

JURISDICTIONAL WATERS REPORT

Beebe Springs Natural Area Chelan County, Washington Phase 3

Prepared for

Washington Department of Fish and Wildlife

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1.0 INTRODUCTION

Phase 3 of the Beebe Springs Natural Area Development Project will consist of the creation of a series of new side channels to Lake Entiat (Columbia River), the enhancement and creation of wetlands, planting of upland and riparian vegetation, and construction of trails with viewpoints. Phases 1 and 2 involved the creation of a new, second channel for Beebe Springs Creek, the creation of one side channel, trail and viewpoint construction, one vault-style restroom, and riparian and shrub-steppe restoration.

A previous delineation was conducted on the site in 2005 by Watershed Company for Phase 1 work around Beebe Creek. URS conducted a wetland delineation of the Phase 2 area on March 6, 2007 (URS Corporation 2007).

For Phase 3, URS conducted a field visit on February 19, 2010 to determine the presence and extent of wetlands and other jurisdictional waters on the remainder of the project site. URS Corporation confirmed the presence of two wetlands in the Phase 3 area. These wetlands are an extension of the Lake Entiat shoreline wetlands delineated during Phases 1 and 2. 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.

2.0 METHODS

2.1 WETLAND DELINEATION

Documents reviewed to aid in the identification and determination of wetlands in the Phase 3 vicinity include the:

- National Wetlands Inventory Map (USFWS 2010); online at: <http://wetlandsfws.er.usgs.gov/wtlnds/launch.html>
- Soil Survey of Chelan County Area Washington (NRCS 2010); 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 determinations were made on site by wetland biologists using the 1987 US Army Corps of Engineers (Corps) *Wetlands Delineation Manual* (Corps 1987) and the Washington State Department of Ecology (Ecology) *Wetland Identification and Delineation Manual* (Ecology 1997), in conjunction with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Corps 2008). The 1997 Ecology methodology was developed to be consistent with the 1987 Corps manual. The recently-adopted 2008 *Regional Supplement* (Corps 2008) provides technical guidance and procedures specific to the arid west region. This wetland delineation is subject to agency verification and approval.

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 sample plots were used to investigate the Phase 3 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 (GretagMacbeth 2000). 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 (GretagMacbeth 2000), 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 6.0 (USDA NRCS 2006).

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 US 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 2-1. 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 3 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 class found in the project area is lake-fringe.

Lake-fringe wetlands occur in or adjacent to bodies of water greater than 20 acres in size with at least 30% of the open water areas more than 10 feet deep. The HGM definition of lake-fringe, which accounts for geomorphology, differs from the Cowardin definition of lacustrine that uses persistence of vegetation. The hydrologic characteristics of the two systems also provide subtle differences in definition.

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 2005) 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.

2.6 ORDINARY HIGH WATER MARK

The Ordinary High Water Mark (OHWM) on Lake Entiat (Columbia River) was established by locating where the fluctuations of water in the reservoir have created a clear, natural line on the bank indicated by changes in the character of the soil/substrate and destruction of terrestrial vegetation. During a February 7, 2007 site visit, a single point along this line was flagged by Tim Erkel (U.S. Corps of Engineers, Eastern Washington Regional Office). A URS biologist made a visit to the Beebe Springs Natural Area Development project area on February 9, 2007, to record OHWM elevations along the shoreline of Lake Entiat (Columbia River). After locating the flag, a Trimble GeoExplorer Geo XT GPS unit was used to record the marked location and similar locations along the length of the shoreline of Lake Entiat in the project area.

The data were post-processed with Trimble TerraSync software to obtain sub-meter points for each location. The OHWM locations were then added to CADD coverage of the project area and elevations were derived from surveyed topographic lines (2 foot interval lines). Based on the surveyed locations, the line for OHWM falls between an elevation of 708 and 709 feet (1927 Datum) and this elevation line was defined as the OHWM for the project area. This methodology was accepted for permitting Phase 2 of the Beebe Springs Natural Areas project.

3.0 RESULTS

URS conducted a pre-field review of the NWI map, the local NRCS soil survey, and topographic maps. The NWI map indicates that a series of palustrine scrub-shrub and emergent wetlands occur along the right shoreline of the Columbia River in the project area and the greater vicinity (Figure 2). A review of the Chelan County hydric soils list determined that the four soil types mapped in the project area are not hydric soils (NRCS 2001). A field investigation and wetland delineation was performed on February 19, 2010. 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*, four soil types are mapped within the project area (Figure 3). They include Chelan gravelly sandy loam, 0 to 3 and 3 to 8 percent slopes (C1A and C1B), Pogue gravelly fine sandy loam, 3 to 8 percent slopes (PrB), and Supplee very fine sandy loam, 3 to 8 percent slopes (SuB). Although all four soil types are present, Chelan soils represent the majority of the site.

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 C1A and C1B, and the hazard of water erosion is none to slight.

The Pogue series is comprised of somewhat excessively drained, moderately coarse textured soils that formed in glacial outwash derived mainly from quartz-bearing rocks. The surface soil layer is grayish brown fine sandy loam, gravelly or very stony in places, 6-inches thick, underlain by brown fine sandy loam 11-inches thick, underlain by brown gravelly fine sandy loam 13-inches thick. Outwash sand and gravel underlie these soils at a depth of 30 inches. Runoff is slow for soil PrB, and the hazards of soil blowing and water erosion are slight. If this soil is irrigated, runoff is medium and the hazard of water erosion is moderate.

The Supplee series is comprised of well-drained, medium-textured soils that formed in pumice, volcanic ash, and deposits of loess over gravelly and cobbly glacial outwash. The surface soil layer is grayish brown very fine sandy loam 6 inches thick, underlain by brown gravelly fine sandy loam and very gravelly sandy loam 25 inches thick, underlain by glacial outwash material of sand, gravel, and cobblestones at a depth of 31 inches, which extends to a depth of 60 inches and more. Runoff is slow for soil SuB, and the hazard of water erosion is slight. If this soil is irrigated, runoff is medium and the hazard of erosion is moderate.

3.2 SITE HYDROLOGY

The Beebe Springs project area contains two major sources of water – Beebe Springs Creek and the Columbia River/Lake Entiat. Beebe Springs Creek flows through the site rapidly along a moderate gradient and does not provide much hydrologic input to the project area. Lake Entiat is a reservoir pool created by the Rocky Reach Dam. The project area is located in the upper third of the reservoir where the pool levels are more heavily influenced by the highly fluctuating flows being released from the nearby upstream Wells Dam. Therefore, the hydrology along this section of the river/reservoir has characteristics of both.

The wetlands in the Phase 3 project area are within the river's active floodplain. Their hydrology is associated with both the daily elevation fluctuations of the reservoir, and seasonal overbank flooding during upstream spring runoff. These flood occurrences correspond to seasonal snowmelt. According to WDFW staff, this flooding occurs in middle and late spring, with multiple events possible that correspond with snowmelt timing in the North Cascades and the

Canadian Rockies. During these events, flood waters are detained in shallow depressions on the low terrace upslope and behind the ordinary high water line. Water captured in these depressions provides temporary inundation in the wetlands.

3.3 WETLANDS

The BSNA has had two previous delineations, in 2005 and 2007. During these previous surveys, two wetlands were identified, Wetland A and Wetland B. Wetland A was delineated along the Columbia River shoreline near the mouth of Beebe Creek. Wetland B was delineated further west of Wetland A and was partially excavated as part of Phase 2.

Two wetlands were identified in the Phase 3 project area (Figure 4). Wetlands C and D lie along the Columbia River (Lake Entiat) shoreline and were partially delineated during Phases 1 and 2 of the project (as part of Wetland A). The remainder of these wetlands on the Beebe Springs Natural Area site was delineated during Phase 3 surveys. They were delineated as 2 different wetlands, because they are now separated from each other by the newly excavated side channel and by Beebe Creek.

3.3.1 Wetland C

The segment of Wetland C within the Phase 3 area is a 1.36-acre wetland (Figures 5 and 6). It is classified under Cowardin as palustrine scrub-shrub and as a lake-fringe wetland using the HGM system. The boundary of Wetland C was defined on the waterward side by the edge of persistent vegetation and on the upslope side by a short, steep embankment.

Since this wetland is immediately adjacent to Lake Entiat, its hydrology is directly controlled by both the river/reservoir's daily and seasonal water elevations. This would be described as regularly saturated or flooded by Cowardin (Cowardin 1979). Hydrology may range from dry to flooded depending on the time of day, time of year, and hydroelectric generation demand by both Wells Dam and Rocky Reach Dam.

Soils within Wetland C typically have a 7 inch olive brown (2.5Y 4/3) very fine sand surface with brown (10YR 4/3) redox concentrations. From 7 to 13 inches, the soil is a dark grayish brown (2.5Y 4/2.5) fine sand with dark yellowish brown (10YR 4/4) redox concentrations. From 13 to 20 inches, the soil is an olive gray (5Y 5/2) very fine sand/silt with dark yellowish brown (10YR 4/4) redox concentrations. From 20 to 30 inches, the soil is an olive gray (5Y 4/2) medium sand with brown (7.5YR 4/4) redox concentrations. This bottom layer was very moist at the time of the site visit.

The vegetation in Wetland C consists of both a scrub-shrub overstory and an herbaceous emergent layer. Dominant woody plant species include white alder (*Alnus rhombifolia*/FACW), coyote willow (*Salix exigua*/OBL), red-osier dogwood (*Cornus sericea*/FACW), and some Himalayan blackberry (*Rubus armeniacus*/FACU). Herbaceous species include reed canarygrass (*Phalaris arundinacea*/FACW), smooth scouring-rush (*Equisetum laevigatum*/FACW), purple loosestrife (*Lythrum salicaria*), and field mint (*Mentha arvensis*/FACW-). Ute ladies'-tresses (*Spiranthes diluvialis*) was observed in this wetland in September 2009. This plant species is listed as Threatened under the Endangered Species Act (ESA).

According to the state and county rating methods, Wetland C would be rated as a Category III based on functions. However, since an ESA-listed plant is known to occur in the wetland, the rating is elevated to a Category I wetland. 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 200-foot buffer be located around Category I wetlands situated in low intensity developed areas.

3.3.2 Wetland D

The segment of Wetland D within the Phase 3 area is a 1.62-acre wetland (Figure 7). It is classified under Cowardin as palustrine scrub-shrub and as a lake-fringe wetland using the HGM system. The Wetland D boundary was defined on the waterward side by the edge of persistent vegetation. The upland side of the wetland is situated on a gradual slope from Lake Entiat.

