

WETLAND AND STREAM REPORT

Parcel #315133
Kittitas County, Washington

Prepared for:

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GG Environmental
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Summary

On July 3, 2021, Geoffrey Gray (GG Environmental) completed a wetland and stream investigation within a subpart of parcel 315133 (study area), situs address 11798 Manastash Rd, in unincorporated Kittitas County, Washington.

The parcel (property) borders Manastash Creek and intersects the creek floodway and 100-year floodplain. A rural residence, multiple outbuildings, and fenced livestock area occupy the northwest quarter of the property, the northeast quarter of the property has been historically managed for agriculture, and the southern half of the property supports a riparian, forested wetland along the creek.

One Category I Riverine wetland unit¹ was delineated along the creek. According to Table 17B.50.020G-1, of the Kittitas County Code (KCC) (Shorelines), the wetland is assigned a protective buffer of 125 to 250 feet, depending upon proposed land use intensity and development.

Manastash Creek is the only stream within the property limits. It is listed by Kittitas County as a Shoreline (Type S) stream with a Rural Conservancy designation. According to KCC Table 17B.05.050-1, the creek is assigned a protective buffer of 100 feet.

According to the Washington State Department of Wildlife, steelhead are documented in the creek, and both Chinook and coho salmon are potentially present.

The stream is also designated by the National Marine Fisheries Service as critical habitat for Mid-Columbia River Distinct Population Segment steelhead.

¹ The wetland investigation was limited to the study area. The wetland unit boundary is identified for rating purposes and is estimated based on satellite imagery, LIDAR, and visual observation from Manastash Road.

This report is confidential.

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Acronyms and Abbreviations

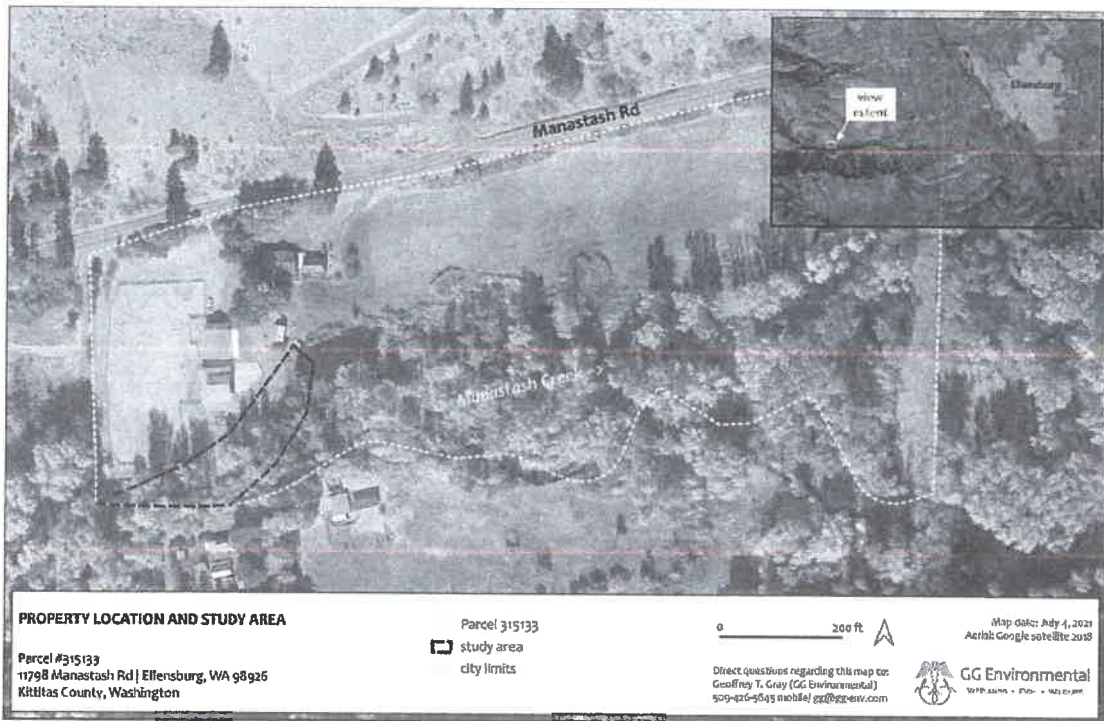
AgACIS	Agricultural Applied Climate Information System
Corps	United States Army Corps of Engineers
Cowardin	Cowardin Classification System
DNR	Washington State Department of Natural Resources
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HGM	Hydrogeomorphic (Wetland Classification)
KCC	Kittitas County Code
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PEM	Palustrine Emergent
PFO	Palustrine Forested
PSS	Palustrine Scrub-shrub
PHS	Priority Habitats and Species
PWS	Professional Wetland Scientist
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WDFW	Washington State Department of Fish and Wildlife
WETS	Climate Analysis for Wetlands Tables
WGS84	World Geodetic System 1984

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1. Introduction

GG Environmental (Geoffrey Gray, MA, PWS #3162) was retained by Georgann Williamson (property owner) to complete a wetland and stream assessment within a subpart (study area) of Kittitas County tax parcel 315133 (property) (Figure 1).

Figure 1. Property Location and Study Area



2. Location

The property is located in unincorporated Kittitas County, Washington, south of Manastash Road, and between the road and Manastash Creek. At approximately 2,247 feet in elevation, it lies in a narrow valley framed with steep, basalt hills to the north and south. Topography along the creek is gently sloped toward the east, in which direction the creek flows. Occurring within the NW ¼ of Section 16, Township 17 North, Range 17 East, the northwest corner of the property is approximately located at latitude 46°58'1.87"N and longitude 120°43'12.18"W (WGS84).

The property straddles the border between USDA Land Resource Regions (LRR) A and B (NRCS 2006). Due to the presence of conifers in the valley bottom and on steeper surrounding terrain that is characteristic of the Cascade Mountain foothills, the property is considered, for the purpose of the wetland delineation, to fall within LRR A and Major Land Use Area (MLRA) *Cascade Mountains, Eastern Slope*.² The property is also located in Water Resource Inventory Area (WRIA) 39 (Upper Yakima), as well as the Manastash Creek-Yakima River subwatershed (12th Hydrologic Unit Code 170300010511).

3. Methods

An overview of the methods employed to delineate wetlands and streams in the study area is presented in this section.

3.1. Background Research

Prior to conducting fieldwork, available data for the study area, including information on soils, topography, vegetation, precipitation, wetlands, streams, sensitive species, habitats, historic aerial imagery, and the county code were researched:

Wetlands

- National Wetlands Inventory (NWI) (USFWS 2021a). (**Appendix A-1**);
- Kittitas County wetland GIS data (Kittitas County 2021a). (**Appendix A-1**);
- Wetlands and Plants of High Conservation Value (DNR 2021a, DNR 2021b);
- Natural Resources Conservation Service soil survey data (NRCS 2021a). (**Appendix A-2**);
- Agricultural Applied Climate Information System climate data (NRCS 2021b). (**Appendix B**);
- Historic aerial photography: 1954 (CWU 2021) (**Appendix A-4**) and 2000-2018 (Google 2021);
- Light Detection and Ranging (LIDAR) data recorded in 2018 (DNR 2021c); and
- Title 17B (Shorelines) of the KCC (Kittitas County 2021b).

Streams

- Kittitas County floodplain and shorelines data (Kittitas County 2021a) (**Appendix A-3**);
- Kittitas County (DNR) stream type (Kittitas County 2021a) (**Appendix A-4**);
- USGS topographic map (USGS 2021); and
- Title 17B (Shorelines) of the KCC (Kittitas County 2021b).

Sensitive Species and Habitats

- Federal and state-listed species (USFWS 2021b, WDFW 2019)
- Designated critical habitats (USFWS 2021c, NOAA 2021a).
- WDFW Priority Habitats and Species (PHS) (WDFW 2021).

² Assigned to LRR A, the wetland delineation follows guidance in the Army Corps of Engineers Western Mountains, Valleys, and Coast regional supplement (Corps 2010).

3.2. Field Investigation

Fieldwork was completed within the study area on July 3, 2021 by GG Environmental (Geoffrey Gray, MA, PWS #3162). The study area includes the left (north) bank of the creek from the property's southwest corner to a small, wooden dock on the pond bank.

The delineation footprint was targeted toward providing data sufficient to identify the nearest boundary of the creek ordinary high water mark (OHWM) and/or wetlands to the property's two westernmost existing structures.

3.3. Geospatial Documentation

Key features were geospatially surveyed with a Motorola G7 mobile phone, running the Mapit Spatial GIS application paired via Bluetooth® with a Juniper Systems Geode™ Multi-Global Navigation Satellite System (Multi-GNSS) receiver capable of sub-meter horizontal accuracy.

3.4. Wetland Delineation

Wetlands were delineated using routine methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). Plants were identified by scientific name and wetland indicator status per Corps (2018).

Wetlands were rated per the *Washington State Wetland Rating System for Eastern Washington – 2014 Update* (Hruby 2014) and classified following the U.S. Fish and Wildlife Service (USFWS) *Cowardin Classification System* (Cowardin et al. 1979) and *Hydrogeomorphic Classification System* (HGM) by Brinson (1993).

Three sample locations (**Figure 2**) were investigated to determine the presence or absence of three requisite wetland indicators (water, plants, and soils), the results of which are outlined in **Table 1**.

