *Dendroica petechia* |
| Wilson's warbler | *Wilsonia pusilla* |
| Lazuli bunting | *Passerina amoena* |
| Yellow-breasted chat | *Icteria virens* |
| Fox sparrow | *Passerella iliaca* |
| Golden-crowned sparrow | *Zonotrichia atricapilla* |
| Lesser goldfinch | *Carduelis psaltria* |
| Western meadowlark | *Sturnella neglecta* |
| Band-tailed pigeon | *Columba fasciata* |

**HERPTILES**

| | |
|---|---|
| Western pond turtle | *Clemmys marmorata* |
| Southern torrent salamander | *Rhyacotriton variegatus* |
| Rough-skinned newt | *Taricha granulosa* |
| Clouded salamander | *Aneides ferreus* |
| Coastal tailed frog | *Ascaphus truei* |
| Western toad | *Bufo boreas* |
| Red-legged frog | *Rana aurora* |
| Foothill yellow-legged frog | *Rana boylii* |

**MAMMALIA**

| | |
|---|---|
| Virginia opossum | *Didelphis virginiana* |
| Vagrant shrew | *Sorex vagrans* |
| Pacific shrew | *Sorex pacificus* |
| Marsh shrew | *Sorex bendirii* |
| Trowbridge's shrew | *Sorex trowbridgii* |
| Shrew-mole | *Neurotrichus gibbsii* |
| Townsend's mole | *Scapanus townsendii* |
| Little brown myotis | *Myotis lucifugus* |
| Yuma myotis | *Myotis yumanensis* |
| Long-eared yotis, | *Myotis evotis* |
| Long-leggged myotis, | *Myotis volans* |
| California myotis | *Myotis californicus* |
| Silver-haired bat | *Lasionycteris noctivagans* |
| Big brown bat | *Eptesicus fuscus* |

| | |
|---|---|
| Hoary bat | *Lasiurus cinereus* |
| Townsend's big-eared bat | *Plecotus townsendii* |
| Brush rabbit | *Sylvilagus bachmani* |
| **MAMMALIA (CONT'D)** | |
| Mountain beaver | *Aplodontia rufa* |
| Townsend's chipmunk | *Tamias townsendii* |
| California ground squirrel | *Spermophilus beecheyi,* |
| Western gray squirrel, | *Sciurus griseus* |
| Douglas squirrel | *Tamiasciurus douglasii* |
| Northern flying squirrel | *Glaucomys sabrinus* |
| Dusky-footed woodrat | *Neotoma fuscipes* |
| Bushy-tailed woodrat | *Neotoma cinerea* |
| Beaver | *Castor canadensis* |
| Nutria | *Myocatsor coypus* |
| Deer mouse | *Peromyscus maniculatus* |
| Western red-backed vole | *Clethrionomys californicus* |
| White-footed vole | *Phenacomys albipes* |
| Red tree vole | *Phenacomys longicaudus* |
| Townsend's vole | *Microtus townsendii* |
| Long-tailed vole | *Microtus longicaudus* |
| Creeping vole | *Microtus oregoni* |
| Muskrat | *Ondatra zibethicus* |
| Pacific jumping mouse | *Zapus trinotatus* |
| Porcupine | *Erethizon dorsatum* |
| Coyote | *Canis latrans* |
| Gray fox | *Urocyon cinereoargenteus* |
| Black bear | *Ursus americanus* |
| California sea lion | *Zalophus californianus* |
| Ringtail | *Bassariscus astutus* |
| Raccoon | *Procyon lotor* |
| Marten | *Martes americana* |
| Ermine | *Mustela ermine* |
| Long-tailed weasel | *Mustela frenata* |
| Mink | *Mustela vison* |
| Western spotted skunk | *Spilogale gracilis* |
| Striped skunk | *Mephitis mephitis* |
| River otter | *Lutra Canadensis* |
| Harbor seal | *Phoca vitulina* |
| Cougar | *Felis concolor* |
| Bobcat | *Felis rufus* |
| Elk | *Cervus elaphus* |
| Black-tailed deer | *Odocoileus hemionus columbiana* |

