Wheeler Ridge Wetland Summary Report

Project Information

Project:	**Wheeler Ridge Wetland Summary Report**
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Reviewing Agency

Jurisdiction:	Chelan County Community Development 316 Washington Street, Suite 301 Wenatchee, WA 98801

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Project Reference:	SCJ #2512.01

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

The Project site is located in Section 17, Chelan County, Washington State (Figure 1). Wheeler Ridge, LLC is proposing a 260-acre orchard development within 640 forested acres (Figure 2). Details describing the proposed development impacts and proposed mitigation are provided below.

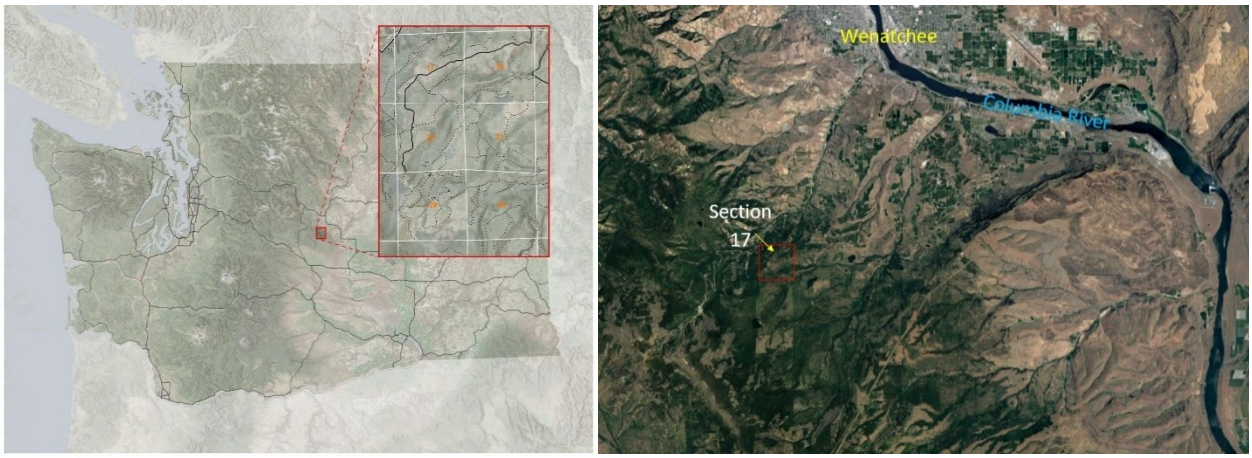

***Figure 1**. Location of the proposed project, Wheeler Ridge, Chelan County, Washington State; location of wetland delineation and riparian assessment.*

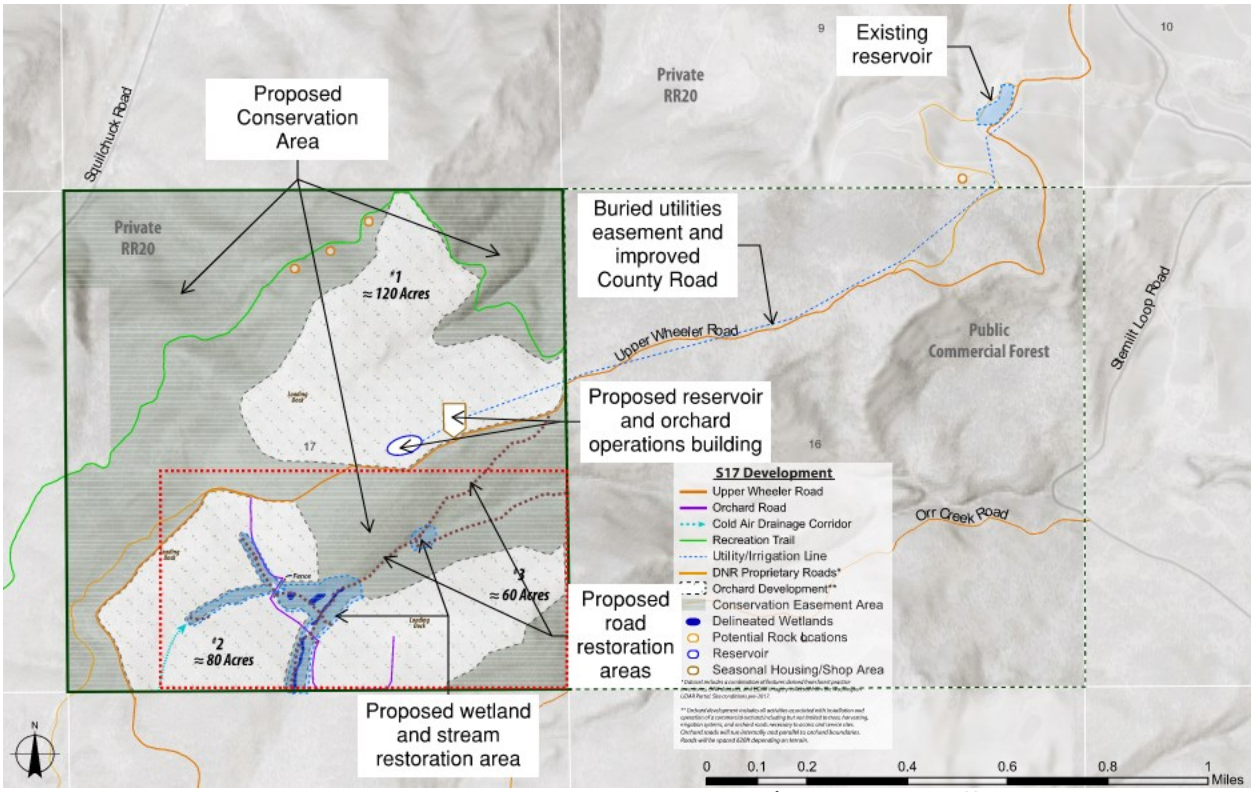

Figure 2. Proposed impacts; Conservation Area; and Wetland/ Stream and Buffer Mitigation areas (red outline).

Wetland and stream assessment information was previously embedded in a comprehensive Wheeler Ridge habitat assessment report submitted in October 2018 to Chelan County for review. In response to comments and questions from that review process, a revised habitat assessment report was submitted to Chelan County in November 2019. Some of the wetland and stream descriptions and assessment work was retained in the primary report, but an entire stand-alone wetland/stream report was adapted and provided as a separate technical report in the appendices (along with other technical reports). The November 2019 wetland/stream report was reviewed by County consultants, and two Technical Memos were submitted to Chelan County to respond to their review comments.

The purpose of this report is to update and replace all previous reports and Technical Memos related to wetland and stream impacts and associated mitigation, as this new report incorporates the responses to review comments and updates information as requested by the County since November 2019.

1.2 REPORT AND FIELD WORK TIMELINE SUMMARY

1) May 2018: SCJ Alliance delineated Wetlands A, B and C in the SW quadrant of Section 17, and assessed erosion and potential wetland conditions along Ns West, Ns North and the Np stream to east.
2) October 2018: First draft of the Wheeler Ridge Habitat Assessment Report describing the orchard project was submitted to Chelan County.
3) Summer 2019: Chelan County hired consultant Perteet Inc. to provide 3rd party review of the October 2018 report as well as a review of site conditions -- assessment of habitat features and wetland/stream conditions.
4) November 2019: County review comments on first draft (October 2018) resulted in a rewrite (November 2019) that reorganized the report to bring all of the specialty reports (including the wetland/stream report) into separate Appendices.
5) July 19, 2019: Wheeler Ridge LLC (Ben Alworth) and SCJ Alliance wetland scientist (Lisa Palazzi, PWS, CPSS) carried out a field visit to collect data in the areas indicated by Perteet as needing additional documentation. Results indicated no apparent wetland conditions in the areas Perteet had noted.
6) October 8, 2019: A field meeting with the Dept. of Ecology (DOE, Andrea Jedel, PWS) and USACE (Dale [Jess] Jordan) was scheduled to further review the areas that Perteet had noted. USACE was unable to attend at the last minute, but Ecology staff reviewed the areas in the field with Wheeler Ridge LLC and SCJ Alliance. Ecology conceptually agreed that the areas did not appear to be wetlands.
7) November 7, 2019: The Wetland and Stream Report was updated and provided as an Appendix to the updated Wheeler Ridge Habitat Assessment report. Because field work during the Summer and Fall of 2019 had not discovered any new wetland areas, no new data sheets relative to the original May 2018 delineation work were prepared for the updated critical areas report.
8) November 19, 2019: Chelan County staff (Mike Kaputa and RJ Lott), Wheler Ridge LLC (Ben Alworth) and SCJ Alliance (Lisa Palazzi) met onsite to further review the areas where Perteet had expressed concern. None of the areas had hydrology or apparent wetland indicators. In addition, one of the riparian wetlands associated with the Np stream to the east was assessed, to provide additional context about relative stream versus wetland buffer impacts.
9) March 23, 2020: Chelan County hired a new 3rd party consultant – Shockey Planning Group – to review the overall process and reports.
10) April 24, 2020: Letter from Shockey Group requested a range of information about the overall project, including information intended to resolve questions about possible wetland areas identified by Perteet.

11) April to early May 2020: Efforts to schedule a field visit with another 3rd party reviewer (from Shockey Group or another E-WA PWS) were unsuccessful due to the Governor's COVID-19 Stay At Home Order.
12) May 8, 2020: Shockey Planning Group (citing COVID-19 limitations on travel and safe field work conditions) confirms that Lisa and Ben could go to the field in May without a 3rd party reviewer while hydrology is fully formed to assess current hydrology conditions. The requested work included:
    a) Document current hydrology conditions in areas where Perteet said there were "possible" or "probable" wetlands, i.e., 1) west end of Ns West; 2) middle of Ns North; 3) east of "mud bog", between WL-A and WL B; 4) upslope from Wetland C; and old log deck east of Wetland A near south property line;
    b) Document location of Ns streams mapped directly offsite in the SE corner of Section 17;
    c) Provide more detailed information about onsite riparian wetlands associated with Np stream;
    d) Finalize corrections to Data Forms errors previously discussed – specifically, in relation to there being no Aspen Grove wetlands associated with Wetland A.
    e) In general, it was agreed that there is no need to delineate all wetlands / streams within Section 17 as long as the orchard polygons (the Project Area) are more than 300 ft from the subject wetland and/or stream (i.e., outside of the maximum possible buffer width)
13) May 12, 2020: Lisa and Ben carry out onsite visit to document conditions requested by Shockey planning Group.
14) May 19, 2020: SCJ Alliance submits a Technical Memo describing results of May 12, 2020 work.
15) June 30, 2020: Water typing assessment site visit: WTM #SE-45-20-0019
16) July 1, 2020: SCJ Alliance submits a Technical Memo documenting where wetland and stream conditions were assessed across the entire site (Section 17).

2. METHODS AND MATERIALS

2.1 WETLAND DELINEATION REGULATIONS (FEDERAL AND STATE)

Under the Washington Administrative Code (WAC) section 173-22-035, the Washington State Department of Ecology (Ecology) requires wetland identification and delineation be completed following the approved federal wetland delineation manual and applicable regional supplements, including but not limited to the 1987 Corps of Engineers Wetland Delineation Manual and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010).

2.2 WETLAND RATING, CLASSIFICATION, AND BUFFERS (COUNTY)

Chelan County Code defines wetland protection standards in Chapter 11.80 Wetland Areas Overlay District (WOD), which includes requirements for rating the wetland and making buffer width determinations based on rating score results. Standard mitigation sequencing applies.

As required by Chelan County code, the Washington State Wetland Rating System for Eastern Washington (WRSEW) has been applied. The version of the WRSEW referenced in code was Hruby 2004a but code also indicates "as amended" therefore wetlands associated with the project site were rated according to the 2014 WRSEW (Ecology Publication #14-06-030).

Wetlands identified as part of this project were classified according to the USFWS Cowardin classification system (Cowardin et al. 1979) and the USACE Hydrogeomorphic (HGM) classification system (Brinson 1993). Wetland buffers width are assigned relative to Wetland Category rating results, as provided below in Table 1.

Table 1. Wetland buffer widths required per wetland category.

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

2.3 FISH AND WILDLIFE HABITAT CONSERVATION AREAS AND BUFFERS (COUNTY)

FWHCAs include streams, riparian areas, mapped point locations of priority species wildlife habitat, and mule deer and/or elk winter range and migration corridors. Wetlands are included in the definition of Class II FWHCAs but are generally regulated primarily through Chapter 11.80. This report discussion is limited to stream impacts. Other FWHCAs are discussed in a separate, parallel report described above.

Stream buffers width are assigned based on Stream Type, as provided below (Table 2). Stream Type S is a Shoreline, a large, fish-bearing river system, which is also regulated under the County Shoreline Master

Plan. Stream Type F is a smaller fish-bearing stream, relative to a Type S. Stream Type Np is not fish bearing but flows year-round (is a perennial stream). Stream Type Ns is a seasonal stream, with no fish.

Table 2. Stream type buffer widths.

	Buffer Width (feet)	
Stream Type	**High Intensity (feet)**	**Low Intensity (feet)**
Type S	250	200
Type F	200	150
Type Np	150	100
Type Ns	50	50

2.4 BACKGROUND MATERIALS

To help determine the site conditions that might affect stream type assessment, wetland delineation and rating results SCJ Alliance staff reviewed the following information:

- Chelan County GIS mapping database
- US Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI)
- US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic database online Web Soil Service.
- Precipitation data (US Climate Data 2018)
- Washington State Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS). Database (WDFW PHS 2018)
- Washington State Department of Natural Resources (DNR) FPARS stream mapping system 2018
- Google Earth historic timeline aerial photos of the project area

3. RESULTS AND DISCUSSION

3.1 PROJECT AND SITE DESCRIPTION SUMMARY

Wheeler Ridge, LLC (WR-LLC) is proposing a ~260-acre orchard development within 640 forested acres in Section 17 (Parcel number 212017000000, T21N, R20E) Chelan County, Washington State (Figures 1 and 2). This proposal also includes the following mitigation:

- permanent set aside and management of 360 acres in Section 17 for elk habitat;
- proposed wetlands and stream restoration in disturbed areas in the southern half of Section 17; and
- removal, blocking, and/or restoration and revegetation of off-road trails and other ill-used roads and ATV-impacted areas within the elk habitat conservation easement.

The goal of the proposed mitigation -- wetland, stream, buffers and road restoration work -- is to improve overall habitat in Section 17 and to enhance potential for longer periods of stream flow in spring and early summer months which will improve elk habitat, because under current conditions, there is no surface water onsite in most years by early to mid-June. The proposed stream and wetland restoration will be designed to improve retention of seasonal hydrology.

Potential wetland and stream areas throughout Section 17 were initially assessed using topography, stream typing maps, aerial photos and LiDAR images followed up by onsite field work. Wetlands and streams within 300 feet of proposed orchard unit boundaries were delineated in May 2018. After rating the wetlands and defining the stream types, standard buffers (per Chelan County code) were applied to determine the limits of adjacent orchard units. The site was revisited in July and October of 2019, and in May 2020 to collect additional data as needed to respond to questions and comments from the Chelan County review process.

The purpose of this report is to describe wetlands and associated streams conditions in Section 17, and to describe proposed wetland, stream and buffer restoration work. It is also intended to incorporate information gathered and provided in the form of Technical Memos over the past year in response to review questions, to ensure that all information about the onsite wetlands and streams is in one report.

3.2 REGIONAL SOILS, GEOLOGY, WATERSHEDS AND TOPOGRAPHIC MAPPING

A regional overview of geology, soils, watersheds and topography is provided first, to provide a broad context about what drives and controls hydrology onsite, in relation to seasonal development and timing of stream and wetland hydrology conditions in Section 17.

3.2.1 Soil Mapping (Chelan County NRCS Soil Survey)

The dominant soil type mapped on and near Section 17 is the Stemilt silt loam (map units StD and StE), slope classes 0-25% and 25-45% (Figure 3; Table 3). According the the NRCS standard soil series description, the Stemilt soils are typically "*very deep and deep, well drained soils that formed in mixed ash and loess over material weathered mostly from basalt or andesite. Stemilt soils are on mountains. Slopes are 0 to 75 percent. The mean annual precipitation is about 25 inches and the mean annual temperature is about 44 degrees F.*"

The Stemilt soil series taxonomic classification -- *loamy-skeletal, isotic, frigid Vitrandic Argixerolls* – indicates that the native soils are Mollisols (*Argixeroll*), which would typically have a very dark, nutrient

rich surface horizon and a clay-rich (*argillic*) substrate from about 18 to 60+ inches depth. The typical Stemilt soil profile would include fine-textured surface soils to about 22 inches depth that are influenced by volcanic ash (*Vitrandic*). Both clay content and volcanic ash contribute to soil quality, having a higher cation exchange capacity, and more micronutrients. These soils area also expected to have a later start of spring growing season due to the higher elevation (*frigid*). The coarse fraction soil texture is described as being as high as 60% in the subsoils below about 20 inches (*loamy-skeletal*), which means that despite the high clay content, water holding capacity in the deeper soils may be limited, and irrigation may be needed to sustain an orchard. However, these maps in mountainous areas are generalized, and therefore, while the main concepts will likely apply, site specific conditions can be highly varied across the site and can include areas with deep soils as well as areas with bedrock at or near the surface. Other soil types mapped nearby area are mostly wind-blown loess deposits capping basalt, sandstone or glacial till substrates – the Bjork, Cle Elum, Colockum and Cowiche soil series.