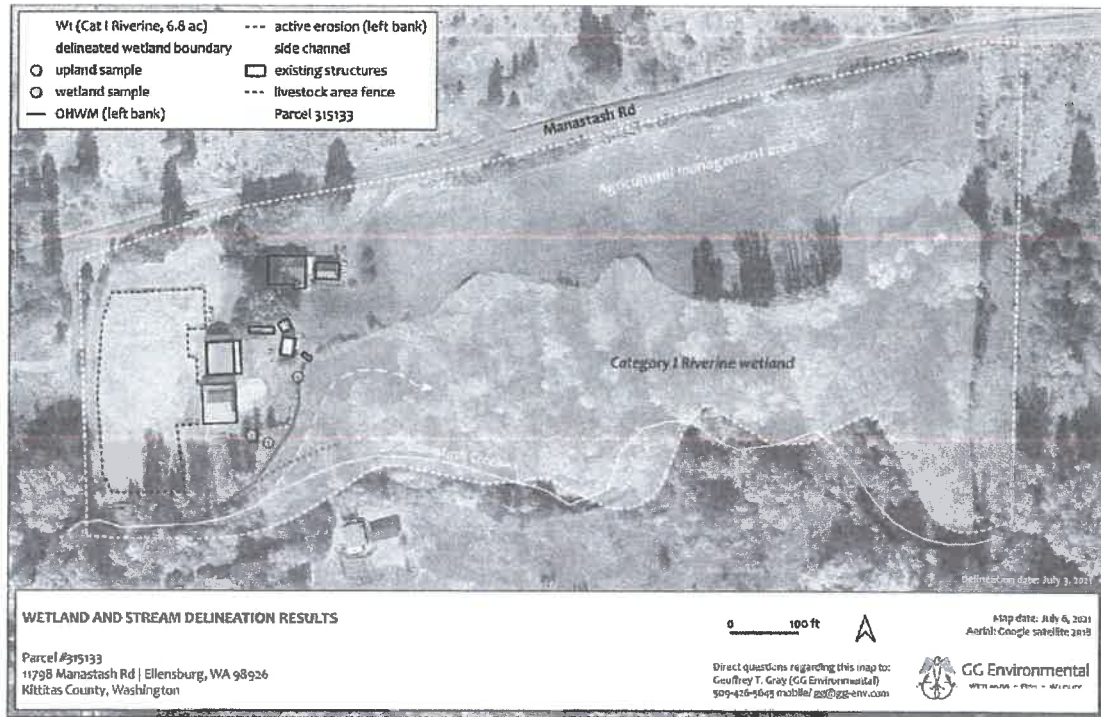
Table 1. Wetland Delineation Sample Data³ by Location

ID	Veg	Sat	ORC	Matrix	Rdx	Tex	Notes	Call
1	yes	yes	no	10YR 3/2	no	LS	Creek/pond backwater/overflow zone	wetland
2	no	no	no	—	no	RF	Dry, elevated fill materials	Upland
3	yes	no	no	10YR 2/1	no	SL	Edge of pond, steep fill slope to OHWM	Upland

Key to column headers: ID (location number); Veg (hydrophytic vegetation dominant); Sat (saturated soil in upper 12"); ORC (oxidized root channels in upper 12"); Matrix (dominant Munsell soil color); Rdx (redoximorphic soil features in upper 12"); Tex (dominant soil texture: loamy sand [LS], sandy loam [SL], rocky fill [RF]); Call (wetland or upland determination).

³ Wetland delineation data forms are included in Appendix C.

Figure 2. Wetland and Stream Delineation Results



The existing wetland buffer zone was assessed according to: (1) land use in the vicinity (e.g., agricultural, residential, commercial, industrial), (2) vegetation structure (tree, shrub, herb, vine, manicured, un-vegetated), and (3) buffer vegetation community (dominant plant species per strata, native vs. non-native dominants, and presence of noxious weeds).

3.5. Stream Delineation

The OHWM of Manastash Creek was delineated per guidance provided by the Army Corps of Engineers (Corps) (Corps 2005). Fish presence was researched using StreamNet (BPA 2021), SalmonScape (WDFW 2021b), and WDFW Priority Habitats and Species (WDFW 2021). Verification of current fish use was obtained via personal communication with Jennifer Nelson, WDFW Fisheries Biologist (WDFW 2021c).

4. Existing Conditions

4.1. Site History

Aerial imagery shows a rural residence on the property in 1954 (CWU 2021), although, according to the property owner, Georgann Williamson, the property has been occupied since at least the early 1900s. The existing pond north of the creek was excavated in the early 1900s to produce block ice for sale. The pond was not connected to the creek at that time as to produce ice from clean groundwater. However, subsequent flood flows and beaver activity has allowed the creek to partially capture the pond, which today functions as a creek side channel. Beavers continue to harvest trees and shrubs in the vicinity, constructing dams that slow flow and elevate groundwater, resulting in the aggradation of sediment in the pond and recruitment of riparian and wetland vegetation into expanded backwater/elevated groundwater areas.

4.2. Soils

The study area includes two soil map units (NRCS 2021a), comprised of the (1) Kyak-Weirman complex, rarely flooded, 0 to 2 percent slopes and (2) Patnish-Mippon-Myzel complex, 0 to 3 percent slopes.

The Kyak-Weirman complex, rarely flooded, 0 to 2 percent slopes occurs north of the pond and areas along the creek. This complex, associated with floodplains and stream terraces, is formed from alluvium. Drainage ranges from somewhat poorly drained to moderately well-drained, and the soil profile consists of materials ranging from ashy loam to extremely gravelly loamy sand. The Kyak-Weirman complex is listed as a hydric soil unit under Rating Criteria 2.

The Patnish-Mippon-Myzel complex, 0 to 3 percent slopes encompassing the pond and areas along the creek. This complex, associated with floodplains, stream terraces, and alluvial fans, is formed from volcanic ash and alluvium. It is moderately well-drained, and consists of materials ranging from ashy sandy clay loam to extremely cobbly loamy sand. This soil complex is not listed as a hydric soil.

4.3. Plants

Within the study area, a sharp boundary exists between the manicured/managed residential use area (grass lawn, ornamental plants, and other areas accessible to foot traffic, livestock, and equipment) and dense stands of trees, shrubs, and emergent vegetation along the pond and creek.

Along the creek, mature cottonwoods (*Populus balsamifera*), red-osier dogwood (*Cornus alba*), alder (*Alnus* sp.), and willows (*Salix* spp.) are dominant. The pond is bordered by cattails (*Typha latifolia*) and reed canarygrass (*Phalaris arundinaceae*), while the open-water portion of the pond supports aquatic bed vegetation.

4.4. Streams

Although the county/DNR streams layer shows a Type 4 stream entering the property from the northwest (Kittitas County 2021a) (**Appendix A-4**), Manastash Creek, listed as a Type S (Shoreline) stream, is the only stream identified within the property limits. A right-bank tributary to the Yakima River, approximately seven miles downstream, the creek is on the Department of Ecology 303d list for elevated temperature both upstream and downstream of the property (Ecology 2021) (**Figure 4 of Appendix D**).

According to data accessible in SalmonScope (WDFW 2021b), StreamNet (BPA 2021), and Priority Habitats and Species (WDFW 2021), combined with current information provided by Jennifer Nelson, WDFW Fisheries Biologist (WDFW 2021c), both rainbow trout and steelhead are documented in the creek, while spring Chinook and coho salmon may also be present.

Many small fish were observed in the pond, but they were not identified to species during fieldwork.

4.5. Landscape

The property occurs within a narrow valley through which the creek flows, dominated by a narrow band of riparian vegetation. Elevated basaltic terrain is present to the north and south, dominated by conifers, annual grasses and sagebrush-scrub species. Scattered rural residences are present along the creek. However, surrounding lands within one kilometer are largely undisturbed by human development (Google 2021).

4.6. Precipitation and Hydrology

Chapter 19 of the Engineering Field Handbook (NRCS 2015) was referenced in determining if precipitation that fell within three months of the site visits was within the normal range (30-year average). Drier than normal climatic conditions prevailed the three months prior to the July 3 field visit (**Appendix B**).

4.7. Growing Season

According to Climate Analysis for Wetlands Tables (WETS) (NRCS 2021b), the growing season (28 °F or greater) at the nearest AgACIS station (Ellensburg) demonstrates a 70 percent probability of occurring between April 16 and October 14 (181 days) and 50 percent between April 20 and October 10 (173 days). Fieldwork was completed during the growing season.

5. Findings

5.1. Wetland Delineation Results

One category I riverine wetland unit (W1) was identified within the property boundary (Table 2, Figure 2). Since the wetland occurs within 200 feet of a shoreline stream, it is regulated under the Title 17B (Shorelines) of the KCC. According to KCC Table 17B.50.020G-1, the wetland is assigned a protective buffer of 125-250 feet, depending on proposed land use intensity.

Existing wetland buffer condition: The existing buffer zone adjacent to the delineated wetland boundary has been managed for rural residential use for many years and encompasses multiple outbuildings, landscaping, and a fenced livestock area. Open areas between the structures are comprised of lawn grass, coarse gravels, and/or mowed grasses and weeds. Given the pervious, elevated substrate upon which the structures are founded, it is reasonable to infer that runoff from the structure roofs and irrigation infiltrates rapidly and does not enter the stream or associated wetlands. However, due to the lack of native vegetation and residential activity, the effectiveness of the buffer zone in protecting wetland and stream functions and values is low.


Wetland delineation data forms are included in Appendix C and an Ecology rating form is presented in Appendix D. Representative photos of the study area are included in Appendix E. A large-format map of delineation results is included in Appendix F.

5.2. Stream Delineation Results

Manastash Creek flows along the property's southern boundary (Table 3). Designated by the county as a Shoreline stream with a Rural Conservancy designation, the creek is regulated under KCC Title 17B (Shorelines) with a protective buffer radius 100 feet.⁴ The OHWM of the creek's left bank was delineated as illustrated in Figure 2.