Since this wetland is immediately adjacent to Lake Entiat, its hydrology is directly controlled by both the river/reservoir's daily and seasonal water elevation. This would be described as regularly saturated or flooded by Cowardin (Cowardin 1979). Hydrology may range from dry to flooded depending on the time of day, time of year, and hydroelectric generation demand by both Wells Dam and Rocky Reach Dam.

Soils within Wetland D typically have a 7 inch brown (10YR 4/3) very cobbly sandy loam surface with yellowish brown (10YR 5/6) redox concentrations. The subsurface to 12 inches is a very dark grayish brown (10YR 3/2) silt loam with brown (10YR 4/3) redox concentrations.

The vegetation in Wetland D consists of both a scrub-shrub overstory and an herbaceous emergent layer. Dominant woody plant species include white alder, coyote willow, red-osier dogwood, and Himalayan blackberry. Herbaceous species include reed canarygrass and common cattail (*Typha latifolia*/OBL)

According to the state and county rating methods, Wetland D would be rated as a Category III wetland having a moderate potential and opportunity to provide habitat and water quality functions. Its position on a reservoir significantly reduced its opportunity to provide hydrologic 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.

4.0 PROJECT IMPACTS

The proposed project would grade and recontour upland, wetland, and shoreline areas to enhance the existing site conditions and create off-channel fish habitat along the Columbia River.

Approximately 0.42 acre of wetland will be permanently impacted from construction of the project. The permanent impact will result from a combination of filling of wetland to protect the

rearing side channel and to place the approach to a dock and a boardwalk and viewing platform and converting of wetland to unvegetated open water. In addition, approximately 0.51 acre of temporary wetland impact will result from construction of the project. Much of the temporary impact is located in Wetlands C and D in areas where the side channel will connect to Lake Entiat. The temporary impact will be restored by planting a combination of native trees, shrubs, and herbaceous vegetation. Permanent and temporary impacts are shown in Table 3.

Over half of Wetland B was impacted by the construction of a side channel in Phase 2 of the Beebe Springs Natural Area. These impacts were described in the JARPA prepared for that work. The BSNA master plan shows that the area around the rest of Wetland B will be further impacted by the construction of the side channel.

The wetland was delineated as a Class III wetland with hydrology driven by occasional high flows in the Columbia River. It appears that, with the construction of the side channel, ground water levels dropped due to the permeable soils in the area. In addition, Wetland B was also modified through on-going vegetation management designed to remove non-native vegetation from the site with the long range plan to enhance the area and to plant extensive areas of native vegetation. It was impossible to remove the invasive vegetation without disturbing the few native species that existed within the remaining areas of Wetland B. Ultimately the area has been cleared.

As anticipated in Phase 3, additional work will be completed in the vicinity of Wetland B. All remaining portions of Wetland B will be impacted by this next phase, with most of the wetland being enhanced and developed as a seasonally saturated marsh. These impact areas are accounted for in the calculation of wetland impacts for Phase 3. See the Phase 3 JARPA to which this report is attached.

Table 3. Temporary and Permanent Wetland Impacts.

Wetland	Permanent Impact (sq. ft.)	Temporary Impact (sq. ft.)
Wetland B	770	7,452
Wetland C	3,420	4,535
Wetland D	14,250	10,076
Totals	18,440 (0.42 acre)	22,063 (0.51 acre)

Chelan County enforces buffer regulations for jurisdictional waters. Most of Phase 3 construction also occurs in the buffers of Wetlands C and D and the Columbia River/Lake Entiat. Currently the buffers of these features are degraded by previous land uses. The construction of Phase 3 actually enhances the buffers and therefore will require no mitigation.

No indirect impacts from the project are anticipated to the portions of Wetland C and D that will not be directly impacted by construction. The hydrology of these wetlands will remain unchanged since it is driven by dam management. The vegetation will also not be affected by the project. In addition, the functions of the wetlands are anticipated to remain the same after construction.

Approximately 0.67 acre will be excavated below the OHWM of Lake Entiat as part of the construction of the side channels. This area does not include impact to wetland that lies below the OHWM, as it is already included in the wetland impacts. The work below the OHWM (and outside of wetland) is considered self-mitigating as the jurisdictional water and its habitat value will remain relatively unchanged after construction. In addition, construction of a dock for observation will require installation of up to four pilings. The pilings will occupy less than one square foot each of substrate surface, and of course will displace a small volume (probably less than a cubic yard) of water. The dock would extend 30 feet into the river/lake, and would be a about 6 feet wide. The decking would be grating so as to minimize shading of substrate, most of which is not vegetated.

The proposed culvert removal on Beebe Springs Creek would include some in-water work to remove the culverts and the fill covering them. The temporary effects will lead to restoration of a naturally vegetated stream channel.

5.0 MITIGATION

5.1 RATIOS

Implementation of Phase 3 of the Beebe Springs Natural Area will include creation of additional side channels to the Columbia River/Lake Entiat, which will impact Wetlands C and D. One side channel was already installed in Phase 2, affecting Wetland A (which is connected to Wetland C). Similar to Phase 2, the Phase 3 side channels will actually result in a net gain of wetland area. Phase 2 of the project was considered self-mitigating, as twice as much wetland area was created as was lost.

Wetland D is a Category III wetland. It seems reasonable that the 2:1 wetland creation ratio accepted during Phase 2 of the project would be appropriate for impacts to this wetland.

However, since Phase 2 was permitted, Ute ladies'-tresses (a Threatened species under the Endangered Species Act) was discovered along the banks of Lake Entiat in Wetland C. The presence of this species in Wetland C automatically results in its designation as a Category I "Natural Heritage" wetland. According to agency guidance, it is not considered possible to create, rehabilitate, or re-establish a Category I Natural Heritage wetland. However, the Chelan PUD (who has monitored this species in Lake Entiat since 2000) has concluded that Ute ladies'-tresses became established in the area after creation of the reservoir.

Since the "natural heritage" status of the wetland is solely based on the presence of the orchid (it would be a Category III based on functions), creating more habitat for the species will be a positive change. As part of Phase II ESA consultation, it was determined that no known orchid locations will be disturbed during construction. The creation of side channels would create more potential habitat for this species. In addition, these side channels would be physically connected to Wetland C and act as a continuation of the wetland. Therefore we believe that a 2:1 wetland creation ratio would be appropriate for impacts to Wetland C.

Table 4. Proposed Wetland Mitigation Ratios and Areas

Impact Type	Ratio	Impact Area (sq. ft.)	Mitigation Needed (sq. ft.)	Mitigation Area Available (sq. ft.)
Permanent Impact	2:1	18,440	36,800	52,708
Temporary Impact	1:1	22,063	22,063	22,063

As discussed earlier, the impacts below the OHWM of Lake Entiat are considered self-mitigating, as the jurisdictional water will remain relatively unchanged after construction.

6.0 REFERENCES

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APPENDIX A
WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beese Springs City/County: Chelan Sampling Date: Feb 19, 2010
 Applicant/Owner: WDFW State: WA Sampling Point: SP-12
 Investigator(s): P. Hamdi, J. Walker Section, Township, Range: T27N R23E Sec 20
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): flat Slope (%): 3
 Subregion (LRR): B Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: _____ _____ _____	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rhombifolia</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>7</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				
<u>20</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Cornus sericea</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	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 = _____
2. <u>Salix eripha</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
3. <u>Alnus rhombifolia</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
4. _____				
5. _____				
<u>100</u> = Total Cover				
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Lyttrum salicaria</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	<input checked="" type="checkbox"/> 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.
2. <u>Phalaris arundinacea</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Equisetum laevigatum</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
<u>30</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. _____				Yes <input checked="" type="checkbox"/> No _____
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				
Remarks: _____ _____ _____				

SOIL

Sampling Point: SP-12

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
<i>in. of litter</i> 0-7	2.5Y 4/3	97	10YR 4/3	3	C	m	V. fine sand	
7-13	2.5Y 4/2.5	97	10YR 4/4	3	C	m	fine sand	
20-30	5Y 4/2	95%	7.5YR 4/4	5%	C	M	medium sand w/ 10% gravel; very moist	
13-20	5Y 5/2	95	10YR 4/4	5	C	m	V. fine sand/silt	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input checked="" type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators 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

Remarks:
 frequently flooded > 7 days during growing season
 April to June

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input checked="" type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input checked="" type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input checked="" type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes No

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

Remarks:
 *note: Lake Erie level rises later in spring and inundates this area

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs City/County: Chelan Sampling Date: Feb 19, 2010
 Applicant/Owner: WDFW State: WA Sampling Point: SP-13
 Investigator(s): P. Hamidi, J. Walker Section, Township, Range: 27N, R23E, Sec 20
 Landform (hillslope, terrace, etc.): terrace edge Local relief (concave, convex, none): flat Slope (%): _____
 Subregion (LRR): B Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
4. _____	_____	_____	_____	
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet:
1. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species _____ x 3 = _____
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
= Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators:
1. <u>Coryza canadensis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	___ Dominance Test is >50%
2. <u>Centaurea</u>	<u>10</u>	_____	_____	___ Prevalence Index is ≤3.0 ¹
3. <u>Aquifolium sp.</u>	<u>5</u>	_____	_____	___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. <u>Bromus tectorum</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	___ Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>95</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
= Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>
Remarks:				

SOIL

Sampling Point: SP-13

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

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-5	10YR 4/3	100				fine sandy loam	
5-20	2.5Y 4/3	100				loamy fine sand	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

Indicators for Problematic Hydric Soils³:

³Indicators 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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Water Marks (B1) (Riverine)
	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
	<input type="checkbox"/> Drainage Patterns (B10)
	<input type="checkbox"/> Dry-Season Water Table (C2)
	<input type="checkbox"/> Crayfish Burrows (C8)
	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input type="checkbox"/> Shallow Aquitard (D3)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No

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

Remarks:

no wetland hydrology indicators present

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beabe Springs City/County: Chelan Sampling Date: Feb 19, 2010
 Applicant/Owner: WDFW State: WA Sampling Point: SP-14
 Investigator(s): P. Hamill, J. Walker Section, Township, Range: ~~T27N~~ R23E Sec 20
 Landform (hillslope, terrace, etc.): Flats/Plain Local relief (concave, convex, none): flat Slope (%): _____
 Subregion (LRR): B Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: PSS/PSPM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rhombifolia</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
<u>5</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Sedra exilima</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Rubus arvensis</u>	<u>1</u>		<u>FACU</u>	OBL species _____ x 1 = _____
3. _____				FACW species _____ x 2 = _____
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
<u>25</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Phalaris arundinacea</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
2. <u>Typha latifolia</u>	<u>5</u>		<u>OBL</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. _____				<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____				
6. _____				
7. _____				
8. _____				
<u>105</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Footnote:
1. _____				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____		
Remarks:				