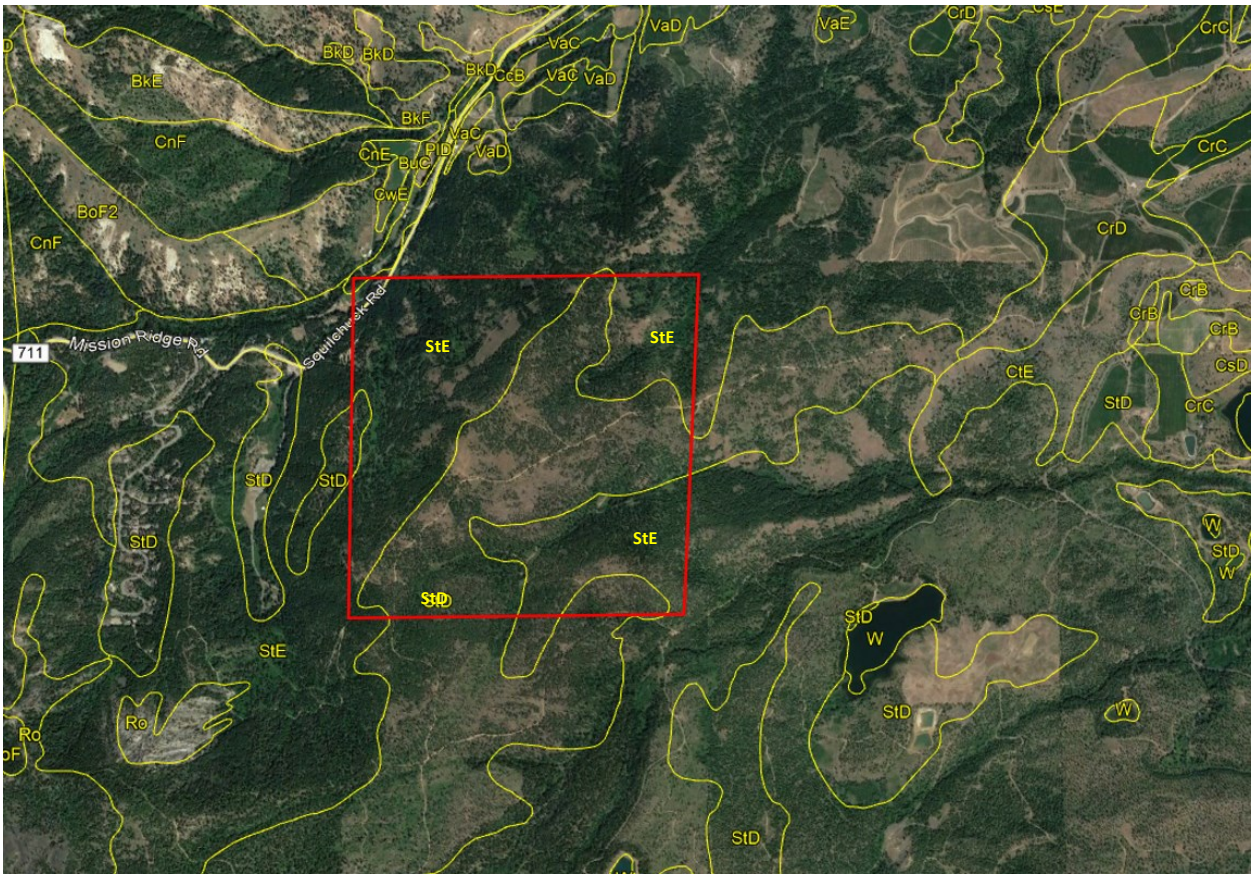

Figure 3. Soil map of area in and around Section 17.

Table 3. Soil map units and descriptions

Soil Map Unit	Soil Name	Description
BoF2	Bjork-Rock outcrop complex, F=25% to 65% slopes, eroded	Rock outcrops – bedrock at surface
BkD, BkE, BkF	Bjork SiL, Aridic Argixeroll, D=15-25%, E=25-45%, F=45-65%	Moderately deep, well drained soils formed in loess and colluvium and residuum from schist, sandstone, or conglomerate on hillsides and mountainsides.
BuC	Burch FSL, Aridic Haploxeroll, C=8-15%	Deep, well drained soils that formed in valley fill material on terraces.
CnE	Cle Elum SiL, Ultic Haploxeralf, E=25-45%,	Moderately deep, well drained soils formed in loess and residuum and colluvium from sandstone. They are on foothills and mountain slopes.
CrB, CrC, CrD, CrE	Colockum SiL, Calcic Argixeroll, B=3-8%, C=8-15%, D=15-25%, E=25-45%,	Very deep, well drained soils that formed in loess over material weathered from basalt, sandstone, and glacial till on benches, foothills, hillslopes, canyon side slopes and lower mountain slopes.
CsD, CsE	Colockum Cobbly SiL, Calcic Argixeroll, D=15-25%, E=25-45%,	Very deep, well drained soils that formed in loess over material weathered from basalt, sandstone, and glacial till on benches, foothills, hillslopes, canyon side slopes and lower mountain slopes.
CtE	Colockum Bouldery SiL, Calcic Argixeroll, E=25-45%,	Very deep, well drained soils that formed in loess over material weathered from basalt, sandstone, and glacial till on benches, foothills, hillslopes, canyon side slopes and lower mountain slopes.
CwE	Cowiche SiL, Aridic Argixeroll, E=25-45%,	Deep, well drained soils formed in loess and residuum on uplands.
StD, StE	Stemilt SiL, Vitrandic Argixeroll, D=0-25%, E=25-45%	Very deep and deep, well drained soils that formed in mixed ash and loess over material weathered mostly from basalt or andesite on mountains.

3.2.2 Geology Mapping

The dominant geology mapping (Figure 4) on and near the site is defined as Quaternary Landslide (Qls, light tan map unit), with block slide movement toward the relatively rare Tdyo map unit (orange map unit). The Tdyo map unit is rather vaguely described as "Older Diamictite." According to the SandAtlas online geologic dictionary (http://www.sandatlas.org/diamictite/),

> "*Diamictite is a poorly sorted or non-sorted terrigenous non-calcareous sedimentary rock that contains variously sized clasts from clay to boulders in a muddy matrix*."

This description is purely illustrative, and does not explain how this material formed. However, because it is composed of poorly sorted sediment (i.e., is not sorted by water or wind), it is thought to be more likely formed from an old mudflow, or landslide, or layers from intraglacial sediments. Its landscape position suggests it could have formed from a unique combination of river flow impacts from the north in concert with lava flow impacts from the southeast.

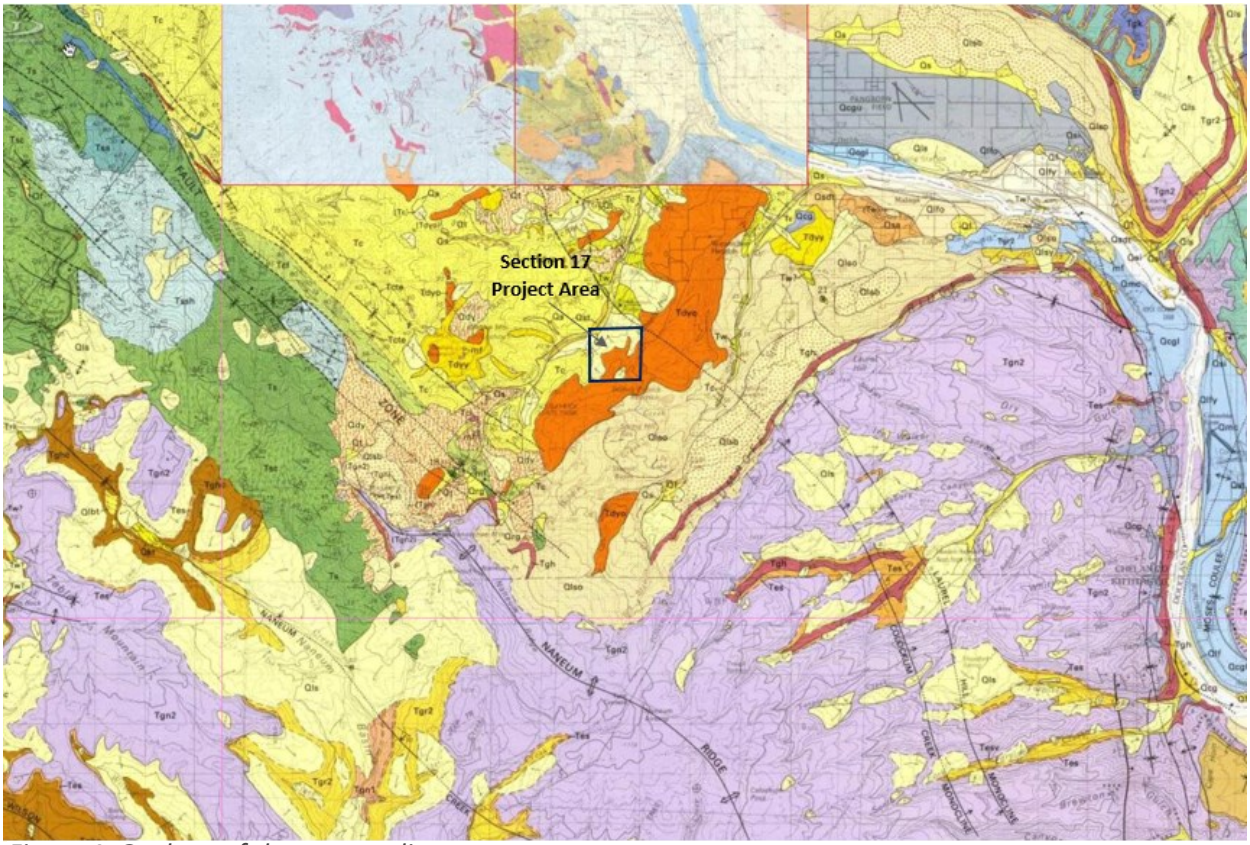

Figure 4. Geology of the surrounding area.

3.3 WATERSHED AND STREAM MAPPING

The Section 17 Project area is bisected by a drainage divide between two watersheds, the Stemilt Creek watershed which drains the site to the southeast and the Squilchuck Creek watershed, which drains the site to the northwest. Both watersheds eventually drain north to the Columbia River. Figure 5 shows the outline of each watershed and where Section 17 spans the divide in the greater landscape.

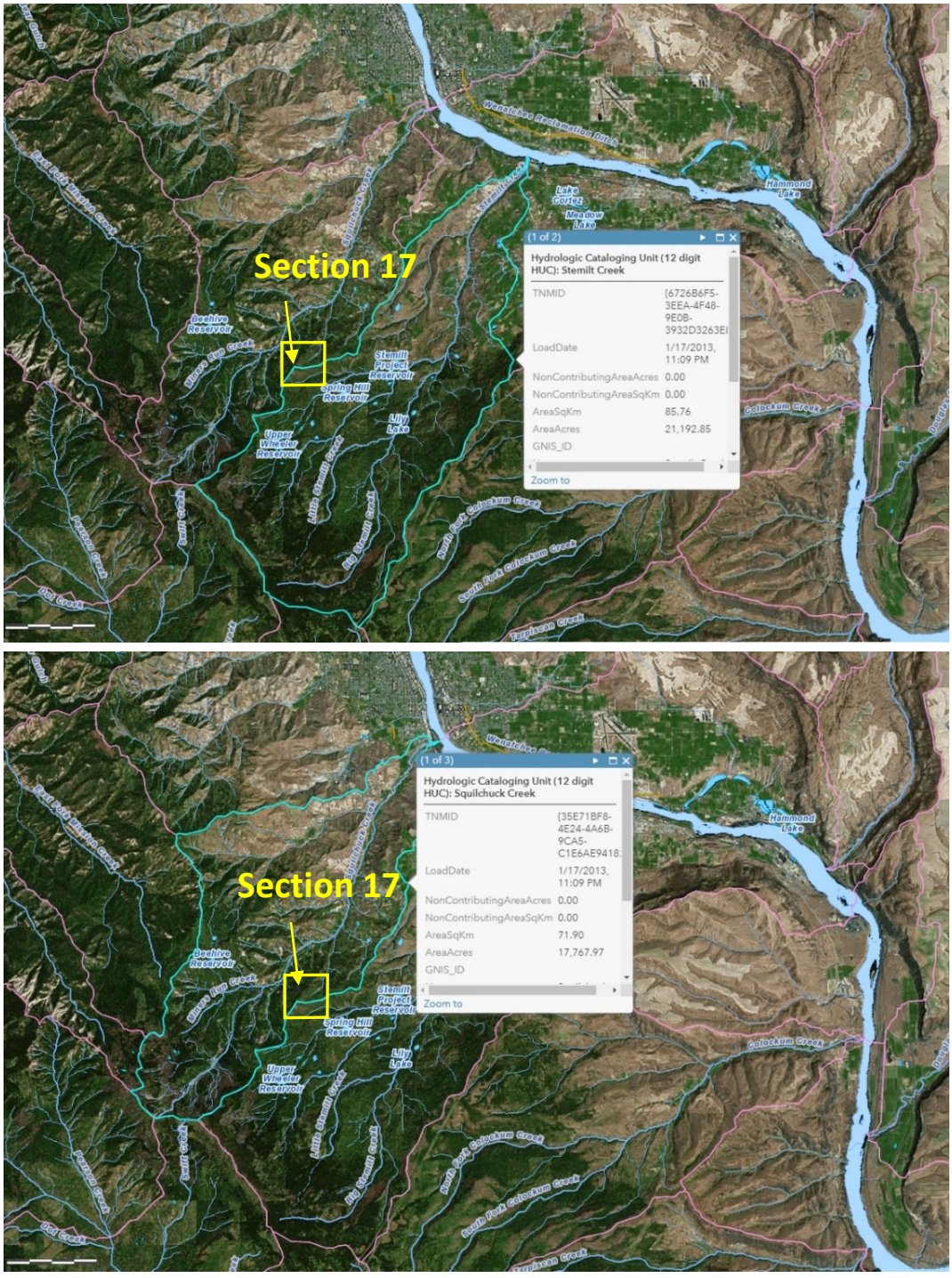

Figure 5. Stemilt Creek and Squilchuck Creek Watersheds (12-digit HUC Units).

From both map work and field work, it was determined that the central ridge, the highest elevation area onsite -- was the key feature that controls onsite hydrology. The ridge is oriented from southwest to northeast, and splits into two lobes in the northeast quadrant. The convex ridge surface does not provide opportunity for water to collect for extended periods of time. No wetlands or streams were documented on or near the ridge top divide.

The northern side of the ridge and the interior of the two lobes to the northeast are entirely fed by onsite hydrology sources – snow meltwater and direct precipitation. There are no significant hydrologic or geomorphic landscape formations other than the V-shaped stream channels that provide opportunity to capture water. No wetlands were observed or expected in those stream channels.

The southern half of Section 17 is more hydrologically complex than the northern half and contains more geomorphic features that trap water.The southern half of the site is fed by hydrology from the southern ridge slope, but also by some offsite inflows from the southwest -- small headwater and snowmelt areas. The southern area was the primary focus of wetland and stream delineation and mitigation work.

3.3.1 WDNR Stream Type Mapping and Hydrologic Functions

Department of Natural Resources (DNR) Stream Type maps provided an initial assessment of potential stream types in the project area. The extents and locations of streams in Section 17 were formally assessed, and Stream Type mapping was updated in 2018 and 2020, following field work carried out with DNR and WDFW staff assistance, and applying the standard DNR stream type assessment and determination process. Figure 6 shows the current Stream Type mapping (stream outline includes the buffer) and Wetland A, B and C polygons. Figure 7 shows the orchard overlay in relation to the stream and wetland buffers.

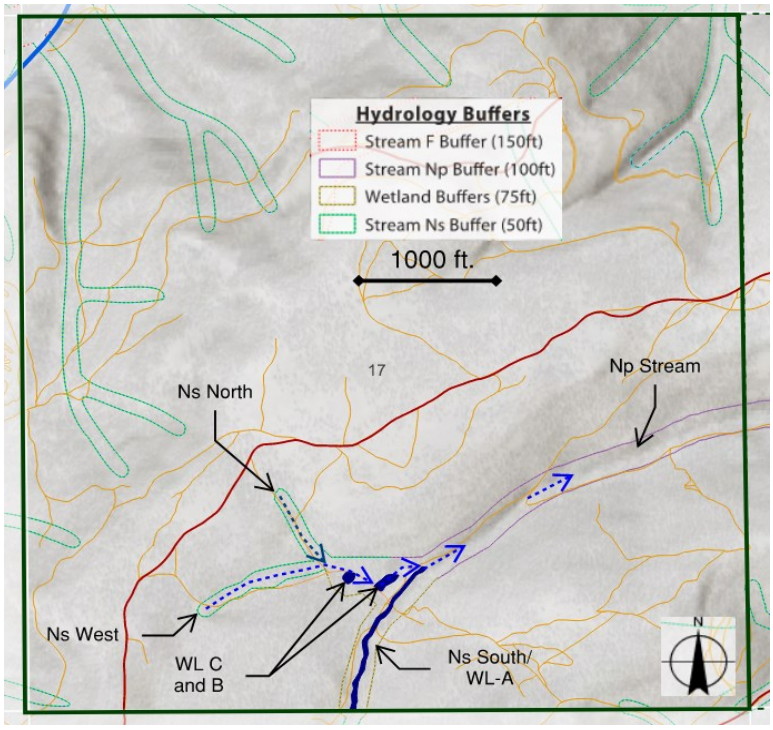

Figure 6. Showing extents of current DNR Stream Type mapping.