⁴ KCC Table 17B.05.050-1 Standard Shoreline Buffers (Type S Waters)

Table 2. Wetland Unit W1 Summary

WETLAND UNIT W1 – INFORMATION SUMMARY			
	Latitude	46°58'1.87"N,	
	Longitude	120°43'12.18"W	
	Elevation	2,247 feet.	
	Lead Agency	Kittitas County	
	Ecology Rating	I	
	Size (ac)	6.8	
	County Buffer (SMP)	125 to 250 feet ⁵	
Wetland Data Sheet(s): Appendix B; Delineation Form 1			
Upland Data Sheet(s): Appendix B; Delineation Form 2			
Description			
HGM (Riverine); Cowardin (Palustrine emergent (PEM), Palustrine Forested (PFO))			
Hydrology			
Source	Creek surface flow, high groundwater table		
Saturation depth (in)	Delineation Form 1: saturation at surface.		
Vegetation			
Dominants	Black cottonwood (FAC), alder sp. (FACW), willows (Salix spp.) (FACW-OBL.), red-osier dogwood (FACW), reed canarygrass (FACW).		
Soils – Delineation Form 1			
Horizon (in)	Matrix Color	Texture	Redoximorphic Features
0-12 12+ (cobble)	10YR 3/2	Loamy sand	None apparent, porous substrate and hyporheic flow. Hydric soil indicator inferred due to presence of hydrology and hydrophytic vegetation, including FACW and OBL.
Functions Provided (Ecology Rating Form)			
Water Quality:	8 points (high) – sediment removal, nutrient and toxicant removal		
Hydrology:	8 points (high) – erosion control and shoreline stabilization		
Habitat:	9 points – (high) – habitat disturbance regime, connectivity, ESA-listed species habitat		
Buffer Condition			
Areas to the north and west of the wetland unit are disturbed by residential development and agriculture. The buffer condition in these areas is determined to be poor in regards to protection of wetland functions and values.			

⁵ KCC Table 17B.50.020G-1. Buffer radius is contingent on land use intensity and development.

Table 3. Stream Summary

STREAM INFORMATION SUMMARY – MANASTASH CREEK		
	Stream Name	Manastash Creek
	WRIA #	39
	Local Jurisdiction	Kittitas County
	DNR Water Type	F
	Stream Type (county)	S
	Stream Buffer radius	100 ft
	Documented Fish Use	Steelhead, rainbow trout
Connectivity	The creek is a right-bank tributary to the Yakima River, approximately seven miles downstream.	
Critical Habitat	Mid-Columbia River DPS steelhead	
Riparian/Buffer Condition	The creek reach occurs within a relatively large and intact riparian corridor that supports off-channel fish habitat, beavers, and a Category I riverine, forested wetland.	

5.3. Species and Habitats of Interest in the Vicinity

Lists of sensitive species and habitats protected under the Endangered Species Act (ESA) are maintained by the United States Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA). Washington State-listed species are managed by the Washington Department of Fish and Wildlife (WDFW). These lists were queried for the study area vicinity,⁶ the results for which are summarized in Tables 4 and 5.

Table 4. ESA-listed species and critical habitats mapped in the vicinity

Common Name	Scientific Name	Federal Status ^a	State Status ^b
Canada lynx	<i>Lynx canadensis</i>	Threatened	Endangered
Gray wolf	<i>Canis lupus</i>	Delisted ⁷	Endangered
yellow-billed cuckoo	<i>Coccyzus americanus</i>	Threatened	Endangered
bull trout	<i>Salvelinus confluentus</i>	Threatened	Candidate
MCR DPS ^c steelhead	<i>Oncorhynchus mykiss</i>	Threatened	Candidate
MCR DPS steelhead DCH ^d	-----	Designated	-----

^a USFWS (2021b) and NOAA (2021b), ^b WDFW (2019), ^c Distinct Population Segment, ^d Designated Critical Habitat

⁶ Query results are for general reference only within the query zone, and do not conclusively determine that a particular species or habitat is present.

⁷ The USFWS delisted the gray wolf in the lower 48 states on 11/3/2020 (85 FR 69778 69895).

Table 5. WDFW priority habitats and species listed near the study area.

Fish	Mammal	Birds	Reptile	Habitats
rainbow trout	mule deer, elk	none	none	shrub steppe

^a WDFW (2021)

6. Limitations

The data presented herein reflect site conditions encountered on July 3, 2021. Work was performed in accordance with accepted standards for professional wetland biologists and applicable and current federal, state, and local ordinances.

Although the report is accurate and complete to the best of available scientific knowledge, it should be considered a preliminary determination, with no warranty, express or implied, until it has been reviewed, and approved in writing, by appropriate jurisdictional authorities.

7. Consultant Qualifications

Geoffrey Gray is a professional biologist and wetland scientist whose 24-year career has provided him with a unique breadth of experience that can readily assist you in moving your project forward.

Investing eight years in higher education, he earned a Bachelor’s Degree in Business Management and a Master’s degree in Biology from California State University at Fresno.

Geoffrey has earned 12.4 credit hours of certified professional wetland training, including completion of the 38-hour *Army Corps of Engineers (Corps) Wetland Delineation and Management Training Program*, as well as *Corps Advanced Wetland Delineation*, *Corps Delineation Manual Regional Supplements*, *Washington State Department of Ecology (Ecology) 2014 Wetland Rating System*, *Ecology Credit-Debit Method for Estimating Mitigation Needs*, *Ecology Selecting Wetland Mitigation Sites Using a Watershed Approach*, and multiple courses in wetland plant identification.

Continuously employed as a wetland, fish, and wildlife biologist since 1997, while serving tenures in field research, a large environmental consulting firm, state agencies in both California and Washington, and as an independent environmental consultant, Geoff’s resume includes over 16 years of full-time duty as a wetland biologist, with experience ranging from the unique vernal pool wetland habitats of California’s Central Valley to the diverse wetlands of Eastern Washington State, stretching from the Cascade crest to Idaho. Spanning his career, Geoff has performed 85 wetland delineations and has managed 40 wetland mitigation/riparian restoration sites. As a fish and wildlife biologist, he has evaluated 625 projects for compliance under the Endangered Species Act, including over 125 federal consultations.

Geoff founded GG Environmental in 2015, and has since served a diverse palette of clients including habitat restoration groups, private landowners, commercial businesses, and local governments who

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need assistance in overcoming the challenges of Critical Areas/Shorelines permitting and Endangered Species Act consultation.

A professional-level GPS/GIS user for over 20 years, Geoff employs cutting-edge GPS technology in the field and is proficient in GIS mapping with ArcGIS and QGIS.

Certified as a Professional Wetland Scientist by the Society of Wetland Scientists, Geoff's work is performed to the highest standards and is fully insured (StarStone #R80561190AEM).

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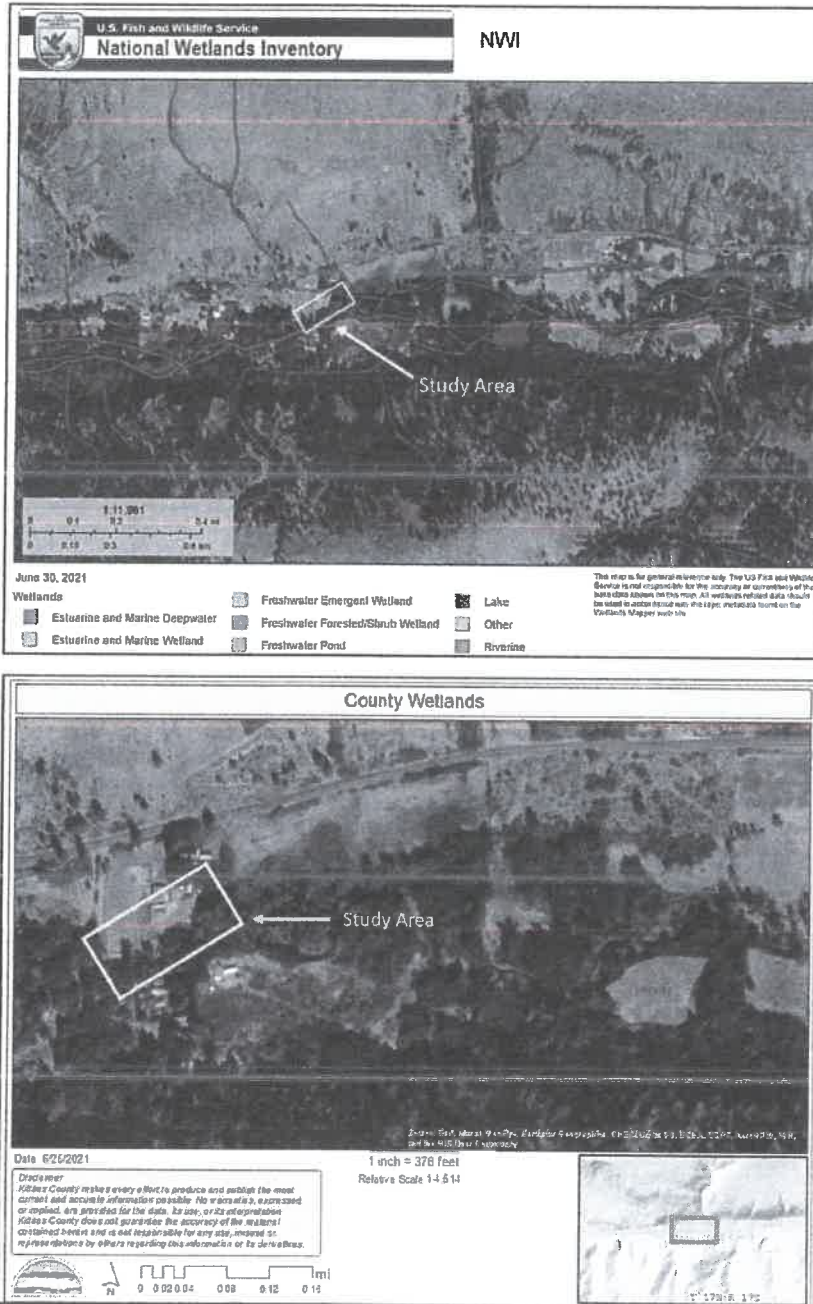
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https://www.arcgis.com/home/webmap/viewer.html?url=https://services.arcgis.com/QVENGdaPbd4LUkLV/ArcGIS/rest/services/USFWS_Critical_Habitat/FeatureServer/0&source=sd
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<http://apps.wdfw.wa.gov/phsontheweb>
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<https://apps.wdfw.wa.gov/salmonscape/map.html>
- [WDFW] 2021c. Personal communication with Jennifer Nelson, WDFW Fisheries Biologist, regarding fish species documented in Manastash Creek. E-mail date: July 8, 2021.