SOIL

Sampling Point: SP-14

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-7	10YR 4/3	95	10YR 5/6	5	C	M	very cobbly	Sandy loam
7-12	10YR 3/2	98	10YR 4/3	2	C	M	Silt loam	15% cobbles

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

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

Indicators for Problematic Hydric Soils³:

- 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)

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

³Indicators 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

Remarks:

frequently flooded for >7 days during the growing season

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

- 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)

- 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 Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

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

Remarks:

note: Lake Entiret rises later in spring + inundates/saturates this area

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs City/County: Chelan Sampling Date: Feb 19, 2010
 Applicant/Owner: WDFW State: WA Sampling Point: SP-15
 Investigator(s): P. Hamidi, J. Walker Section, Township, Range: T27N R23E Sec. 20
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR): B Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: inland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Populus balsamifera</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
4. _____				
<u>100</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Rubus armenicus (mowed)</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Total % Cover of: _____ Multiply by: _____
2. _____				OBL species _____ x 1 = _____
3. _____				FACW species _____ x 2 = _____
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
<u>100</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation indicators:
1. _____				<input type="checkbox"/> Dominance Test is >50%
2. _____				<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. _____				<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Footnote:
1. _____				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>

Remarks:
 Most of *Rubus armenicus* has been mowed as part of previous phases of weed control

SOIL

Sampling Point: SP-25

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/2	100	—	—	—	—	silt loam	20% cobbles
4-12	10YR 5/6	100	—	—	—	—	sandy loam	as finely cobbly

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators 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: *note: area at base of highway embankment fill*

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks: *no wetland hydrology indicators present*

APPENDIX B

WASHINGTON STATE DEPARTMENT OF ECOLOGY

WETLAND RATING DATA FORM

Wetland name or number C

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): C Date of site visit: 2/19/10

Rated by Jeff Walker Trained by Ecology? Yes No Date of training 4/10/07

SEC: 20 TOWNSHIP: 27N RANGE: 23E Is S/T/R in Appendix D? Yes No

Map of wetland unit: Figure Estimated size

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I II III IV

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

Score for "Water Quality" Functions

Score for Hydrologic Functions

Score for Habitat Functions

TOTAL score for functions

12
4
21
37

Category based on SPECIAL CHARACTERISTICS of wetland

I II III Does not Apply

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

I

Summary of basic information about the wetland unit

Wetland Type	Wetland Class
Vernal Pool	Depressional
Alkali	Riverine
Natural Heritage Wetland	Lake-fringe <input checked="" type="checkbox"/>
Bog	Slope
Forest	
None of the above	Check if unit has multiple HGM classes present

Wetland name or number C

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>	X	
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>	W	X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>	X	
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		X

Ute ladies'-tresses observed by ~~WDFW~~ WDFW botanist in Sept. 2009;
 → bull trout, Upper Columbia Steelhead, Upper Columbia spring run Chinook are all in Lake Entreat.

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 C

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 classes. 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 C

L Lake-fringe Wetlands WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality		Points (only 1 score per box)
L	L 1.0 Does the wetland have the <u>potential</u> to improve water quality?	(see p.52)
L	L 1.1 Average width of vegetation along the lakeshore: Vegetation is more than 33 ft (10m) wide points = 6 Vegetation is between 16 ft (5m) and 33 ft wide <u>points = 3</u> Vegetation is 6ft (2m) wide to < 16 ft wide points = 1 Map of Cowardin classes with widths marked	Figure <u>3</u>
L	L 1.2 Characteristics of the vegetation in the wetland <i>choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.</i> Herbaceous plants cover >90% of the vegetated area points = 6 Herbaceous plants cover >2/3 of the vegetated area points = 4 Herbaceous plants cover >1/3 of the vegetated area <u>points = 3</u> Other vegetation that is not aquatic bed in > 2/3 vegetated area points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area points = 1 Aquatic bed cover > 2/3 of the vegetated area points = 0 Map with polygons of different vegetation types	Figure <u>3</u>
L	Total for L1 <i>Add the points in the boxes above</i>	<u>6</u>
L	L 2.0 Does the wetland have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in the lake water, or surface water flowing through the wetland to the lake is polluted. <i>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.</i> — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Untreated stormwater flows into the wetland — Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland <input checked="" type="checkbox"/> Powerboats with gasoline or diesel engines use the lake — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of shore of lake) — Other _____ <input checked="" type="checkbox"/> YES multiplier is <u>2</u> NO multiplier is 1	(see p. 53) multiplier <u>2</u>
L	TOTAL - Water Quality Functions Multiply the score from L1 by the multiplier in L2 <i>Record score on p. 1 of field form</i>	12

Wetland name or number C

L Lake-fringe Wetlands HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce shoreline erosion		Points (Only 1 score per box)
L	L 3.0 Does the wetland have the <u>potential</u> to reduce shoreline erosion?	(see p. 54)
L	<p>L 3.1 Average width and characteristics of vegetation along the lakeshore (do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)</p> <p>> ¾ of the vegetation is shrubs or trees at least 33 ft (10m) wide points = 6</p> <p>> ¾ of the vegetation is shrubs or trees at least 6 ft. (2 m) wide points = 4</p> <p>> ¼ of the vegetation is shrubs or trees at least 33 ft (10m) wide points = 4</p> <p>Vegetation is at least 6 ft (2m) wide points = 2</p> <p>Vegetation is less than 6 ft (2m) wide points = 0</p> <p>Aerial photo or map with Cowardin vegetation classes</p>	Figure <u>4</u>
L	<p>L 4.0 Does the wetland have the <u>opportunity</u> to reduce erosion?</p> <p>Are there features along the shore that will be impacted if the shoreline erodes? Note which of the following conditions apply.</p> <p>— There are human structures and activities along the shore behind the wetland (buildings, fields) that can be damaged by erosion.</p> <p>— There are undisturbed natural resources along the shore (e.g. mature forests, other classes of wetland) behind the wetland than can be damaged by shoreline erosion</p> <p>— Other _____</p> <p>YES multiplier is 2 <u>NO</u> multiplier is 1</p>	(see p. 55)
L	<p><i>Water is controlled by management of reservoir</i></p> <p>TOTAL - Hydrologic Functions Multiply the score from L3 by the multiplier in L4</p> <p><i>Record score on p. 1 of field form</i></p>	Multiplier <u>1</u>
		<u>4</u>

Comments

Wetland name or number C

<i>These questions apply to wetlands of all HGM classes.</i>		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?		Figure _____								
<p>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.</p> <p> <input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input checked="" type="checkbox"/> Emergent plants >12 – 40 in. (>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in. (> 100cm) high are the highest layer with >30% cover <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover) </p> <p>Add the number of vegetation types that qualify. If you have:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td><u>points = 2</u></td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table>		4-6 types	points = 3	3 types	<u>points = 2</u>	2 types	points = 1	1 type	points = 0	2
4-6 types	points = 3									
3 types	<u>points = 2</u>									
2 types	points = 1									
1 type	points = 0									
Map of Cowardin vegetation classes and areas with different heights of emergents										
<p>H 1.2. Is one of the vegetation types "aquatic bed?" (see p.64) YES = 1 point <u>NO</u> = 0 points</p>		0								
<p>H 1.3. Surface Water (see p.65)</p> <p>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)? <i>Note: answer YES for Lake-fringe wetlands</i> <u>YES</u> = 3 points & go to H 1.4 NO = go to H 1.3.2</p> <p>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</p> <p style="text-align: center;">Map showing areas of open water</p>		3								
<p>H 1.4. Richness of Plant Species (see p. 66) Count the number of plant species in the wetland that cover at least 10 ft². (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 <i>Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)</i></p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 < 4 species points = 0 points</p> <p># of species _____ List species below if you wish</p>		1								

Wetland name or number C

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points</p> <p>High = 3 points</p> <p>[Riparian braided channel]</p> <p>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</p>	<p>Figure <u> </u></p> <p style="text-align: center;">1</p>
<p>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.</p> <p><input checked="" type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input checked="" type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. The presence of "yellow flag" <i>Iris</i> is a good indicator of vegetation in areas permanently ponded.</p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)</p> <p style="text-align: right;">Maximum score possible = 6</p>	<p style="text-align: center;">2</p>
<p style="text-align: right;">TOTAL Potential to provide habitat Add the scores in the column above</p>	<p style="text-align: center;">9</p>
<p>Comments</p>	

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p> <p>H 2.1 Buffers (see p. 71) <i>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.</i></p> <ul style="list-style-type: none"> — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5 <input checked="" type="checkbox"/> 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure <u> </u></p> <p style="text-align: center; font-size: 2em;">4</p>
<p>H 2.2 Wet Corridors (see p. 72)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) <input checked="" type="radio"/> NO = go to H 2.2.2</p> <p>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?</p> <p><input checked="" type="radio"/> YES = 2 points (go to H 2.3) NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p>YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">2</p>

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).
- 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**

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)

4

Wetland name or number C

<p>H 2.4 Landscape (choose the <i>one</i> description of the landscape around the wetland that best fits) (see p. 76)</p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> 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 	<p>2</p>	
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>		<p>12</p>
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>		
<p>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)</p> <p style="text-align: center;">YES = - 5 points NO = 0 points</p>	<p>Points will be subtracted</p>	
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>		<p>21</p>

Comments

Wetland name or number C

Uteladies-bresses found in wetland by WNHP botanist in Sept. 2009

<p>SC 3.0 Natural Heritage Wetlands (see p. 81) Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.</p> <p>SC 3.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (<i>this question is used to screen out most sites before you need to contact WNHP/DNR</i>) S/T/R information from Appendix D ___ or accessed from WNHP/DNR database ___</p> <p>YES ___ – contact WNHP/DNR (see p. 79) and go to SC 3.2 NO <u>X</u></p> <p>SC 3.2 Has DNR identified the wetland unit as a high quality undisturbed wetland or as or as a site with state threatened, endangered, or sensitive plant species? <u>YES</u> = Category I NO –not a natural heritage wetland</p>	<p>Cat. I</p>
<p>SC 4.0 Bogs (see p. 82) Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs. <i>Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>SC 4.1. Does the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to SC 4.3 <u>No</u> - go to SC 4.2</p> <p>SC 4.2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 <u>No</u> - Is not a bog for rating</p> <p>SC 4.3. Does the wetland unit have more than 70% cover of mosses at ground level in any area within its boundaries, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes - Category I bog No - go to Q. 4.4</p> <p><i>NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.</i></p> <p>SC 4.4. Is the unit, or any part of it, forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (> 30% coverage of the total shrub/herbaceous cover)? Yes - Category I bog NO</p>	<p>Cat. I</p> <p>Cat. I</p>