As described above, Section 17 overlays a drainage divide which bisects the flow pathways. The northern portion of Section 17 flows north, and the southern portion flows south. Because this geomorphology results in minimal upslope surface collection area, most of the onsite streams are small Ns systems with only one on-site stream classified as Non-Fish, Perennial (Np). There is one Fish-bearing stream (Type F) at the far northwest corner of the Section, and another is located just offsite to the southeast. These two Type F streams are well outside of the proposed orchard units. Most stream onsite are Non-Fish, Seasonal (Ns)

The Np stream in the southeast quadrant receives flow from three converging upstream Ns systems, and has some associated Cat III riparian wetlands. But because the Np stream is in a ravine, these wetlands

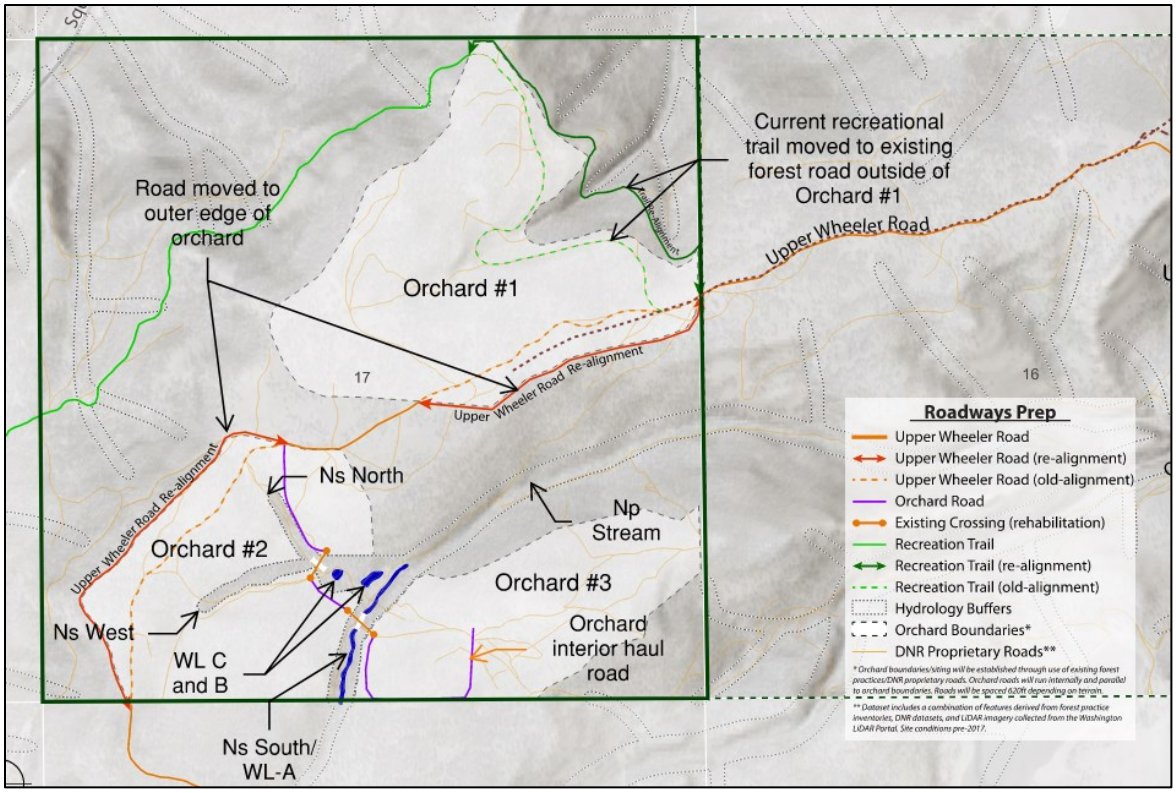

Figure 7. Showing wetlands and streams in relation to Orchard Units and roads.

are very narrow – most being less than 10 feet wide. The riparian wetlands along the Np stream are not within 300 feet of any proposed orchard unit. Therefore, they are noted and described in some detail below, but they were not delineated.

The streams and wetland systems adjacent to Orchard Units #2 and #3 in the southern part of Section 17 are described in more detail below.

3.4 Southern Section 17 Streams and Buffers Descriptions

3.4.1 Ns North

Ns North (see Figures 6 and 7 for stream and wetland labels) is a seasonal stream, fed almost exclusively from onsite meltwater from the south side of the central ridge. Its upper end starts about 400 ft below the ridge divide. The stream has only sporadic surface flow in the upstream 300+ feet; sections farther south show periodic erosion scouring in the channel base. In some areas, the erosion gully is over 8 ft deep for short distances, undercutting adjacent root systems (Figures 8, 9, and 10). There was no continuous flow in most sections of the stream during the May 12, 2020 site visit. However, there were 2-3 locations where subsurface flow is visible in deep holes in the stream bed – possibly where trees naturally fell and uprooted in the past, exposing gravelly substrates. The holes in the stream bed areas are not vegetated, and do not have hydric soils (Figure 10).

At one location along Ns North, an old logging road or ATV trail crosses the stream channel and dams stream flow, creating a small 3-parameter wetland area upslope of the crossing that is about 10 ft long and 2 to 3 ft wide (marked by WP 015 in Figure 11). The soils are disturbed, mixed with wood chips and

gravel, and saturated to the surface upstream of the crossing only. Soil characteristics meet Indicator F3 requirements (Figure 12).

Figure 8. 2020 photo: Downed tree creating hole in channel base.

Figure 9. 2020 photo: Showing dry flow path in upper end of Ns North on May 12, 2020.

Figure 10. 2020 photo: Showing deep hole in stream bed, base is about 2 ft below stream bed and about 5 ft below surrounding grade.

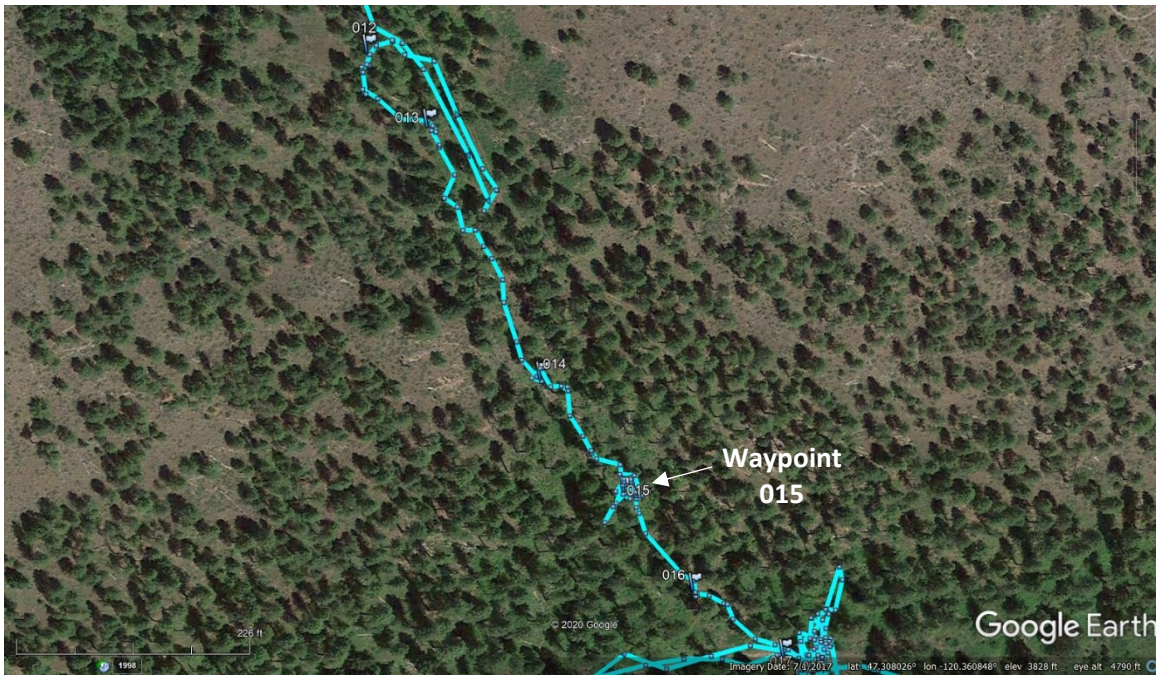

Figure 11. Showing GPS Track and waypoint locations.

This old road crossing appears to be the area that was previously described as a potential wetland along the Ns North stream channel by a 3rd party reviewer (Perteet, 2018). This 30 sq.ft. wetland area is so small that the seasonal hydrology conditions were not readily apparent during the October 2019 site visit, when the channel and Facultative vegetation were dry, and the crossing area looked like the rest of the dry Ns stream bed.

It is proposed to restore and enhance this Ns North stream channel, with special attention paid to stabilizing severely eroding sections to reduce downstream erosion impacts. The compacted road crossing would be restored during that stream restoration process, and hydrology would most likely no longer be trapped upslope of the crossing. More discussion is provided on this wetland below.

Figure 12. 2020 photo: F3 indicator at Ns North road crossing to left, and full wetland extent shown to right (about 10x3 ft).

3.4.2 Ns West

Figure 13. Showing severe erosion in the Ns West stream channel, where stream has jumped to logging road.

Stream Ns West receives about half of its hydrology from the onsite ridge sideslope to the north, but also receives minor inflows from the southwest – a headwater area with snowmelt hydrology source that starts about 500 ft offsite. Ns West has no associated wetlands, and is severely damaged from past logging and recreational activities. The stream jumped from its main channel to flow down an adjacent severely eroded logging road, with some gullies more than 5 feet deep (Figure 13). The natural channel is about 20-50 feet north of the logging road, and is currently dry. It is proposed to restore the stream to its natural channel during mitigation work, described in more detail below.

3.4.3 Ns South

Ns South flows through Wetland A (a narrow riparian wetland). It is fed by onsite collection from nearby sideslopes and and receives offsite water from the south – a headwater area with snowmelt hydrology source that starts about 1000 ft offsite. The seasonal stream channel is typically no more than 1-2 feet wide.

3.4.4 Np Stream

Ns North, Ns West and Ns South (including Wetland A) merge to form the Np stream which flows to the east and exits the eastern site boundary about 2000 ft north of the SE Section corner. The Np stream is in a v-shaped channel near the confluence, and is actually without flow by mid- to late-June in most years. It has some associated narrow riparian floodplain wetlands farther east in areas where the stream channel widens.

There is a small wetland on Ns North at an old road crossing, which appears to have developed due to the road backing up flow. Under current conditions, the stream cuts around the fill pad and flows down the road that continues along the south side of the stream for about 50-100 feet. Then the diverted flow cuts back down into the stream channel from the roadbed in a small erosion gully.

3.4.5 Stream buffers

Per Chelan County Code, Ns streams are assigned a buffer of 50 feet; Np streams are assigned a buffer of 100 feet. In areas where both wetland and stream conditions occur, the most restrictive buffer applies.

3.5 WETLAND SYSTEMS DESCRIPTIONS

3.5.1 Growing Season Conditions

It is not appropriate to use weather stations from lower elevations to define growing season on this high elevation site, which is why frost free season data from the Wenatchee weather station was not used to define start of growing season. WR LLC photos from 2019 and 2020 (2020 photos are provided in Figures 14, 15, and 16) document that there typically is snow on the ground in the areas around Wetlands A, B and C, but also flowing surface water (from snow melt) in late April (photo documented on April 22, 2019 and on April 17, 2020). Elevation on Wheeler Ridge ranges from about 3,600-3,800 ft. Therefore, taking into account the presence of snow (cold temperatures) in combination with meltwater (indicating warming has started) by mid-April in most years, the growing season is assumed to start no later than April 22 in most years. Wetland hydrology must persist at least 21 days into the growing season (into mid-May) in most years, under normal circumstances, in order for an area to meet the minimum hydrology duration requirement needed to be regulated as wetland.

The original 2018 delineation was carried out on May 16, 2018. Follow up wetland assessment work for a second Technical Memo (provided to Shockey Group) was carried out on May 12, 2020. During both May field visits. wetland hydrology must have been present in order to meet the minimum federal and local requirements for an area to be regulated as wetland. More discussion is provided below.

Figure 14. Ns West, April 17,2020

Figure 15. At Wetland C, April 17, 2020

Figure 16. At Wetland B, April 17, 2020

3.5.2 Wetlands Locations in Project Area

Three wetland areas (Wetlands A, B and C, described below) were identified and flagged in the southern portion of Section 17. Wetlands A, B and C were associated with hydrology from Ns North, Ns West and Ns South to varying degrees. Wetland A includes Ns South. Wetland B and C formed near the confluence of Ns North, Ns West and Ns South, and are affected by impacts from recreational ATV use at that wet confluence.

In May 2020, another small wetland was noted (and location was marked) at a crossing on Ns North. The wetland was rated, and scored as a Cat 4 wetland (15 points total, with a habitat score of 7 -- due to surrounding habitat conditions). A Category 4 wetland is assigned a 50 ft wetland buffer – the same as the 50-ft stream buffer in the crossing area.

Also in May 2020, other previously described but not mapped riparian wetlands along the Np stream farther east were noted and locations were marked. These wetlands were not delineated, as the wetlands and their maximum possible buffers were outside of the proposed orchard units.

Figure 17 shows standard buffers for all streams and wetland systems, and also shows how these systems feed into each other and share seasonal hydrology, most of which is from snow melt moving through groundwater, but also from surface accumulation of rainfall. This Figure also shows the location of the Category 4 wetland crossing in Ns North as well as the section of the Np stream that had some associated riparian wetlands. The reach upstream from the Np crossing is a more deeply incised V-shaped channel, which does not allow for development of associated floodplain wetlands.

Per Chelan County Code, in areas where both wetland and stream conditions occur, the most restrictive buffer applies.

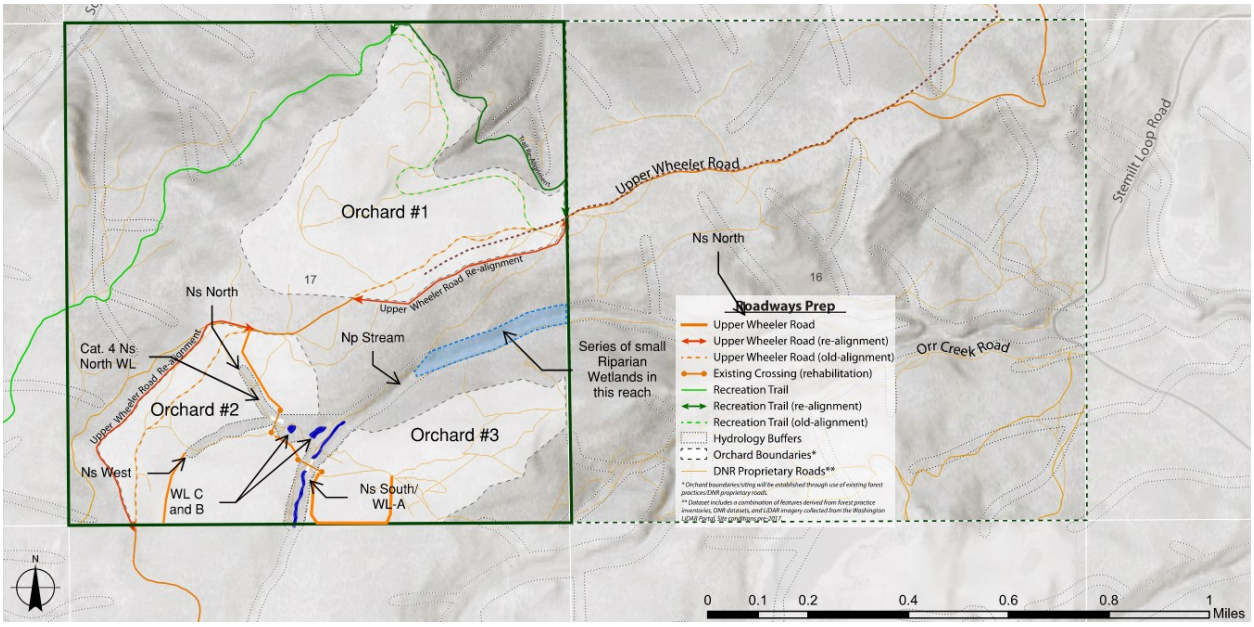

Figure 17. Showing locations of streams and wetlands in relation to the adjacent Orchard Units.

3.5.3 Wetlands A, B and C

Wetland A is a seasonally wet riparian Palustrine Scrub-Shrub (PSS) system that parallels Ns South, sometimes occurring on one side of the stream, and sometimes on both. However, because the 75 ft wetland buffer (measured from the wetland edge) is greater than the 50 ft Ns stream buffer (which is measured from the edge of the stream channel), the 75 ft buffer defines the regulated width of the Wetland A system (Figure 18).

Wetlands B and C (both are PSS/ PEM systems) are seasonal wetlands associated with flow from the diverted section of Ns West (described above), and also receive some seasonal flow from Ns North. Wetland C's hydrology is fed primarily from upslope snowmelt from the south; therefore, it no longer has hydrology by early summer in most years. Hydrology from Wetland C overflows north into the logging road (i.e., seasonal flow from Ns West). That flow drains east along the logging road, then overflows to Wetland B.

During the May 2018 and 2020 field visits, there was no current flow in Ns West (in logging road) upslope of Wetland C. However, over flow from Wetland C (groundwater fed from the south) was actively flowing down the road to the east. The ruts in the road conduct seasonal Ns West and Ns North flow as well as overflow from Wetland C to the east, until a slight rise in surface elevation to the east caused by ATV road use forces the water in the road to spill to the north into Wetland B, a sloped

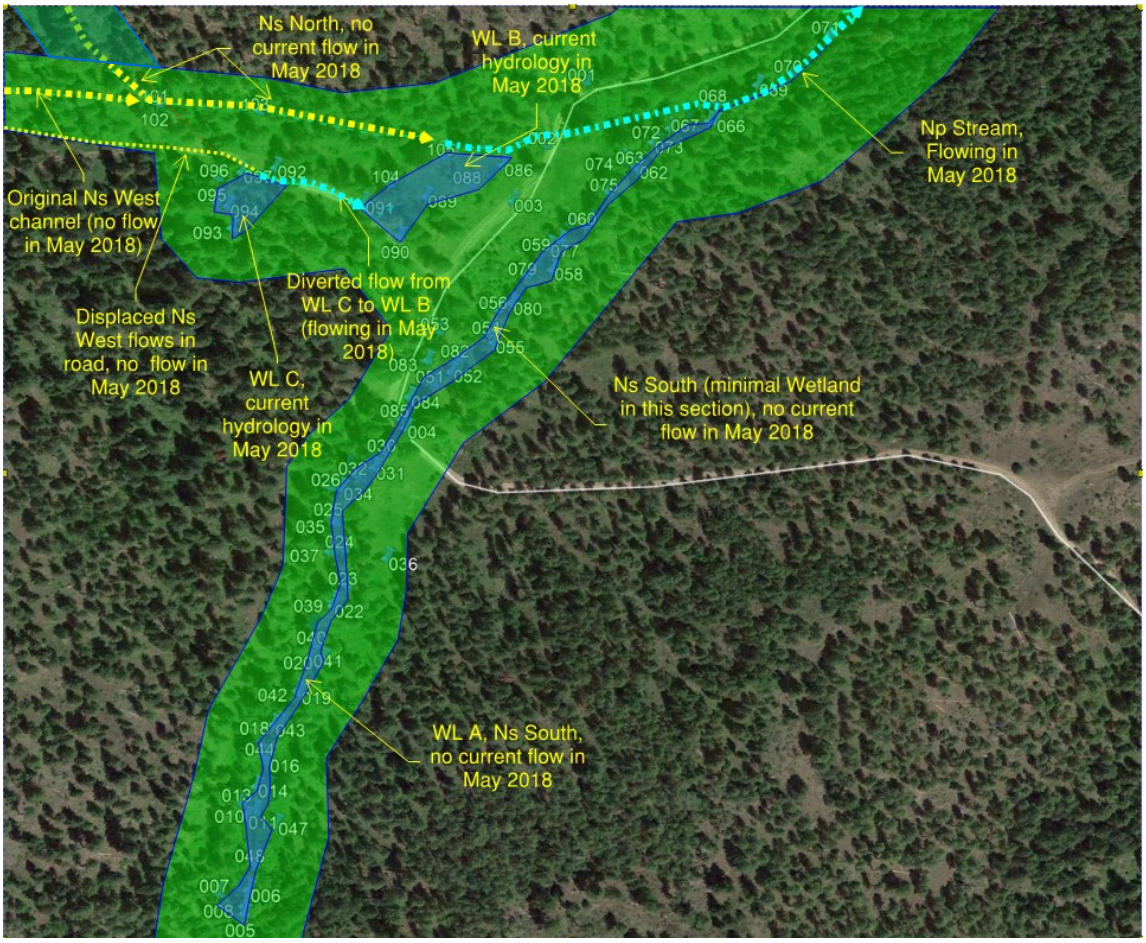

Figure 18. Showing location and extents of Wetlands A, B and C with approximate buffers in southern portions of Section 17.

wetland system. The diverted flow seeps north through Wetland B, then into an Ns stream channel about 300 ft downstream from the original confluence of Ns North and Ns West. That channel was dry upslope of Wetland B in May of 2018 and again in 2020. However, there was flow in the stream bed downstream of Wetland B, indicating that Wetlands C and B contribute hydrology to the confluence area longer in the spring than the upslope Ns West and Ns North stream systems.