Appendix A. Background Information

Appendix A includes the following sub-appendices:

- A-1 USFWS NWI and Kittitas County wetlands maps
- A-2 NRCS soil survey map
- A-3 Kittitas County floodplain and shorelines map
- A-4 1954 historic aerial image and county (DNR) stream type

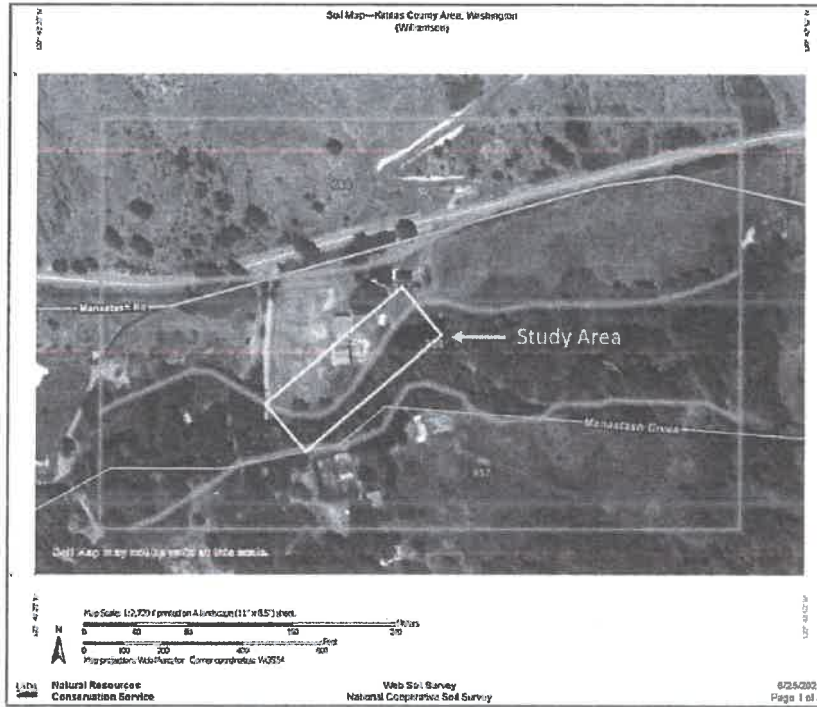
Appendix A-1. USFWS NWI and Kittitas County Wetlands



Parcel 315133
 Kittitas County, Washington
 Wetland and Stream Report
 GG Environmental (Geoffrey Gray MA, PWS #3162)

July 8, 2021

Appendix A-2. NRCS Soil Survey Map

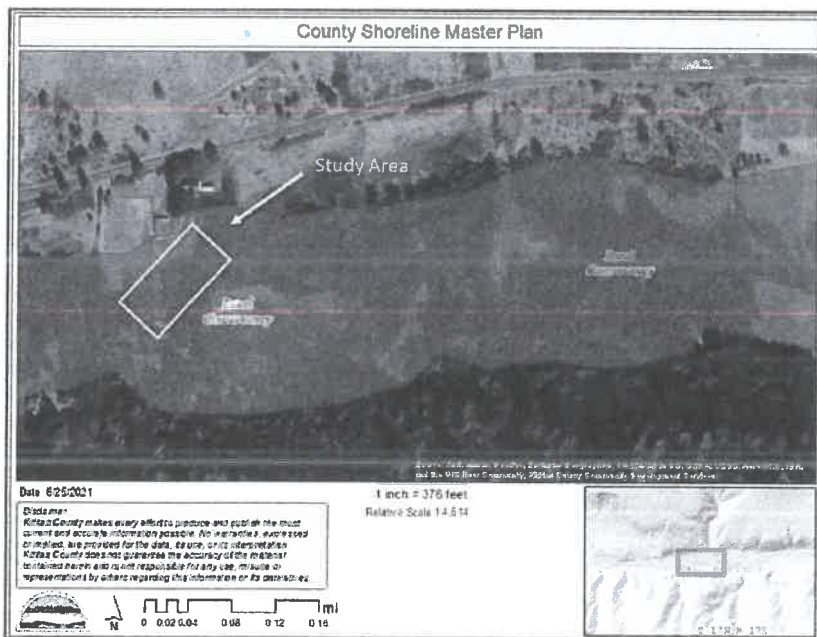
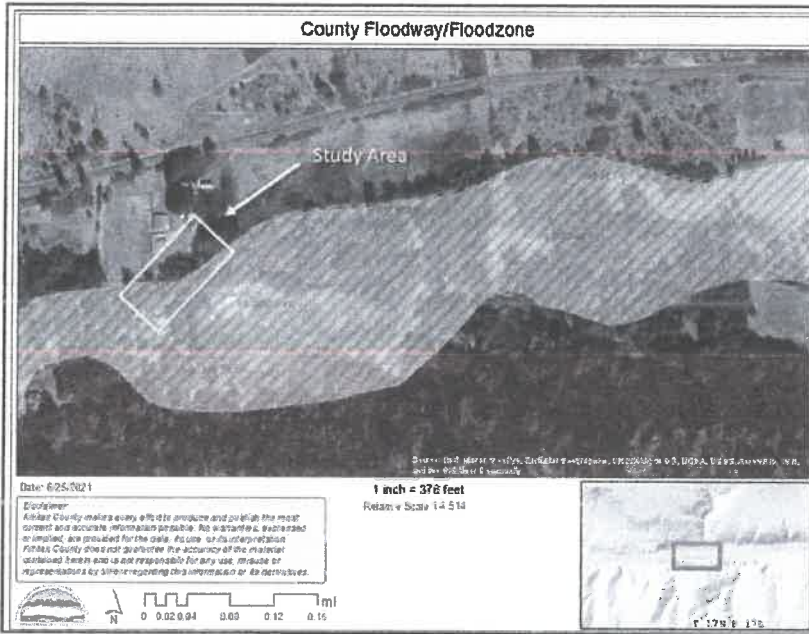


Soil Map—Kittitas County Area, Washington Wilkinson

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
208	Patish-Mippos-Myzel complex, 0 to 3 percent slopes	0.0	23.0%
668	Lauffer-Thiessen-Rubble land complex, 30 to 75 percent slopes	10.6	27.0%
657	Kayak-Weinman complex, rarely flooded, 0 to 2 percent slopes	18.6	50.0%
Totals for Area of Interest		39.1	100.0%

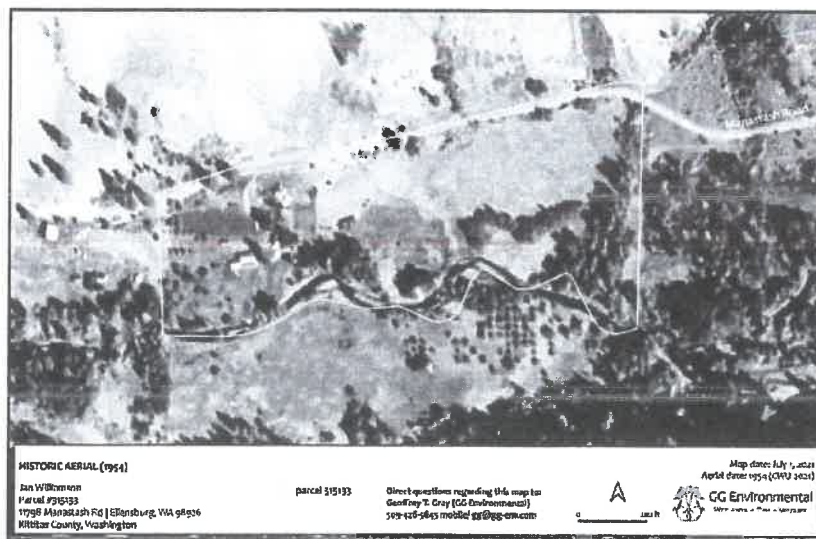
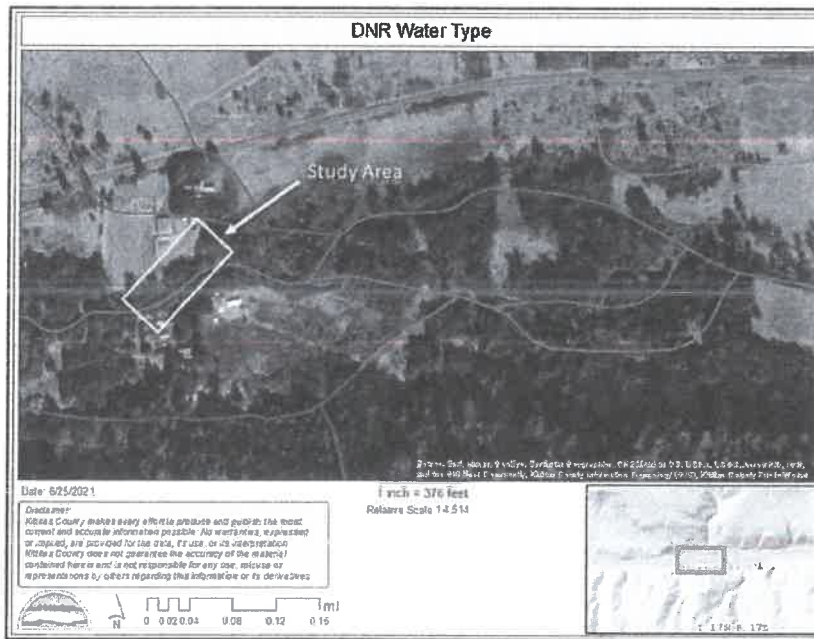
Appendix A-3. Floodplain, Floodway, and Shorelines



Parcel 315133
 Kittitas County, Washington
 Wetland and Stream Report
 GG Environmental (Geoffrey Gray MA, PWS #3162)

July 8, 2021

Appendix A-4. DNR Water Type and 1954 Aerial



Parcel 315133
Kittitas County, Washington
Wetland and Stream Report
GG Environmental (Geoffrey Gray MA, PWS #3162)

July 8, 2021

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Appendix B. Precipitation Analysis

Precipitation analysis per NRCS (2015). All data were obtained from the AgACIS weather station⁸ at Ellensburg.