<p>SC 5.0 Forested Wetlands (see p. 85)</p> <p>Does the wetland unit have an area of forest (<i>you should have identified a forested class, if present, in question H 1.1</i>) rooted within its boundary that meet at least one of the following three criteria?</p> <ul style="list-style-type: none"> — The wetland is within the “100 year” floodplain of a river or stream — aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant of the “woody” vegetation. (<i>Dominants means it represents at least 50% of the cover of woody species, co-dominant means it represents at least 20% of the total cover of woody species</i>) — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are “mature” or “old-growth” according to the definitions for these priority habitats developed by WDFW (<i>see p. 83</i>) <p>YES = go to SC 5.1 NO = not a forested wetland with special characteristics</p>	
<p>SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees</p> <p>Slow growing trees are: western red cedar (<i>Thuja plicata</i>), Alaska yellow cedar (<i>Chamaecyparis nootkatensis</i>), pine spp. mostly “white” pine (<i>Pinus monticola</i>), western hemlock (<i>Tsuga heterophylla</i>), Englemann spruce (<i>Picea engelmannii</i>).</p> <p>YES = Category I NO = go to SC 5.2</p>	<p>Cat. I</p>
<p>SC 5.2 Does the unit have areas where aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant species?</p> <p>YES = Category I NO = go to SC 5.3</p>	<p>Cat. I</p>
<p>SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species.</p> <p>Fast growing species are:</p> <p>Alders – red (<i>Alnus rubra</i>), thin-leaf (<i>A. tenuifolia</i>)</p> <p>Cottonwoods – narrow-leaf (<i>Populus angustifolia</i>), black (<i>P. balsamifera</i>)</p> <p>Willows- peach-leaf (<i>Salix amygdaloides</i>), Sitka (<i>S. sitchensis</i>), Pacific (<i>S. lasiandra</i>), Aspen - (<i>Populus tremuloides</i>), Water Birch (<i>Betula occidentalis</i>)</p> <p>YES = Category II NO = go to SC 5.5</p>	<p>Cat. II</p>
<p>SC 5.5 Is the forested component of the wetland within the “100 year floodplain” of a river or stream?</p> <p>YES = Category II</p>	<p>Cat. II</p>
<p>Category of wetland based on Special Characteristics</p> <p>Choose the “highest” rating if wetland falls into several categories. If you answered NO for all types enter “Not Applicable” on p.1</p>	
<p>I</p>	

Wetland name or number D

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): D Date of site visit: 2/19/10

Rated by Jeff Walker Trained by Ecology? Yes No Date of training 4/10/07

SEC: 20 TOWNSHIP: 27N RANGE: 23E Is S/T/R in Appendix D? Yes No

Map of wetland unit: Figure Estimated size

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I II III IV

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

Score for "Water Quality" Functions

18

Score for Hydrologic Functions

4

Score for Habitat Functions

21

TOTAL score for functions

43

Category based on SPECIAL CHARACTERISTICS of wetland

I II III Does not Apply

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	
Natural Heritage Wetland	Lake-fringe	<input checked="" type="checkbox"/>
Bog	Slope	
Forest		
None of the above	Check if unit has multiple HGM classes present	

Wetland name or number D

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i></p> <p>For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>	X	
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i></p> <p>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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>	X	
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i></p> <p>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.</p>		X

bull tract, Upper Columbia Steadhead, Upper Columbia springrun Chinook are all in Lake Entiat

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 D

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 classes. 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 D

L Lake-fringe Wetlands HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce shoreline erosion		Points (only 1 score per box)
L	L 3.0 Does the wetland have the <u>potential</u> to reduce shoreline erosion?	(see p. 54)
L	<p>L 3.1 Average width and characteristics of vegetation along the lakeshore (do not include aquatic bed): (choose the highest scoring description that matches conditions in the wetland)</p> <p>> 3/4 of the vegetation is shrubs or trees at least 33 ft (10m) wide points = 6</p> <p>> 3/4 of the vegetation is shrubs or trees at least 6 ft. (2 m) wide points = 4</p> <p>> 1/4 of the vegetation is shrubs or trees at least 33 ft (10m) wide <u>points = 4</u></p> <p>Vegetation is at least 6 ft (2m) wide points = 2</p> <p>Vegetation is less than 6 ft (2m) wide points = 0</p> <p>Aerial photo or map with Cowardin vegetation classes</p>	Figure <u>4</u>
L	<p>L 4.0 Does the wetland have the <u>opportunity</u> to reduce erosion?</p> <p>Are there features along the shore that will be impacted if the shoreline erodes? Note which of the following conditions apply.</p> <ul style="list-style-type: none"> — There are human structures and activities along the shore behind the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the shore (e.g. mature forests, other classes of wetland) behind the wetland than can be damaged by shoreline erosion — Other _____ <p>YES multiplier is 2 <u>NO</u> multiplier is 1</p>	(see p. 55) Multiplier <u>1</u>
L	<p>TOTAL - Hydrologic Functions Multiply the score from L3 by the multiplier in L4</p> <p><i>Record score on p. 1 of field form</i></p>	4

most woody plants have been removed (non-vegetated)

water is controlled by management of Reservoir

Comments

<i>These questions apply to wetlands of all HGM classes.</i>		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>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.</p> <p> <input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input checked="" type="checkbox"/> Emergent plants >12 – 40 in. (>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in. (> 100cm) high are the highest layer with >30% cover <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover) </p> <p>Add the number of vegetation types that qualify. If you have:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td><u>points = 2</u></td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	<u>points = 2</u>	2 types	points = 1	1 type	points = 0	<p>Figure <u> </u></p> <p style="text-align: center; font-size: 2em;">2</p>
4-6 types	points = 3									
3 types	<u>points = 2</u>									
2 types	points = 1									
1 type	points = 0									
<p>H 1.2. Is one of the vegetation types "aquatic bed?" (see p.64)</p> <p>YES = 1 point <u>NO = 0</u> points</p>		0								
<p>H 1.3. Surface Water (see p.65)</p> <p>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)? <i>Note: answer YES for Lake-fringe wetlands</i></p> <p><u>YES</u> = 3 points & go to H 1.4 NO = go to H 1.3.2</p> <p>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)?</p> <p>YES = 3 points NO = 0 points</p> <p>Map showing areas of open water</p>		<p>Figure <u> </u></p> <p style="text-align: center; font-size: 2em;">3</p>								
<p>H 1.4. Richness of Plant Species (see p. 66)</p> <p>Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold)</p> <p>You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)</p> <p>If you counted: > 9 species points = 2 <u>4-9</u> species points = 1 < 4 species points = 0 points</p> <p># of species <u> </u></p> <p>List species below if you wish</p>		<p>Figure <u> </u></p> <p style="text-align: center; font-size: 2em;">1</p>								

Wetland name or number D

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points</p> <p>High = 3 points</p> <p>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</p>	<p>Figure <u> </u></p>
<p>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.</p> <p><input checked="" type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. The presence of "yellow flag" <i>Iris</i> is a good indicator of vegetation in areas permanently ponded.</p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)</p> <p style="text-align: right;">Maximum score possible = 6</p>	<p style="text-align: center; font-size: 2em;">2</p>
<p style="text-align: right;">TOTAL Potential to provide habitat Add the scores in the column above</p>	<p style="text-align: center; font-size: 2em; border: 1px dashed black;">9</p>
<p>Comments</p>	

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p> <p>H 2.1 Buffers (see p. 71) <i>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.</i></p> <ul style="list-style-type: none"> — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5 <input checked="" type="checkbox"/> 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure _____</p> <p style="text-align: center; font-size: 2em;">4</p>
<p>H 2.2 Wet Corridors (see p. 72)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) <input checked="" type="radio"/> NO = go to H 2.2.2</p> <p>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?</p> <p><input checked="" type="radio"/> YES = 2 points (go to H 2.3) NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p>YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">2</p>

Wetland name or number D

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).
- 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

*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)*

4

Wetland name or number D

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> 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 	<p>2</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	
<p>12</p>	
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points NO = 0 points</p>	<p>Points will be subtracted</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p> <p>21</p>	