The combined seasonal flows from Ns West, Ns North, Wetlands B and C merge with flows from the Wetland A/ Ns South system about 300 feet farther to the east, forming the headwaters for the Np stream which continues downstream to the east (Figure 17 and 18).

The convergence area is severely damaged from past mud-bogging activities (Figure 19). This area is targeted for restoration of stream and wetland conditions, described in more detail below.

Figure 19. ATV mud-bogging area at convergence of Ns streams and Wetlands.

3.5.4 Other Assessed Areas

Responding to questions from the earlier Chelan County third-party reviewer (Perteet), several other areas were assessed for wetland conditions. Detailed descriptions of this field work was provided in a Technical Memo dated May 19, 2020. The information below is a summary of those descriptions.

A small upland meadow area east of Wetland A is at the downslope end of an old logging road. There was some wetland vegetation in that area. However, during the May 2018 field work, no consistent

wetland hydrology was documented, and hydric soil characteristics were inconclusive. The soils in the area were damaged from combined past road and log deck activities. That area was revisited several times to assess conditions -- in July and October of 2019 as well as in May 2020, when wetland hydrology should have been present. No wetland hydrology was documented, and the area did not show clear evidence of long-duration saturation within 12 inches of the surface during the growing season, and therefore, it was not flagged as wetland.

An area at the headwaters of Ns West was assessed for wetland conditions (Figure 20). SCJ Alliance has dug and evaluated soil pits in this area on five different occasions – in May 2018; in July, October, and November 2019, and most recently on May 12, 2020. Results were the same for all of these site visits. There was no hydrology or hydrology indicators within 12+ inches of the soil surface, and there were no hydric soil characteristics. Most vegetation is grasses and forbs -- Facultative vegetation – with no sedges or other Facultative Wet or Obligate plants.

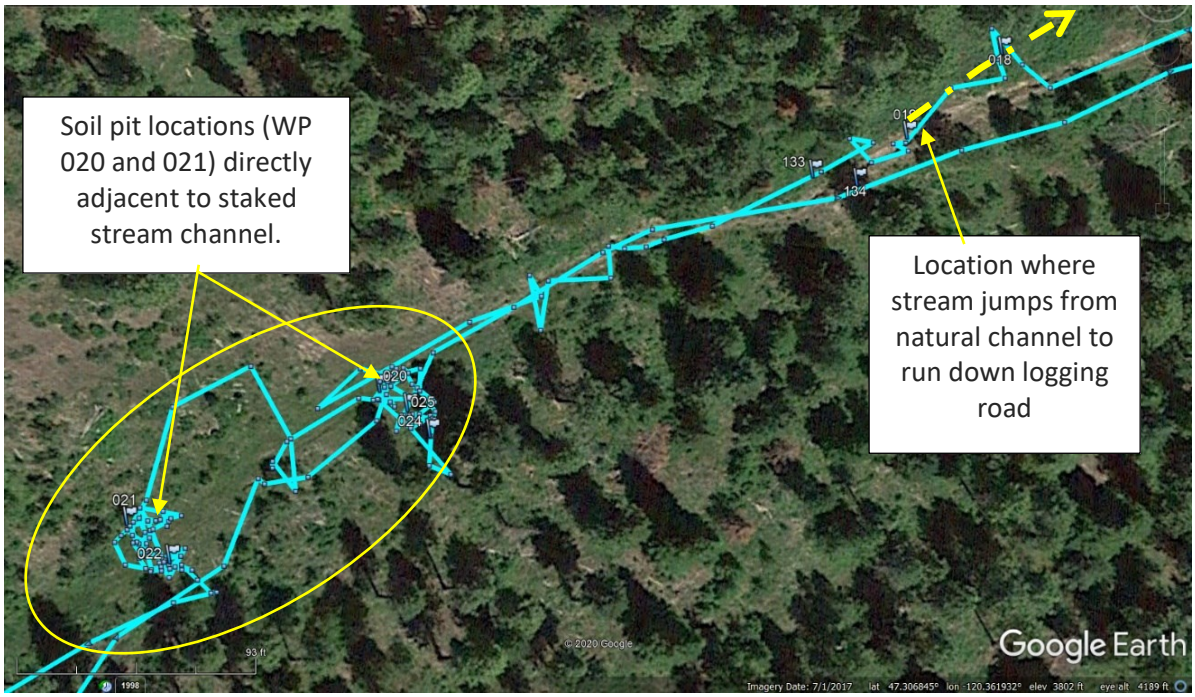

Figure 20. Western start of Ns West, as mapped by DNR.

We note that the Stemilt soil series, which is mapped across all of Wheeler Ridge, is a naturally dark colored soil, which can be confusing if one is not aware of the soil mapping. The NRCS describes the Stemilt soils as being "very deep and deep, well drained soils that formed in mixed ash and loess over material weathered mostly from basalt or andesite on mountains." They are classified as Argixerolls, which means they have at least 35% clay content within the upper 20 inches, and are Mollisols – which by definition have an over thickened, very dark colored surface horizon.

On a small terrace surface east of the "mud bog", between WL-A and WL B, there are two small depressions with three-parameter wetland characteristics (Figure 21). The mud bog forms in a triangle that is flanked to the west by WL-B; to the east by WL-A and to the north by the confluence of Ns North and Ns West. The terrace surface shows past evidence of ATV traffic – tire track ruts leading from the mud bog up onto the terrace surface. This condition is common throughout this area – a result of ATV users trying to find other ways around the mud bog when water is too deep. There are two spots on the terrace surface where it appears ATVs were stuck in the past, each creating a small depression. One

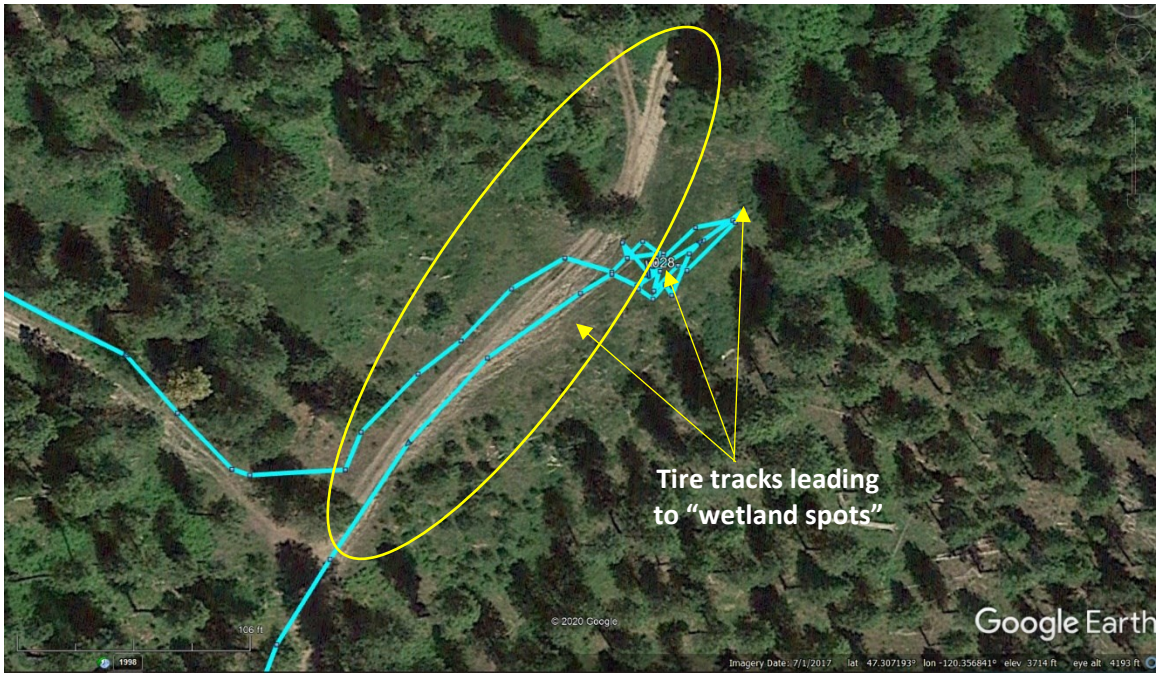

Figure 21. Two small wetland depressions – one 9x9' and one 15x12' were noted. See Figure 21 for details.

depression is 9x9 ft, and the other is 15x12 ft (Figures 22 and 23). Both of these spots have wetland conditions -- current hydrology at or near the surface; hydric soils (Indicator F6) and hydrophytic vegetation (grasses plus one type of rush – too young to ID in May 2020). None of the rest of the surrounding surface has hydrology within 12 inches of the surface or hydric soils.

These two areas would be expected to rate no higher than Category 3 or 4, and as such, would have 75 or 50 ft buffers, respectively. The wetland and their buffers are entirely embedded within overlapping buffers from WL-A (from the south and east), WL-B (from the west) and the Ns/Np stream confluence (from the north). The entire mud bog area is slated for restoration, which will be designed to eliminate the mud bog, and replace the current severely disturbed confluence area with a PEM/PSS wetland / stream complex. Figure 24 shows conditions around the mud bog west of the terrace.

Figure 23. 2020 photo: 15x12 ft wetland depression

Figure 22. 2020 photo: 9 x 9 ft wetland depression

Figure 24. 2020 Photo: View of mud bog disturbance from the south. Raised area to right has the two small wetland depressions.

Perteet also thought that the **area upslope from Wetland C** might be wetland (Figure 25). Wetland C – mostly PEM vegetation -- is fed by a groundwater seep from the south that surfaces once the slope flattens. The change in slope is essentially the edge of the wetland, and there was current hydrology at the surface in Wetland C during the May 2020 site visit (Figure 27), matching what was documented during the first May 2018 site visit.

The area just upslope from Wetland C has different vegetation. It transitions abruptly to a mixture of snowberry and wild rose (Figure 26). The soil profile in this shrubby area is similar to what we documented and observed at the start of Ns West – a very deep, dark colored, silty clay loam soil profile, but with no hydrology, no redox concentrations or any other Hydric soil indicators within 14 " of the soil surface. Perteet thought that the shrubby area upslope from WL-C might be wetland, likely due to the presence of wild rose, and ranunculus in the forb class. However, the slope drives hydrology at that location, and only the flat areas at toeslope had current hydrology in May 2018 and 2020. The area upslope of Wetland C is not wetland.

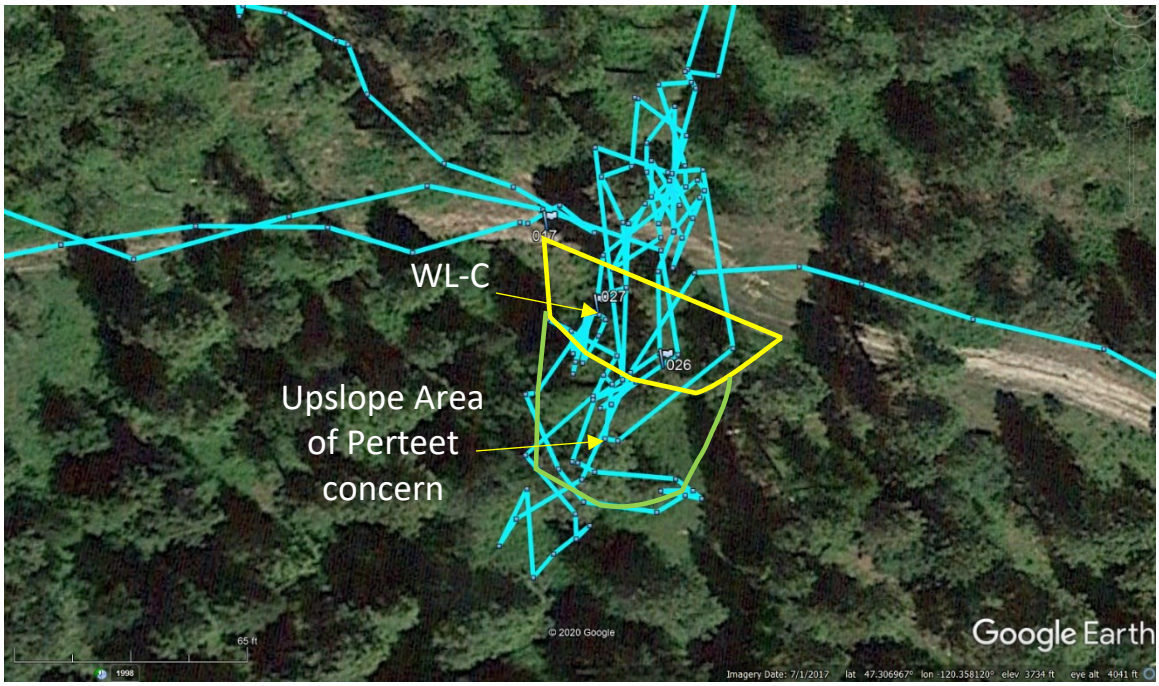

Figure 25. Showing area where Perteet thought there might be upslope wetlands.

Figure 26. 2020 Photo: View of shrubby area upslope from WL-C.

Figure 27. 2020 Photo: Surface Hydrology in WL-C on May 12, 2020.

Perteet noted potential **wetlands conditions along the Np Stream**. This area was described earlier in this report, but that information is summarized again below. An old trail crosses the Ns North stream channel, causing water to back up and create a small 3-parameter wetland area upslope of the crossing (10 ft x 3 ft). The wetland rates as Category 4 with a 50-ft buffer – the same as the stream channel.

It is proposed to restore and enhance the Ns North stream channel, including the compacted road crossing. Hydrology would most likely no longer be trapped upslope of the crossing, but the stream habitat and buffer area would be restored.

Riparian wetlands along the Np stream channel to the eastern parcel boundary were visited and described in more detail in May 2020. Figure 28 shows locations of 7 riparian wetlands associated with the Np stream corridor. In most cases, these wetlands are no more than 10 feet wide and less than 30 feet long along one or the other side of the incised stream channel. Three of the wetlands are forested; two are scrub-shrub with forested perimeter, and two are emergent. There is only one wetland with more than 2-3 quaking aspen trees inside the wetland. In most areas, where aspen are present, they are in the upland buffer area adjacent to the stream, or in one location, they are on an upland island between two branches of the incised stream. In most locations, the forested wetland is dominated by red alder. All of these wetlands are more than 300 feet from the nearest orchard area. No impacts to these wetlands are proposed, aside from restoration of the PEM wetland and stream channel at the far western stream crossing visible near the lower left corner of Figure 28, and shown in Figure 29. There are no aspen at that location.

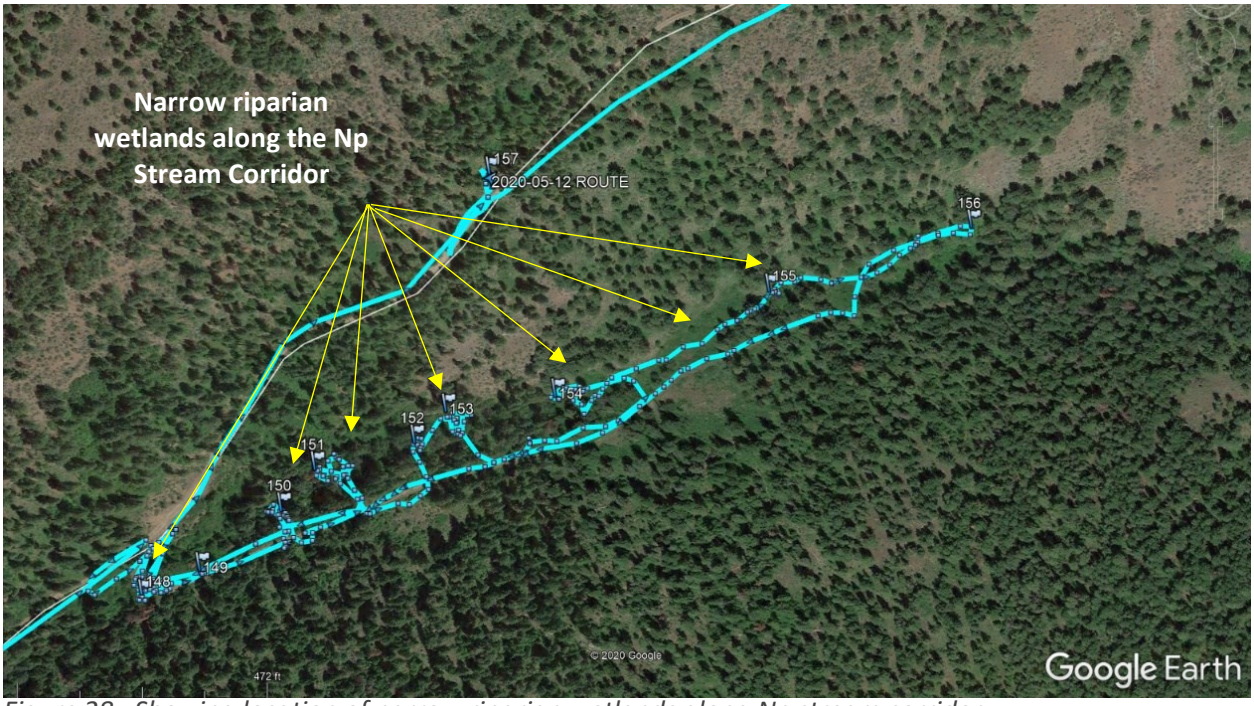

Figure 28. Showing location of narrow riparian wetlands along Np stream corridor.

