JURISDICTIONAL WATERS REPORT

Beebe Springs Natural Area
Chelan County, Washington
Phase 4a

Prepared for

Washington Department of Fish and Wildlife

Prepared by:
URS Corporation in Association with J.A. Brennan & Associates

February 13, 2012

1501 Fourth Avenue, Suite 1400
Seattle, WA 98101-1616
(206) 438-2700

33763344.05000

CONTENTS

APPENDICES

TABLES

FIGURES

1.0 INTRODUCTION

In 2003, the Washington State Department of Fish and Wildlife (WDFW) acquired 182 acres surrounding the Chelan Fish Hatchery. The acquisition provided the opportunity to preserve low elevation Columbia Basin riparian and shrub-steppe habitat, restore habitats on the portion of the property formerly in orchard, and develop education and interpretive opportunities. The Beebe Springs Natural Area is being created, in several phases, on 120 acres of this property. This property sits north of Beebe Bridge along the western shore of the Columbia River. A reservoir (also known as Rocky Reach Reservoir) occurs in this section of the river, created by Rocky Reach Dam, a hydroelectric dam operated by the Chelan Public Utility District No. 1 (CPUD).

Highway 97 bisects the property, running north and south. To the west of Highway 97, the property is composed of post-agricultural lands and native shrub-steppe, cliffs, and talus natural areas. Two springs on the west margin of the property erupted into existence during the Ribbon Cliff earthquake of 1872 and later subsided to form Beebe Springs and Beebe Springs Creek. About 1.5 miles to the south is the town of Chelan Falls, and the City of Chelan is approximately 2.5 miles to the west.

Phase 1 of the Beebe Springs Natural Area Development Project included the creation of a new spawning/rearing channel (north channel) of Beebe Springs Creek to increase available spawning and rearing habitat for native salmonids. The channel was created to encourage and increase the number of summer/fall-run Chinook salmon, summer-run steelhead (listed as threatened under the ESA), and coho salmon spawning and rearing in Beebe Springs Creek. This channel was completed in 2006 and approximately two thirds of the creek flow is being directed into this channel, with the remainder directed into the original channel (south channel), which serves as additional salmonid habitat and as an overflow channel. Flows in the two channels of Beebe Springs Creek downstream Highway 97 has been monitored and adjusted to optimize access and available spawning and rearing for salmonids.

Phase 2 included the creation of a side channel to the Columbia River, the enhancement of wetlands, restoration of upland and riparian vegetation, improved site access from Highway 97 and a parking area, as well as trails with three pedestrian bridges, viewpoints, and interpretive displays.

Phase 3 included the creation of a series of new side channels to the Columbia River (including a rearing side channel to provide refuge for juvenile salmonids), the enhancement and creation of wetlands, planting of upland and riparian vegetation, removal of a dirt road and two culverts on the south channel of Beebe Springs Creek, enhancement of aquatic habitat in Beebe Springs Creek, hand-carry boat launch, and construction of trails with viewpoints.

Phase 4 includes an Americans with Disabilities Act (ADA) compliant pedestrian trail that will lead from the Phase 3 trail loop and run north-south paralleling the Columbia River. Along the trail system, up to three strategically placed viewpoints will allow views of the Columbia River and surroundings. Shrub-steppe and riparian vegetation will be planted to restore the shoreline and uplands. Finally, a 135 foot long culvert that drains surface water from the west side of U.S.97 will be abandoned, and a new channel will be excavated through the shrub-steppe environment to accommodate the runoff. Phase 4 is planned to be constructed concurrently with the proposed work, Phase 4a.

The current work, **Phase 4a** of the Beebe Springs Natural Area Development Project, will focus on restoration and access improvements north of the Chelan Fish Hatchery. It includes the following elements:

- Beebe Springs Creek: Restoration and Access Improvements
- Chinook Spring: Restoration and Access Improvements
- Toad Creek: Restoration and Access Improvements
- Trail Construction
- Interpretive and Educational Signage

The project will improve wetland, stream and riparian habitat. No long-term, adverse impacts to wetlands and streams are anticipated. A detailed project description and a discussion of proposed impacts and mitigation are provided in Section 4.

Additional phases of this habitat enhancement and watchable wildlife project may be completed at a later date when additional funding is obtained. The improvements are based on the graphics prepared by J.A. Brennan Associates.

A wetland delineation was conducted on the site in 2005 by Watershed Company for Phase 1 work around Beebe Springs Creek. URS conducted wetland delineations of the Phase 2 area on March 6, 2007 (URS Corporation 2007), and the Phase 3 area on February 19, 2010 (URS 2010). The delineation for Phase 3 also covered the Phase 4 area, but not the Phase 4a area.

For Phase 4a, URS conducted a field visit on December 1 and 2, 2011 to determine the presence and extent of wetlands and other jurisdictional waters on the Phase 4a project area, west of U.S.97. URS Corporation confirmed the presence of two wetlands in the Phase 4a area. This report documents the delineated wetlands and characterizes the vegetation communities, soils, and hydrologic regimes occurring on the property that were used to distinguish wetlands from uplands. The ordinary high water mark (OHWM) of Beebe Springs Creek, and the centerline of Toad Creek were also marked. A dry wash was also identified in the project area, but it was determined not to be connected via surface channel to any other jurisdictional feature.

2.0 METHODS

2.1 WETLAND DELINEATION

Documents reviewed to aid in the identification and determination of wetlands in the Phase 4a vicinity include the following:

- National Wetlands Inventory Map (USFWS 2011); online at: *http://107.20.228.18/Wetlands/WetlandsMapper.html#*
- Soil Survey of Chelan County Area Washington (NRCS 2011); online at: *http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx*
- Aerial Photographs; online at: *http://terraserver.microsoft.com* and Google Earth
- Wetland Delineation and Impacts Report; Beebe Springs Natural Area – Phase 2 (URS 2007)
- Wetland Delineation and Impacts Report; Beebe Springs Natural Area – Phase 3 (URS 2010)

Wetland determinations were made on site by wetland biologists using the 1987 U.S.Army Corps of Engineers (Corps) *Wetlands Delineation Manual* (Corps 1987) in conjunction with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Corps 2008). The recently-adopted 2008 *Regional Supplement* provides technical guidance and procedures specific to the arid west region. State laws require that wetlands protected under the Growth Management Act and the Shoreline Management Act be delineated using a manual that is developed by Ecology and adopted into rules (RCW 36.70A.175; RCW 90.58.380). The Department of Ecology adopted a wetland delineation manual (*Wetland Identification and Delineation Manual)* in 1997 (WAC 173-22-080) that was based on the original 1987 Corps of Engineers manual and subsequent Regulatory Guidance Letters.

During the last few years the Army Corps of Engineers has updated and expanded their delineation manual with regional supplements. To maintain consistency between the state and federal delineations of wetlands, Ecology has repealed WAC 173-22-080 (the state delineation manual) and replaced it with a revision of WAC 173-22-035 that states delineations should be done according to the currently approved federal manual and supplements. The changes were effective March 14, 2011.

This wetland delineation, and the delineated and surveyed wetland boundaries, are subject to agency verification and approval.

For regulatory purposes, wetlands are defined as follows (Corps 1987):

> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in*

saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

According to the manuals, the following three characteristics usually must be present for an area to be identified as a wetland: (1) wetland hydrology, (2) hydric soil, and (3) hydrophytic vegetation. Wetland hydrology includes seasonal, periodic, or permanent inundation or soil saturation that creates anaerobic conditions in the soil for a portion of the growing season sufficient for wetland soil and vegetation to be maintained. Hydric soils are saturated, flooded, or ponded long enough during the growing season to become deoxygenated in the upper soil horizon. Hydrophytic vegetation consists of those plant species growing in water, in soil, or on a substrate that at least periodically lacks oxygen.

The growing season is technically defined as the period when soil temperatures 19.7 inches below the ground surface (bgs) are greater than 5°C (41°F), according to the 1987 Corps Wetlands Delineation Manual. However, Corps regulatory guidance letters and the Ecology manual state that the final determination of growing season should be based on careful observations of evidence that active growth is occurring. This evidence can include new or recent growth such as flowers, new shoots, new leaves, or swollen buds on plants.

A total of four detailed sample plots were used to investigate the Phase 4a project area. The sample plots are located in places that adequately represent the variation in vegetation, soils, and hydrologic regime across the site. The presence or absence of hydrophytic vegetation, hydric soil, and wetland hydrology indicators were documented for each sample plot as a means of justifying the delineated wetland boundaries. Wetland determination data forms can be found in Appendix A.

2.1.1 Wetland Hydrology

To determine whether a vegetation community has wetland hydrology, an area is examined for inundation, soil saturation, shallow groundwater tables, or other hydrologic indicators. An area in which soils are saturated to the surface for at least 5 to 12 percent of the growing season meets the criterion for wetland hydrology. Seasonal changes in water levels and the effect of recent precipitation events must be considered when evaluating an area's hydrology. Wetland hydrology can also be inferred from the presence of any of the following indicators: watermarks on vegetation, drift lines, sediment deposits, water-stained leaves, surface-scoured areas, wetland drainage patterns, algae growth, and oxidized root channels.

2.1.2 Hydric Soil

Soil observations were made in wetlands and adjacent upland areas by digging soil investigation pits in each sample plot. Soil color and other characteristics used to indicate hydric soils were documented using the Munsell Soil Color Chart (Munsell Color 2009). The Natural Resources Conservation Service (NRCS) soil survey provided soil taxonomy, map unit name (soil series), and drainage class data. Soil in which any of the following indicators is present meets the criteria for hydric soil:

- **Gleyed soil (gray colors)**. Gleyed soils develop when mineral soil is saturated or inundated for periods of time sufficient to result in anaerobic (no oxygen) conditions. Anaerobic conditions cause elements common in soil, such as iron and manganese, to exist in reduced forms that are usually bluish, greenish, or grayish in

color. Soil colors are determined using a Munsell soil color chart (Munsell Color 2009), which has separate pages for gley-colored soils.

- **Low chroma matrix**. A low chroma matrix develops when mineral soil is saturated or inundated for substantial periods of time during the growing season (but not long enough to produce gleyed soil) to result in anaerobic or hypoxic (low oxygen) conditions. A soil matrix is the portion of a given soil layer (usually more than 50 percent by volume) that has the predominant color. The Munsell system uses three dimensions to describe soil color: hue, value, and chroma. The Munsell soil color chart uses abbreviations to describe the colors, for example, 10YR 3/2. In the abbreviation, the first number and letters indicate the hue (10YR), the next number indicates the value (3), and the last number indicates chroma (2). A chroma of 1 or 2 is considered low. Soils with a matrix chroma of 2 are usually considered hydric when mottles are present. Mottles are rust-colored spots or blotches in the soil formed by the oxidation of iron compounds via fluctuating water levels. Mottles found in soil with a matrix chroma of 2 (or less) often indicate that a soil is hydric.
- **High organic content**. Soil retains high levels of organic matter when saturation prevents decomposition over long periods, thus allowing organic debris to accumulate. Organic content is considered high if the soil is composed of more than 20 to 30 percent (threshold differs depending upon other soil characteristics) organic material by weight in a layer at least 8 inches thick located in the upper 32 inches of the soil profile.
- **Soils appearing on the hydric soils list**. A list of hydric soils has been compiled by the U.S. Department of Agriculture's National Technical Committee for Hydric Soils (NRCS 2001). Listed soils have reducing conditions for a significant portion of the growing season in a major portion of the root zone and are frequently saturated within 12 inches of the soil surface.
- **Other hydric indicators**. Other positive indicators of hydric soil include sulfide or "rotten egg" odor, aquic or peraquic moisture regimes (reducing soil moisture regimes due to groundwater at or near the soil surface), and the presence of iron or manganese concretions.