Comments

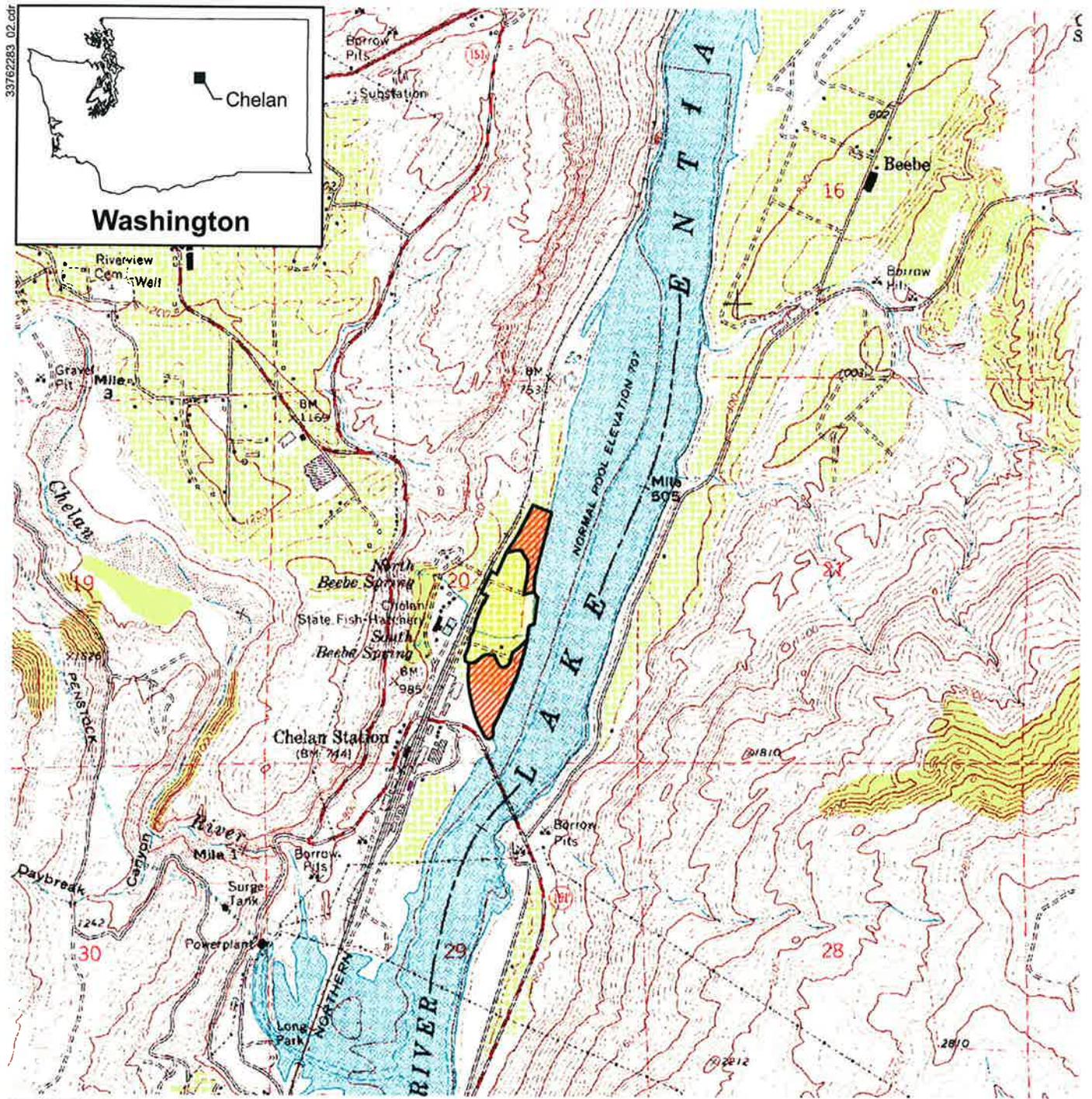
Wetland name or number D

<p>SC 3.0 Natural Heritage Wetlands (see p. 81) Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.</p> <p>SC 3.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (<i>this question is used to screen out most sites before you need to contact WNHP/DNR</i>) S/T/R information from Appendix D ___ or accessed from WNHP/DNR database ___</p> <p>YES ___ – contact WNHP/DNR (see p. 79) and go to SC 3.2 NO <input checked="" type="checkbox"/></p> <p>SC 3.2 Has DNR identified the wetland unit as a high quality undisturbed wetland or as or as a site with state threatened, endangered, or sensitive plant species? YES = Category I <input checked="" type="radio"/> NO – not a natural heritage wetland</p>	<p>Cat. I</p>
<p>SC 4.0 Bogs (see p. 82) Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs. <i>Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>SC 4.1. Does the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils?) Yes - go to SC 4.3 <input checked="" type="radio"/> NO - go to SC 4.2</p> <p>SC 4.2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 <input checked="" type="radio"/> NO - Is not a bog for rating</p> <p>SC 4.3. Does the wetland unit have more than 70% cover of mosses at ground level in any area within its boundaries, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes – Category I bog No - go to Q. 4.4</p> <p><i>NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.</i></p> <p>SC 4.4. Is the unit, or any part of it, forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (> 30% coverage of the total shrub/herbaceous cover)? Yes – Category I bog NO</p>	<p>Cat. I</p> <p>Cat. I</p>

Wetland name or number D

<p>SC 5.0 Forested Wetlands (see p. 85)</p> <p>Does the wetland unit have an area of forest (<i>you should have identified a forested class, if present, in question H 1.1</i>) rooted within its boundary that meet at least one of the following three criteria?</p> <ul style="list-style-type: none"> — The wetland is within the “100 year” floodplain of a river or stream — aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant of the “woody” vegetation. (<i>Dominants means it represents at least 50% of the cover of woody species, co-dominant means it represents at least 20% of the total cover of woody species</i>) — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are “mature” or “old-growth” according to the definitions for these priority habitats developed by WDFW (<i>see p. 83</i>) <p>YES = go to SC 5.1 NO = not a forested wetland with special characteristics</p>	
<p>SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees</p> <p>Slow growing trees are: western red cedar (<i>Thuja plicata</i>), Alaska yellow cedar (<i>Chamaecyparis nootkatensis</i>), pine spp. mostly “white” pine (<i>Pinus monticola</i>), western hemlock (<i>Tsuga heterophylla</i>), Englemann spruce (<i>Picea engelmannii</i>).</p> <p>YES = Category I NO = go to SC 5.2</p>	<p>Cat. I</p>
<p>SC 5.2 Does the unit have areas where aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant species?</p> <p>YES = Category I NO = go to SC 5.3</p>	<p>Cat. I</p>
<p>SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species.</p> <p>Fast growing species are:</p> <p>Alders – red (<i>Alnus rubra</i>), thin-leaf (<i>A. tenuifolia</i>)</p> <p>Cottonwoods – narrow-leaf (<i>Populus angustifolia</i>), black (<i>P. balsamifera</i>)</p> <p>Willows- peach-leaf (<i>Salix amygdaloides</i>), Sitka (<i>S. sitchensis</i>), Pacific (<i>S. lasiandra</i>), Aspen - (<i>Populus tremuloides</i>), Water Birch (<i>Betula occidentalis</i>)</p> <p>YES = Category II NO = go to SC 5.5</p>	<p>Cat. II</p>
<p>SC 5.5 Is the forested component of the wetland within the “100 year floodplain” of a river or stream?</p> <p>YES = Category II</p>	<p>Cat. II</p>
<p>Category of wetland based on Special Characteristics</p> <p>Choose the “highest” rating if wetland falls into several categories.</p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p>	<p>N/A</p>

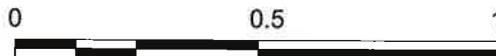
FIGURES



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

LEGEND

- Phase 1 and 2
- Phase 3



Scale in Miles

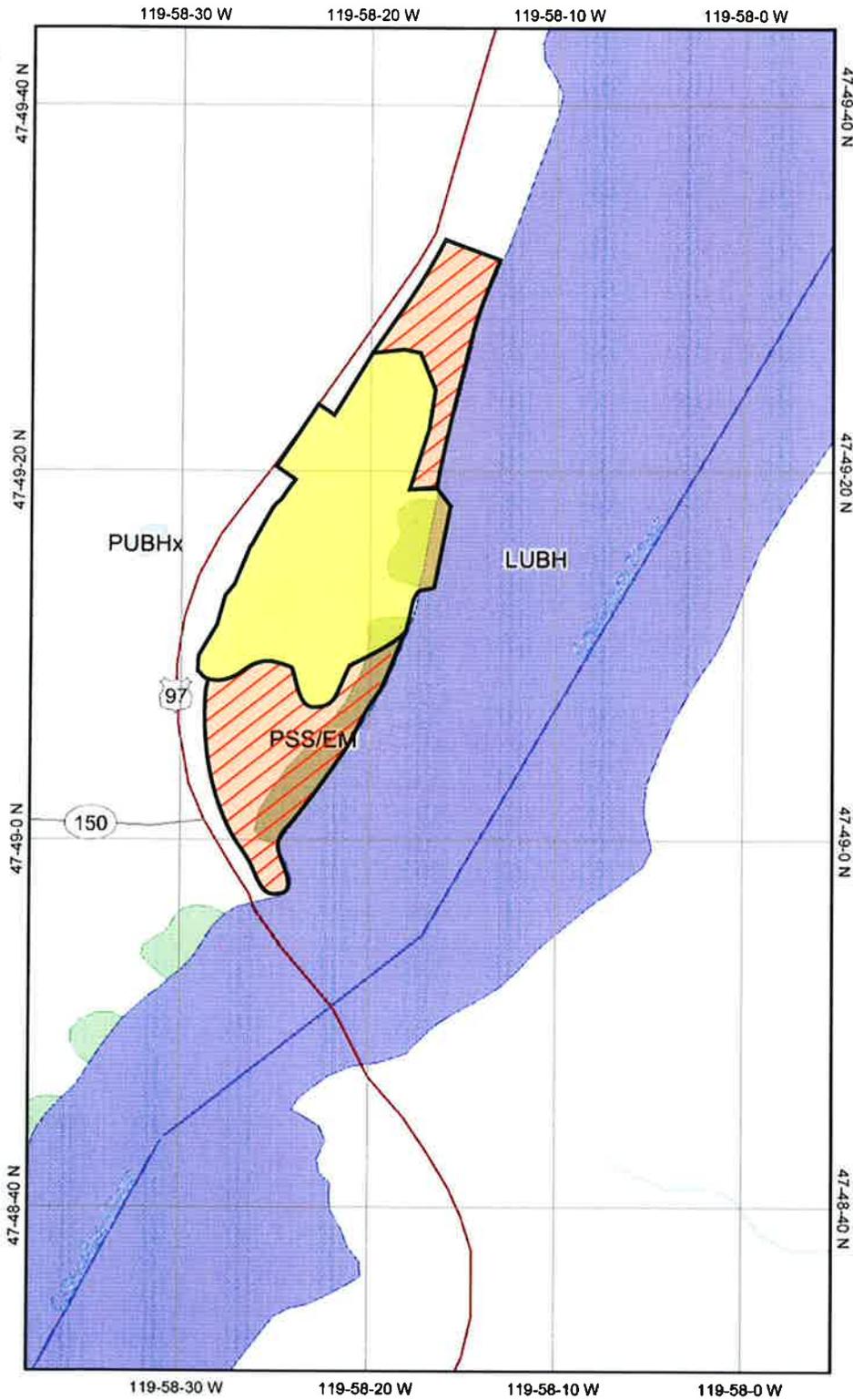
Figure 1
Site Vicinity

Job No. 33762283



Jurisdictional Waters Report
Beebe Springs Natural Area – Phase 3
Chelan County, Washington

33762283_03.cdr



LEGEND

- LUB Lacustrine unconsolidated bottom
- PSS/EM Palustrine scrub-shrub/emergent
- PUB Palustrine unconsolidated bottom
-  Phase 1 and 2
-  Phase 3