Figure 29. 2020 photo: Showing proposed wetland enhancement area at crossing.

3.5.5 Wetland A, B and C Vegetation Community (similar in all three systems)

The vegetation from within to outside of the wetland areas reflected a transition from wetland to upland conditions, as would be expected. But the majority of wetland vegetation in all three wetlands (A, B and C) was Facultative, reflecting the seasonally wet conditions expected in this area (Figure 30). Obligate vegetation was documented only in Wetland C or near the mud-bog Np road crossings where water backed up and ponded for long periods above the partially blocked culvert.

NOTE: Quaking aspen trees and saplings were sometimes near wetland areas, but almost never within the wetland areas. When they were in a wetland area, it was typically limited to one or two trees. Quaking aspen are classified as Facultative Upland vegetation in the Western Mountains, Valleys and Coast (WMVC) as well as Arid West Land Resource Areas.

Wetland species include:

Trees

Red alder (*Alnus rubra – not dominant, but present)*)

Shrubs

Serviceberry *(Amelanchier alnifolia)*
Twinberry (*Lonicera-involucrata*)
Red osier dogwood (*Cornus sericea*)
Wild crabapple (*Malus fusca*)
Wild rose (*Rosa spp)*

Herbs, Ferns and Vines

Water parsley (*Oenanthe sarmentosa*)
Wild columbine (*Aquilegia formosa)*
Yellow lily *(Iris pseudacorus*)
Wild iris (*Iris missouriensis)*
Sedge spp (*Carex spp)*
Coltsfoot (*Tussilago farfara*)
Small-fruited bulrush (*Scirpus microcarpus*)
Horsetail (*Equisetum spp*)
Spike rush (*Eleocharis palustris*)
Spreading buttercup (*Ranunculus repens*)

Figure 30. Wetland A is between the two stakes. Showing Facultative and Facultative Upland plant community in wetland and in adjacent upslope Buffer vegetation community

Dominant or common upland species include:

Trees

Ponderosa pine *(Pinus ponderosa*)
Red alder (*Alnus rubra*)
Quaking aspen (*Populus tremuloides*)

Shrubs

Oregon grape *(Mahonia aquifolium)*
Bitterbrush *(Purshia tridentate*)
Oceanspray (*Holodiscus discolor*)
Snowberry *(Symphoricarpos albus)*
Wild rose (*Rosa spp)*

Herbs, Ferns and Vines

Yarrow (*Achillea millefolium)*
Arrow leaf balsamroot (*Balsamorhiza sagittate*)
Violet (*Viola spp*)
Lupine (*Lupinus spp*)
Wild geranium (*Geranium maculatum*)
Bleeding heart (*Dicentra formosa*)
Trillium (*Trillium ovatum)*

3.5.6 Hydrology

Hydrology for all three wetlands is from direct precipitation (rain and snow), and subsequent concentration of stormwater and snow melt in low-lying areas (Figure 31). On the day of the original May 2018 site visit, groundwater was at or near the surface in Wetland A areas adjacent to the stream with only minor surface ponding. When surface elevation increased by one to two feet in the riparian area relative to the stream elevation, wetland conditions were no longer present, resulting in a very narrow linear wetland along the edge of the stream.

Hydrology in both Wetland B and C was at the surface, but there were indications that it was diminishing as the season progressed. All of these seasonal wetlands systems have no hydrology by mid to late summer.

Figure 31. Showing groundwater hydrology conditions in Wetland A, within 1 ft elevation of the adjacent stream channel.

3.5.7 Soil Conditions

Soils in the surrounding area are very generally mapped as Stemilt ashy silt loam, which is not a wetland soil map unit. However, the map unit does contain wetland and stream areas where terrain directs seasonal water and snow melt to low lying areas or ravines.

Soils within the wetlands expressed a variety of hydric soil indicators, ranging from A11 (Depleted Below Dark Surface), to A4 (Hydrogen sulfide) to F6 (Redox Dark Surface) (Figure 32 – Redox Dark Surface).

Figure 32. Example of Hydric Soil with Indicator F6 – Redox dark surface.

3.6 WETLAND RATING RESULTS

The wetlands were rated using the 2014 Eastern Washington Rating System, as required in Chelan County Code.

Wetland A's rating results indicated that it had moderate Site and Landscape potential to provide for water quality treatment and flood storage, but low Value, due to the lack of significant pollution and flooding problems – i.e., its potential to treat water quality or to store flood water was not needed in the current setting. Wetland A scored **moderate** for habitat Site and Landscape potential and

high Value for habitat functions. The final combined score was 18 points – a Category 3 wetland system.

Wetlands B and C were rated as one system, partly because they were associated, but also because they were similar systems. The Wetland B/C rating results indicated that for Water Quality functions and values, these wetlands had **low** Site potential and **moderate** Landscape potential to provide for water quality treatment –due to lack of physical structure and ponding, which would provide for more effective treatment. They had **low** Value for water quality treatment due to the lack of pollutants in the area.

For Hydrologic functions and values, Wetland B/C had **low** Site and Landscape potential to provide for water storage–due to being small with minimal ponding depths. However, they had **high** Value for hydrologic functions due to helping provide off-road storage in an area that periodically floods.

Wetland B/C's final combined score was 17 points – a Category 3 wetland system. Per Chelan County Code, a Category 3 wetland adjacent to Low Intensity Development (agriculture) is assigned a standard buffer of 75 feet. The code language below describes how the buffer areas must be managed, including areas where the vegetation community will be restored.

> *(2) Buffer areas protect wetlands from degradation by stabilizing soil and preventing erosion; filtering suspended solids, nutrients and harmful or toxic substances; moderating impacts of stormwater runoff; moderating system microclimate; protecting wetland wildlife habitat from adverse impacts; maintaining and enhancing habitat diversity and/or integrity; supporting and protecting wetland plant and animal species and biotic communities; and reducing disturbances to wetland resources caused by intrusion of humans and domestic animals.*
>
> *(3) Except as otherwise specified, wetland buffer zones shall be retained in their natural condition. Where buffer disturbance has occurred during construction, revegetation with native vegetation shall be required.*
>
> *(4) All wetland buffer areas shall be temporarily fenced between the construction activity and the buffer area with a highly visible and durable protective barrier(s) during construction to prevent access and sedimentation from disturbed areas from entering the wetland or its buffer. This requirement may be waived by the administrator if an alternative to fencing which achieves the same objective is proposed and approved.*

3.7 PROPOSED MITIGATION

The proposed outline of the orchard development area as well as the proposed wetland, stream, buffer and road restoration areas are shown in Figure 33. The Ns North and Ns West corridors (stream and 50-ft. buffer) and the wetlands and buffers around Wetlands A, B and C are preserved within proposed orchard areas. Two existing road crossing are retained, due to terrain controlling the location of existing roads that are needed to support orchard operations.

Ns North and Ns West flows have eroded deeply into existing relic logging road system ruts, due to the stream base being used as a road in the past. A logging road that ran down the base of the swale feature upstream from Ns West moved out of the swale to parallel it to the south, presumably when the stream base became too wet for travel. However, the stream flow followed the road ruts, and the natural flow path for Ns West is currently dry. The road has eroded severely, and sends large volumes of sediment

downstream into the area surrounding Wetlands B and C. Ns North is also severely eroded in several places, but not as badly as Ns West.

Because these two stream systems were so badly damaged, it was previously proposed to capture and pipe the seasonal flow in Ns West and Ns North to stop the erosion and convey cleaner flow to downstream wetland systems without a sediment load.

However, Chelan County Code does not allow piping of regulated streams unless there is no alternative. Therefore, the proposal to pipe the two Ns streams was withdrawn, and instead, it is proposed to restore and revegetate the stream channels, using erosion control measures to reduce future erosion potential.

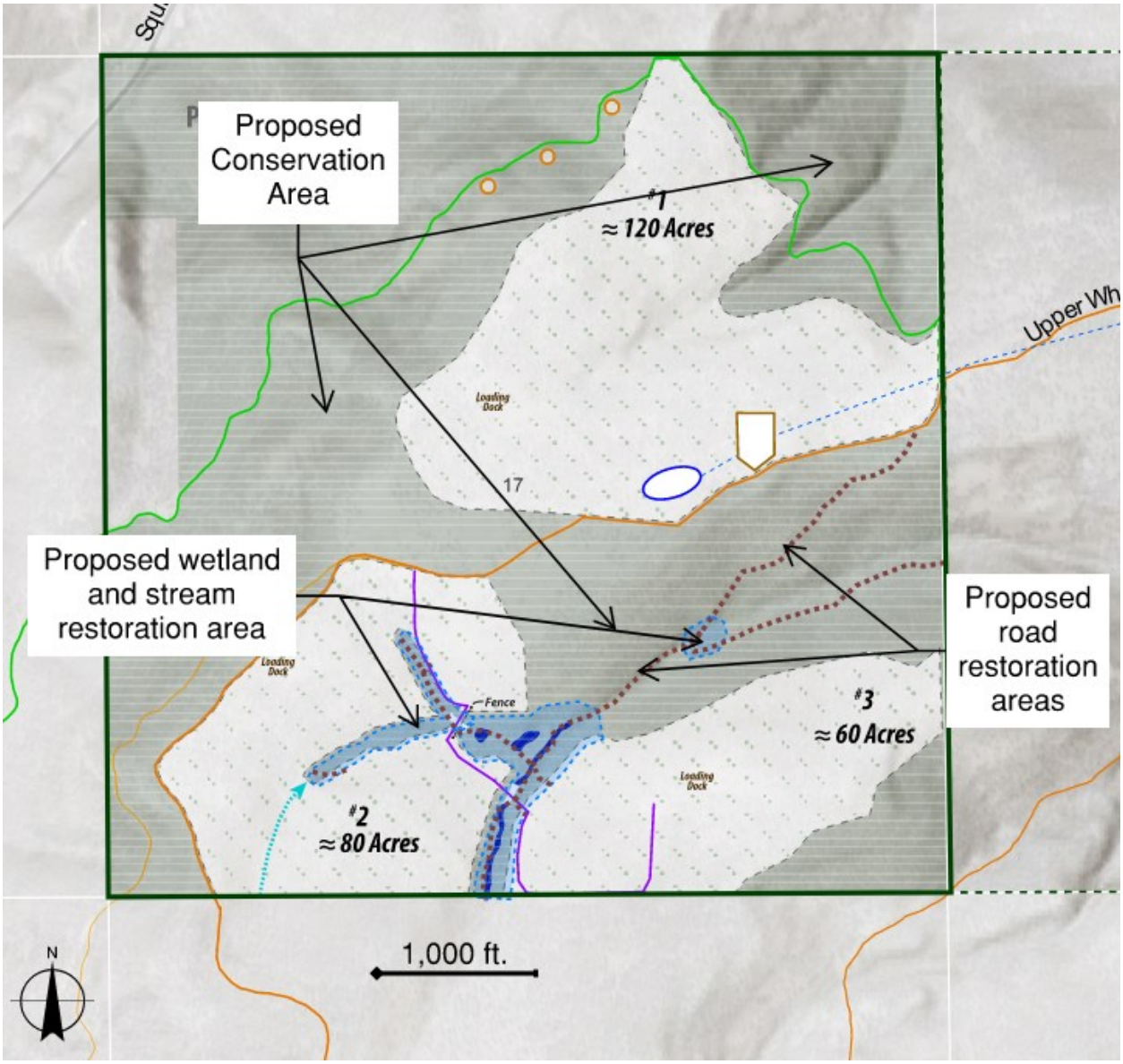

Figure 33. Showing proposed wetland, stream, buffer, and road restoration areas

It is proposed to restore Ns West to its original stream channel, which is about 100 ft north of its current flow pathway. Because the current channel is well-vegetated, no need for significant erosion control measures are anticipated once the flow pathway is restored. The portions of the riparian buffer that are degraded from the old logging road will be replanted with dense native trees and shrubs, similar to those already growing in the area. The perimeter of the Ns West buffer will be fenced and signed to ensure there is no entry from the adjacent orchard activities.

Ns North will remain in its current flow pathway, but will require erosion control measures to reduce current gully erosion in certain sections. Similar to Ns West, an old logging parallels this stream system. That road will be realigned to run outside of the stream buffer, and maintained for future orchard operations. The perimeter of the buffer will be fenced, and the portions of the riparian buffer that are degraded from the old logging road will be replanted with dense native trees and shrubs, as was described above for Ns West.

The logging road that currently runs between Wetlands B and C as well as the disturbed downslope "mud bog" area will be tilled and replanted in native wetland vegetation, with a species list similar to what is growing in nearby systems.

The total area covered by the mud bog area restoration proposal is about 300,000 sqft (about 7 acres). The additional enhancement proposals for Ns West (restoration to native channel flow; enhancing buffer vegetation) and Ns North (erosion controls and enhancing buffer vegetation) is about 200,000 sqft (about 4.5 acres).

An existing road which crosses Wetland A and crosses again at the confluence of Ns West and Ns North will be retained. But the crossings will be enhanced to insure that flows are not impeded, and erosion is eliminated. In addition, the continuation of the road will be realigned to move it outside of the buffers' perimeter fencing, to connect with the orchard perimeter fence. The crossings will be culverted and sized to ensure that the seasonal flows are not restricted. The outside perimeter of the orchard will have an 8-ft tall elk exclusion fence, which will run along the edge of the buffers as shown in Figure 33.

Figure 33 shows the wetland and stream enhancement areas as well as specific roads that will be tilled and restored by replanting with native vegetation are. Clearly, this proposed restoration and enhancement area is only a few acres within the greater Conservation Area in Section 17. However, it will have a disproportionate positive effect, as it involves restoration (replanting) and isolation (road removal) of areas that can be used by elk during the early spring months when orchard activities are minimal, and elk are onsite for breeding and calving. Because these wetland and stream systems are seasonally wet, they will provide a nearby water source in most years until late June. Because May and June are the calving season, these enhanced areas will provide high quality forage and hiding habitat during a critical period of the year for cow elk and their calves, and will ensure that the cows do not need to travel far for water for the first month when the calves are typically hiding in brush near the mother as she browses. Once the calves are more mobile during their second month, it is assumed that the cow-calf pairs will slowly migrate offsite to the south, where surface water is more plentiful along Orr Creek.

3.8 MITIGATION GOAL

The primary goal of the Conceptual Mitigation described above is to restore soils, hydrology and plant communities in the disturbed mud-bog areas and to restore natural stream flow to the original Ns West channel. This will result in expansion of wetland acreage in the confluence area (mud bog) described above; will improve water quality; and potentially could extend the duration of seasonal stream flows in downstream areas by increasing infiltration and storage in soils around the restored wetland perimeter.

If this Conceptual Mitigation Proposal is accepted by Chelan County, a detailed Planting, Monitoring and Maintenance Mitigation Plan with clearly defined Performance Standards will be developed and provided for final review and approval.

Figure 34. Foreground is an example of a disturbed logging road near Wetland B that will be restored during mitigation work.

4. SUMMARY

Wheeler Ridge LLC is proposing to convert about 260 acres of forest habitat within a 640 historical working forest to orchard development. Conceptual mitigation designed to compensate for impacts to upland habitats is described above – i.e., work that will be carried out in the southern portion of Section 17 to restore a severely disturbed stream and wetland complex and removal/ restoration of associated primitive roads.

The proposed mitigation will enhance and restore about 10-11 acres of a wetland complex; about 4.5 acres of an Ns stream systems and its associated riparian buffer; and about 1-2 miles of primitive roads. If the Conceptual Mitigation Proposal described above is accepted, a detailed Planting Plan and final Mitigation Plan – including a standard Monitoring and Maintenance Plan -- will be prepared for review and approval. Wheeler Ridge LLC will consult with permitting agencies to ensure conceptual mitigation recommendations are implemented to maximize benefits to wildlife and their habitat.

5. REFERENCES

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Washington Department of Fish and Wildlife SalmonScape Maps 2018 http://apps.wdfw.wa.gov/salmonscape/map.html

Washington State Department of Natural Resources FPARS mapping system, 2018 (for stream typing): http://fortress.wa.gov/dnr/app1/fpars/viewer.htm.

Washington State Department of Natural Resources WRIA mapping database.