The 2008 *Regional Supplement* uses similar and additional indicators, adopted from *Field Indicators of Hydric Soils in the United States*, version 7.0 (USDA NRCS 2010).

2.1.3 Hydrophytic Vegetation

The dominant plant species in each vegetation community were identified within each sample plot. Vegetation communities are defined here as a contiguous assortment of plants in a given area sharing similar environmental conditions. Dominant plants are those plant species that collectively account for more than 50 percent of the total coverage of vegetation in a stratum (trees, shrubs, herbs, vines), or individually comprises at least 20 percent of the total. The sample plots are circular and have a 30-foot radius for trees and shrubs and a 5-foot radius for herbaceous plants. Plots were situated so that they best represent the vegetation present within each community.

The hydrophytic indicator status for each dominant species, as designated by the U.S.Fish and Wildlife Service (USFWS) for Region 9 (USFWS 1993), was used to determine whether the vegetation in each community is hydrophytic. To meet the hydrophytic vegetation criteria, more than 50 percent of the dominant species must have an indicator status of obligate (OBL), facultative wetland (FACW), and/or facultative (FAC). Indicator status categories are defined in Table 1. The facultative status categories are often modified using minus (-) or plus (+) symbols. For example, FAC+ species are considered to have a somewhat greater estimated probability of occurring in wetlands than FAC species, whereas FAC- species are considered to have a somewhat lesser estimated probability of occurring in wetlands than FAC species. The 2008 *Regional Supplement* no longer uses the (-) and (+) modifiers.

Table 1. Plant Species Wetland Indicator Categories

Indicator Category	Occurrence	Probability in Wetlands (estimated)
Obligate (OBL)	Occurs almost always in wetlands under natural conditions	>99%
Facultative Wetland (FACW)	Usually occurs in wetlands, but occasionally found in non-wetlands	67-99%
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands	34–66%
Facultative Upland (FACU)	Usually occurs in non-wetlands, but occasionally found in wetlands	1–33%
Upland (UPL)	Occurs almost always under natural conditions in non-wetlands in this region but may occur in wetlands in another region	<1%

Source: Corps 1987

2.2 WETLAND CLASSIFICATION

2.2.1 Cowardin Classification

Wetlands are classified according to the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). Under the Cowardin classification scheme, wetlands and deepwater habitats are grouped into systems based on shared hydrologic factors. These systems are marine, estuarine, riverine, lacustrine, and palustrine. Palustrine systems are present in the Phase 4a project area.

Palustrine Systems include all wetlands having less than 0.5% salinity and containing persistent vegetation. Vegetation may include trees, shrubs, erect (emergent) or floating (aquatic bed) herbaceous plants, mosses, and/or lichens. Wetlands included in the palustrine system are those commonly referred to as marshes, swamps, bogs, fens, prairies, seeps, and intermittent ponds. A palustrine system can exist directly adjacent to or within the lacustrine, riverine, or estuarine systems.

Palustrine wetlands are divided into classes by the dominant vegetation. Palustrine forested (PFO) wetlands or forested wetland communities are dominated by trees or arborescent shrubs greater than 20 feet tall having greater than 30 percent cover. Palustrine scrub-shrub (PSS) wetlands or scrub-shrub wetland communities are dominated by woody shrubs less than 20 feet tall with at least 30 percent cover. Palustrine emergent (PEM) wetlands or emergent wetland

communities are dominated by nonwoody, rooted vascular plants having at least 30 percent cover.

The U. S. Fish and Wildlife Service National Wetlands Inventory (NWI) provides information on the characteristics, extent, and status of the nation's wetlands and deepwater habitats. The NWI collects data from aerial photography to produce maps that correspond to the USGS 7.5 or 15 minute topographic quadrangles. NWI quadrangles use the Cowardin classification system to characterize wetland features on each map.

2.2.2 HGM Classification

Wetlands were also classified according to the Hydrogeomorphic (HGM) classification. The HGM classification groups wetlands into categories based on the geomorphic and hydrologic characteristics that control many wetland functions. The modified version of this classification system that is found in the Washington State Wetland Rating System for Eastern Washington (Ecology 2004) was used for HGM classification. The HGM classes found in the project area are Riverine and Slope.

Riverine wetlands occur in valleys associated with stream or river channels. They lie in the active floodplain, and have important hydrologic links to the water dynamics of the river or stream. The distinguishing characteristic of riverine wetlands is that they are flooded by overbank flow from the stream or river at least every other year.

Slope wetlands occur on hill or valley slopes where groundwater "daylights" and begins running along the surface, or immediately below the soil surface. Water in these wetlands flows only in one direction (down the slope) and the gradient is steep enough that the water is not impounded. The "downhill" side of the wetland is always the point of lowest elevation in the wetland.

2.3 WETLAND RATINGS AND BUFFERS

Wetlands were rated using Ecology's *Revised Wetlands Rating System for Eastern Washington* (Ecology 2004). Chelan County Code also uses Ecology's rating system (Chelan County 2010). The Eastern Washington Wetland Rating Data Forms are provided in Appendix B.

2.3.1 Department of Ecology Wetland Rating System

Category I are those wetlands of exceptional value in terms of protecting water quality, storing flood and storm water, and/or providing habitat for wildlife as indicated by a rating system score of 70 points or more on the Ecology rating forms. These wetlands are communities of infrequent occurrence that often provide documented habitat for sensitive, threatened, or endangered species, and/or have other attributes that are very difficult or impossible to replace if altered.

Category II wetlands are those wetlands that are difficult, though not impossible, to replace, generally have little to no disturbance, and provide high levels of some functions. The primary criteria for category II wetlands are that they score 51–69 out of 100 points on the rating questions related to functions. Category II wetlands also include estuarine wetlands less than 1 acre, or greater than 1 acre that are disturbed, and interdunal wetlands greater than 1 acre. Although category II wetlands occur more commonly than category I wetlands, they are deemed to warrant a relatively high level of protection.

Category III wetlands generally provide a moderate level of functions, have been disturbed in some way, and are often less diverse or more isolated from other natural resources. The primary criteria for category III wetlands are that they score 30–50 out of 100 points as defined in Ecology's Wetlands Rating System for Eastern Washington. Interdunal wetlands between 0.1 and 1 acre in size are also category III regardless of their score. Category III wetlands are regulated wetlands that do not contain features or levels outlined in Categories I, II, or IV. They occur more frequently, are less difficult to replace, and need a moderate level of protection compared to higher rated wetlands.

Category IV wetlands have the lowest levels of functions (less than 30 points on the rating questions relating to functions). They do not meet the criteria for Category I, II or III wetlands. These are wetlands that should be replaceable and, in some cases, can be improved from a functions standpoint. These wetlands may provide important functions and values and should be protected to some degree.

2.3.2 Chelan County Wetland Buffers

Chelan County enforces wetland buffers (Chelan County 2011) to provide additional protections to a wetland's physical and biological function. Buffers are calculated based on the wetland's categorical rating and the intensity of adjacent land uses (Table 2).

Table 2. Chelan County Wetland Buffer Widths for High and Low Intensity Land Uses.

Wetland Category	High Intensity (feet)	Low Intensity (feet)
Category 1	300	200
Category 2	200	100
Category 3	150	75
Category 4	50	50

Source: Chelan County Code Section 11.80.060

2.4 WETLAND FUNCTIONS ASSESSMENT

Wetland functions were analyzed using methodology developed by Ecology and published in the *Revised Wetlands Rating System for Eastern Washington* (Ecology 2004). These functions are assessed in three broad categories: water quality improvement, hydrologic function, and habitat quality. Both the potential and opportunity to provide each function is analyzed. The potential to perform a function is based on the physical, biological, and chemical characteristics within the wetland itself. The opportunity is to what degree the wetland's position in the landscape will allow it to perform a specific function.

2.5 WETLAND MAPPING

The boundary between wetland and upland areas was marked in the field with orange "Wetland Delineation" tape flagging. Sample plots were marked with pink flagging. Flag locations were collected using a mapping-grade Trimble GeoXT global positioning system and post-processed to obtain sub-meter accuracy of the regulatory wetland edge. Wetland boundaries have also been professionally surveyed.

2.6 ORDINARY HIGH WATER MARK

The OWHM on Beebe Springs Creek was identified according to guidance from ACOE (2005) and Ecology (2010). The OHWM was established by locating where the fluctuations of water in the stream have created a clear, natural line on the bank indicated by changes in the character of the soil/substrate and changes in the nature of the vegetation. The OHWM was flagged on both banks, and positions were collected with a GPS. The data were post-processed with Trimble TerraSync software to obtain sub-meter points for each location. Locations were also professionally surveyed.

URS was unable to identify the OHWM on Toad Creek due to almost complete cover of the stream and banks by dense Himalayan blackberry (Rubus armeniacus). In place of marking the OHWM, URS marked the estimated centerline of the stream, and estimated the width of the channel.

3.0 RESULTS

URS conducted a pre-field review of the NWI map, the local NRCS soil survey, and topographic maps. No wetlands are shown onsite on the NWI map (Figure 2). The closest wetlands are mapped along the Columbia River/Lake Entiat. A review of the Chelan County hydric soils list determined that the three soil map units mapped in the project area are not hydric soils (NRCS 2001). A field investigation and wetland delineation was performed on December 1 and 2, 2011. The presence of two wetlands was confirmed during the field visit.

3.1 SITE SOILS

According to the USDA Natural Resources Conservation Service (NRCS) *Soil Survey of Chelan County Area, Washington*, three soil map units are mapped within the project area (Figure 3). They include Chelan gravelly sandy loam, pumiceous, 3 to 8 percent slopes (soil map unit CIB), Chelan bouldery sandy loam, 0 to 25 percent slopes (CKD), and Chelan bouldery sandy loam, 25 to 45 percent slopes (CKE).

The Chelan series is comprised of well-drained, moderately coarse textured soils that formed in pumice, volcanic ash, and loess over non-sorted gravelly, cobbly, or bouldery deposits of ablation glacial till. The surface soil layer is gray gravelly sandy loam about 18-inches thick, underlain by dark grayish brown gravelly sandy loam 17-inches thick, underlain by pale brown very gravelly sandy loam that extends to a depth of 60 inches. Runoff is very slow for soils ClB and the hazard of water erosion is none to slight.