## Appendix III

## List of Fish species in the Coquille River and in Coquille Valley Wildlife Area.

| Fish Species Occurring in the Coquille River Mainstem and Tributaries (below rm 40) [1] | | | |
|---|---|---|---|
| **Common Name** | **Scientific Name** | **Game Fish** | **2013 CVWA Monitoring [2]** |
| **NATIVE SPECIES:** | | | |
| **White Sturgeon** | ***Acipenser transmontanus*** | ✓ | |
| **Green Sturgeon** | ***Acipenser medirostris*** | ✓ | |
| **Pacific Eulachon/Smelt** | ***Thaleichthys pacificus*** | | |
| **Pacific Llamprey** | ***Entospenus tridentata*** | | ✓ |
| **Western Brook Lamprey** | ***Lampetra richardsoni*** | | |
| **Coho Salmon** | ***Oncorhynchus kisutch*** | ✓ | ✓ |
| **Steelhead (winter run)** | ***O. mykiss*** | ✓ | |
| **Cutthroat Trout** | ***O. clarki ssp.*** | ✓ | ✓ |
| **Chinook (fall and spring run) Salmon** | ***O. tshawytscha*** | ✓ | |
| **Chum Salmon** | ***O. keta*** | ✓ | |
| **Speckled Dace** | ***Rhinichthys osculus*** | | |
| **Largescale Sucker** | ***Catostomus macrocheilus*** | | |
| **Three-spined Stickleback** | ***Gasterosteus aculeatus*** | | ✓ |
| **Coast Range Sculpin** | ***Cottus aleuticus*** | | |
| **Pacific Staghorn Sculpin** | ***Leptocottus armatus*** | | |
| **Prickly Sculpin** | ***Cottus asper*** | | |
| **NON-NATIVE SPECIES:** | | | |
| **Mosquitofish** | ***Gambusia affinis*** | | ✓ |
| **American Shad** | ***Alosa sapidissima*** | ✓ | |
| **Largemouth Bass** | ***Micropterus salmoides*** | ✓ | ✓ |
| **Smallmouth Bass** | ***Micropterus dolomieui*** | ✓ | |
| **Striped Bass** | ***Morone saxatilis*** | ✓ | |
| **Bluegill** | ***Lepomis macrochirus*** | ✓ | ✓ |
| **Black Crappie** | ***Pomoxis nigromaculatus*** | ✓ | ✓ |
| **Brown Bullhead** | ***Ameiurus nebulosus*** | ✓ | ✓ |

**[1] List is not exhaustive; does not include species that are primarily marine-dependent (e.g. rockfish spp., gunnels, flounders/soles, etc.).**

**[2] Species identified in fish monitoring conducted in spring of 2013 in CVWA water bodies.**

**Appendix IIIb.**

**Special status fish species in the mainstem Coquille River and tributaries.**

| Common Name | Scientific Name | State Status [1] | Federal Status [2] |
|---|---|---|---|
| Green Sturgeon | *Acipenser medirostris* | | T |
| Pacific Eulachon/Smelt | *Thaleichthys pacificus* | | T |
| Pacific Lamprey | *Entosphenus tridentata* | S/V | SoC |
| Western Brook Lamprey | *Lampetra richardsoni* | S/V | |
| OR Coast Coho | *Oncorhynchus kisutch* | S/V | T |
| OR Coast steelhead | *O. mykiss* | S/V | SoC |
| Coastal Cutthroat Trout | *O. clarki ssp.* | | SoC |
| Coastal Chinook (spring run) | *O. tshawytscha* | S/C | |

[1] S/V = State Sensitive/Vulnerable; S/C = State Sensitive/Critical.

[2] T = Threatened; SoC = Species of Concern.