APPENDIX A

Wetland Rating Figures and Forms

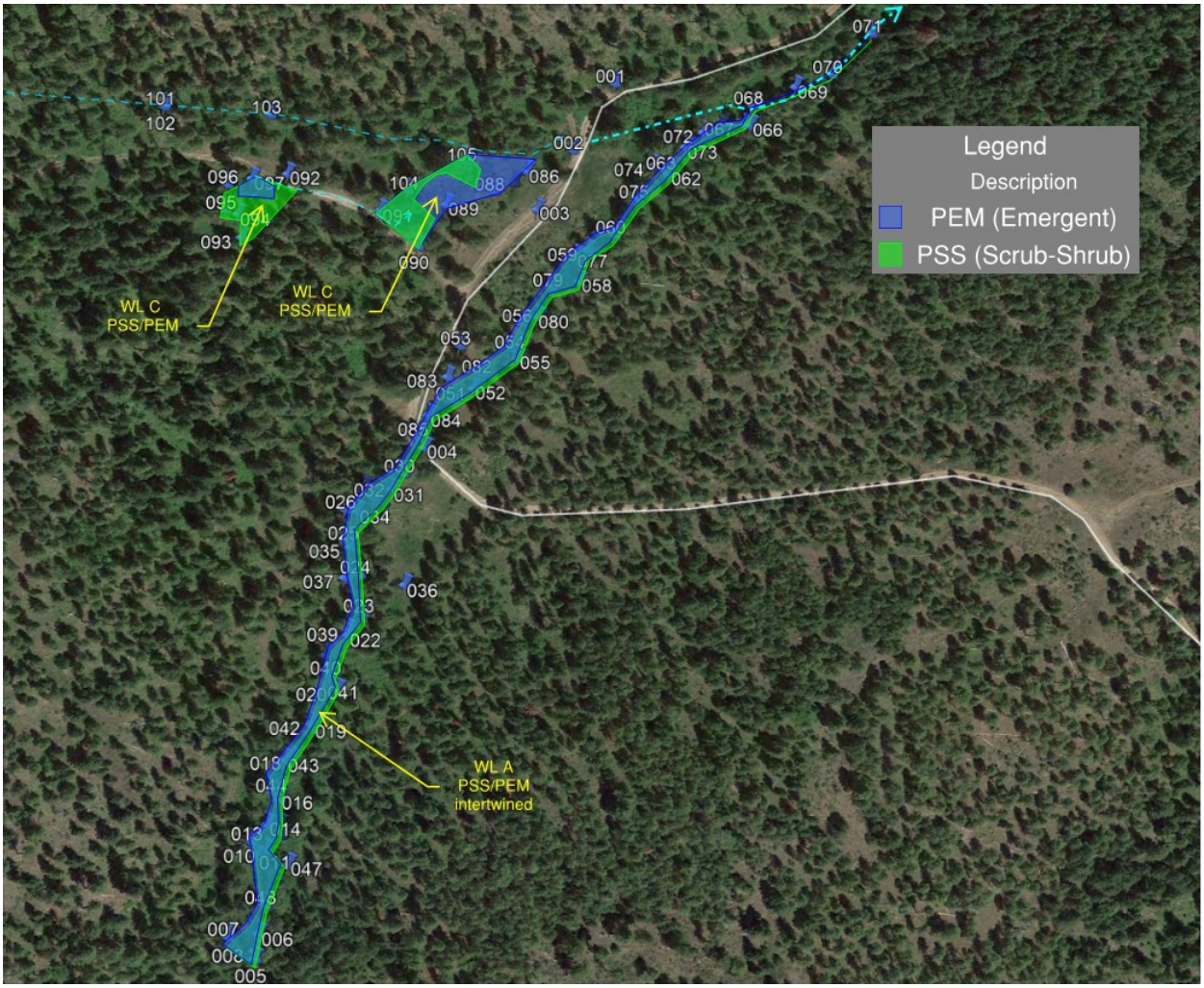


Figure A-35. Cowardin Plant Classes

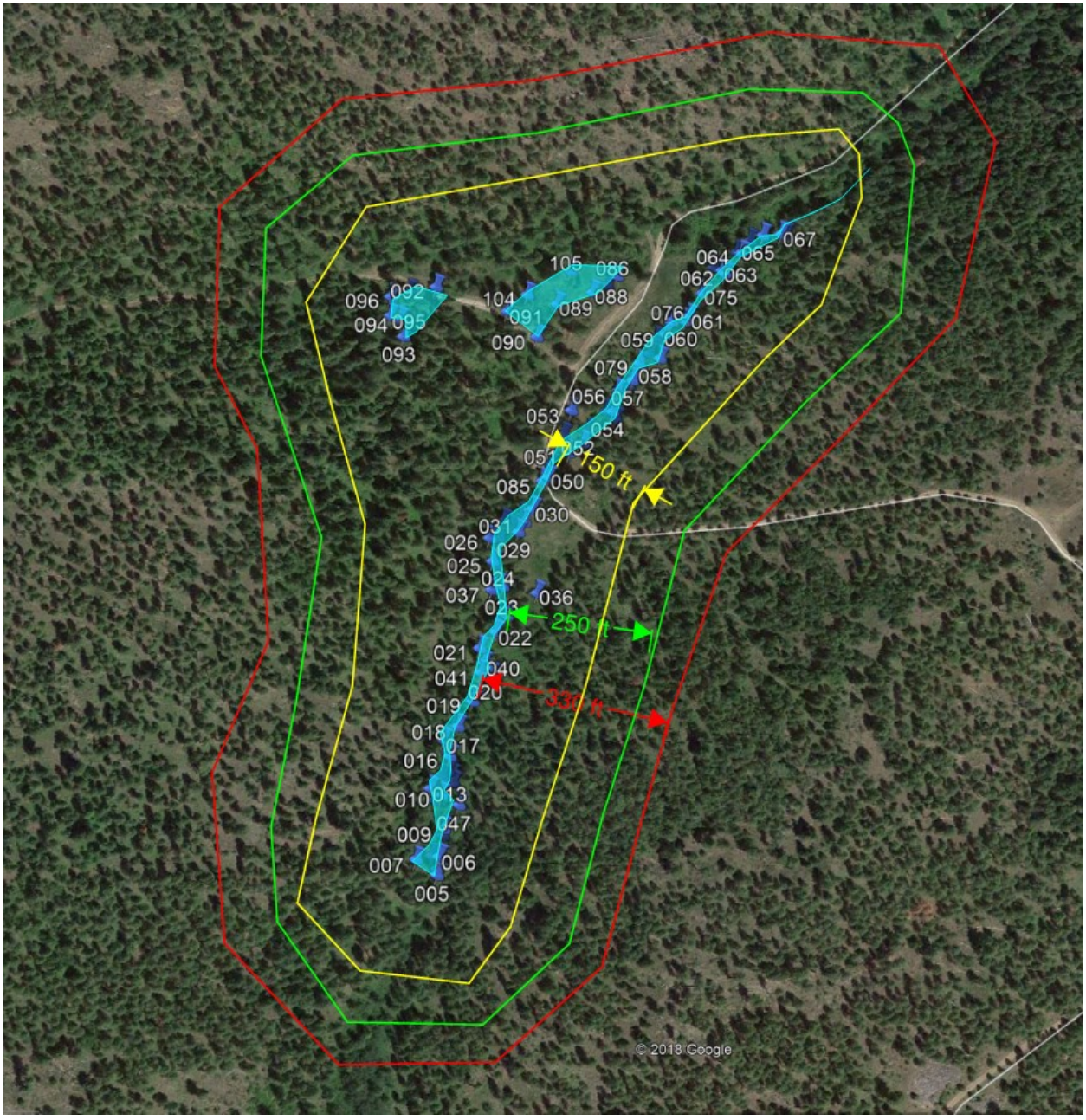


Figure A-36. Areas within 150', 250' and 330' of the wetlands.

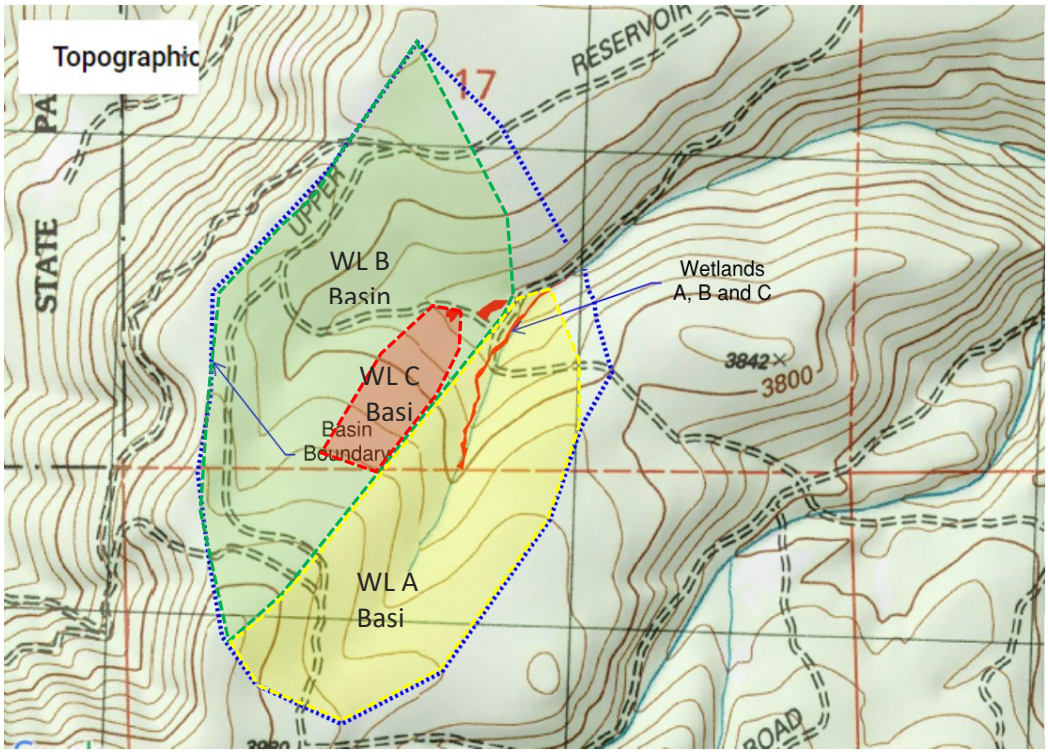


Figure A-37. Map of the Contributing Basin.

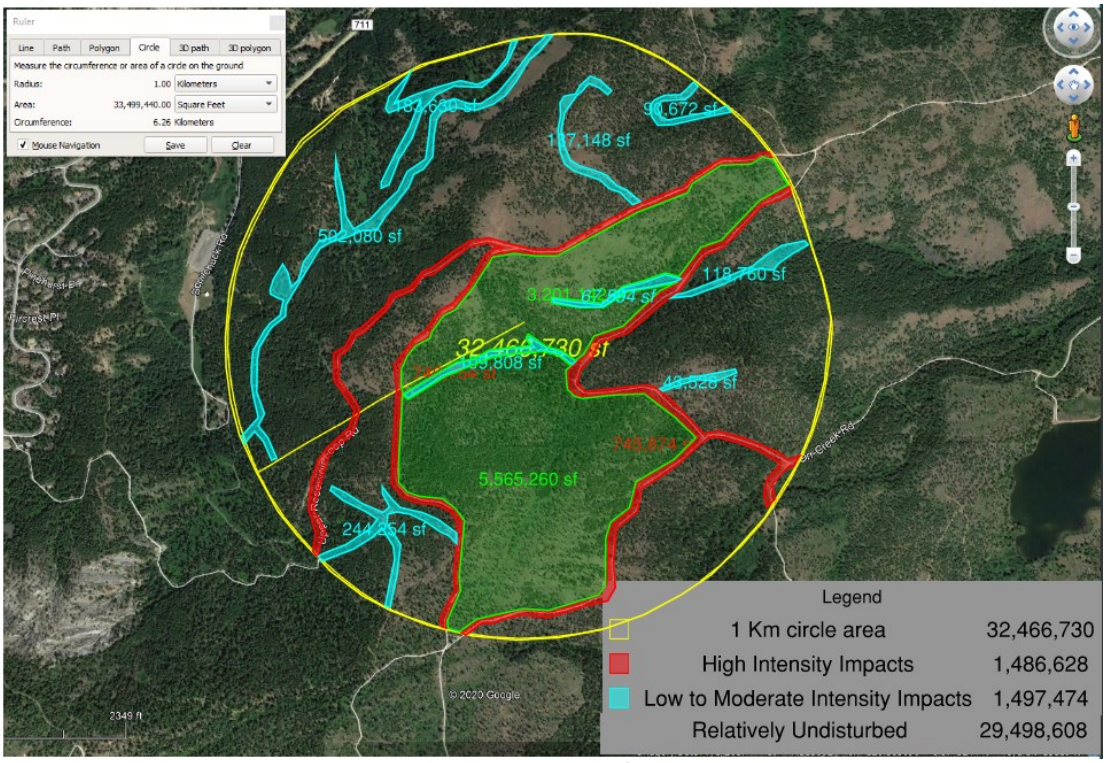


Figure A-38. Show habitat conditions within 1km of the wetland boundary edge.

Figure A-39. Showing project location relative to 303D Waters.

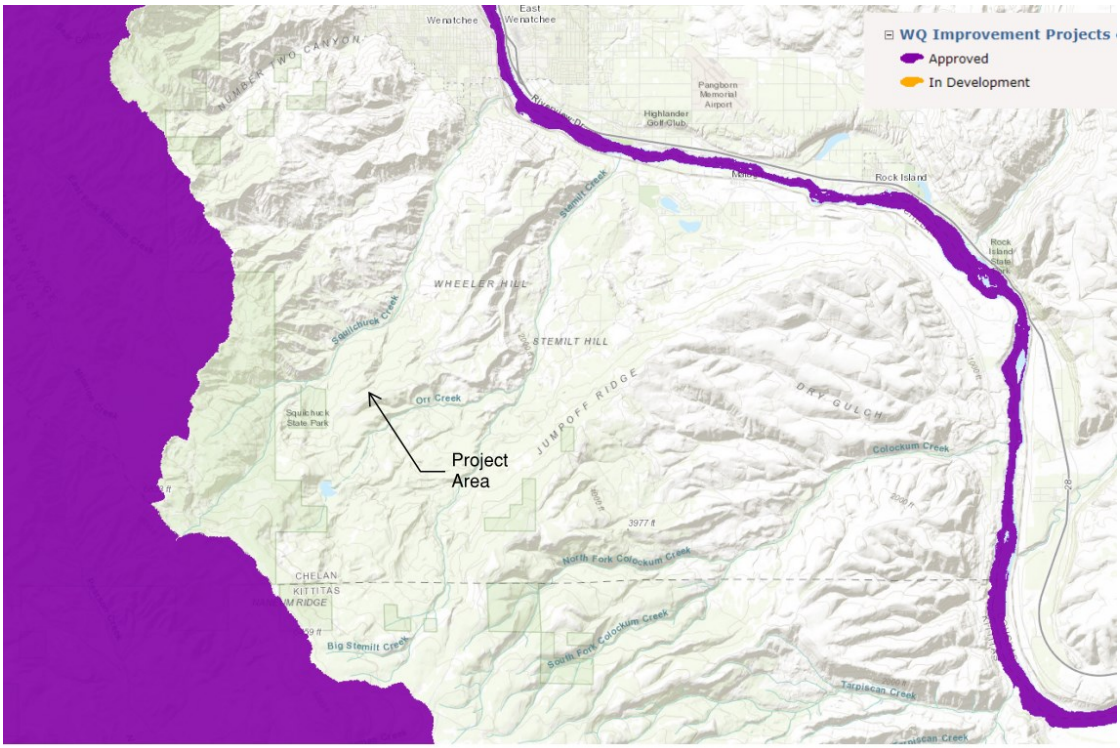


Figure A-40. Showing project location in relation the TMDL studies.

Wetland name or number Wheeler Ridge Wetland A

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wheeler Ridge Wetland A Date of site visit: 5/16/2018

Rated by Lisa Palazzi, PWS, CPSS Trained by Ecology? ☑ Yes ☐ No Date of training 2014

HGM Class used for rating Riverine Wetland has multiple HGM classes? ☑ Y ☐ N

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY ____ (based on functions ☐ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 22-27

_____**Category II** – Total score = 19-21

xx_____**Category III** – Total score = 16-18

_____**Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H **M** L	H **M** L	H **M** L	
Landscape Potential	H **M** L	H **M** L	**H** M L	
Value	H M **L**	H M **L**	**H** M L	**TOTAL**
Score Based on Ratings	5	5	8	18

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	

Wetland name or number Wheeler Ridge Wetland A

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	A-34
Hydroperiods	H 1.2, H 1.3	too small
Ponded depressions	R 1.1	Too small
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	A-35
Map of the contributing basin	R 2.2, R 2.3, R 5.2	A-36
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	A-34
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	NA
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	A-37
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	A-38
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	A-39

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number Wheeler Ridge Wetland A

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

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 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ☐ The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ☐ At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 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**.

   NO - go to 3 ☑ ☐ YES – The wetland class is **Slope**
   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 <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ☑ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ☑ The overbank flooding occurs at least once every 10 years.

   NO - go to 4 ☐ ☑ YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

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

   NO – go to 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 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND 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 the wetland unit being scored.

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 HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

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

Wetland name or number Wheeler Ridge Wetland A

RIVERINE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover >1/3 area of wetland points = 6 Depressions cover > 1/10 area of wetland points = 3 Depressions present but cover < 1/10 area of wetland points = 1 No depressions present points = 0	1
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; **not** Cowardin classes): Forest or shrub > 2/3 the area of the wetland points = 10 Forest or shrub 1/3 – 2/3 area of the wetland points = 5 Ungrazed, herbaceous plants > 2/3 area of wetland points = 5 Ungrazed herbaceous plants 1/3 – 2/3 area of wetland points = 2 Forest, shrub, and ungrazed herbaceous < 1/3 area of wetland points = 0	5
Total for R 1 Add the points in the boxes above	6

Rating of Site Potential If score is: ☐ **12-16 = H** ☑ **6-11 = M** ☐ **0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	0
R 2.2. Does the contributing basin include a UGA or incorporated area? Yes = 1 No = 0	0
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	0
R 2.4. Is > 10% of the area within 150 ft of wetland in land uses that generate pollutants Yes = 1 No = 0	1
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4? Source_____ Yes = 1 No = 0	0
Total for R 2 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ☐ **3-6 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	0
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	0
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the drainage in which wetland is found*. Yes = 2 No = 0	0
Total for R 3 Add the points in the boxes above	0

Rating of Value If score is: ☐ **2-4 = H** ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

Wetland name or number Wheeler Ridge Wetland A

RIVERINE WETLANDS **Hydrologic Functions** - Indicators that site functions to reduce flooding and stream erosion	Points (only 1 score per box)
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* If the ratio is more than 2 points = 10 If the ratio is 1-2 points = 8 If the ratio is ½-<1 **points = 4** If the ratio is ¼-< ½ points = 2 If the ratio is < ¼ points = 1	4
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have > 90% cover at person height. These are NOT Cowardin classes).* Forest or shrub for more than $^{2}/_{3}$ the area of the wetland points = 6 Forest or shrub for >$^{1}/_{3}$ area OR emergent plants > $^{2}/_{3}$ area **points = 4** Forest or shrub for > $^{1}/_{10}$ area OR emergent plants > $^{1}/_{3}$ area points = 2 Plants do not meet above criteria points = 0	4
Total for R 5 Add the points in the boxes above	8

Rating of Site Potential If score is ☐ **12-16 = H** ☑ **6-11 = M** ☐ **0-5 = L** *Record the rating on the first page*