3.2 SITE VEGETATION

The native vegetation in the vicinity is dry shrub-steppe, characterized by drought-tolerant shrubs and grasses. Common shrubs in the uplands on the project site include big sagebrush (*Artemisia tridentata*), common rabbit-brush (*Chrysothamnus nauseosus*), antelope bush (*Purshia tridentata*), and parsnip-flowered buckwheat (*Eriogonum heracleoides*). Common grasses in the uplands include needle-and-thread grass (*Stipa comata*), cheat grass (*Bromus tectorum*). Wetland and riparian vegetation are described below.

3.3 SITE HYDROLOGY

The majority of the project site is well- to excessively-well drained due to either steep, rocky slopes or deep, coarse soils. The narrow wetland fringes are associated with either seasonal stream flow (Wetland E on Toad Creek), or areas of slope seepage (Wetland F on Chinook Spring).

3.4 WETLANDS

The BSNA has had three previous delineations, in 2005, 2007 and 2010. During these previous surveys, four wetlands were identified, Wetlands A through Wetland D. Wetland A was delineated along the Columbia River shoreline near the mouth of Beebe Springs Creek. Wetland

B was delineated further west of Wetland A and was partially excavated as part of Phase 2. Wetlands C and D were also delineated adjacent to the Columbia River.

Two wetlands were identified in the **Phase 4a** project area (Figure 4). **Wetland E** is a very small wetland within the flood plain of Toad Creek. **Wetland F** is a narrow linear wetland that follows the hillside seep. Photographs of the wetlands are found in Appendix C.

3.4.1 Wetland E

Wetland E is a 1,626 square foot wetland. It is classified under Cowardin as a **palustrine emergent**, **seasonally flooded** wetland, and as a **riverine** wetland using the HGM system. The wetland was dry at the time of inspection. It appears to receive its water from Toad Creek during periods of high flow in the spring.

Soils within Wetland E typically have a 5-inch dark brown (10YR 3/1.5) silt loam surface. From 5 to 14 inches, the soil is olive gray (5Y 5/2) fine sandy loam with 10YR 5/4 redox concentrations and 5Y 5/1 redox depletions. From 14 to 20 inches, the soil is an olive gray (5Y 5/2) silt with 7.5YR 4/4 redox concentrations.

The vegetation in Wetland E consists of an herbaceous emergent layer. Dominant species include bigleaf sedge (*Carex amplifolia*/FACW+) and common cattail (*Typha latifolia*/OBL).

According to the state and county rating methods, Wetland E rates as a **Category III** wetland based on functions. It has moderate water quality and hydrology functions, and low habitat functions. The wetland rating form is available in Appendix B.

Chelan County requires buffers be placed around wetlands to protect and enhance the biotic, physical, and chemical functions that wetlands perform. Chelan County requires that a **75-foot** buffer be located around Category III wetlands situated in low intensity developed areas.

3.4.2 Wetland F

Wetland F is within the Chinook Spring drainage, approximately 200 feet northeast of Beebe Springs Creek. It is classified under Cowardin as a **palustrine scrub-shrub**, **seasonally saturated** wetland, and as a **slope** wetland using the HGM system. The wetland had surface saturation at the time of inspection.

Only the lower part of Wetland F was delineated. Since the upslope portion of the wetland was not delineated, its boundary has been conservatively estimated on Figure 5, based on the delineated portion of Wetland F and field notes. The delineated portion of Wetland F is a 1,625 square feet.

Soils within Wetland F typically have a 6-inch dark brown (10YR 3/1) silt loam surface. The subsurface to 16 inches is olive gray (2.5Y 5/2.5) very gravelly or cobbly coarse sand.

The vegetation in Wetland F consists of both a scrub-shrub overstory and an herbaceous emergent layer. Many of the shrubs have been planted. Dominant woody plant species include Pacific willow (*Salix lucida* ssp. *lasiandra*/FACW+), coyote willow (*Salix exigua*/OBL), and red-osier dogwood (*Cornus sericea*/FACW). Herbaceous species include watercress (*Rorippa nasturtium-aquaticum*/OBL) and *Epilobium ciliatum*/FACW-).

According to the state and county rating methods, Wetland F rates as a **Category IV** wetland, having a low potential and opportunity to provide habitat, hydrology and water quality functions. The wetland rating form is available in Appendix B.

Chelan County requires buffers be placed around wetlands to protect and enhance the biotic, physical, and chemical functions that wetlands perform. Chelan County requires that a **50-foot** buffer be located around Category IV wetlands situated in low intensity developed areas.

3.5 STREAMS

Two streams were observed onsite, Beebe Springs Creek and Toad Creek. A dry sand wash is located in a narrow ravine on the west side of the project site between the two streams. URS could not identify a bed or bank for this feature. According to hatchery personnel, flow only occurs in the wash during "flash flood" events. A narrow seepage area (Chinook Spring) with minor surface flow was identified just north of Beebe Springs Creek. URS classified this as a wetland (Wetland F) rather than a stream due to the lack of a well-defined channel and bed.

3.5.1 Beebe Springs Creek

Beebe Springs Creek is a perennial stream fed by springs emerging at the base of volcanic hills between Lake Chelan and the Columbia River. The springs are also utilized by the adjacent fish hatchery. The stream has been highly manipulated through water diversions, weirs, bank hardening and invasive plant species. Much of the riparian buffer has been eliminated due to agricultural activities on the north bank and the fish hatchery on the south bank. The lower channel abuts the railroad tracks. Common plants in the riparian area include knotweeds (*Polygonum* sp.), stinging nettle (*Urtica dioica*), Himalayan blackberry, climbing nightshade (*Solanum dulcamara*) and introduced elm trees (*Ulmus* sp.).

The upper channel of Beebe Springs Creek is high gradient, with bed material of cobble size or larger. The lower channel has a lower gradient, with bed material of fine sand and gravel. Coho salmon were observed spawning in the lower channel during the December 2011 field visit. Steelhead trout also utilize the lower channel according to hatchery personnel. A Biological Assessment for the Beebe Springs Natural Area Development has been prepared by URS (2012).

Beebe Springs Creek classifies as a **Type F** Water according to the water typing criteria (WAC 222-16-030) utilized by Chelan County. Type F waters require a buffer of **150 feet** for low intensity development (Chelan County Code 11.78.090).

3.5.2 Toad Creek

Toad Creek is an intermittent stream which may also be influenced by springs, but its flow is much reduced compared to Beebe Springs Creek. On maps this drainage is unnamed, but was dubbed "Toad Creek" by WDFW project staff. Historically some of the flow has been contributed from so-called "apple-wash" water. The upper part of Toad Creek had flowing water at the time of our inspection. The lower part of the creek was dry. The channel was not visible due to almost complete coverage by Himalayan blackberry. Wetland E occurs in the lower part of Toad Creek. Toad Creek flows east towards U.S.97.

Toad Creek classifies as a **Type Ns** Water according to the water typing criteria (WAC 222-16-030) utilized by Chelan County. Type Ns waters require a buffer of **50 feet** for low intensity development (Chelan County Code 11.78.090).

4.0 PROJECT IMPACTS AND MITIGATION

Project impacts are outlined below by project component. The impacts are associated exclusively with stream and habitat restoration and recreation access improvements.

4.1 BEEBE SPRINGS CREEK: RESTORATION AND ACCESS IMPROVEMENTS

Beebe Springs Creek, which flows from west to east along the northern boundary of the hatchery, is a fairly channelized creek that includes a segment of concrete-lined bottom. Steelhead trout spawn in this creek roughly to a point just below the concrete-lined portion of the channel, where a small pedestrian bridge crosses the creek at the eastern end of the concrete liner. The restoration plan for this segment of Beebe Springs Creek will include removing the concrete liner and excavating portions of the stream bank to install woody debris and rounded rock. The riparian buffer will undergo selective invasive species control and planting of native vegetation. The intent of the restoration is to partially reestablish predevelopment channel morphology, provide better habitat opportunities for spawning steelhead and better cover for wildlife and fish.

A pedestrian bridge currently spans Beebe Springs Creek. However, the grated deck bridge across the creek is light-duty, insufficient for frequent use, and does not provide ADA access. The project proposal includes removing the bridge and replacing it with a stronger solid-decked bridge.

The restoration and access improvements at Beebe Springs Creek include the following:

- Removal of approximately **50 lineal feet** of concrete channel liner
- Channel along approximately **150 lineal feet** of Beebe Springs Creek, which includes substrate enhancement, the installation of woody debris, and placement of boulders and cobbles
- Selective clearing of approximately **400 square feet** of invasive, non-native vegetation within the stream buffer
- Planting of approximately **3,000 square feet** of native riparian vegetation
- Removal of existing bridge (approximately **60 square feet**)
- Installation of a bridge (approximately **63 square feet**)

4.2 CHINOOK SPRING: RESTORATION AND ACCESS IMPROVEMENTS

Chinook Spring is approximately 200 feet north of Beebe Springs Creek and runs parallel to it. A very small amount of water trickles down the slope more or less continuously from part of the Beebe Springs complex. The riparian plant community along Chinook Spring consists primarily of native plant material. Wetland F has been delineated along the lower part of the spring's wetted area.

Restoration of the Chinook Spring includes the removal of a failed culvert near the bottom of the slope and the placement of native plants along the day-lighted section. Proposed restoration

work will also include the removal of a patch of blackberries and managing the young blackberry sprouts by mowing and application by spot spraying and cut stem treatment of a permitted and effective herbicide. A grass seed mix will be planted to aid in erosion control. Invasive species control will occur for two to three growing seasons.

The project includes a proposed pedestrian crossing of Chinook Spring. The crossing will be in the form of a crushed rock surfaced trail with culverts beneath to accommodate water flow. It will result in the fill of approximately 112 square feet of Wetland F.

The restoration and access improvements at Chinook Spring include:

- The full removal of a 4-inch culvert, approximately **30 feet** in length
- Creation of approximately **325 square feet** of wetland adjacent to Wetland F, where the culvert will be removed
- Selective clearing of **550 square feet** of invasive, non-native vegetation within the undelineated portion of Wetland F
- Planting of **325 square feet** of native riparian vegetation
- Installation of **250 square feet** of crushed rock trail through Wetland F
- Installation of **two 8-foot long, 12-inch culverts**

4.3 TOAD CREEK: RESTORATION AND ACCESS IMPROVEMENTS

Toad Creek is approximately 600 feet long, runs at a fairly steep gradient down the steep, almost hanging valley, and flows into a low-lying level area where there is an identified wetland, Wetland E. The banks of the creek are covered with invasive species, predominantly Himalayan Blackberry, for nearly the entire length. Restoring the vegetation of the creek would do much to enhance habitat opportunities along this riparian corridor, and significantly enhance the experience of those hiking along the proposed Toad Creek trail.