Map center: 47° 49' 8" N, 119° 58' 17" W



Scale: 1:14,475

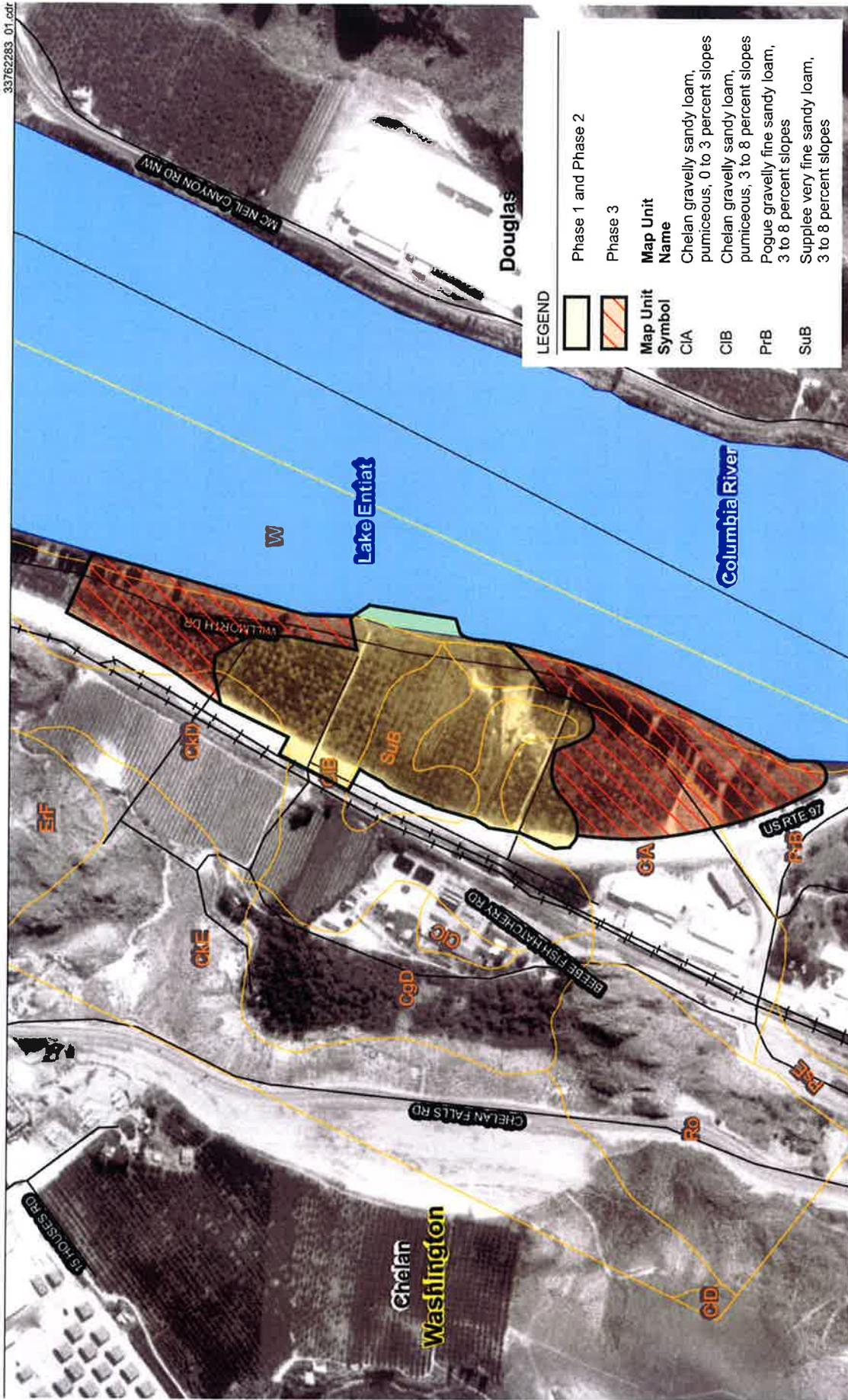
SOURCE: U.S. Fish and Wildlife Service
NWI mapping tool, 1998, accessed March 2010

Job No. 33762283

**Figure 2
National Wetlands Inventory**

Jurisdictional Waters Report
Beebe Springs Natural Area – Phase 3
Chelan County, Washington





SOURCE: Soil Survey of Chelan County Area, Washington, USDA Natural Resources Conservation Service, accessed March 2010

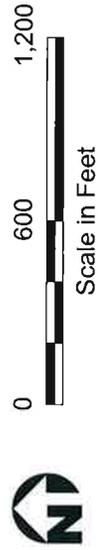
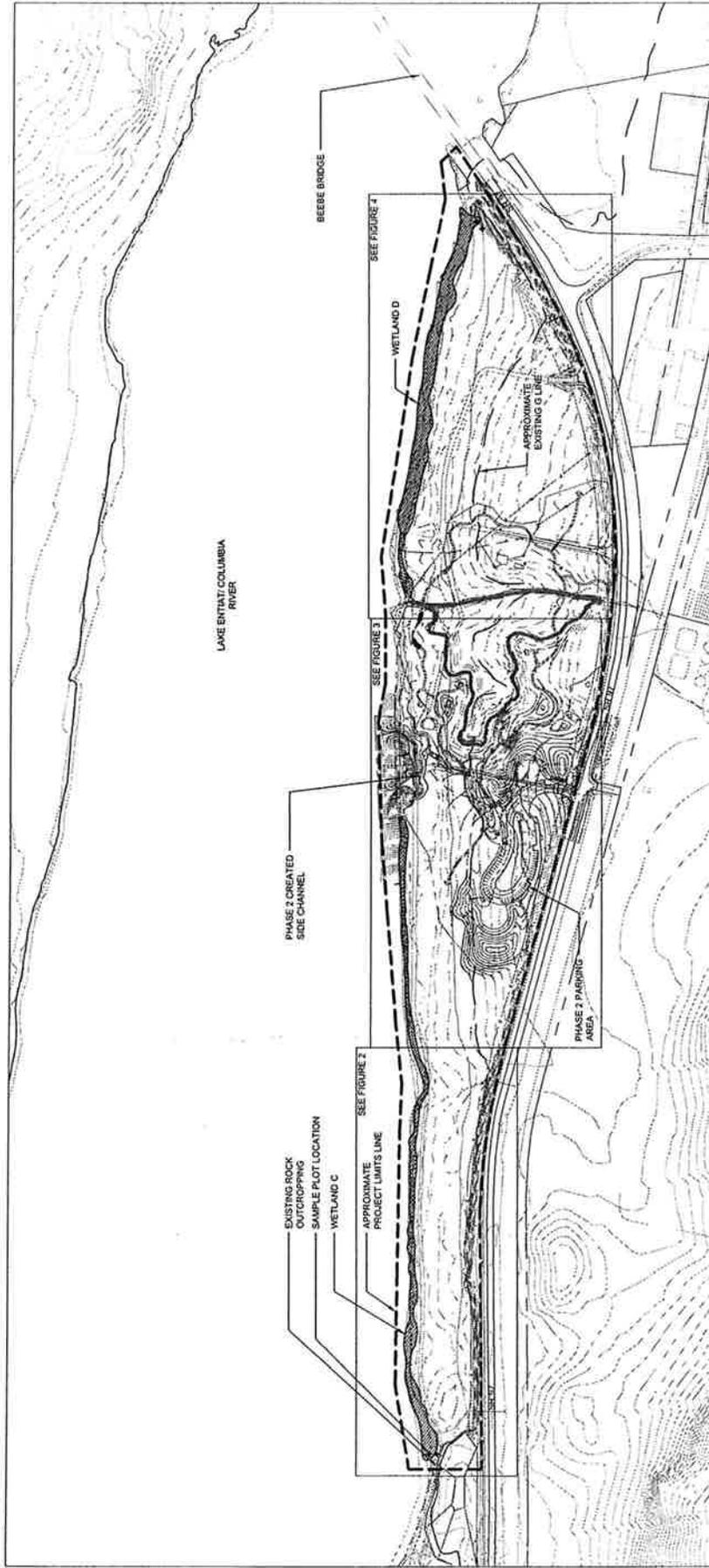


Figure 3
Soils



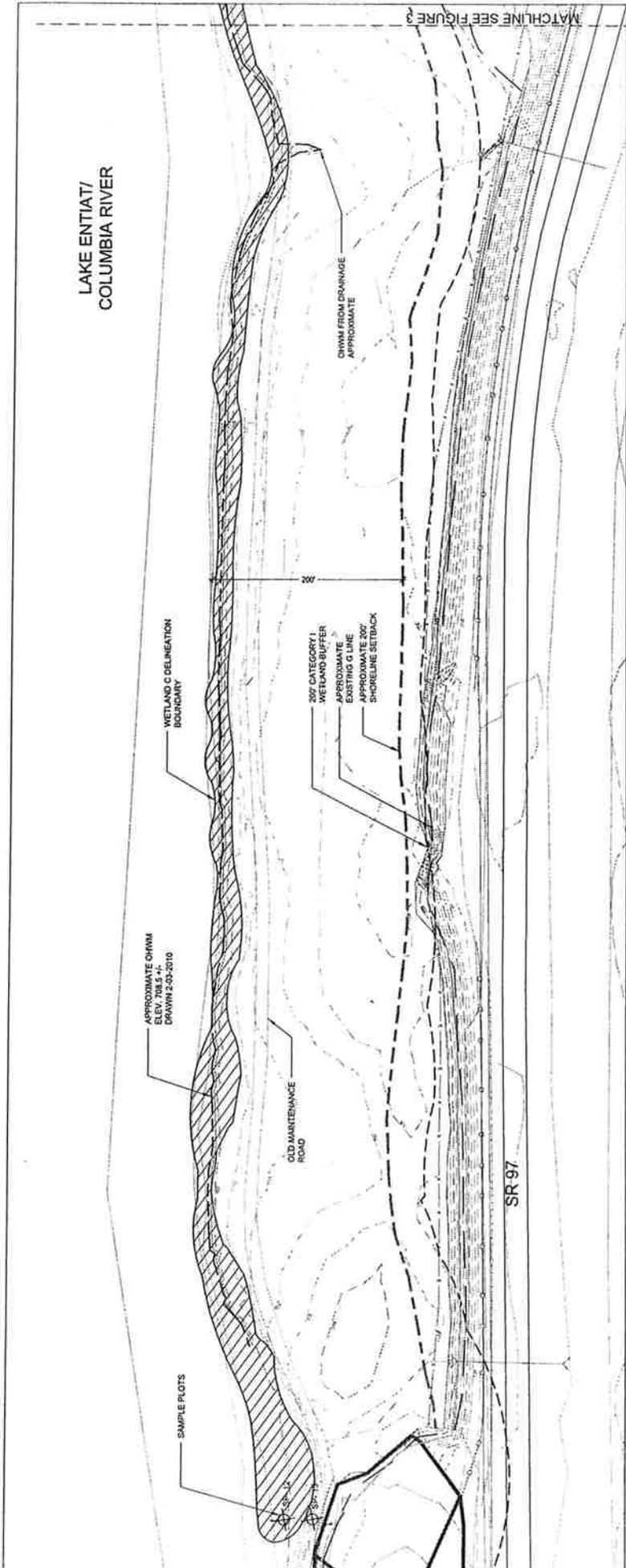
SCALE: 1" = 200'
 0 200' 400'