Drier than normal climatic conditions prevailed the previous three months prior to July 3, 2021 fieldwork, and no precipitation fell within the preceding 10 days.

	Long-term rainfall records ¹ (inches)			Total Rainfall Obs. ²	Condition dry, wet, normal ³	Condition Value	Month weight value ⁴	Product of previous two columns	
	3 yrs. in 10 less than	Average	3 yrs. in 10 more than						
1 st prior month	Jun	0.26	0.64	0.78	0.33	Normal	2	3	6
2 nd prior month	May	0.35	0.57	0.69	0.12	Dry	1	2	2
3 rd prior month	Apr	0.35	0.59	0.71	0.11	Dry	1	1	1
Sum									9⁵

¹ WETS table (NRCS 2021d); ² Accumulated Daily Precipitation (NRCS 2021d); ³ WETS table "30% more than and 30% less than values are referenced to compare recorded rainfall to statistically-normal precipitation; ⁴ Value: Dry = 1; Normal = 2; Wet = 3; ⁵ 6-9: drier than normal, 10-14: normal, 15-18: wetter than normal.

Date (2021)	Precipitation Total (Inches)
July 3 (fieldwork)	0
June 23-July 2	0

⁸ (NRCS 2021b). AgACIS station: Ellensburg, Kittitas County (FIPS 53037).

Appendix C. Wetland Delineation Data Forms



WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kittitas County Parcel #315133 City/County: Kittitas County Sampling Date: 7/3/2021
 Applicant/Owner: Jan Williamson State: WA Sampling Point: 1
 Investigator(s): Geoffrey Gray, PWS #3162 Section, Township, Range: T17N-R17E-S16
 Landform (hillslope, terrace, etc.): channel (active) Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): A Lat: 46°57'59.12"N Long: 120°43'8.83"W Datum: WGS84
 Soil Map Unit Name: Patnish-Mippon-Myzel complex, 0 to 3 percent slopes NWI Classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soil Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is the Sampled Area within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Remarks: Drier than normal climatic conditions prevailed the prior three months.	

VEGETATION – Use scientific names of plants.

Stratum	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status																																	
Tree Stratum (Plot size: <u>20ft x 20ft</u>)																																					
1. <u>Populus balsamifera</u>	<u>5</u>	<u>Y</u>	<u>100.0</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																																
2. _____	_____	_____	_____	_____																																	
3. _____	_____	_____	_____	_____																																	
4. _____	_____	_____	_____	_____																																	
<u>5</u> = Total Cover																																					
Sapling/Shrub Stratum (Plot size: <u>15ft x 15ft</u>)																																					
1. <u>Cornus alba</u>	<u>5</u>	<u>Y</u>	<u>100.0</u>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td align="center" colspan="2">Total % Cover of:</td> <td align="center" colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td align="center"><u>51</u></td> <td align="center">x 1 =</td> <td align="center"><u>51</u></td> </tr> <tr> <td>FACW species</td> <td align="center"><u>53</u></td> <td align="center">x 2 =</td> <td align="center"><u>106</u></td> </tr> <tr> <td>FAC species</td> <td align="center"><u>6</u></td> <td align="center">x 3 =</td> <td align="center"><u>18</u></td> </tr> <tr> <td>FACU species</td> <td align="center"><u>0</u></td> <td align="center">x 4 =</td> <td align="center"><u>0</u></td> </tr> <tr> <td>UPL species</td> <td align="center"><u>0</u></td> <td align="center">x 5 =</td> <td align="center"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td align="center"><u>110</u></td> <td align="center">(A)</td> <td align="center"><u>175</u></td> </tr> <tr> <td align="center" colspan="4">Prevalence Index = B/A = <u>1.591</u></td> </tr> </table>	Total % Cover of:		Multiply by:		OBL species	<u>51</u>	x 1 =	<u>51</u>	FACW species	<u>53</u>	x 2 =	<u>106</u>	FAC species	<u>6</u>	x 3 =	<u>18</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>110</u>	(A)	<u>175</u>	Prevalence Index = B/A = <u>1.591</u>			
Total % Cover of:		Multiply by:																																			
OBL species	<u>51</u>	x 1 =	<u>51</u>																																		
FACW species	<u>53</u>	x 2 =	<u>106</u>																																		
FAC species	<u>6</u>	x 3 =	<u>18</u>																																		
FACU species	<u>0</u>	x 4 =	<u>0</u>																																		
UPL species	<u>0</u>	x 5 =	<u>0</u>																																		
Column Totals:	<u>110</u>	(A)	<u>175</u>																																		
Prevalence Index = B/A = <u>1.591</u>																																					
2. _____	_____	_____	_____	_____																																	
3. _____	_____	_____	_____	_____																																	
4. _____	_____	_____	_____	_____																																	
<u>5</u> = Total Cover																																					
Herb Stratum (Plot size: <u>5ft x 5ft</u>)																																					
1. <u>Scirpus microcarpus</u>	<u>50</u>	<u>Y</u>	<u>50.0</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0* <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																
2. <u>Phalaris arundinacea</u>	<u>48</u>	<u>Y</u>	<u>48.0</u>	<u>FACW</u>																																	
3. <u>Mimulus guttatus</u>	<u>1</u>	<u>N</u>	<u>1.0</u>	<u>OBL</u>																																	
4. <u>Rumex crispus</u>	<u>1</u>	<u>N</u>	<u>1.0</u>	<u>FAC</u>																																	
5. _____	_____	_____	_____	_____																																	
6. _____	_____	_____	_____	_____																																	
7. _____	_____	_____	_____	_____																																	
8. _____	_____	_____	_____	_____																																	
9. _____	_____	_____	_____	_____																																	
10. _____	_____	_____	_____	_____																																	
<u>100</u> = Total Cover																																					
Woody Vine Stratum (Plot size: <u>15ft x 15ft</u>)																																					
1. <u>none</u>	_____	_____	_____	<u>#N/A</u>																																	
2. _____	_____	_____	_____	_____																																	
_____ = Total Cover																																					
% Bare Ground in Herb Stratum <u>0</u>																																					
Remarks:																																					

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR	3/2	100	none			Loamy Sand	
12-16	10YR	3/2	100	none			small cobble	10% matrix is loamy sand

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

2 cm Muck (A10)
 Red Parent Material (TF2)
 Very Shallow Dark Surface (TF12)
 Other (Explain in Remarks)

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

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Substrate is porous and hyporheic flow rapid, inhibiting the formation of redoximorphic soil features. Given the presence of perennial hydrology and dominance by hydrophytic plant species (FACW, OBL), the hydric soil indicator is inferred to be present.

HYDROLOGY

Wetland Hydrology Indicators:

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

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators (2 or more required)

<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

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

Remarks:
 Creek flow volumes, and management of flow by beavers and landowner likely causes hydrology in this location to fluctuate.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kittitas County Parcel #315133 City/County: Kittitas County Sampling Date: 7/3/2021
 Applicant/Owner: Jan Williamson State: WA Sampling Point: 2
 Investigator(s): Geoffrey Gray, PWS #3162 Section, Township, Range: T17N-R17E-S16
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 20
 Subregion (LRR): A Lat: 46°57'59.23"N Long: 120°43'9.18"W Datum: WGS84
 Soil Map Unit Name: Patnish-Mippon-Myzel complex, 0 to 3 percent slopes NWI Classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <input type="radio"/> Yes <input checked="" type="radio"/> No Hydric Soil Present? <input type="radio"/> Yes <input checked="" type="radio"/> No Wetland Hydrology Present? <input type="radio"/> Yes <input checked="" type="radio"/> No	Is the Sampled Area within a Wetland? <input type="radio"/> Yes <input checked="" type="radio"/> No
Remarks: Drier than normal climatic conditions prevailed the prior three months. Pit dug just abot the toe of a fill slope, comprised of miscellaneous rock and soil, and subject to weed management.	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status																	
Tree Stratum (Plot size: <u>20ft x 20ft</u>)																					
1. <u>none</u>				<u>#N/A</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)																
2. _____																					
3. _____																					
4. _____																					
_____ = Total Cover																					
Sapling/Shrub Stratum (Plot size: <u>15ft x 15ft</u>)																					
1. <u>none</u>				<u>#N/A</u>	Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Total % Cover of:</td> <td style="text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td style="text-align: center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td style="text-align: center;">x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td style="text-align: center;">x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>45</u></td> <td style="text-align: center;">x 4 = <u>180</u></td> </tr> <tr> <td>UPL species <u>25</u></td> <td style="text-align: center;">x 5 = <u>125</u></td> </tr> <tr> <td>Column Totals: <u>70</u> (A)</td> <td style="text-align: center;"><u>305</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>4.357</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>45</u>	x 4 = <u>180</u>	UPL species <u>25</u>	x 5 = <u>125</u>	Column Totals: <u>70</u> (A)	<u>305</u> (B)	Prevalence Index = B/A = <u>4.357</u>	
Total % Cover of:	Multiply by:																				
OBL species <u>0</u>	x 1 = <u>0</u>																				
FACW species <u>0</u>	x 2 = <u>0</u>																				
FAC species <u>0</u>	x 3 = <u>0</u>																				
FACU species <u>45</u>	x 4 = <u>180</u>																				
UPL species <u>25</u>	x 5 = <u>125</u>																				
Column Totals: <u>70</u> (A)	<u>305</u> (B)																				
Prevalence Index = B/A = <u>4.357</u>																					
2. _____																					
3. _____																					
4. _____																					
5. _____																					
_____ = Total Cover																					
Herb Stratum (Plot size: <u>5ft x 5ft</u>)																					
1. <u>Chenopodium album</u>	<u>30</u>	<u>Y</u>	<u>42.9</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0* <input type="checkbox"/> 4 - Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants* <input type="checkbox"/> Problematic Hydrophytic Vegetation* (Explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Sisymbrium altissimum</u>	<u>15</u>	<u>Y</u>	<u>21.4</u>	<u>FACU</u>																	
3. <u>Bromus tectorum</u>	<u>25</u>	<u>Y</u>	<u>35.7</u>	<u>UPL</u>																	
4. _____																					
5. _____																					
6. _____																					
7. _____																					
8. _____																					
9. _____																					
10. _____																					
11. _____																					
_____ = Total Cover																					
Woody Vine Stratum (Plot size: <u>15ft x 15ft</u>)																					
1. <u>none</u>				<u>#N/A</u>																	
2. _____																					
_____ = Total Cover																					
% Bare Ground in Herb Stratum <u>30</u>																					
Remarks:																					