Site preparation will be conducted to eradicate invasive species within a portion of Toad Creek and its riparian buffer. This would involve clearing blackberry, grubbing to the extent possible, and managing the young blackberry sprouts by mowing and application by spot spraying and cut stem treatment of a permitted and effective herbicide. A grass seed mix will be planted to aid in erosion control. Invasive species control will occur for two to three growing seasons.

The project proposal includes the installation of a solid-decked pedestrian bridge across Toad Creek.

The restoration and access improvements at Toad Creek include:

- Selective clearing of approximately **30,000 square feet** of invasive, non-native vegetation within the stream buffer
- Installation of a bridge (approximately **128 square feet**)

4.4 TRAIL CONSTRUCTION AND ACCESS IMPROVEMENTS

The project includes a proposed hiking trail connecting the Chelan Hatchery with the scenic areas in the vicinity of Toad Creek, and on top of the adjacent bluff. The portion of the trail along the low-lying part of the site is planned to be ADA accessible. It will include stream and wetland crossings as previously mentioned. The portion of the trail that accesses the top of the bluff will have a higher degree of hiking difficulty due to steep terrain. The trail will be designed and built to U.S. Forest Service standards.

The trail project also includes a proposed trail spur from the established trail system on the opposite side of U.S. 97. This trail segment will connect existing trails to an interpretive viewpoint beneath the Beebe Bridge.

At the Chelan Hatchery, access improvements will be implemented that allow visitors the ability to have ADA access from existing parking facilities to the proposed trail system. Improvements include some asphalt paving, striping and directional signage within the existing developed hatchery area.

4.5 INTERPRETIVE AND EDUCATIONAL SIGNAGE

The project entails the installation of up to five interpretive or educational signs along the proposed trail system. Post-mounted signs will be located in non-wetland areas along the proposed trail system at the most beneficial places. Sign content will include information pertaining to wildlife, geology, and human history. This will complement the existing interpretive sign system installed on the opposite side of U.S. 97 during previous phases of the project.

4.6 SUMMARY OF IMPACTS AND MITIGATION

4.6.1 Wetlands

Approximately **550 square feet** of **Wetland F** will be temporarily impacted for removal of invasive species (Himalayan blackberry). Removal will include mechanical cutting and grubbing, with repeated spot treatments and herbicide treatments over two to three years. This area was identified after the delineation field work was completed, so an estimated wetland boundary is being utilized to determine impacts. All of the clearing area is considered wetlands for purposes of the project, although the actual area of wetland is likely less than this. These temporary wetland impacts will be mitigated in place since all of the cleared area, plus an **additional 500 square feet** of wetland buffer, will be seeded with native species. The restoration area will be monitored and maintained for two to three years to maximize removal of invasive species and survival of planted vegetation. Some areas may be planted after 3 years.

Approximately **112 square feet** of Wetland F will be impacted by placement of crushed rock trail and embankment for the trail crossing. Two culverts will be installed beneath the rock so as to avoid disrupting the flow path. A **30-foot long** culvert immediately downslope from the trail crossing will be removed to restore wetland habitat.

4.6.2 Streams

Beebe Springs Creek and Toad Creek will be bridged for trail crossings. The bridge across Beebe Springs Creek will be located at the same location as an existing pedestrian bridge. The Toad Creek pedestrian bridge will be located to avoid impacts to Wetland E. In-channel work is limited to habitat improvements, including the removal of a concrete liner, and the placement of woody debris and river cobbles in Beebe Springs Creek.

4.6.3 Riparian Buffers

Approximately **400 square feet** of riparian buffer along Beebe Springs Creek, and **30,000 square feet** along Toad Creek will be temporarily impacted by removal of invasive plant species, including Himalayan blackberry. Removal will include mechanical cutting and grubbing, with repeated spot treatments and herbicide treatments over two to three years. These temporary buffer impacts will be mitigated in place since all of the cleared areas will be planted with predominantly native species. The restoration area will be monitored and maintained for two to three years to maximize removal of invasive species and survival of planted vegetation.

5.0 REFERENCES

Chelan County. 2011. Chelan County Code, Title 11 Zoning Chapter 11.80 Wetland Areas Overlay District. Available at: http://www.codepublishing.com/WA/chelancounty.html. Chelan County Board of Commissioners, Chelan, Washington. Current through October 4, 2011.

Corps – see U.S. Army Corps of Engineers

Ecology – see Washington State Department of Ecology

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Publication FWS/OBS-79/31. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, DC.

Munsell Color. 2009. Munsell Soil Color Charts. Munsell Color. Grand Rapids, Michigan.

Natural Resources Conservation Service (NRCS). 2001. Hydric Soils List: Chelan County Area, Washington. Available at: http://www.wa.nrcs.usda.gov/technical/soils/county_hydric_lists.html

———. 2010. Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 7.0. In cooperation with the National Technical Committee for Hydric Soils.

———. 2011. Soil Survey of Chelan County Area, Washington. Web Soil Survey, available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

U.S. Army Corps of Engineers (Corps). 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Waterways Experiment Station, Vicksburg, Mississippi.

———. 2005. Regulatory Guidance Letter – Ordinary High Water Mark Identification. Letter No. 05-05. 4 pages.

———. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

U.S. Fish and Wildlife Service (USFWS). 1993. List of Plant Species That Occur in Wetlands (Region 9); Combined 1998 List and 1993 Supplement. Washington, DC.

———. 2011. National Wetlands Inventory Map, National Online Mapper. Available at: http://107.20.228.18/Wetlands/WetlandsMapper.html# Washington, D.C

URS Corporation. 2007. Wetland Delineation and Impacts Report, Beebe Springs Natural Area – Phase 2. Seattle, Washington.

———. 2010. Jurisdictional Waters Report, Beebe Springs Natural Area – Phase 3. Seattle, Washington.

———. 2012. Biological Assessment Addendum for The Beebe Springs Natural Area Development Phase 4A Project. Seattle, Washington.

Washington State Department of Ecology (Ecology). 1997. Washington State Wetlands Identification and Delineation Manual. Publication 96-94, Olympia, Washington.

———. 2004. Washington State Wetlands Rating System for Eastern Washington-Revised. Publication #04-06-015. Olympia, Washington.

———. 2010. Determining the Ordinary High Water Mark on Streams of Washington State, 2nd Review Draft. Ecology Publication #: 08-06-001. Available online at: http://www.ecy.wa.gov/pubs/0806001.pdf

APPENDIX A

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs City/County: Chelan Sampling Date: Dec 1, 2011

Applicant/Owner: WDFW State: WA Sampling Point: SP-1

Investigator(s): P. Hamidi, J. Wallser Section, Township, Range: T27N, R23E, Sec. 20

Landform (hillslope, terrace, etc.): Stream Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: Chelan bouldery sandy loam, 0-25% slopes NWI classification: PEMIC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. —			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. —			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Carex aquatilis	100	X	FACW
2. Typha latifolia	5		OBL
3.			
4.			
5.			
6.			
7.			
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1. —			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR3/1.5	100	—				SiL	
5-14	5Y5/2	85	10YR5/M 5Y5/1	10 5	C D	M,PL M	Sa SL	
14-20	5Y5/2	90	7.5Y4/4	10	C	M,PL	SiLT	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs City/County: Chelan Sampling Date: 12-1-11

Applicant/Owner: WDFW State: _____ Sampling Point: SP-2

Investigator(s): P. Hamidi, J. Walker Section, Township, Range: T27N, R22E, Sec. 20

Landform (hillslope, terrace, etc.): Stream Terrace Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): B Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Chelan bouldery sandy loam, 6-25% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Eriogonum heracleoides	10		
2. Purshia tridentata	20	X	
3. Artemisia tridentata	20	X	
4.			
5.			
	50 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Bromus tectorum	20	X	
2. Stipa comata	40	X	
3. Eriogonum filifolium	5		
4.			
5.			
6.			
7.			
8.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. Rubus armeniacus (=R. bifrons)	5	X	FACU
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR4/2	100					S:L	
3-16	10YR4/3	100					S:L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (Includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs City/County: Chelan Sampling Date: 12-2-11
Applicant/Owner: WDFW State: WA Sampling Point: SP-3
Investigator(s): P. Hamidi, J. Walker Section, Township, Range: T27N, R23E, Sec. 20
Landform (hillslope, terrace, etc.): hillslope / seep Local relief (concave, convex, none): Concave Slope (%): 3
Subregion (LRR): B Lat: Long: Datum:
Soil Map Unit Name: Chelan gravelly sandy loam, pumiceous NWI classification: PSSIB
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1. —			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 25' x 10')			
1. Salix exigua	20	X	OBL
2. Rosa [illegible] woodsii	5		FACU
3. Cornus sericea	10		FACW
4. Salix lucida ssp. lasiandra	40	X	FACW
5.			
75 = Total Cover			
Herb Stratum (Plot size: ____)			
1. Ranunculus natantifolius - aquatilis	65	X	OBL
2. Epilobium ciliatum	20	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
85 = Total Cover			
Woody Vine Stratum (Plot size: ____)			
1. —			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100					S.L	
3-6	10YR 3/1	100					S.L w/ Fine strata of sand	
6-10	10YR 3.5/2	100					Very gravelly coarse sand	
10-16	2.5Y 5/2.5	100					Very cobbly Coarse sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- X Other (Explain in Remarks)

S7 indicator is present

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

"S7: Dark Surface" indicator

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0-0.5" (only @ top)

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beeks Spring Creek City/County: Chelan Sampling Date: Dec 2, 2011
Applicant/Owner: WDFW State: WA Sampling Point: SP-4
Investigator(s): P. Hamid, J. Walker Section, Township, Range: T23N, R23E, Sec. 20
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 5
Subregion (LRR): B Lat: Long: Datum:
Soil Map Unit Name: Chelan gravelly sandy loam, Pumicrous NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. —			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Chrysothamnus nauseosus	15	X	
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Bromus tectorum	50	X	
2. Salsola tragus (= S. kali)	5		UPL
3. Lactuca serriola	10		FACU
4. Verbascum thapsus	5		
5. Achillea millefolium	T		FACU
6. ~~Sp~~ Oryzopsis hymenoides	5		
7. Conyza canadensis	20	X	FACU
8. Sisymbrium altissimum	5		FACU
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2.5/2	100	—				gravelly sandy loam	
8-12	10YR 4/2.5	100	—				gravelly loamy sand	
12-16	10YR 4/3	100	—				very cobbly loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

WASHINGTON STATE DEPARTMENT OF ECOLOGY
WETLAND RATING DATA FORMS

Wetland name or number E

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland E Date of site visit: Dec 1, 2011

Rated by Hamidi, Walker Trained by Ecology? Yes X No___ Date of training 2005

SEC: 20 TWNSHP: 27N RNGE: 23E Is S/T/R in Appendix D? Yes___ No X

Map of wetland unit: Figure ____ Estimated size < 1/4 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for "Water Quality" Functions	12
Score for Hydrologic Functions	16
Score for Habitat Functions	12
TOTAL score for functions	40

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ III___ **Does not Apply** X

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

Wetland Type		Wetland Class	
Vernal Pool		Depressional	
Alkali		Riverine	X
Natural Heritage Wetland		Lake-fringe	
Bog		Slope	
Forest			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number E

Does the wetland being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 20 for more detailed instructions on classifying wetlands.