ONE INCH
 AT SCALE
 NOT SCALE ACCORDINGLY

FIGURE 4
 WETLAND LOCATIONS
 Jurisdictional Waters Report
 Beebe Springs Natural Area - Phase 3
 Chelan County, Washington

DRAFT



LEGEND

	URS DELINEATED WETLAND 03-2010
	WATERSHED GROUP (TWG) DELINEATED WETLAND 2005
	PHASE 2 AREA BOUNDARY
	OHWM LINE ELEV 708.5
	SAMPLE PLOT
	WETLAND BUFFER LINE (VARIES SEE PLANS)

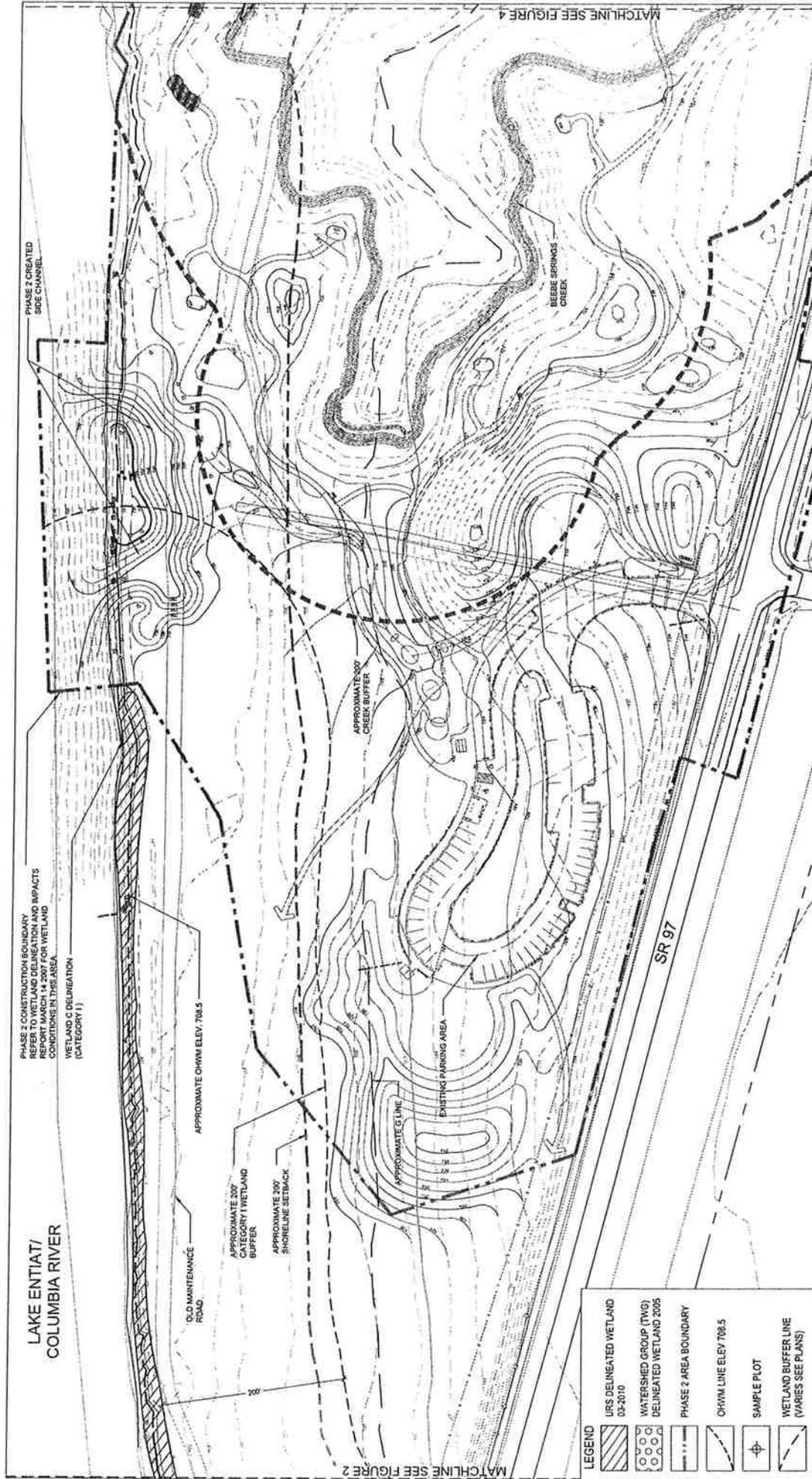


SCALE: 1" = 50'
 0 50 100
 ONE INCH
 AS SHOWN ON THIS PLAN
 NOT TO SCALE ACCORDINGLY

FIGURE 5
WETLAND C-NORTH

Jurisdictional Wetland Report
 Beebe Springs Natural Area - Phase 3
 Chelan County, Washington

DRAFT



LEGEND

	URS DELINEATED WETLAND 03-2010
	WATERSHED GROUP (TWG) DELINEATED WETLAND 2005
	PHASE 2 AREA BOUNDARY
	OHWM LINE ELEV 708.5
	SAMPLE PLOT
	WETLAND BUFFER LINE (VARIES SEE PLANS)



SCALE: 1" = 50'
0 50 100

ONE INCH
AT FULL SIZE IF NOT ONE
INCH SCALE ACCURATELY

FIGURE 6
WETLAND C-SOUTH

Jurisdictional Wetlands Report
Beere Springs Wetland Area, Task 3
Green County, Washington

DRAFT

LAKE ENTIATI/
COLUMBIA RIVER

APPROXIMATE CH2M
44' ELEVATION 708.5
CORPS AND ECOLOGY
75 WETLAND BUFFER
(CATEGORY III)
CHELAN COUNTY 50'
WETLAND BUFFER
(CATEGORY III)

WETLAND D DELINEATION
(03-2010)

TWG WETLAND
DELINEATION
AREA 2005

MOUTH OF BEEBE
SPRINGS

SAMPLE PLOTS

OLD MAINTENANCE
ROAD

APPROXIMATE 2007
SHORELINE SETBACK

APPROXIMATE LOCATION OF
EXISTING CURB

BEEBE SPRINGS
CREEK

APPROXIMATE 2007
CREEK BUFFER

PHASE 2 CONSTRUCTION BOUNDARY
AND WETLAND DELINEATION AND IMPACTS
REPORT MAPPING OF WETLAND
CONDITIONS IN THIS AREA

SR 97

SP-74

MATCHLINE SEE FIGURE 3

LEGEND	
	URS DELINEATED WETLAND 03-2010
	WATERSHED GROUP (TWG) DELINEATED WETLAND 2005
	PHASE 2 AREA BOUNDARY
	CH2M LINE ELEV 708.5
	SAMPLE PLOT
	WETLAND BUFFER LINE (VARIES SEE PLANS)



SCALE: 1" = 50'
0 50 100
ONE INCH
NOT FULL SIZE IF NOT ONE
INCH PER FOOT

FIGURE 7

WETLAND D

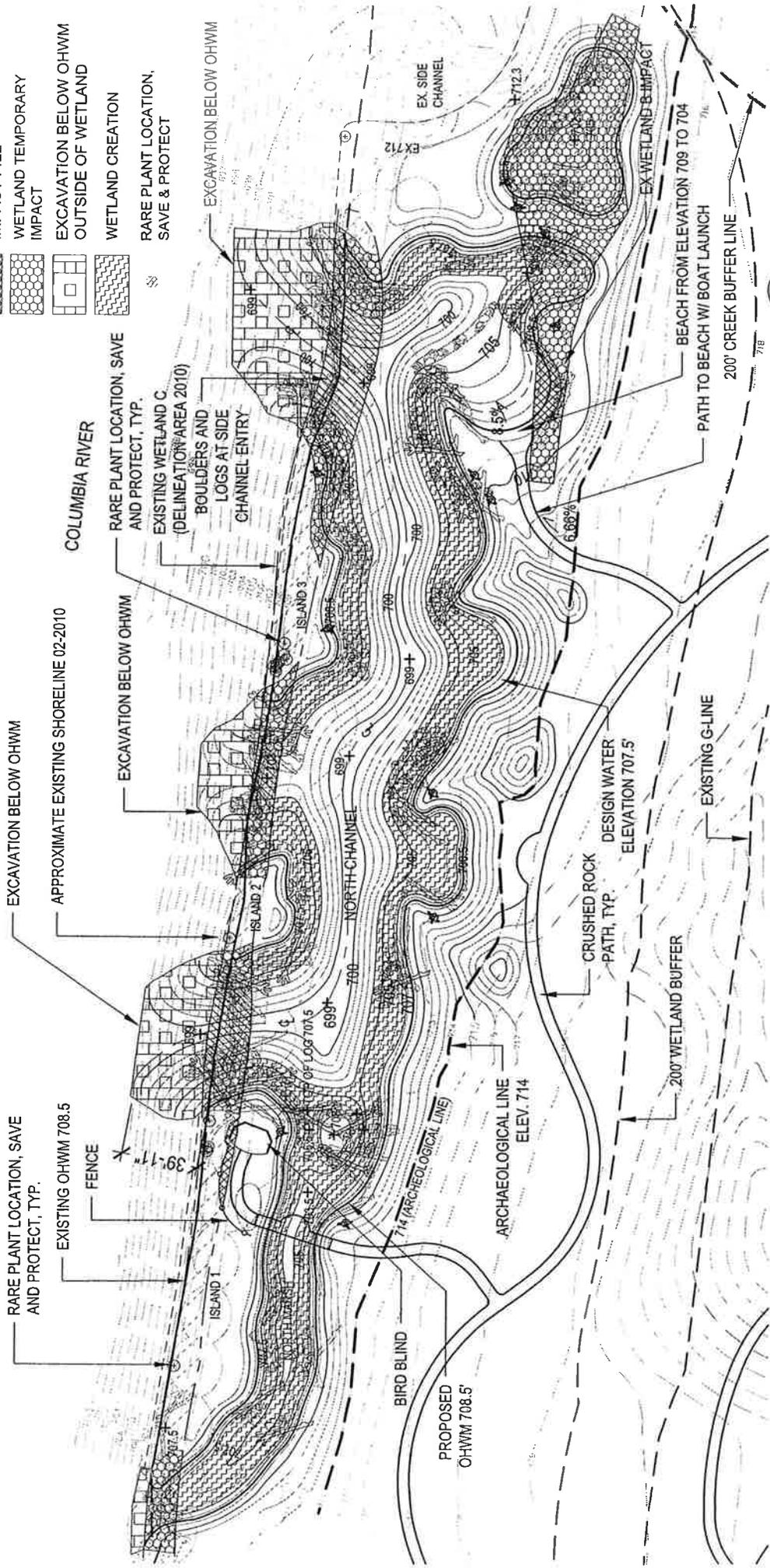
Jurisdictional Waters Phase 3
Beebe Springs Natural Area - Phase 3
Chelan County, Washington