**Appendix IV**

**Plant Species found on Bandon Marsh NWR.**

| | |
|---|---|
| Pacific silverweed | *Argentina egedii* [old: Potentilla anserina, Potentilla pacifica] |
| Douglas' aster | *Symphyotrichum subspicatum var. subspicatum* [old: *Aster subspicatus*] |
| Deer fern | *Blechnum spicant* |
| Lyngbye's sedge | *Carex lyngbyei* |
| Slough sedge | *Carex obnupta* |
| Tufted hairgrass | *Deschampsia cespitosa* |
| Seashore saltgrass | *Distichlis spicata* |
| Creeping spikerush | *Eleocharis palustris* |
| Fleshy jaumea | *Jaumea carnosa* |
| Baltic rush | *Juncus balticus* |
| Soft rush | *Juncus effuses* |
| Tall fescue | *Lolium arundinaceum* |
| Black twinberry | *Lonicera involucrate* |
| Skunk cabbage | *Lysichiton americanum* |
| Pacific crabapple | *Malus fusca* |
| California waxmyrtle | *Myrica californica* |
| Water parsley | *Oenanthe sarmentosa* |
| Reed canarygrass | *Phalaris arundinacea* |
| Salmonberry | *Rubus spectabilis* |
| Sitka spruce | *Picea sitchensis* |
| Coast willow | *Salix hookeriana* |
| Sitka willow | *Salix sitchensis* |
| Pickleweed | *Salicornia virginica* |
| Three-square bulrush | *Scirpus americanus* |
| Small-fruited bulrush | *Scirpus microcarpus* |
| Seaside arrowgrass | *Triglochin maritimum* |
| Evergreen huckleberry | *Vaccinium ovatum* |

* Unless otherwise annotated, full name shown is currently accepted USDA listed name as of 9/30/02.
** New nomenclature [in brackets] is not yet in general use, so the older name was used in this report.

**Appendix V**

**Non-native plants known to exist on CVWA**

| | |
|---|---|
| Himalayan blackberry | *Rubus discolor* |
| Scotch broom | *Cytisus scoparius* |
| Reed canary grass | *Phalaris arundinacea* |
| Canada thistle | *Cirsium arvense* |
| Bent grass | *Agrostis Sp.* |
| Velvet grass | *Holcus Sp.* |

**Appendix VI**

**Legal Obligations Influencing Management Of CVWA:**

**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
**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
**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

## Appendix VII

## Monitoring Elements - CVWA

***Note: Monitoring elements will be completed as staff time and funding allows. Information listed below is not deemed to be exhaustive, and does not restrict ODFW from adding, substracting or modifying any of the information listed. Equipment will be same or equivalent . See comments.***

| Element | Priority (primary=1, secondary=2) | Time of year/frequenc | Methods | Coordinator (staff) | Goals | Notes |
|---|---|---|---|---|---|---|
| water temperature | 1 | Apr-Oct/as opportunity allows | YSI Model 55 Handheld Unit; thermometers | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine water temperature differences pre- and post-project; infer reasons for temperature differences, if present | ODFW hopes to deploy automated water temperature sensors on Winter Lake, as funding allows. Staff biologists will continue monitoring water temperatures onsite as opportunity allows. |
| dissolved oxygen | 1 | Apr-Oct/as opportunity allows | YSI Model 55 Handheld Unit | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine dissolved oxygen differences pre- and post-project; infer reasons for differences, if present | Time of year selected based on previous measurements and known low oxygen periods. |
| salinity | 1 | Aug-Oct/once per year | refractometer | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine if saltwater intrusion will be increased due to project implementation | Salinity measurements will be taken during highest tide cycle with lowest precipitation input. |
| water volume/CFS | 2 | Jul-Oct/once per year | stream flow discharge equipment | ODFW (ODFW, OSU, SWOCC, Coquille HS, Oregon Water Resources Department, other volunteers) | determine discharge of China Camp Creek and if volume is sufficient to cause water to back up east of Hwy 42 and into Garden Valley | Measurements taken during lowest freshwater input. Secondary priority because other monitoring elements indicate potential groundwater and surface water intrusion. |
| surface water elevations | 1 | year-round/once per hour | In-Situ LevelTroll 300 | ODFW | determine how tidegate operation affects surface water elevations in China Camp Creek above and below Hwy 42 | Automated monitoring. Sensor set to collect water surface elevation automatically. |
| groundwater infiltration | 1 | year-round/once per hour | monitoring wells | Beaver Slough Drainage District | determine if lateral groundwater movement is occurring due to tidegate operation | Automated monitoring. Sensor set to collect groundwater measurements automatically. |
| noxious weed monitoring and control | 1 | year-round/as opportunity allows | plant surveys across property | TNC (Coquille HS, SWOCC, OSU, other volunteers) | determine presence of noxious weeds, and apply best management practices | OWEB grant lists funds for invasive species control. |
| vegetation distribution/percent coverage | 2 | May-Jun/every other year | vegetation transects | TNC (Coquille HS, SWOCC, OSU, other volunteers) | determine relative abundance/% coverage of different plant species/communities, track changes to composition over time | |
| photopoints | 1 | once per year | digital phtography in established locations | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | demonstrate plant/habitat changes on Winter Lake property over time | Time of year to be determined. |