Wetland name or number E

Classification of Vegetated Wetlands for Eastern Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Does the entire wetland unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
   ___At least 30% of the open water area is deeper than 3 m (10 ft)?

   NO – go to Step 2 **YES** – The wetland class is **Lake-fringe (lacustrine fringe)**

2. Does the entire wetland unit **meet all** of the following criteria?
   ____The wetland is on a slope (*slope can be very gradual*),
   ____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ____The water leaves the wetland **without being impounded?**
   NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

   NO - go to Step 3 **YES** – The wetland class is **Slope**

3. Is the entire wetland unit in a valley or stream channel where it gets inundated by overbank flooding from that stream or river? In general, the flooding should occur at least once every ten years to answer "yes." *The wetland can contain depressions that are filled with water when the river is not flooding.*

   NO - go to Step 4 **YES** – The wetland class is **Riverine**

4. Is the entire wetland unit in a topographic depression, outside areas that are inundated by overbank flooding, in which water ponds, or is saturated to the surface, at some time of the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to Step 5 **YES** – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

Wetland name or number E

HGM Classes Within One Delineated Wetland Boundary	Class to Use for Rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine (riverine is within boundary of depression)	Depressional
Depressional + Lake-fringe	Depressional

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number E

	Riverine Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality	Points (only 1 score per box)
R	**R 1.0 Does the wetland unit have the potential to improve water quality?**	*(see p. 45)*
R	R 1.1 Area of surface depressions within the riverine unit that can trap sediments during a flooding event: Depressions cover >1/3 area of wetland — points = 6 Depressions cover > 1/10 area of wetland — points = 3 If depressions > 1/10th of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/10 area of wetland — points = 1 No depressions present — points = 0	Figure ___ 1
R	R 1.2 Characteristics (cover) of the vegetation in the unit *(area of polygons with >90% cover at person height. This is not Cowardin vegetation classes)*: Forest or shrub > 2/3 the area of the wetland — points = 10 Forest or shrub 1/3 – 2/3 area of the wetland — points = 5 Ungrazed, herbaceous plants > 2/3 area of wetland — points = 5 Ungrazed herbaceous plants 1/3 – 2/3 area of wetland — points = 2 Forest, shrub, and ungrazed herbaceous < 1/3 area of wetland — points = 0 Aerial photo or map showing polygons of different vegetation cover	Figure ___ 5
R	**Total for R1** *Add the points in the boxes above*	6
R	**R 2.0 Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Wetland intercepts groundwater within the Reclamation Area — Untreated stormwater flows into wetland X Tilled fields or orchards within 150 feet of wetland X Water flows into wetland from a stream or culvert that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential or urban areas are within 150 ft of wetland — The river or stream that floods the wetland has a contributing basin where human activities have raised the levels of sediment, toxic compounds or nutrients in the river water above water quality standards — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.46)* multiplier 2
R	**TOTAL - Water Quality Functions** Multiply the score from R1 by the multiplier in R2 ***Record score on p. 1 of field form***	12

Wetland name or number E

	Riverine Wetlands HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream degradation	Points (only 1 score per box)
R	**R 3.0 Does the wetland have the potential to reduce flooding and erosion?**	*(see p. 47)*
R	R 3.1 Amount overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow of water and the width of the stream or river channel (distance between banks).* *Calculate the ratio: width of wetland/ width of stream.* If the ratio is 2 or more — points = 10 If the ratio is between 1 and < 2 — points = 8 If the ratio is ½ to < 1 — points = 4 If the ratio is ¼ to < ½ — points = 2 If the ratio is < ¼ — points = 1 Aerial photo or map showing average widths	Figure ___ 8
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub" (area of polygons with >90% cover at person height. This is not Cowardin vegetation classes)*: Forest or shrub for more than 2/3 the area of the wetland. — points = 6 Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area — points = 4 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area — points = 2 Vegetation does not meet above criteria — points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___ 0
R	**Total for R3** *Add the points in the boxes above*	8
R	**R 4.0 Does the wetland have the opportunity to reduce flooding and erosion?** *Answer NO if the major source of water is irrigation return flow or water levels are controlled by a reservoir.* Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* X There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. X There are natural resources downstream (e.g. salmon redds) than can be damaged by flooding — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 50)* multiplier 2
R	**TOTAL - Hydrologic Functions** Multiply the score from R3 by the multiplier in R4 ***Record score on p. 1 of field form***	16

Comments

Wetland name or number E

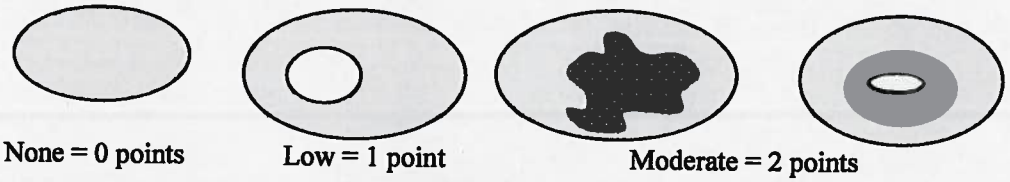
These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *(see p.62)* *Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is ¼ acre or more than 10% of the area if unit is < 2.5 acres.* ____Aquatic bed ____Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover __X__Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ____Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *Add the number of vegetation types that qualify. If you have:* 4-6 types points = 3 3 types points = 2 2 types points = 1 1 type points = 0 Map of Cowardin vegetation classes and areas with different heights of emergents	Figure ___ 0
H 1.2. Is one of the vegetation types "aquatic bed?" *(see p .64)* YES = 1 point NO = 0 points	0
H 1.3. Surface Water *(see p.65)* H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? *Note: answer YES for Lake-fringe wetlands* YES = 3 points **& go to H 1.4** NO = go to H 1.3.2 H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, AND that has an unvegetated bottom (*answer yes only if H 1.3.1 is NO*)? YES = 3 points NO = 0 points Map showing areas of open water	Figure ___ 0
H 1.4. Richness of Plant Species *(see p. 66)* Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites ,Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)* If you counted: > 9 species points = 2 4-9 species points = 1 # of species 2 < 4 species points = 0 points *List species below if you wish*	0

Wetland name or number E

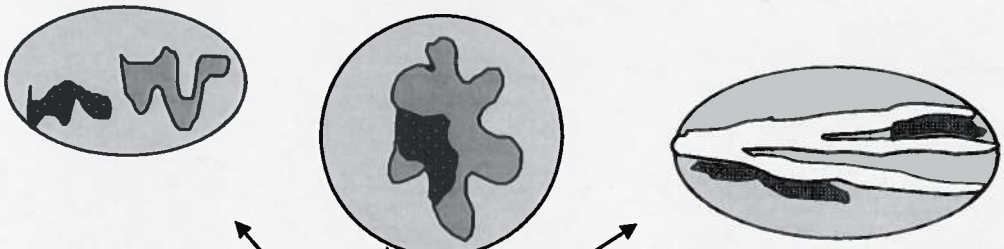
H 1.5. Interspersion of habitats *(see p. 67)*

Decided from the diagrams below whether interspersion between categories of vegetation (described in H 1.1), or categories and un-vegetated areas (can include open water or mudflats) is high, medium, low, or none.

Figure ___



None = 0 points Low = 1 point Moderate = 2 points



[Riparian braided channel]

High = 3 points

NOTE: If you have four or more vegetation categories or three vegetation categories and open water the rating is always "high". Use maps from H1.1 and H1.3

0

H 1.6. Special Habitat Features: *(see p. 68)*

Check the habitat features that are present in the wetland unit. The number of checks is the number of points you put into the next column.

____Loose rocks larger than 4" **or** large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.

__X__ Cattails or bulrushes are present within the unit.

____Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.

____Emergent or shrub vegetation in areas that are permanently inundated/ponded. *The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.*

____Stable steep banks of fine material that might be used by beaver or muskrat for denning (>45 degree slope) OR signs of recent beaver activity

__X__ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*

Maximum score possible = 6

2

TOTAL Potential to provide habitat
Add the scores in the column above

2

Comments

Wetland name or number E

H 2.0 Does the wetland have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 71)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed." Relatively undisturbed also means no grazing, no landscaping, no daily human use, and no structures or paving within undisturbed part of buffer.* — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference **Points = 5** — 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 80ft (25 m) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <6.6ft wide (2m) for more than 95% of the circumference (e.g . tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 3
H 2.2 Wet Corridors *(see p. 72)* H 2.2.1 Is the wetland unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor at least ¼ mile long with surface water or flowing water throughout most of the year (> 9 months/yr)? (*dams, heavily used gravel roads, paved roads, fields tilled to edge of stream, or pasture to edge of stream are considered breaks in the corridor*). YES = 4 points (go to H 2.3) NO = go to H 2.2.2 H 2.2.2 Is the unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor, at least ¼ mile long with water flowing seasonally, **OR** a lake-fringe wetland without a "wet" corridor, **OR** a riverine wetland without a surface channel connecting to the stream? YES = 2 points (go to H 2.3) NO go to H 2.2.3 H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (*do not include man-made ditches*)? YES = 1 point NO = 0 points	1

Wetland name or number E

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

____**Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife *(full descriptions in WDFW PHS report p. 152)*.

____**Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora *((full description of herbaceous species found here are in WDFW PHS report p. 153)*.

____**Old-growth/Mature forests (east of Cascade crest):** *(full descriptions in WDFW PHS report p. 157)*. Old-growth: Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. Mature: Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.

____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important *(full descriptions in WDFW PHS report p. 158)*.

____**Juniper Savannah:** All juniper woodlands *(SE part of state only; check map)*

__X__**Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

__X__**Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

____Inland Dunes This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. *(check WDFW web site)*

____**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.

____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

____**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

If wetland has **2 or more** Priority Habitats = **4 points**
If wetland has **1** Priority Habitat = **2 points**
No Priority habitats = **0 points**

4

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

Wetland name or number E

H 2.4 Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 76)***	
— The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (*Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs*) **points = 5**	
— There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing in the connection or an open water connection along a lake shore without heavy boat traffic are OK, but connections should NOT be bisected by paved roads, fill, fields, heavy boat traffic or other development) **points = 5**	2
— There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? **points = 2**	
— There is at least 1 wetland within ½ mile. **points = 1**	
— Does not meet any of the four criteria above **points = 0**	
H 2. TOTAL Score - opportunity for providing habitat *Add the scores in the column above*	10
H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?	
H 3.1 Indicator of reduced habitat functions ***(see p. 75)*** Do the areas of open water in the wetland unit have a resident population of carp (see text for indicators of the presence of carp)? *(NOTE: This question does not apply to reservoirs with water levels controlled by dams, such as the reservoirs on the Columbia and Snake Rivers)* YES = **- 5 points** NO = 0 points	*Points will be subtracted* 0
Total Score for Habitat Functions – *add the points for H 1, H 2, and H 3 and record the result on p. 1*	12

Comments

Wetland name or number F

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): [redacted] Wetland F Date of site visit: Dec 2, 2014

Rated by Hamidi, Walker Trained by Ecology? Yes X No ___ Date of training 2005

SEC: 20 TWNSHP: 27N RNGE: 23E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure ____ **Estimated size** < 1/4 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for "Water Quality" Functions	6
Score for Hydrologic Functions	2
Score for Habitat Functions	11
TOTAL score for functions	19

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ III___ **Does not Apply** X

Final Category (choose the "highest" category from above) IV

Summary of basic information about the wetland unit

Wetland Type		Wetland Class	
Vernal Pool		Depressional	
Alkali		Riverine	
Natural Heritage Wetland		Lake-fringe	
Bog		Slope	X
Forest			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number F

Does the wetland being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 20 for more detailed instructions on classifying wetlands.