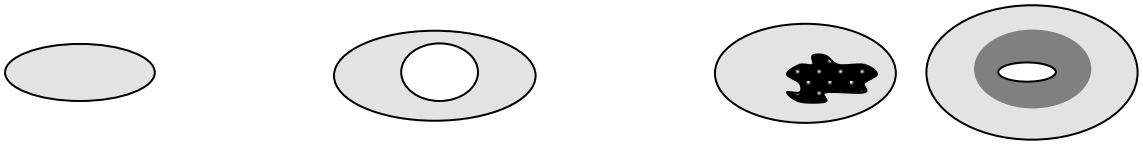
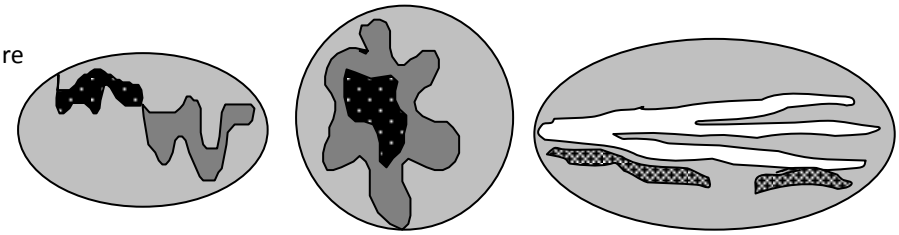
R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
R 5.1. Is the stream or river adjacent to the wetland downcut? Yes = 0 **No = 1**	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area? Yes = 1 **No = 0**	0
R 5.3. Is the up-gradient stream or river controlled by dams? Yes = 0 **No = 1**	1
Total for R 5 Add the points in the boxes above	2

Rating of Landscape Potential If score is ☐ **3 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems? *Choose the description that best fits the site.* The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources points = 2 Surface flooding problems are in a basin farther down-gradient points = 1 No flooding problems anywhere downstream **points = 0**	0
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 **No = 0**	0
Total for R 6 Add the points in the boxes above	0

Rating of Value If score is: ☐ **2-4 = H** ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

Wetland name or number Wheeler Ridge Wetland A

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ☐ Aquatic bed ☑ Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover ☐ Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ☐ Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ☑ Scrub-shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	2
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***Answer YES for Lake Fringe wetlands***. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No*. Yes = 3 No = 0	3
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. 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 saltcedar (Tamarisk)* # of species 15 Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	2
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 2

Wetland name or number Wheeler Ridge Wetland A

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ☑ Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. ☐ Cattails or bulrushes are present within the wetland. ☐ Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ☐ Emergent or shrub vegetation in areas that are permanently inundated/ponded. ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ☑ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	2
Total for H 1 — Add the points in the boxes above	11

Rating of Site Potential If score is: ☐ **15-18 = H** ☑ **7-14 = M** ☐ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat 27 **+** [(% moderate and low intensity land uses)/2] 0.27 = 27.3 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon — points = 0	2
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat 90 **+** [(% moderate and low intensity land uses)/2] 5 = 95 % Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	3
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use — points = (- 2) Does not meet criterion above — points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 No = 0	0
Total for H 2 — Add the points in the boxes above	5

Rating of Landscape Potential If score is: ☑ **4-9 = H** ☐ **1-3 = M** ☐ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: ☑ **2 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number Wheeler Ridge Wetland A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? ☐ Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. ☐ Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool*. ☐ The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. ☐ Surface water is present for less than 120 days during the wet season. Yes **–** Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes **–** Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? ☐ The wetland has a conductivity > 3.0 mS/cm. ☐ The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). ☐ If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? ☐ Salt encrustations around more than 75% of the edge of the wetland ☐ More than ¾ of the plant cover consists of species listed on Table 4 ☐ A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I**

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SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils*. Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in 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** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **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 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: ☐ Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems ☐ The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) ☐ The wetland is within the 100 year floodplain of a river or stream ☐ Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species ☐ There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2** SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3** SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4** SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. I** **Cat. I** **Cat. II** **Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

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

☑ **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*).

☐ **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

☐ **Oregon White Oak:** Woodland 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 – see web link above*).

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

☑ **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 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), 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 > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **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).

☐ **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

☐ **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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Wetland name or number Wheeler Ridge Wetland B and C

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wheeler Ridge Wetland B and C Date of site visit: 5/16/2018

Rated by Lisa Palazzi, PWS, CPSS Trained by Ecology? ☑ Yes ☐ No Date of training 2014

HGM Class used for rating Slope Wetland has multiple HGM classes? ☑ Y ☐ N

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY III (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 22-27

_____**Category II** – Total score = 19-21

xx_____**Category III** – Total score = 16-18

_____**Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M **L**	H M **L**	H **M** L	
Landscape Potential	H **M** L	H M **L**	**H** M L	
Value	H M **L**	**H** M L	**H** M L	**TOTAL**
Score Based on Ratings	4	5	8	17

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	

Wetland name or number Wheeler Ridge Wetland B and C

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	A-34
Hydroperiods	H 1.2, H 1.3	NA
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	A-34
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	too small
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	A-35
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	A-36
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	A-37
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	A-38

Wetland name or number Wheeler Ridge Wetland B and C

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

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 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ☐ The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ☐ At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 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**.

   NO - go to 3 ☑ ☐ YES – The wetland class is **Slope**
   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 <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ☑ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ☑ The overbank flooding occurs at least once every 10 years.

   NO - go to 4 ☑ ☐ YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

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

   NO – go to 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 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND 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 the wetland unit being scored.

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 HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

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

Wetland name or number Wheeler Ridge Wetland B and C

SLOPE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of average slope of wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less points = 3 Slope is > 1% - 2% points = 2 Slope is > 2% - 5% points = 1 Slope is greater than 5% points = 0	2
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or tureorganic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	3
Total for S 1 Add the points in the boxes above	5

Rating of Site Potential If score is: ☐ **12 = H** ☐ **6-11 = M** ☑ **0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function at the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	0
Total for S 2 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ☑ **1-2 = M** ☐ **0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly to a stream, river, or lake that is on the 303(d) list (*within 1 mi*)? Yes = 1 No = 0	0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. Yes = 1 No = 0	0
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which wetland is found*)? Yes = 2 No = 0	0
Total for S 3 Add the points in the boxes above	0

Rating of Value If score is: ☐ **2-4 = H** ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

Wetland name or number Wheeler Ridge Wetland B and C

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion	Points (only 1 score per box)
S 4.0. Does the site have the potential to reduce flooding and erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows*. Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	0

Rating of Site Potential If score is: ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses that generate excess surface runoff? Yes = 1 No = 0	0

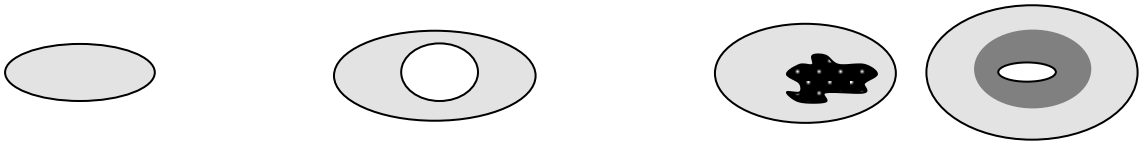
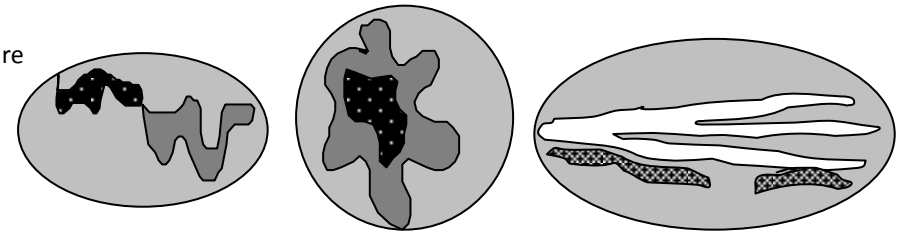
Rating of Landscape Potential If score is: ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	2
S 6.2. Has the site been identified as important for flood storage and flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	2

Rating of Value If score is: ☑ **2-4 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number Wheeler Ridge Wetland B and C

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ☐ Aquatic bed ☑ Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover ☑ Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ☐ Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ☑ Scrub-shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	2
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***A**nswer YES for Lake Fringe wetlands*. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No*. Yes = 3 No = 0	3
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. 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 saltcedar (Tamarisk)* # of species 15 Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	2
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 2

Wetland name or number Wheeler Ridge Wetland B and C

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ☐ Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. ☐ Cattails or bulrushes are present within the wetland. ☐ Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ☐ Emergent or shrub vegetation in areas that are permanently inundated/ponded. ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ☑ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	1
Total for H 1 — Add the points in the boxes above	10

Rating of Site Potential If score is: ☐ **15-18 = H** ☑ **7-14 = M** ☐ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat 90 **+** [(% moderate and low intensity land uses)/2] 5 = 95 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon — points = 0	3
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat 90 **+** [(% moderate and low intensity land uses)/2] 5 = 95 % Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	3
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use — points = (- 2) Does not meet criterion above — points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 No = 0	0
Total for H 2 — Add the points in the boxes above	6

Rating of Landscape Potential If score is: ☑ **4-9 = H** ☐ **1-3 = M** ☐ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: ☑ **2 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number Wheeler Ridge Wetland B and C

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? ☐ Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. ☐ Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool*. ☐ The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. ☐ Surface water is present for less than 120 days during the wet season. Yes **–** Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes **–** Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	NA
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? ☐ The wetland has a conductivity > 3.0 mS/cm. ☐ The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). ☐ If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? ☐ Salt encrustations around more than 75% of the edge of the wetland ☐ More than ⅓ of the plant cover consists of species listed on Table 4 ☐ A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I** NA

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils*. Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in 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** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **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 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: ☐ Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems ☐ The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) ☐ The wetland is within the 100 year floodplain of a river or stream ☐ Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species ☐ There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2** SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3** SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4** SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. I** **Cat. I** **Cat. II** **Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

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

☑ **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*).

☐ **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

☐ **Oregon White Oak:** Woodland 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 – see web link above*).

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

☑ **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 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), 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 > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **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).

☐ **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

☐ **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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Wetland name or number Wheeler Ridge Wetland Ns North

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wheeler Ridge Wetland Ns North Date of site visit: 5/12/2020

Rated by Lisa Palazzi, PWS, CPSS Trained by Ecology? ☑ Yes ☐ No Date of training 2014

HGM Class used for rating Depressional Wetland has multiple HGM classes? ☑ Y ☐ N

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY III (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 22-27

_____**Category II** – Total score = 19-21

xx_____**Category III** – Total score = 16-18

xx_____**Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H **M** L	H M **L**	H M **L**	
Landscape Potential	H M **L**	H M **L**	**H** M L	
Value	H M **L**	H **M** L	**H** M L	**TOTAL**
Score Based on Ratings	4	4	7	15

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	

Wetland name or number Wheeler Ridge Wetland Ns North

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	A-34
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	too small
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	Fig. 32
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	A-35
Map of the contributing basin	D 5.3	A-36
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	A-37
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	A-38
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	A-39

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	Page 45
Hydroperiods	H 1.2, H 1.3	NA
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	Page 45
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	NA
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	Page 46
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	Page 47
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	Page 48
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	Page 48

Wetland name or number Wheeler Ridge Wetland B and C

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

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 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ☐ The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ☐ At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 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**.

   NO - go to 3 ☑ ☐ YES – The wetland class is **Slope**
   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 <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ☑ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ☑ The overbank flooding occurs at least once every 10 years.

   NO - go to 4 ☐ ☑ YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

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

   NO – go to 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 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND 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 the wetland unit being scored.

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 HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

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

Wetland name or number Wheeler Ridge Wetland Ns North

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet — points = 5 Wetland has an intermittently flowing outlet — points = 3 Wetland has a highly constricted permanently flowing outlet — points = 3 Wetland has a permanently flowing, unconstricted, surface outlet — points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > 2/3 of area — points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area — points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area — points = 1 Wetland has persistent, ungrazed vegetation < 1/10 of area — points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland — points = 3 Area seasonally ponded is ¼ - ½ total area of wetland — points = 1 Area seasonally ponded is < ¼ total area of wetland — points = 0	0
Total for D 1 — Add the points in the boxes above	8

Rating of Site Potential If score is: ☐ **12- 16 = H** ☑ **6- 11 = M** ☐ **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 — Add the points in the boxes above	0

Rating of Landscape Potential If score is: ☐ **3 or 4 = H** ☐ **1 or 2 = M** ☑ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 No = 0	0
Total for D 3 — Add the points in the boxes above	0

Rating of Value If score is: ☐ **2-4 = H** ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

Wetland name or number Wheeler Ridge Wetland Ns North

DEPRESSIONAL WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and erosion.

Points (only 1 score per box)

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland: **4**

- Wetland has no surface water outlet — points = 8
- Wetland has an intermittently flowing outlet — points = 4
- Wetland has a highly constricted permanently flowing outlet — points = 4
- Wetland has a permanently flowing unconstricted surface outlet — points = 0

(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* **0**

- Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 8
- Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 6
- The wetland is a headwater wetland — points = 4
- Seasonal ponding: 1 ft - < 2 ft — points = 4
- Seasonal ponding: 6 in - < 1 ft — points = 2
- Seasonal ponding: < 6 in or wetland has only saturated soils — points = 0

Total for D 4 — Add the points in the boxes above: **4**

Rating of Site Potential If score is: ☐ **12-16 = H** ☐ **6-11 = M** ☑ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff?	Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses?	Yes = 1 No = 0	0
Total for D 5	Add the points in the boxes above	0

Rating of Landscape Potential If score is: ☐ **3 = H** ☐ **1 or 2 = M** ☑ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The wetland is in a landscape that has flooding problems. **1**

Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.*

The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND

- Flooding occurs in sub-basin that is immediately down-gradient of wetland — points = 2
- Surface flooding problems are in a sub-basin farther down-gradient — points = 1

The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood.

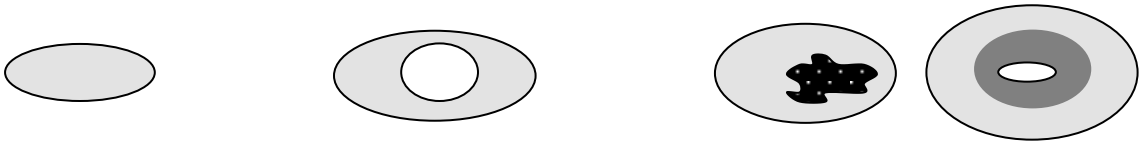
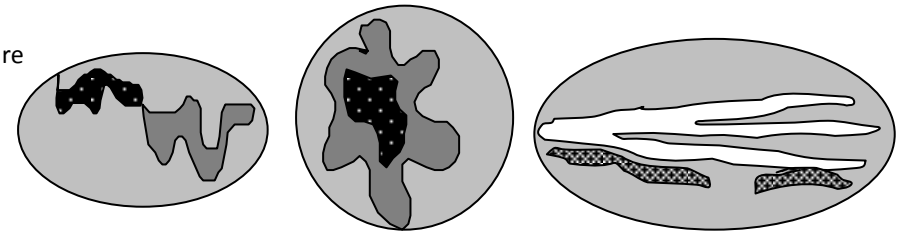
- *Explain why* _____ — points = 0
- There are no problems with flooding downstream of the wetland — points = 0

D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0 **0**

Total for D 6 — Add the points in the boxes above: **1**

Rating of Value If score is ☐ **2-4 = H** ☑ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number Wheeler Ridge Wetland Ns North

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ☐ Aquatic bed ☑ Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover ☐ Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ☐ Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ☐ Scrub-shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	0
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***Answer YES for Lake Fringe wetlands***. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No*. Yes = 3 No = 0	3
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. 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 saltcedar (Tamarisk)* # of species 5 Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 0

Wetland name or number Wheeler Ridge Wetland Ns North

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ☐ Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. ☐ Cattails or bulrushes are present within the wetland. ☐ Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ☐ Emergent or shrub vegetation in areas that are permanently inundated/ponded. ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ☑ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	1
Total for H 1 — Add the points in the boxes above	5

Rating of Site Potential If score is: ☐ **15-18 = H** ☐ **7-14 = M** ☑ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat 27 **+** [(% moderate and low intensity land uses)/2] 0.27 = 27.3 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon — points = 0	2
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat 90.8 **+** [(% moderate and low intensity land uses)/2] 2.3 = 93.1 % Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	3
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use — points = (- 2) Does not meet criterion above — points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 No = 0	0
Total for H 2 — Add the points in the boxes above	5

Rating of Landscape Potential If score is: ☑ **4-9 = H** ☐ **1-3 = M** ☐ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: ☑ **2 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number Wheeler Ridge Wetland Ns North

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? ☐ Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. ☐ Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool*. ☐ The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. ☐ Surface water is present for less than 120 days during the wet season. Yes **–** Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes **–** Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	NA
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? ☐ The wetland has a conductivity > 3.0 mS/cm. ☐ The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). ☐ If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? ☐ Salt encrustations around more than 75% of the edge of the wetland ☐ More than ⅓ of the plant cover consists of species listed on Table 4 ☐ A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I** NA

Wetland name or number Wheeler Ridge Wetland Ns North

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils*. Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in 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** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **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 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: ☐ Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems ☐ The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) ☐ The wetland is within the 100 year floodplain of a river or stream ☐ Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species ☐ There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2** SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3** SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4** SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. I** **Cat. I** **Cat. II** **Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

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

☑ **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*).

☐ **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

☐ **Oregon White Oak:** Woodland 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 – see web link above*).

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

☑ **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 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), 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 > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

☐ **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).