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12			none				rock, soil	see remark

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Substrate is comprised of miscellaneous fill, including angular rock and soil. Soil was very dry and given the substrate mixture, a meaningful Munsell color was not possible.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

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

Wetland Hydrology Present? Yes No

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

Remarks:
 Given the elevation of this location, it is not evident that soil saturates within 12 inches of the surface at any time.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Kittitas County Parcel #315133 City/County: Kittitas County Sampling Date: 7/3/2021
 Applicant/Owner: Jan Williamson State: WA Sampling Point: 3
 Investigator(s): Geoffrey Gray, PWS #3162 Section, Township, Range: T17N-R17E-S16
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 20
 Subregion (LRR): A Lat: 46°58'0.08"N Long: 120°43'8.21"W Datum: WGS84
 Soil Map Unit Name: Patrish-Mippon-Myzel complex, 0 to 3 percent slopes NWI Classification: upland
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soil Present? <input type="radio"/> Yes <input checked="" type="radio"/> No Wetland Hydrology Present? <input type="radio"/> Yes <input checked="" type="radio"/> No	Is the Sampled Area within a Wetland? <input type="radio"/> Yes <input checked="" type="radio"/> No
Remarks: Pit dug just above the toe of a fill slope near an excavated pond. Drier than normal climatic conditions prevailed the prior three months.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status																	
1. <u>none</u>				<u>#N/A</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. _____																					
3. _____																					
4. _____																					
_____ = Total Cover																					
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)					Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width:50%;">Total % Cover of:</th> <th style="width:50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>100</u></td> <td>x 2 = <u>200</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>200</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.000</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>100</u>	x 2 = <u>200</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>100</u> (A)	<u>200</u> (B)	Prevalence Index = B/A = <u>2.000</u>	
Total % Cover of:	Multiply by:																				
OBL species <u>0</u>	x 1 = <u>0</u>																				
FACW species <u>100</u>	x 2 = <u>200</u>																				
FAC species <u>0</u>	x 3 = <u>0</u>																				
FACU species <u>0</u>	x 4 = <u>0</u>																				
UPL species <u>0</u>	x 5 = <u>0</u>																				
Column Totals: <u>100</u> (A)	<u>200</u> (B)																				
Prevalence Index = B/A = <u>2.000</u>																					
1. <u>none</u>				<u>#N/A</u>																	
2. _____																					
3. _____																					
4. _____																					
5. _____																					
_____ = Total Cover																					
Herb Stratum (Plot size: 5ft x 5ft)					Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0' <input type="checkbox"/> 4 - Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants* <input type="checkbox"/> Problematic Hydrophytic Vegetation* (Explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
1. <u>Phalaris arundinacea</u>	<u>100</u>	<u>Y</u>	<u>100.0</u>	<u>FACW</u>																	
2. _____																					
3. _____																					
4. _____																					
5. _____																					
6. _____																					
7. _____																					
8. _____																					
9. _____																					
10. _____																					
11. _____																					
_____ = Total Cover																					
Woody Vine Stratum (Plot size: 15ft x 15ft)																					
1. <u>none</u>				<u>#N/A</u>																	
2. _____																					
_____ = Total Cover																					
% Bare Ground in Herb Stratum <u>0</u>																					
Remarks:																					

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR	2/1	100	none			Loamy Sand	heavy root mass
12+							rock	shovel denial

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Substrate is comprised of miscellaneous fill, including angular rock and soil. Soil was damp but not moist. Very heavy RCG root mass. RCG is often observed in upland areas adjacent to wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? <input type="radio"/> Yes <input checked="" type="radio"/> No	Depth (inches): _____	Wetland Hydrology Present? <input type="radio"/> Yes <input checked="" type="radio"/> No
Water Table Present? <input type="radio"/> Yes <input checked="" type="radio"/> No	Depth (inches): _____	
Saturation Present? <input type="radio"/> Yes <input checked="" type="radio"/> No (includes capillary fringe)	Depth (inches): _____	

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

Remarks:

Appendix D. Wetland Rating Form

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): W1 Date of site visit: 7/3/2021

Rated by Geoffrey Gray, PWS #3162 Trained by Ecology? Yes No Date of training 2014, 2018

HGM Class used for rating Riverine Wetland has multiple HGM classes? Yes No

NOTE: Form is not complete with out the figures requested (figures can be combined).

Source of base aerial photo/map: Google satellite

OVERALL WETLAND CATEGORY I (based on functions or special characteristics)

1. Category of wetland based on FUNCTIONS

- X Category I - Total score = 22 - 27
- _____ Category II - Total score = 19 - 21
- _____ Category III - Total score = 16 - 18
- _____ Category IV - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	H	H	H	
Landscape Potential	M	M	H	
Value	H	H	H	Total
Score Based on Ratings	8	8	9	25

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
Vernal Pools	
Alkali	
Wetland of High Conservation Value	
Bog and Calcareous Fens	
Old Growth or Mature Forest - slow growing	
Aspen Forest	
Old Growth or Mature Forest - fast growing	
Floodplain forest	II
None of the above	

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 (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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	1
Hydroperiods	H 1.2, H 1.3	1
Ponded depressions	R 1.1	1
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	R 2.4	1
Map of the contributing basin	R 2.2, R 2.3, R 5.2	2
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	1
Width of wetland vs. width of stream (<i>can be added to another figure</i>)	R 4.1	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	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	5

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 (<i>can be added to another figure</i>)	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 (<i>can be added to figure above</i>)	S 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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	

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 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.*

NOTES and FIELD OBSERVATIONS:

Excavated pond which has been partially captured by Manastash Creek. The pond now functions as a creek side channel, offering open water (<1/4 ac) and aquatic bed vegetation.

RIVERINE WETLANDS		Points (only 1 score per box)
Water Quality Functions - Indicators that the site functions to improve water quality		
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	3
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	
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	10
<input type="checkbox"/> Forest or shrub 1/3 - 2/3 area of the wetland	points = 5	
<input type="checkbox"/> 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	
Total for R 1	Add the points in the boxes above	13
Rating of Site Potential If score is: <input checked="" type="checkbox"/> 2 - 16 = H <input type="checkbox"/> 1 - 11 = M <input type="checkbox"/> 0 - 5 = L <i>Record the rating on the first page</i>		

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 to the wetland 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 the 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?		1
Sources <u>waterfowl, horse feces, septic system</u>	Yes = 1 No = 0	
Total for R 2	Add the points in the boxes above	2
Rating of Landscape Potential If score is: <input type="checkbox"/> 3 - 6 = H <input checked="" type="checkbox"/> 1 or 2 = M <input type="checkbox"/> = L <i>Record the rating on the first page</i>		

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	1
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 the unit is found).	Yes = 2 No = 0	2
Total for R 3	Add the points in the boxes above	3
Rating of Value If score is: <input checked="" type="checkbox"/> 2 - 4 = H <input type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L <i>Record the rating on the first page</i>		

RIVERINE WETLANDS		Points (only 1 score per box)
Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosion		
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:		
<i>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).</i>		
If the ratio is more than 2	points = 10	8
If the ratio is 1 - 2	points = 8	
If the ratio is 1/2 - < 1	points = 4	
If the ratio is 1/4 - < 1/2	points = 2	
If the ratio is < 1/4	points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: <i>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).</i>		
Forest or shrub for more than 2/3 the area of the wetland	points = 6	4
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	
Total for R 4	Add the points in the boxes above	12

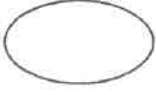
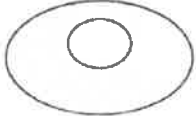

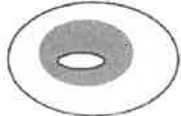

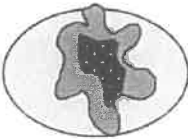
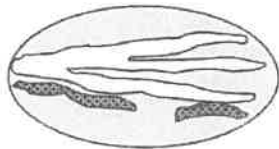
Rating of Site Potential If score is: 12 - 16 = H - 11 = M - 5 = L *Record the rating on the first page*

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 or 2 = M = 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?		
<i>Choose the description that best fits the site.</i>		
The sub-basin immediately down-gradient of the site has flooding problems that result in damage to human or natural resources	points = 2	2
Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
No flooding problems anywhere downstream	points = 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	2
Total for R 6	Add the points in the boxes above	4