Wetland name or number F

Classification of Vegetated Wetlands for Eastern Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Does the entire wetland unit **meet both** of the following criteria?

___The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

___At least 30% of the open water area is deeper than 3 m (10 ft)?

NO – go to Step 2 **YES** – The wetland class is **Lake-fringe (lacustrine fringe)**

2. Does the entire wetland unit **meet all** of the following criteria?

____The wetland is on a slope (*slope can be very gradual*),

____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

____The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

NO - go to Step 3 **YES** – The wetland class is **Slope**

3. Is the entire wetland unit in a valley or stream channel where it gets inundated by overbank flooding from that stream or river? In general, the flooding should occur at least once every ten years to answer "yes." *The wetland can contain depressions that are filled with water when the river is not flooding.*

NO - go to Step 4 **YES** – The wetland class is **Riverine**

4. Is the entire wetland unit in a topographic depression, outside areas that are inundated by overbank flooding, in which water ponds, or is saturated to the surface, at some time of the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to Step 5 **YES** – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

Wetland name or number F

HGM Classes Within One Delineated Wetland Boundary	Class to Use for Rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine (riverine is within boundary of depression)	Depressional
Depressional + Lake-fringe	Depressional

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number F

S	Slope Wetlands WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	Points (only 1 score per box)
S	**S 1.0 Does the wetland have the potential to improve water quality?**	*(see p.56)*
S	S 1.1 Characteristics of average slope of wetland: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is between 1% and 2% points = 2 Slope is more than 2% but less than 5% points = 1 Slope is 5% or greater points = 0	1
S	S 1.2 The soil 2 inches below the surface is clay or organic *(use NRCS definitions of soil types)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. **Dense** vegetation means you have trouble seeing the soil surface (>75% cover), and **uncut** means not grazed or mowed and plants are higher than 6 inches.* Dense, ungrazed, herbaceous vegetation > 90% of the wetland unit points = 6 Dense, ungrazed, herbaceous vegetation > 1/2 of unit points = 3 Dense, woody, vegetation > ½ of unit points = 2 Dense, ungrazed, herbaceous vegetation > 1/4 of unit points = 1 Does not meet any of the criteria above for herbaceous vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ___ 2
S	**Total for S 1** *Add the points in the boxes above*	3
S	**S 2.0 Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Wetland is a groundwater seep within the Reclamation Area — Untreated stormwater flows through the wetland X Tilled fields or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.58)* multiplier 2
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by the multiplier in S2 ***Record score on p. 1 of field form***	6

Wetland name or number E

	Slope Wetlands HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream degradation	Points (only 1 score per box)
S	**S 3.0 Does the wetland unit have the potential to reduce flooding and stream erosion?**	*(see p.59)*
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. See question S 1.3 for definition of dense and uncut.* ***Rigid*** *means that the stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** vegetation covers > 90% of the area of the unit — points = 6 Dense, uncut, **rigid** vegetation > 1/2 – 90% area of unit — points = 3 Dense, uncut, **rigid** vegetation > 1/4 – 1/2 of unit — points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid — points = 0	1
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2; NO points = 0	0
S	**Total for S3** *Add the points in the boxes above*	1
S	**S 4. 0 Does the wetland unit have the opportunity to reduce flooding and erosion?** *(see p.61)* *Answer NO if the major source of water is irrigation return flow (e.g. a seep that is on the downstream side of a dam or at the base of an irrigated field.* Answer YES if the wetland is in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* X Wetland has surface runoff that can cause flooding problems downgradient — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	multiplier 2
S	**TOTAL - Hydrologic Functions** Multiply the score from S3 by the multiplier in S4 ***Record score on p. 1 of field form***	2

Comments

Wetland name or number F

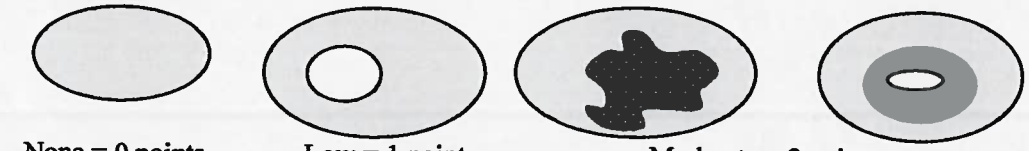
These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *(see p.62)* *Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is ¼ acre or more than 10% of the area if unit is < 2.5 acres.* ____Aquatic bed __X__Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ____Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ____Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover __X__Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *Add the number of vegetation types that qualify. If you have:* 4-6 types points = 3 3 types points = 2 2 types points = 1 1 type points = 0 Map of Cowardin vegetation classes and areas with different heights of emergents	Figure ___ 1
H 1.2. Is one of the vegetation types "aquatic bed?" *(see p .64)* YES = 1 point NO = 0 points	0
H 1.3. Surface Water *(see p.65)* H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? *Note: answer YES for Lake-fringe wetlands* YES = 3 points & **go to H 1.4** NO = go to H 1.3.2 H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, AND that has an unvegetated bottom (*answer yes only if H 1.3.1 is NO*)? YES = 3 points NO = 0 points Map showing areas of open water	Figure ___ 0
H 1.4. Richness of Plant Species *(see p. 66)* Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites ,Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)* If you counted: > 9 species points = 2 4-9 species points = 1 # of species 6 < 4 species points = 0 points *List species below if you wish*	1

Wetland name or number F

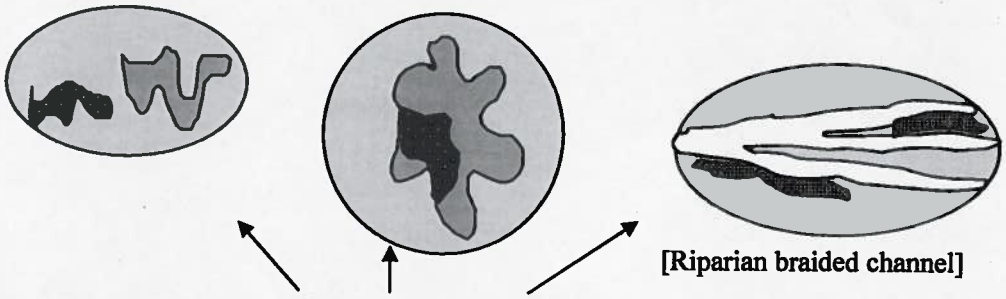
H 1.5. Interspersion of habitats *(see p. 67)*

Decided from the diagrams below whether interspersion between categories of vegetation (described in H 1.1), or categories and un-vegetated areas (can include open water or mudflats) is high, medium, low, or none.

Figure ___



None = 0 points Low = 1 point Moderate = 2 points



[Riparian braided channel]

High = 3 points

NOTE: If you have four or more vegetation categories or three vegetation categories and open water the rating is always "high". Use maps from H1.1 and H1.3

1

H 1.6. Special Habitat Features: *(see p. 68)*

Check the habitat features that are present in the wetland unit. The number of checks is the number of points you put into the next column.

____Loose rocks larger than 4" **or** large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.

____Cattails or bulrushes are present within the unit.

____Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.

____Emergent or shrub vegetation in areas that are permanently inundated/ponded. *The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.*

____Stable steep banks of fine material that might be used by beaver or muskrat for denning (>45 degree slope) OR signs of recent beaver activity

_X_ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*

Maximum score possible = 6

1

TOTAL Potential to provide habitat
Add the scores in the column above

4

Comments

Wetland name or number F

H 2.0 Does the wetland have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 71)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed." Relatively undisturbed also means no grazing, no landscaping, no daily human use, and no structures or paving within undisturbed part of buffer.* — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference **Points = 5** — 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 80ft (25 m) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = (2)** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <6.6ft wide (2m) for more than 95% of the circumference (e.g . tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 2
H 2.2 Wet Corridors *(see p. 72)* H 2.2.1 Is the wetland unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor at least ¼ mile long with surface water or flowing water throughout most of the year (> 9 months/yr)? (*dams, heavily used gravel roads, paved roads, fields tilled to edge of stream, or pasture to edge of stream are considered breaks in the corridor*). YES = 4 points (go to H 2.3) NO = go to H 2.2.2 H 2.2.2 Is the unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor, at least ¼ mile long with water flowing seasonally, **OR** a lake-fringe wetland without a "wet" corridor, **OR** a riverine wetland without a surface channel connecting to the stream? YES = 2 points (go to H 2.3) NO go to H 2.2.3 H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (*do not include man-made ditches*)? YES = 1 point NO = 0 points	1

Wetland name or number F

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

____**Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).

____**Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora ((*full description of herbaceous species found here are in WDFW PHS report p. 153*).

____**Old-growth/Mature forests (east of Cascade crest):** (*full descriptions in WDFW PHS report p. 157*). Old-growth: Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. Mature: Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.