## Monitoring Elements - CVWA (Continued)

***Note: Monitoring elements will be completed as staff time and funding allows. Information listed below is not deemed to be exhaustive, and does not restrict ODFW from adding, substracting or modifying any of the information listed. Equipment will be same or equivalent. See commentts.***

| Element | Priority (primary=1, secondary=2) | Time of year/frequenc | Methods | Coordinator (staff) | Goals | Notes |
|---|---|---|---|---|---|---|
| designed landforms | 2 | pre- and post-restoration, and every 5 years | topographic surveys | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine development and changes over time of designed topograhic variations such as high spots, tidal depressions, hummocks, etc. | Contracted firm will provide pre and post project surveys. |
| channel morphology/development | 2 | pre- and post-restoration, and every 5 years | channel cross-sections, on-the-ground topographic surveys | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine physical channel changes over time | Contracted firm will provide pre and post project surveys. |
| birds | 1 | Sep-May/4 times per year | walk and sight; use existing dikes and waterways as transects | ODFW (Audubon Society, ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine relative abundance of migratory and resident birds and track changes to abundance and/or presence over time | |
| aquatic mammals | 1 | year-round/2 times per year | | | determine presence and utilization by aquatic animals (beaver and nutria) that could have a negative impact on infrastructure and/or surrounding landowners | |
| mammals | 2 | Apr-Oct/as opportunity allows | walk and sight; use existing dikes and waterways as transects | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine presence and utilization of the area by mammals such as Black-tail Deer, Roosevelt Elk, Fox, Raccoon, Otter. | |
| mosquitos | 1 | Apr-Oct | traps, visual surveys | OSU Extension (Coos County, other volunteers) | determine presence/increase of mosquitos | Tentative commitment of funding/interest by Frank Burris (OSU Extension) |
| amphibians/reptiles | 2 | year-round/as opportunity allows | To Be Determined | TNC (Coquille HS, SWOCC, OSU, other volunteers) | determine use of the area by amphibians and reptiles such as Western Pond Turtle. | Explore using volunteers, interns or students to develop and implement surveys |
| fish | 1 | Nov-Jun/2 times per month (as water conditions allow) | beach seine, traps (hoop nets, minnow traps), PIT tagging | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine CO juvenile relative densities pre- and post-project; determine presence of other species of interest, determine size and growth, determine habitat use and movement | |
| invertebrates | 2 | May-Jun/once per year | Serber sampler, kick nets; Ponar dredge, excavation/screen | ODFW (ODFW, OSU, SWOCC, Coquille HS, other volunteers) | determine structure/density of existing aquatic invertebrate community and define changes to structure/density over time | Possible sampling scenario: pre- and post-restoration, and then every other year (or longer). |

**Comments:** Monitoring will be coordinated by ODFW and TNC. Data collection will be through ODFW and TNC efforts as time and funding allows, however, ODFW and TNC will seek to utilize others as often as possible. Data collection methods, data precision/accuracy will be managed by ODFW and TNC. Prioritization of the sampling of individual elements will be determined by ODFW and TNC. Some elements may require regular sampling (hourly, daily, weekly, seasonally, etc.) to determine parameters; other elements may require irregular or infrequent sampling regimes. Several elements may be of concern to neighboring landowners, and as such sampling frequency will be determined through coordinated communication and effort.