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

These questions apply to wetlands of all HGM classes.		(only 1 score per box)
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat		
H 1.0. Does the wetland have the potential to provide habitat for many species?		
H 1.1. Structure of 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.		2
<input checked="" type="checkbox"/> Aquatic bed <input type="checkbox"/> Emergent plants 0 - 12 in (0-30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants > 12 - 40 in (> 30-100 cm) high are the highest layer with >30% cover <input checked="" type="checkbox"/> Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have > 30% cover)		
H 1.2. Is one of the vegetation types Aquatic Bed?		Yes = 1 No = 0
H 1.3. <u>Surface water</u>		
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.		3
<input checked="" type="checkbox"/> 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.		
		<input checked="" type="checkbox"/> Yes = 3 No = 0
H 1.4. <u>Richness of plant species</u>		
Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold. You do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)		2
# of species _____ Scoring: > 9 species: points = 2 4 - 9 species: points = 1 < 4 species: points = 0		
H 1.4. <u>Interspersion of habitats</u>		
Decide from the diagrams below whether interspersions 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		

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.		
<input checked="" type="checkbox"/> Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream.		
<input checked="" type="checkbox"/> Cattails or bulrushes are present within the wetland.		
<input checked="" type="checkbox"/> Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge.		4
<input checked="" type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded.		
<input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity		
<input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)		
Total for H 1		Add the points in the boxes above 15

Rating of Site Potential If Score is: 15 - 18 = H 9 - 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: 49 % undisturbed habitat + (4 % moderate & low intensity land uses / 2) = 51% > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0		3
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. Calculate: 94 % undisturbed habitat + (6 % moderate & low intensity land uses / 2) = 97% 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 1 km Polygon points = 0		3
H 2.3 Land use intensity in 1 km Polygon: > 50% of 1 km 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 only the highest score that applies to the wetland being rated. Site meets ANY of the following criteria: points = 2 <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see Appendix B) <input checked="" type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> 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		2
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		

Rating of Value If Score is: 2 = H 1 = M 0 = L Record the rating on the first page

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	Category
<i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i>	
<p>SC 1.0. Vernal Pools</p> <p>Is the wetland less than 4000 ft², and does it meet at least two of the following criteria?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. <input type="checkbox"/> Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. <i>If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool.</i> <input type="checkbox"/> The soil in the wetland is shallow [< 1 ft (30 cm) deep] and is underlain by an impermeable layer such as basalt or clay. <input type="checkbox"/> Surface water is present for less than 120 days during the wet season. <p style="text-align: right;"><input type="checkbox"/> Yes - Go to SC 1.1 <input checked="" type="checkbox"/> No = Not vernal pool</p> <p>SC 1.1. Is the vernal pool relatively undisturbed in February and March? <input type="checkbox"/> Yes - Go to SC 1.2 <input type="checkbox"/> No = Not a vernal pool with special characteristics</p>	
<p>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.)? <input type="checkbox"/> Yes = Category II <input type="checkbox"/> No = Category III</p>	
<p>SC 2.0. Alkali wetlands</p> <p>Does the wetland meet one of the following criteria?</p> <ul style="list-style-type: none"> <input type="checkbox"/> The wetland has a conductivity > 3.0 mS/cm. <input type="checkbox"/> 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). <input type="checkbox"/> 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. <p>OR does the wetland unit meet two of the following three sub-criteria?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Salt encrustations around more than 75% of the edge of the wetland <input type="checkbox"/> More than ¼ of the plant cover consists of species listed on Table 4 <input type="checkbox"/> 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. <p style="text-align: right;"><input type="checkbox"/> Yes = Category I <input checked="" type="checkbox"/> No = Not an alkali wetland</p>	
<p>SC 3.0. Wetlands of High Conservation Value (WHCV)</p> <p>SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? <input checked="" type="checkbox"/> Yes - Go to SC 3.2 <input type="checkbox"/> No - Go to SC 3.3</p> <p>SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <input type="checkbox"/> Yes = Category I <input checked="" type="checkbox"/> No = Not WHCV</p> <p>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 <input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 3.4 <input type="checkbox"/> No = Not WHCV</p> <p>SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV</p>	

<p>SC 4.0. Bogs and Calcareous Fens <i>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.</i></p> <p>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? <i>See Appendix C for a field key to identify organic soils.</i> <input type="checkbox"/> Yes - Go to SC 4.3 <input checked="" type="checkbox"/> No - Go to SC 4.2</p> <p>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? <input type="checkbox"/> Yes - Go to SC 4.3 <input checked="" type="checkbox"/> No = Is not a bog for rating</p> <p>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? <input type="checkbox"/> Yes = Category I bog <input type="checkbox"/> 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.</p> <p>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? <input type="checkbox"/> Yes = Category I bog <input type="checkbox"/> No - Go to SC 4.5</p> <p>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? <input type="checkbox"/> Yes = Is a Calcareous Fen for purpose of rating <input type="checkbox"/> No - Go to SC 4.6</p> <p>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: <input type="checkbox"/> Marl deposits [calcium carbonate (CaCO₃) precipitate] occur on the soil surface or plant stems within the wetland <input type="checkbox"/> The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland <input type="checkbox"/> Yes = Is a Category I calcareous fen <input type="checkbox"/> No = Is not a calcareous fen</p>		
<p>SC 5.0. Forested Wetlands <i>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)</i></p> <p><input checked="" type="checkbox"/> The wetland is within the 100 year floodplain of a river or stream <input type="checkbox"/> Aspen (<i>Populus tremuloides</i>) represents at least 20% of the total cover of woody species <input type="checkbox"/> 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) <input checked="" type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a forested wetland with special characteristics</p> <p>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)? <input type="checkbox"/> Yes = Category I <input checked="" type="checkbox"/> No - Go to SC 5.2</p> <p>SC 5.2. Does the wetland have areas where aspen (<i>Populus tremuloides</i>) represents at least 20% of the total cover of woody species? <input type="checkbox"/> Yes = Category I <input checked="" type="checkbox"/> No - Go to SC 5.3</p> <p>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)? <input checked="" type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 5.4</p> <p>SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? <input type="checkbox"/> Yes = Category II <input type="checkbox"/> No = Not a forested wetland with special characteristics</p>		
<p>Category of wetland based on Special Characteristics <i>Choose the highest rating if wetland falls into several categories</i> If you answered No for all types, enter "Not Applicable" on Summary Form</p>		<p>Cat. II</p>

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/>

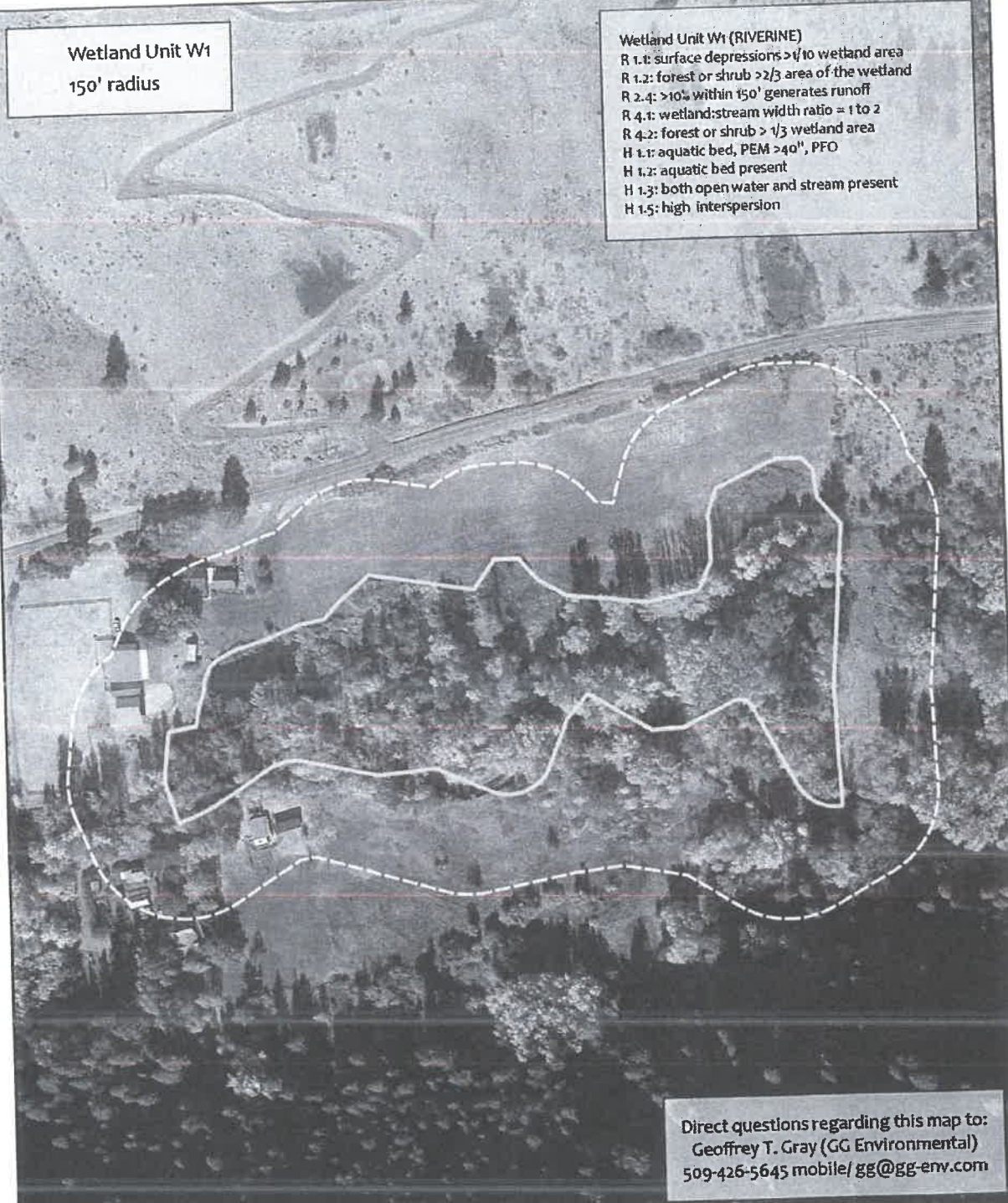
Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: **NOTE:** This question is independent of the land use between the wetland unit and the priority habitat.