____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).

____**Juniper Savannah**: All juniper woodlands (*SE part of state only; check map*)

____**Shrub-steppe**: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

X **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

____Inland Dunes This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. *(check WDFW web site)*

____**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.

____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

____**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

If wetland has **2 or more** Priority Habitats = **4 points**
If wetland has **1** Priority Habitat = **2 points**
No Priority habitats = **0 points**

2

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

Wetland name or number F

H 2.4 Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 76)***	
— The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (*Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs*) **points = 5** — There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing in the connection or an open water connection along a lake shore without heavy boat traffic are OK, but connections should NOT be bisected by paved roads, fill, fields, heavy boat traffic or other development) **points = 5** — There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? **points = 2** — There is at least 1 wetland within ½ mile. **points = 1** — Does not meet any of the four criteria above **points = 0**	2
H 2. TOTAL Score - opportunity for providing habitat *Add the scores in the column above*	7
H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?	
H 3.1 Indicator of reduced habitat functions ***(see p. 75)*** Do the areas of open water in the wetland unit have a resident population of carp (see text for indicators of the presence of carp)? *(NOTE: This question does not apply to reservoirs with water levels controlled by dams, such as the reservoirs on the Columbia and Snake Rivers)* YES = **- 5 points** NO = 0 points	*Points will be subtracted* 0
Total Score for Habitat Functions – *add the points for H 1, H 2, and H 3 and record the result on p. 1*	11

Comments

APPENDIX C

SITE PHOTOGRAPHS

Beebe Springs Creek (upper)

Beebe Springs Creek (middle)

Beebe Springs Creek (lower)

Toad Creek looking downstream (channel not visible)

Toad Creek looking upstream (channel not visible)

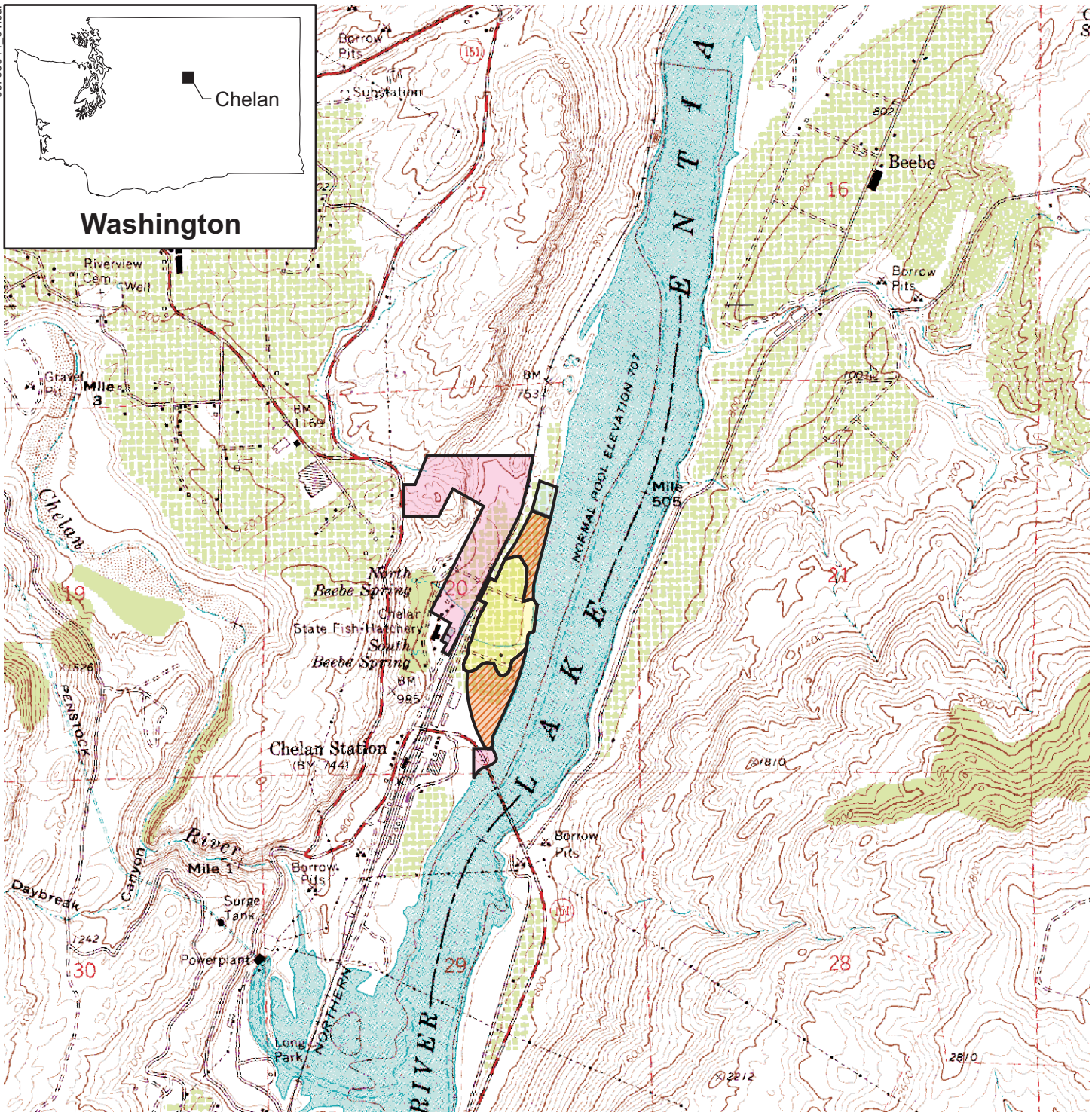
Wetland E

Wetland F (emergent)

Wetland F (scrub-shrub)

Dry Wash

FIGURES



SOURCE: 7.5-minute USGS topographic quadrangle, Chelan Falls, Washington, 1981

LEGEND

- Phase 1 and 2
- Phase 3
- Phase 4
- Phase 4a

N

0 0.5 1

Scale in Miles

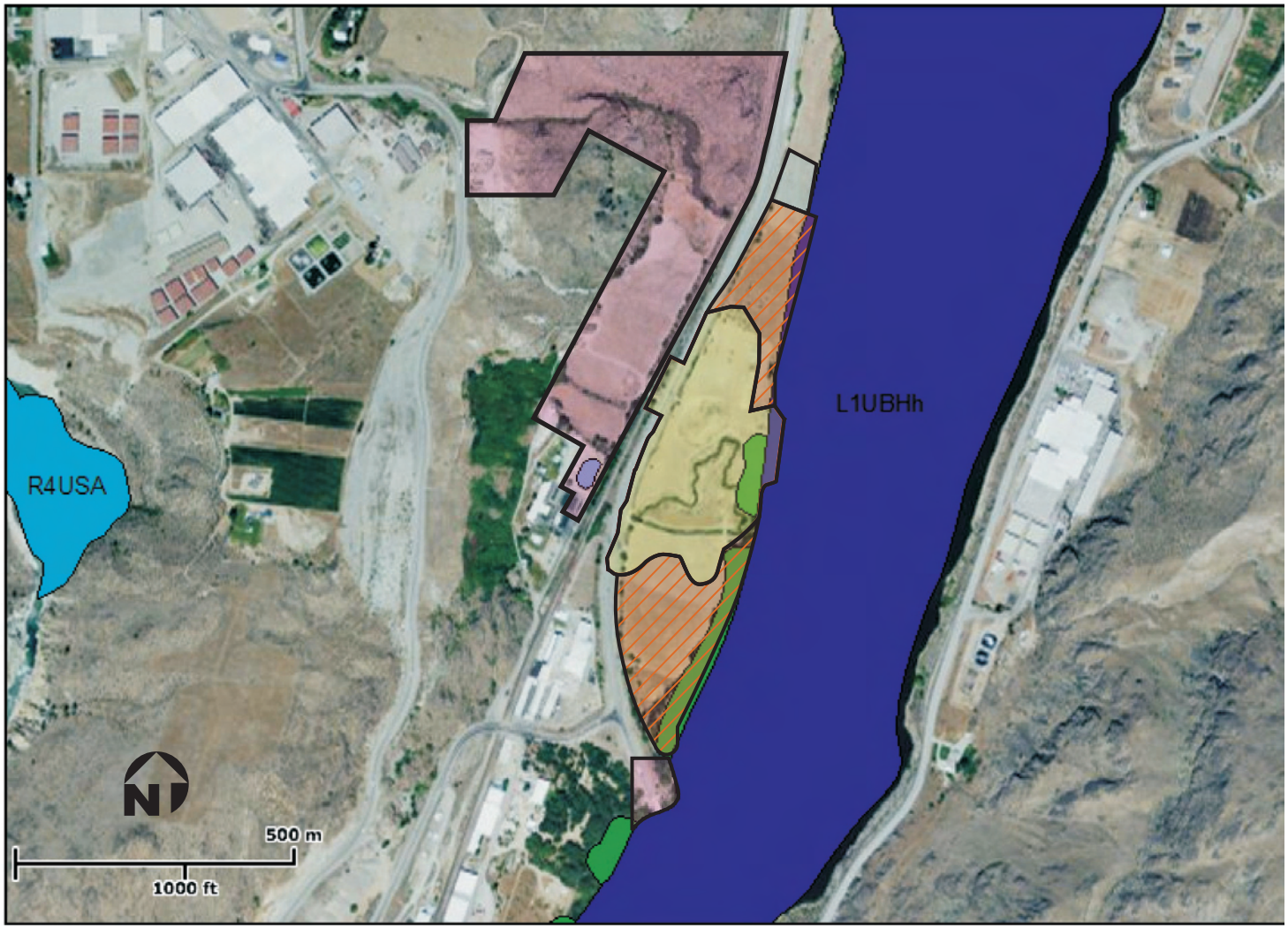
Job No. 33763344

Figure 1

Site Vicinity

URS

Jurisdictional Waters Report
Beebe Springs Natural Area – Phase 4a
Chelan County, Washington



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

LEGEND

- Phase 1 and 2
- Phase 3
- Phase 4
- Phase 4a

SOURCE: U.S. Fish and Wildlife Service, National Wetlands Inventory, accessed January 2012

Job No. 33763344

Figure 2
National Wetlands Inventory

URS

Jurisdictional Waters Report
Beebe Springs Natural Area – Phase 4a
Chelan County, Washington

33763344_03.cdr

SOURCE: Web Soil Survey of Chelan County Area, Washington,
USDA Natural Resources Conservation Service, accessed January 2012

LEGEND

	Phase 1 and Phase 2
	Phase 3
	Phase 4
	Phase 4a

Symbol	Map Unit Name
CgD	Chelan gravelly sandy loam
CkD	Chelan bouldery sandy loam
CkE	Chelan bouldery sandy loam
ClA	Chelan gravelly sandy loam, pumiceous
ClB	Chelan gravelly sandy loam, pumiceous
ClC	Chelan gravelly sandy loam, pumiceous
ErF	Entiat-Rock outcrop complex
PrB	Pogue gravelly fine sandy loam
Ro	Rock outcrop
SuB	Supplee very fine sandy loam
SuD	Supplee very fine sandy loam
W	Water

N

0 500 1,200

Scale in Feet

Figure 3
Soils

Job No. 33763344

URS

Jurisdictional Waters Report
Beebe Springs Natural Area – Phase 4a
Chelan County, Washington