DRAFT

CRITICAL AREA LEGEND

-  WETLAND PERMANENT IMPACT EXCAVATION
-  WETLAND PERMANENT IMPACT FILL
-  WETLAND TEMPORARY IMPACT
-  EXCAVATION BELOW OHWM OUTSIDE OF WETLAND
-  WETLAND CREATION
-  RARE PLANT LOCATION, SAVE & PROTECT

ASSUMED AVERAGE LOW WATER 705



ONE INCH = 100 FEET
 AT FULL SIZE IF NOT ONE INCH FULL SCALE ACCORDING TO

FIGURE 8

WETLAND B & C - NORTH
 Interdisciplinary Wetland Report
 Beebe Springs Natural Area - Phase 3
 Cleburn County, Washington

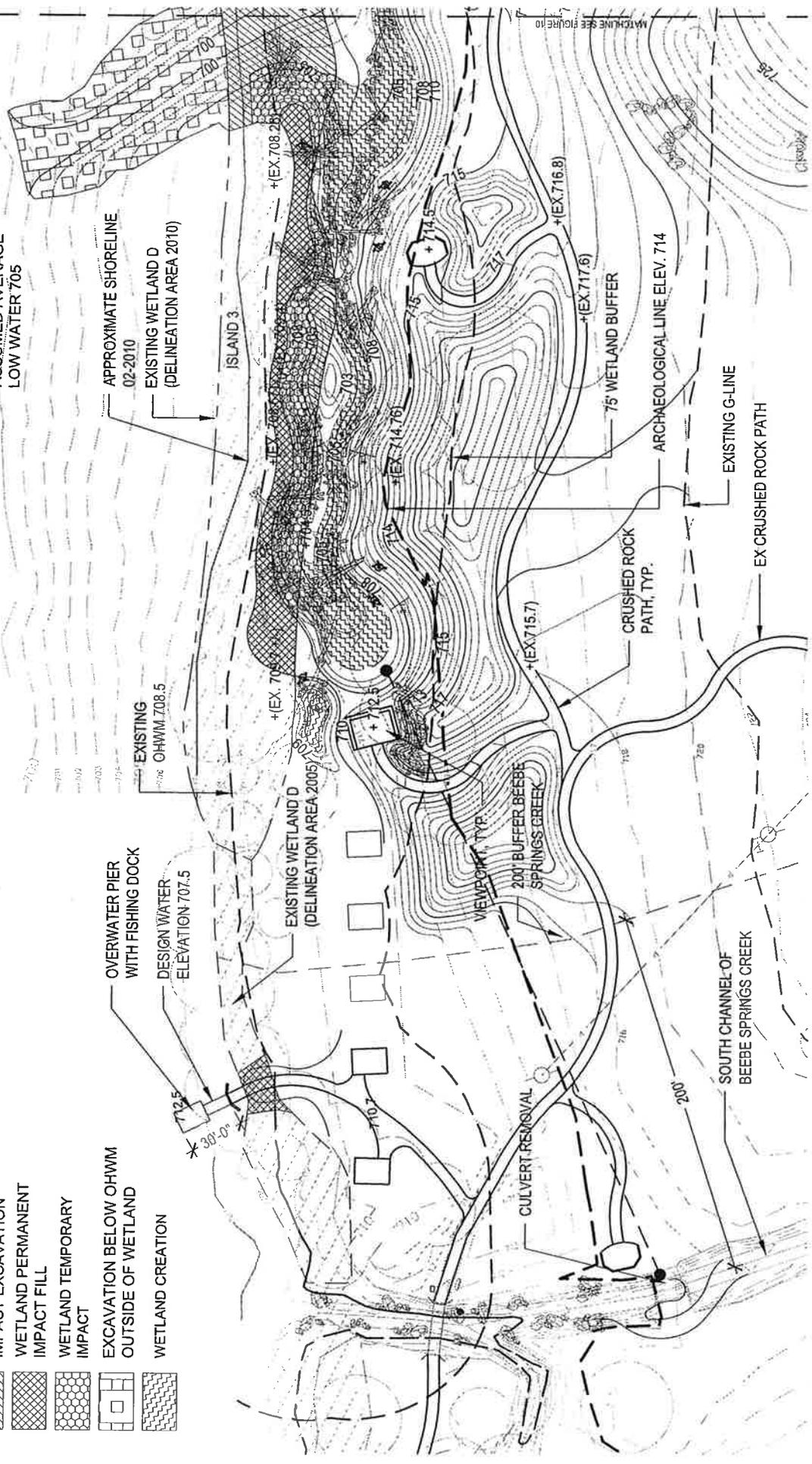
Date: 5-21-2010

CRITICAL AREA LEGEND

-  WETLAND PERMANENT IMPACT EXCAVATION
-  WETLAND PERMANENT IMPACT FILL
-  WETLAND TEMPORARY IMPACT
-  EXCAVATION BELOW OHWM OUTSIDE OF WETLAND
-  WETLAND CREATION

LAKE ENTIAT/ COLUMBIA RIVER

ASSUMED AVERAGE LOW WATER 705



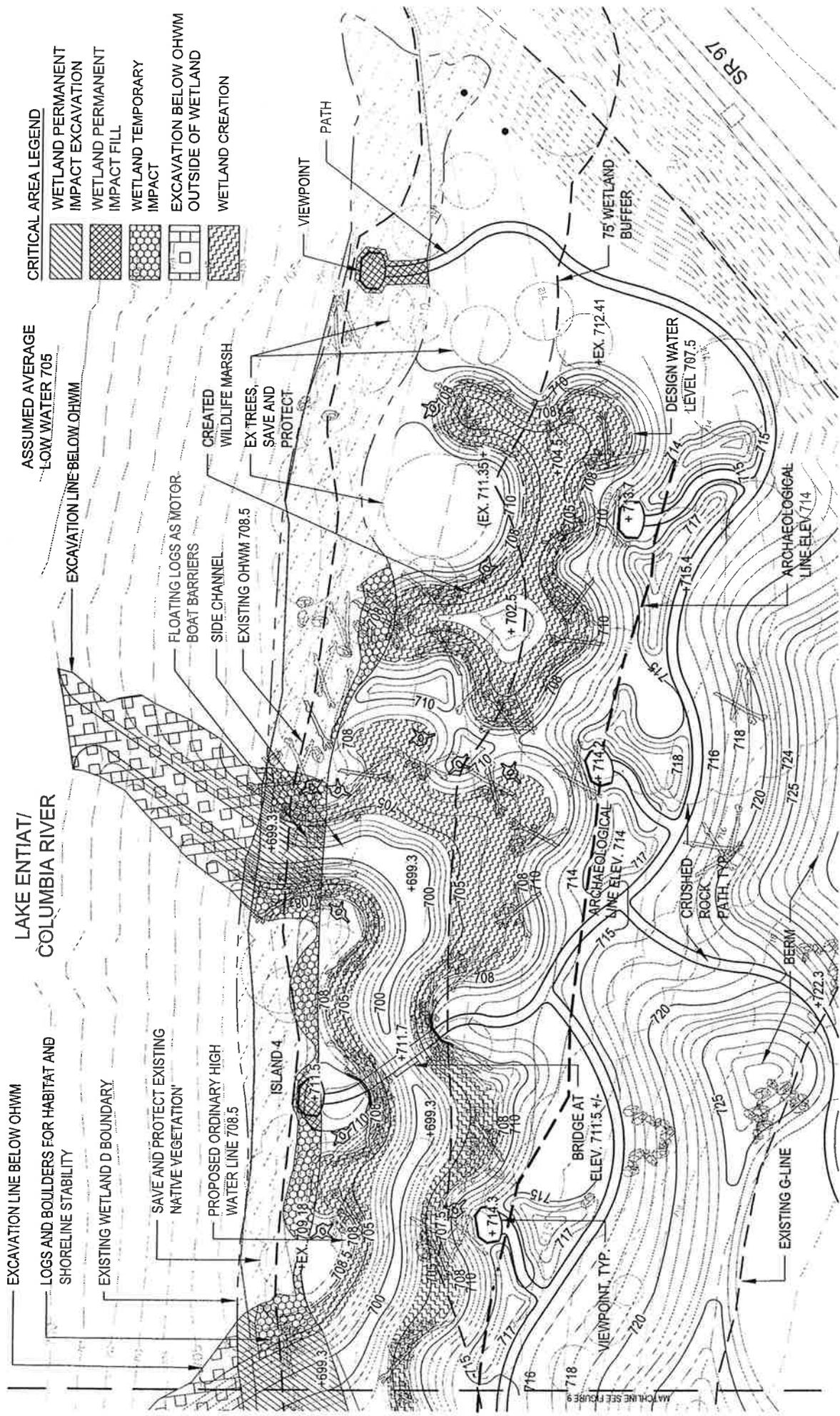
SCALE: 1" = 50'
 0 50 100
 ONE INCH
 AT FULL SIZE IF NOT ONE
 INCH FULLY ACCORDING



FIGURE 9
WETLAND D - SOUTH

Unaffiliated Waters, LLC
 Beebe Springs National Area, Phase 3
 Chelan County, Washington

Date: 5-21-2010



CRITICAL AREA LEGEND

	WETLAND PERMANENT IMPACT EXCAVATION
	WETLAND PERMANENT IMPACT FILL
	WETLAND TEMPORARY IMPACT
	EXCAVATION BELOW OHWM OUTSIDE OF WETLAND
	WETLAND CREATION



FIGURE 10
WETLAND D - SOUTH
 Unpublished Wetland Report
 Beebe Spring Natural Area, Phase 3
 Chelan County, Washington

Date: 5-21-2010