☐ **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

☐ **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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APPENDIX B

Field Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Wheeler Ridge Wetland A City/County: Chelan County near Wenatchee, WA Sampling Date: 05/16/2018

Applicant/Owner: Wheeler Ridge LLC State: WA Sampling Point: WL-A-006

Investigator(s): Lisa Palazzi, CPSS, PWS Section, Township, Range: Section 17, Township 21N, Range 20E

Landform (hillslope, terrace, etc.): Depression, Stream sideslope Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR): LRR B Lat: 47deg 18' 35.77" N Long: 120deg 21' 57.95" W Datum: _____

Soil Map Unit Name: Stemilt Silt Loam, 0-25% slopes NWI classification: PSS

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes XX 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 XX No _____	**Is the Sampled Area within a Wetland?** Yes XX No _____
Hydric Soil Present?	Yes XX No _____	
Wetland Hydrology Present?	Yes XX No _____	

Remarks:
Spring growing season -- hydrology still present but waning

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Alder	10%	Y	FAC
2.			
3.			
4.			
	10% = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Cluster rose (Rosa pisocarpa)	25%	Y	FAC
2. Serviceberry (Amelanchier alnifolia)	10%	N	FACU
3. Twinberry (Lonicera involucrata)	15%	Y	FAC
4. Red osier dogwood (Cornus sericea)	25%	Y	FACW
5. Wild crabapple (Malus fusca)	15%	N	FAC
	90 = Total Cover		
Herb Stratum (Plot size: 30 ft)			
1. water parsley (Oenanthe_sarmentosa)	20% (11.7)	Y	OBL
2. Columbine (Aquilegia formosa)	20% (11.7)	Y	FAC
3. wild iris (blue) (Iris missouriensis)	25% (14.7)	Y	FACW
4. sedge spp (Carex spp)	25% (14.7)	Y	FAC (avg)
5. colts foot (Petasites frigidus)	25% (14.7)	Y	FACW
6. Horsetail (Equisetum hyemale)	20% (11.7)	Y	FACW
7. Spikerush (Eleocharis palustris)	20% (11.7)	Y	OBL
8. Yellow iris (Iris pseudacorus)	15% (11.7)	Y	OBL
	170 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 12 (A)

Total Number of Dominant Species Across All Strata: 12 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	95	x 2 =	190
FAC species	110	x 3 =	330
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	260 (A)		575 (B)

Prevalence Index = B/A = 2.21

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes XX No _____

Remarks:
Plants are actively growing; appears to be at least 1-2 months into the growing season

SOIL

Sampling Point: WL WP 020

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR2/2	100	NA				GrSL	
6-18	10YR4/2	75	10YR 4/6	15	C	M	GrSL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** XX **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes XX No _____ Depth (inches): 1"

Water Table Present? Yes XX No _____ Depth (inches): 5"

Saturation Present? (includes capillary fringe) Yes XX No _____ Depth (inches): 5"

Wetland Hydrology Present? **Yes** XX **No** _____

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

Remarks:

Surface water right by stream; farther away, subsurface only

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Wheeler Ridge Wetland A City/County: Chelan County near Wenatchee, WA Sampling Date: 05/16/2018

Applicant/Owner: Wheeler Ridge LLC State: WA Sampling Point: WL-A-007

Investigator(s): Lisa Palazzi, CPSs, PWS Section, Township, Range: Section 17, Township 21N, Range 20E

Landform (hillslope, terrace, etc.): Depression, Stream swale s Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR): LRR B Lat: 47deg 18' 35.77" N Long: 120deg 21' 57.95" W Datum: _____

Soil Map Unit Name: Stemilt Silt Loam, 0-25% slopes NWI classification: PSS (downslope from this point)

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes XX 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 XX	**Is the Sampled Area within a Wetland?** Yes _____ No XX
Hydric Soil Present?	Yes _____	No XX	
Wetland Hydrology Present?	Yes _____	No XX	

Remarks:
Spring growing season -- hydrology still present but waning

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Alder (Alnus rubra)	25%	Y	FAC
2. Quaking aspen (Populus tremuloides)	25%	Y	FACU
3. Ponderosa pine (Pinus ponderosa)	20	Y	FACU
4. Douglas-fir (Pseudotsuga menziesii)	15	N	FACU
	85	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Cluster rose (Rosa pisocarpa)	30%	Y	FAC
2. Oceanspray (Holodiscus discolor)	25%	Y	FACU
3. Snowberry (Symphoricarpos albus)	25%	Y	FACU
4. Oregon grape (Mahonia nervosa)	20%	N	FACU
5. Bitterbrush (Purshia tridentata)	10%	N	NI
	110	= Total Cover	
Herb Stratum (Plot size: 30 ft)			
1. Yarrow (Achillea millefolium)	20%	N	FACU
2. Columbine (Aquilegia formosa)	20%	N	FAC
3. Arrowleaf balsamroot (Balsamorhiza sagittata)	25%	Y	NI
4. Violet (Viola howellii)	25%	Y	NI
5. Bleeding heart (Dicentra formosa)	15%	N	FACU
6. Dusty miller (Senecio cineraria)	10%	N	NI
7. Lupine (Lupinus arbustus)	15%	N	NI
8. Smooth Solomon seal (Polygonatum biflorum)	15%	N	FACU
	130	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	_____	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	130	x 4 =	520
UPL species		x 5 =	
Column Totals:	205 (A)		745 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes _____ No XX

Remarks:
30 ft plot is too large for wetland, which is very narrow. Tree species are rooted outside of the wetland, upslope

SOIL

Sampling Point: UL -- WP 007

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR2/1	100	NA				GrSL	
8-16	10YR4/3	100	NA				GrSL	no redox features

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** XX

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? **Yes** _____ **No** XX

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

Remarks:

Shallow water by stream only; this site is farther upslope

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Wheeler Ridge Wetland B City/County: Chelan County near Wenatchee, WA Sampling Date: 05/16/2018

Applicant/Owner: Wheeler Ridge LLC State: WA Sampling Point: WL-B-087

Investigator(s): Lisa Palazzi, CPSS, PWS Section, Township, Range: Section 17, Township 21N, Range 20E

Landform (hillslope, terrace, etc.): Depression, Stream sideslope Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR): LRR B Lat: 47deg 18' 35.77" N Long: 120deg 21' 57.95" W Datum: _____

Soil Map Unit Name: Stemilt Silt Loam, 0-25% slopes NWI classification: PSS/ PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes XX 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 XX No _____	**Is the Sampled Area within a Wetland?** Yes XX No _____
Hydric Soil Present?	Yes XX No _____	
Wetland Hydrology Present?	Yes XX No _____	

Remarks:
Spring growing season -- hydrology still present but less than waning

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Alder	15%	Y	FAC
2.			
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Cluster rose (Rosa pisocarpa)	30%	Y	FAC
2. Wild crabapple (Malus fusca)	25%	Y	FAC
3. Twinberry (Lonicera involucrata)	30%	Y	FAC
4. Red osier dogwood (Cornus sericea)	10%	N	FACW
5.			
	95	= Total Cover	
Herb Stratum (Plot size: 30 ft)			
1. Moss (Oligotrichum aligerum)	25%	N	NI
2. False lily of the valley (Maianthemum dilatatum)	35%	Y	FAC
3. wild iris (blue) (Iris missouriensis)	25%	N	FACW
4. sedge spp (Carex spp)	35%	Y	FAC (avg)
5. colts foot (Petasites frigidus)	25%	N	FACW
6. horsetail (Equisetum hyemale)	15%	N	FACW
7.			
8.			
	150	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	_____	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species 75	x 2 = 150
FAC species 170	x 3 = 510
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 245 (A)	660 (B)

Prevalence Index = B/A = 2.69

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes XX No _____

Remarks:
Plants are actively growing; appears to be at least 1-2 months into the growing season.

SOIL

Sampling Point: WL WP 087

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR2/1	100	NA				GrSL	
6-18	10YR4/3	75	10YR 4/6	15	C	M	GrSL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** XX **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes XX No _____ Depth (inches): 1"

Water Table Present? Yes XX No _____ Depth (inches): 5"

Saturation Present? (includes capillary fringe) Yes XX No _____ Depth (inches): 5"

Wetland Hydrology Present? **Yes** XX **No** _____

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

Remarks:

Saturated soils draining N to stream system

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Wheeler Ridge Wetland B City/County: Chelan County near Wenatchee, WA Sampling Date: 05/16/2018

Applicant/Owner: Wheeler Ridge LLC State: WA Sampling Point: WL-B-105

Investigator(s): Lisa Palazzi, CPSS, PWS Section, Township, Range: Section 17, Township 21N, Range 20E

Landform (hillslope, terrace, etc.): Slope by Ns Stream Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR): LRR B Lat: 47deg 18' 35.77" N Long: 120deg 21' 57.95" W Datum: _____

Soil Map Unit Name: Stemilt Silt Loam, 0-25% slopes NWI classification: PSS/PEM (downslope from this point)

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes XX 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 XX	**Is the Sampled Area within a Wetland?** Yes _____ No XX
Hydric Soil Present?	Yes _____	No XX	
Wetland Hydrology Present?	Yes _____	No XX	

Remarks:
Spring growing season

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ponderosa pine (Pinus ponderosa)	45	Y	FACU
2. Quaking aspen (Populus tremuloides)	15	Y	FACU
3.			
4.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Cluster rose (Rosa pisocarpa)	30%	Y	FAC
2. Oceanspray (Holodiscus discolor)	15%	N	FACU
3. Snowberry (Symphoricarpos albus)	45%	Y	FACU
4. Oregon grape (Mahonia nervosa)	10%	N	FACU
5. Serviceberry (Amelanchier alnifolia)	20%	Y	FACU
	100	= Total Cover	
Herb Stratum (Plot size: 30 ft)			
1. Yarrow (Achillea millefolium)	20%	N	FACU
2. Columbine (Aquilegia formosa)	20%	N	FAC
3. Pasture grasses	50%	Y	FAC (avg)
4. Violet (Viola howellii)	15%	Y	NI
5. Bleeding heart (Dicentra formosa)	15%	N	FACU
6. Lupine (Lupinus arbustus)	T	N	NI
7.			
8.			
	120	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
		= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	140	x 4 =	560
UPL species		x 5 =	
Column Totals:	240 (A)		860 (B)

Prevalence Index = B/A = 3.58

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes _____ No XX

Remarks:

SOIL

Sampling Point: UL -- WP 105

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR3/2	100	NA				GrSL	
8-16	10YR4/3	100	NA				GrSL	no redox features

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** XX

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ **No** XX

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

Remarks:

This site is about 1-2 feet higher in elevation that wetland area

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Wheeler Ridge Wetland A City/County: Chelan County near Wenatchee, WA Sampling Date: 05/16/2018

Applicant/Owner: Wheeler Ridge LLC State: WA Sampling Point: WL-A-020

Investigator(s): Lisa Palazzi, CPSS, PWS Section, Township, Range: Section 17, Township 21N, Range 20E

Landform (hillslope, terrace, etc.): Depression, Stream sideslope Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR): LRR B Lat: 47deg 18' 35.77" N Long: 120deg 21' 57.95" W Datum: _____

Soil Map Unit Name: Stemilt Silt Loam, 0-25% slopes NWI classification: PSS

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes XX 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 XX No _____	**Is the Sampled Area within a Wetland?** Yes XX No _____
Hydric Soil Present?	Yes XX No _____	
Wetland Hydrology Present?	Yes XX No _____	

Remarks:
Spring growing season -- hydrology still present but waning

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Cluster rose (Rosa pisocarpa)	30%	Y	FAC
2. Serviceberry (Amelanchier alnifolia)	10%	N	FACU
3. Twinberry (Lonicera involucrata)	15%	Y	FAC
4. Red osier dogwood (Cornus sericea)	15%	Y	FACW
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 30 ft)			
1. water parsley (Oenanthe_sarmentosa)	20%	Y	OBL
2. horsetail (Equisetum hyemale)	20%	Y	FACW
3. wild iris (blue) (Iris missouriensis)	25%	Y	FACW
4. sedge spp (Carex spp)	10%	N	FAC (avg)
5. colts foot (Petasites frigidus)	25%	Y	FACW
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	= Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	85	x 2 =	170
FAC species	55	x 3 =	165
FACU species	10	x 4 =	40
UPL species		x 5 =	
Column Totals:	170 (A)		395 (B)

Prevalence Index = B/A = 2.32

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes XX No _____

Remarks:
Plants are actively growing; appears to be at least 1-2 months into the growing season

SOIL

Sampling Point: WL WP 020

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR2/2	100	NA				GrSL	
6-18	10YR4/2	75	10YR 4/6	15	C	M	GrSL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** XX **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes XX No _____ Depth (inches): 1"

Water Table Present? Yes XX No _____ Depth (inches): 5"

Saturation Present? (includes capillary fringe) Yes XX No _____ Depth (inches): 5"

Wetland Hydrology Present? **Yes** XX **No** _____

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

Remarks:

Surface water right by stream; farther away, subsurface only

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Wheeler Ridge Wetland A City/County: Chelan County near Wenatchee, WA Sampling Date: 05/16/2018

Applicant/Owner: Wheeler Ridge LLC State: WA Sampling Point: WL-A-020

Investigator(s): Lisa Palazzi, CPSS, PWS Section, Township, Range: Section 17, Township 21N, Range 20E

Landform (hillslope, terrace, etc.): Depression, Stream swale s Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR): LRR B Lat: 47deg 18' 35.77" N Long: 120deg 21' 57.95" W Datum: _____

Soil Map Unit Name: Stemilt Silt Loam, 0-25% slopes NWI classification: PSS (downslope from this point)

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes XX 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 XX	**Is the Sampled Area within a Wetland?** Yes _____ No XX
Hydric Soil Present?	Yes _____	No XX	
Wetland Hydrology Present?	Yes _____	No XX	

Remarks:
Spring growing season -- hydrology still present but waning

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Alder (Alnus rubra)	15%	Y	FAC
2. Douglas-fir (Pseudotsuga menziesii)	15%	Y	FACU
3. Ponderosa pine (Pinus ponderosa)	20%	Y	FACU
4.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Cluster rose (Rosa pisocarpa)	30%	Y	FAC
2. Oceanspray (Holodiscus discolor)	25%	Y	FACU
3. Snowberry (Symphoricarpos albus)	30%	Y	FACU
4. Oregon grape (Mahonia nervosa)	15%	N	FACU
5. Bitterbrush (Purshia tridentata)	10%	N	NI
	110	= Total Cover	
Herb Stratum (Plot size: 30 ft)			
1. Yarrow (Achillea millefolium)	20%	Y	FACU
2. Columbine (Aquilegia formosa)	20%	Y	FAC
3. Arrowleaf balsamroot (Balsamorhiza sagittata)	25%	Y	NI
4. Violet (Viola howellii)	25%	Y	NI
5. Bleeding heart (Dicentra formosa)	15%	N	FACU
6.			
7.			
8.			
	105	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	_____	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	140	x 4 =	560
UPL species		x 5 =	
Column Totals:	205 (A)		755 (B)

Prevalence Index = B/A = 3.68

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes _____ No XX

Remarks:

SOIL

Sampling Point: UL -- WP 020

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR2/1	100	NA				GrSL	
8-16	10YR4/3	100	NA				GrSL	no redox features

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** XX

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ **No** XX

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

Remarks:

Shallow water by stream only; this site is farther upslope

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Wheeler Ridge Wetland C City/County: Chelan County near Wenatchee, WA Sampling Date: 05/16/2018

Applicant/Owner: Wheeler Ridge LLC State: WA Sampling Point: WL-C-094

Investigator(s): Lisa Palazzi, CPSS, PWS Section, Township, Range: Section 17, Township 21N, Range 20E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR): LRR B Lat: 47deg 18' 35.77" N Long: 120deg 21' 57.95" W Datum: _____

Soil Map Unit Name: Stemilt Silt Loam, 0-25% slopes NWI classification: PSS/ PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes XX 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 XX No _____	**Is the Sampled Area within a Wetland?** Yes XX No _____
Hydric Soil Present?	Yes XX No _____	
Wetland Hydrology Present?	Yes XX No _____	

Remarks:
Spring growing season -- hydrology still present but waning

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Red Alder	35%	Y	FAC
2.			
3.			
4.			
	35% = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Cluster rose (Rosa pisocarpa)	35%	Y	FAC
2. Wild crabapple (Malus fusca)	25%	Y	FAC
3. Twinberry (Lonicera involucrata)	25%	Y	FAC
4. Red osier dogwood (Cornus sericea)	15%	N	FACW
5.			
	100 = Total Cover		
Herb Stratum (Plot size: 30 ft)			
1. Moss (Oligotrichum aligerum)	50%	Y	NI
2. False lily of the valley (Maianthemum dilatatum)	35%	N	FAC
3. wild iris (blue) (Iris missouriensis)	45%	Y	FACW
4. sedge spp (Carex spp)	35%	N	FAC (avg)
5. colts foot (Petasites frigidus)	25%	N	FACW
6. horsetail (Equisetum hyemale)	20%	N	FACW
7. Small-fruited bulrush (Scirpus microcarpus)	20	N	OBL
8.			
	230 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	105	x 2 =	210
FAC species	190	x 3 =	570
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	315 (A)		800 (B)

Prevalence Index = B/A = 2.54

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes XX No _____

Remarks:
Plants are actively growing; appears to be at least 1-2 months into the growing season.

SOIL

Sampling Point: WL C WP 094

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR2/1	100	NA				Mucky SL	Mucky mineral
6-18	10YR43/2	60	10YR 4/6	25	C	M	Mucky SL	Mucky mineral

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes XX No _____

Remarks:

This system almost meets Black Histic Indicator requirements

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes XX No _____ Depth (inches): 0.5

Water Table Present? Yes XX No _____ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes XX No _____ Depth (inches): 1

Wetland Hydrology Present? Yes XX No _____

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

Remarks:

Seeping from upslope toward road

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Wheeler Ridge Wetland C City/County: Chelan County near Wenatchee, WA Sampling Date: 05/16/2018

Applicant/Owner: Wheeler Ridge LLC State: WA Sampling Point: WL-C-093

Investigator(s): Lisa Palazzi, CPSS, PWS Section, Township, Range: Section 17, Township 21N, Range 20E

Landform (hillslope, terrace, etc.): Slope by Ns Stream Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR): LRR B Lat: 47deg 18' 35.77" N Long: 120deg 21' 57.95" W Datum: _____

Soil Map Unit Name: Stemilt Silt Loam, 0-25% slopes NWI classification: PSS/PEM (downslope from this point)

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes XX 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 XX	**Is the Sampled Area within a Wetland?** Yes _____ No XX
Hydric Soil Present?	Yes _____	No XX	
Wetland Hydrology Present?	Yes _____	No XX	

Remarks:
Spring growing season

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ponderosa pine (Pinus ponderosa)	55	Y	FACU
2. Quaking aspen (Populus tremuloides)	25	Y	FACU
3. Douglas-fir (Pseudotsuga menziesiii)	15	N	FACU
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Cluster rose (Rosa pisocarpa)	30%	Y	FAC
2. Oceanspray (Holodiscus discolor)	15%	N	FACU
3. Snowberry (Symphoricarpos albus)	45%	Y	FACU
4. Serviceberry (Amelanchier alnifolia)	10%	N	FACU
5.			
	100	= Total Cover	
Herb Stratum (Plot size: 30 ft)			
1. Pasture grasses	30%	Y	FAC (avg)
2. Columbine (Aquilegia formosa)	15%	N	FAC
3. Yarrow (Achillea millefolium)	15%	Y	FACU
4. Violet (Viola howellii)	25%	Y	NI
5. Bleeding heart (Dicentra formosa)	20%	N	FACU
6.			
7.			
8.			
	105	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	_____	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	200	x 4 =	800
UPL species		x 5 =	
Column Totals:	275 (A)		1025 (B)

Prevalence Index = B/A = 3.72

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes _____ No XX

Remarks:

SOIL

Sampling Point: UL -- WP 093

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR2/2	100	NA				GrSL	
8-16	10YR4/4	100	NA				GrSL	no redox features

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** XX

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ **No** XX

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

Remarks:

This site is about 1-2 feet higher in elevation than wetland area