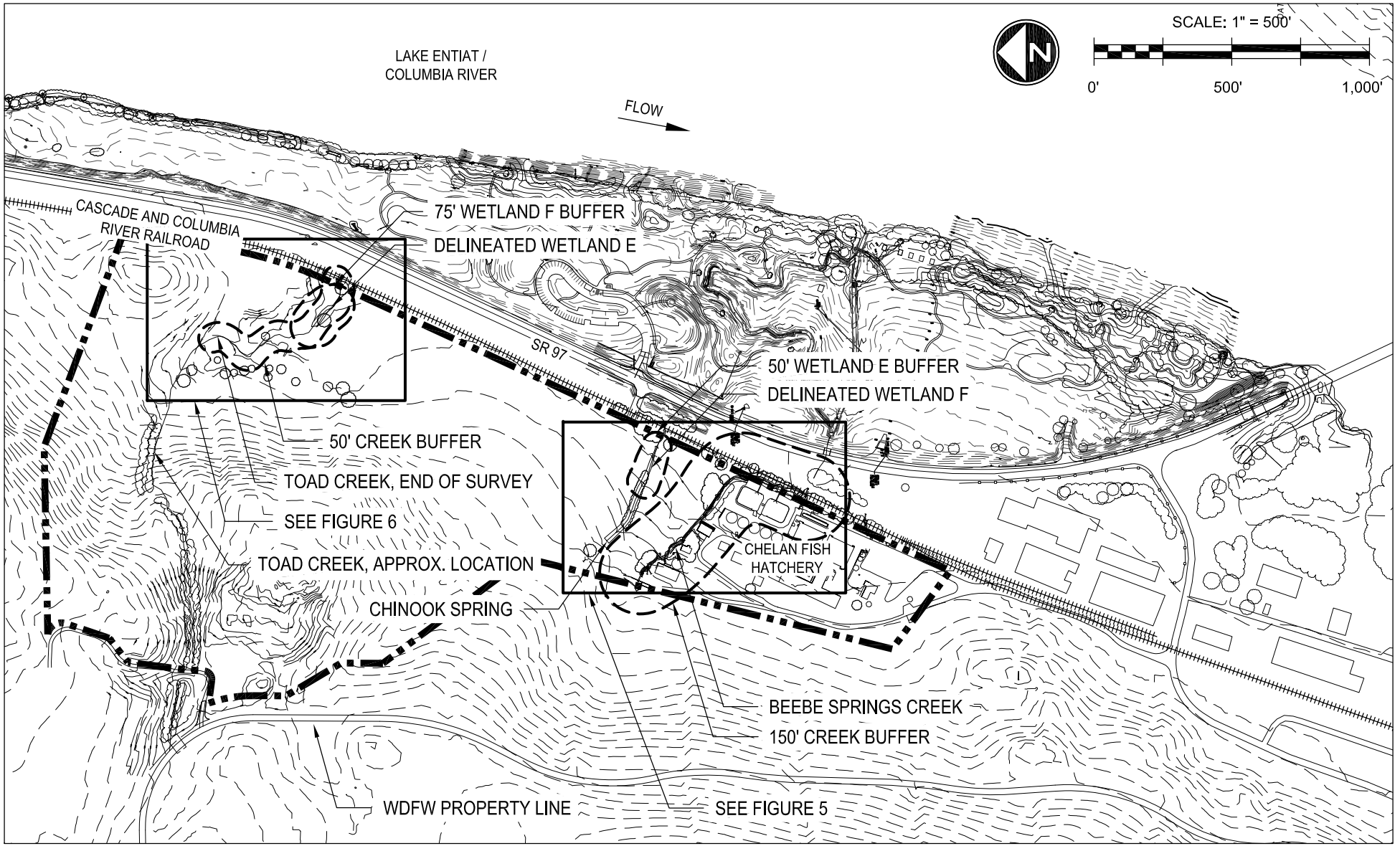


Figure 4

Wetland Locations

Job No. 33763344

DRAFT

Jurisdictional Waters Report
Beebe Springs Natural Area - Phase 4a
Chelan County, Washington

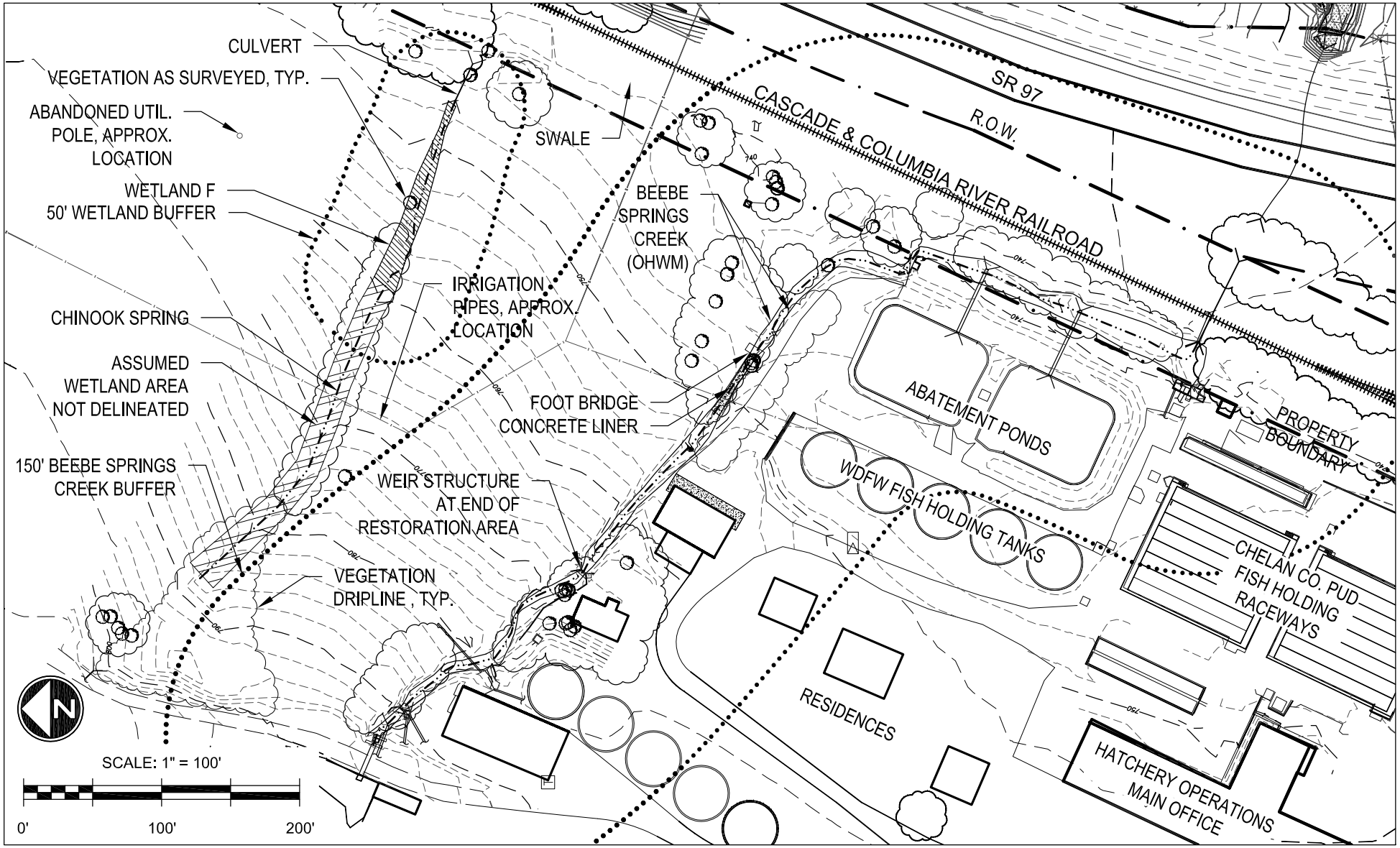


Figure 5

Beebe Springs Creek and Wetland F

Job No. 33763344

DRAFT

Jurisdictional Waters Report
Beebe Springs Natural Area - Phase 4a
Chelan County, Washington

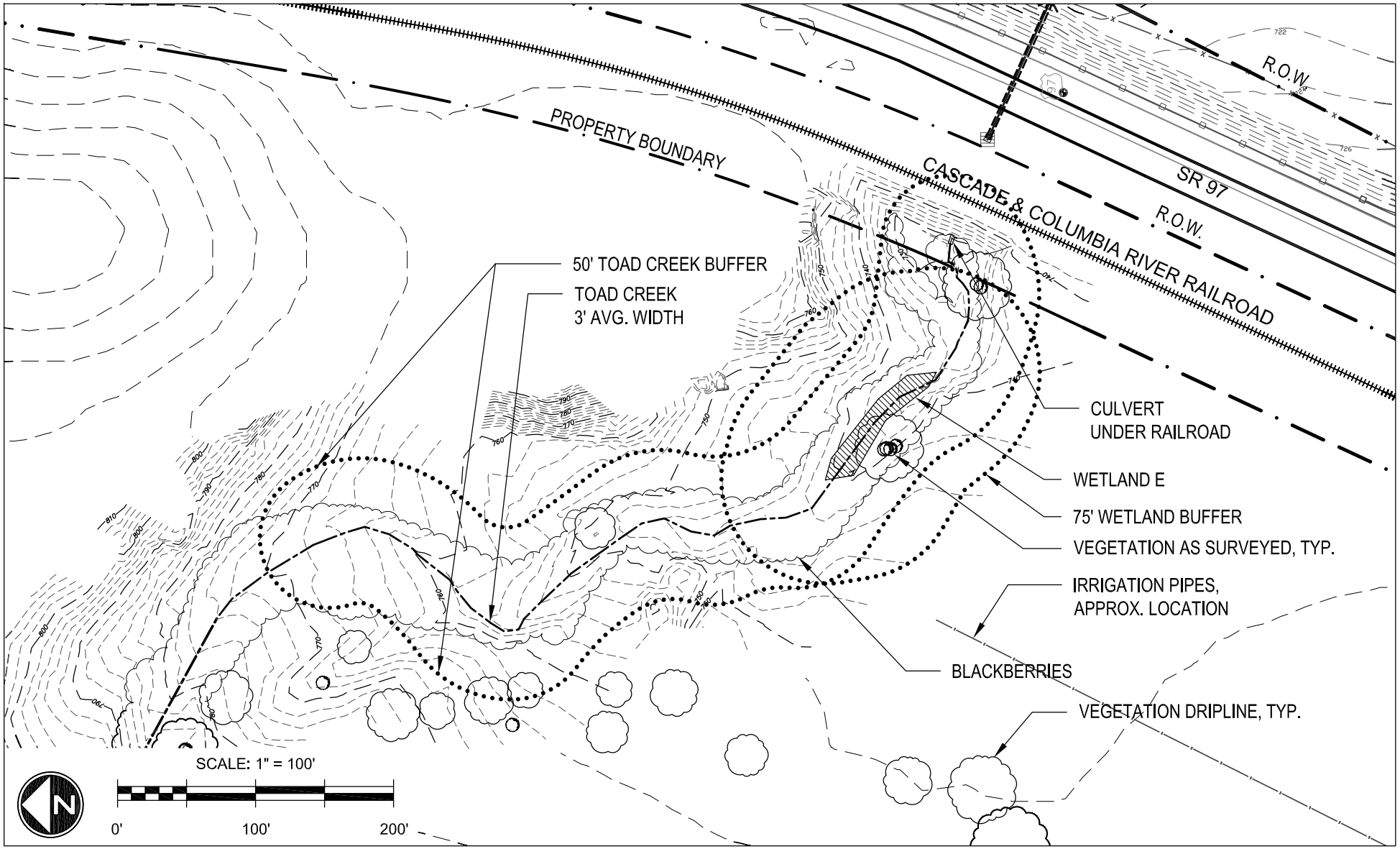


Figure 6

Toad Creek and Wetland E

Job No. 33763344

DRAFT

Jurisdictional Waters Report
Beebe Springs Natural Area - Phase 4a
Chelan County, Washington