- 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.
- 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 > 20 in (51 cm) in western 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.

Wetland Unit W1
150' radius

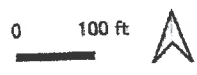
Wetland Unit W1 (RIVERINE)
R 1.1: surface depressions $> 1/10$ wetland area
R 1.2: forest or shrub $> 2/3$ area of the wetland
R 2.4: $> 10\%$ within 150' generates runoff
R 4.1: wetland:stream width ratio = 1 to 2
R 4.2: forest or shrub $> 1/3$ wetland area
H 1.1: aquatic bed, PEM $> 40''$, PFO
H 1.2: aquatic bed present
H 1.3: both open water and stream present
H 1.5: high interspersion



Direct questions regarding this map to:
Geoffrey T. Gray (GG Environmental)
509-426-5645 mobile/ gg@gg-env.com

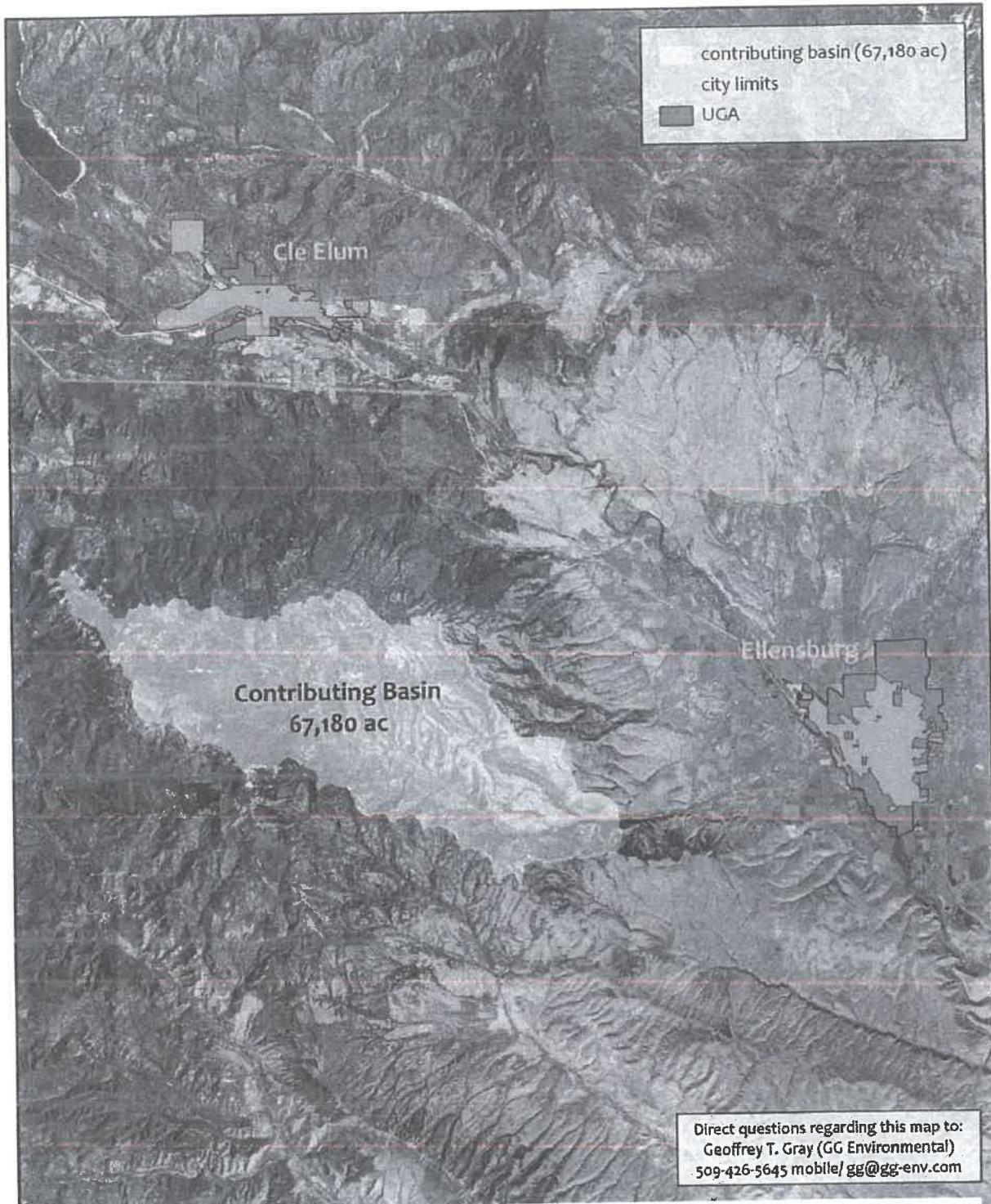
WETLAND RATING - FIGURE 1

Jan Williamson
Parcel #315133
11798 Manastash Rd | Ellensburg, WA 98926
Kittitas County, Washington



Map date: 7/4/2021
Image: Google satellite 2018











WETLAND RATING - FIGURE 2

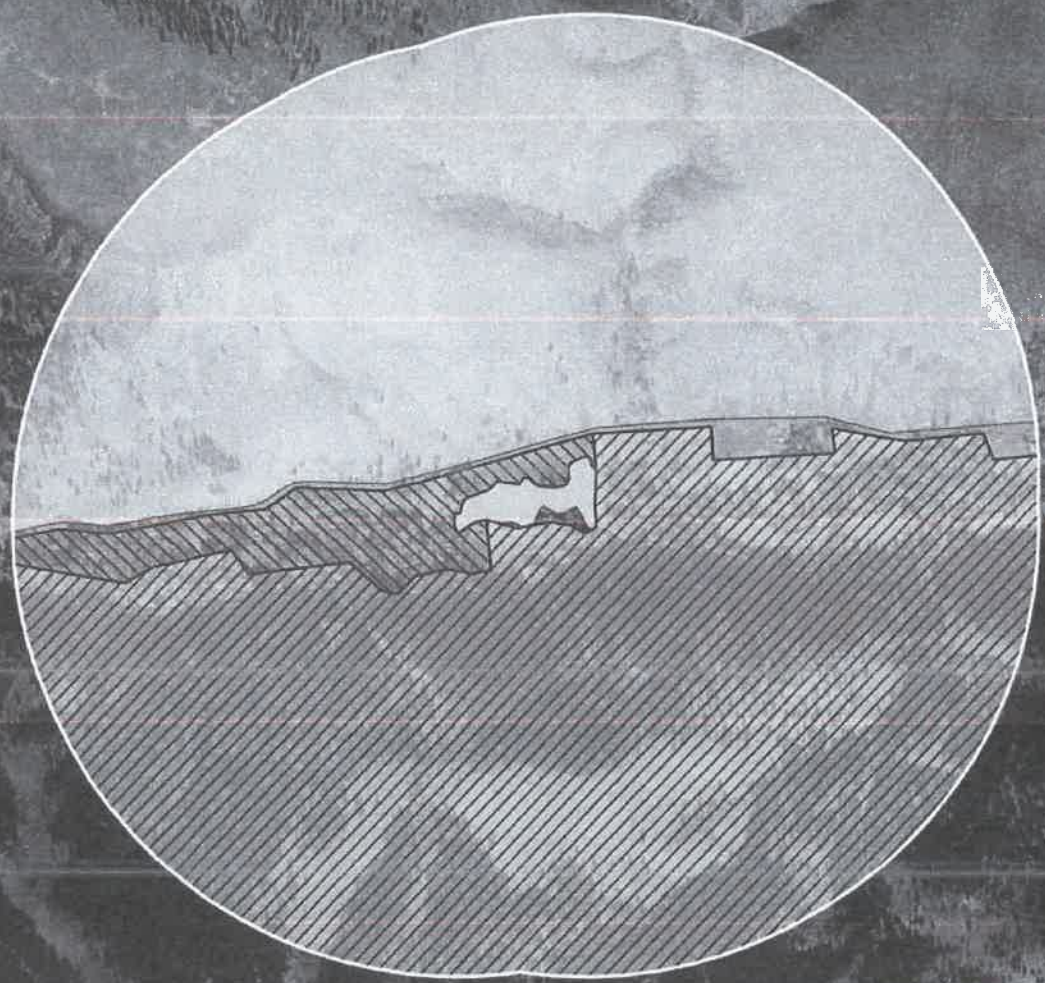
Jan Williamson
Parcel #315133
11798 Manastash Rd | Ellensburg, WA 98926
Kittitas County, Washington



Map date: 7/4/2021
Image: Google satellite 2018



-  1 km radius (1,000 ac) - 100%
-  moderately-disturbed habitat (57 ac) - 6%
-  undisturbed habitat (935 ac) - 94%
-  accessible habitat - undisturbed (493 ac) - 49%
-  accessible habitat - moderate disturbance (42 ac) - 4%
-  wetland unit W1



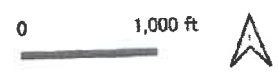
Direct questions regarding this map to:
 Geoffrey T. Gray (GG Environmental)
 509-426-5645 mobile/ gg@gg-env.com

WETLAND RATING - FIGURE 3

Jan Williamson
 Parcel #315133
 11798 Manastash Rd | Ellensburg, WA 98926
 Kittitas County, Washington



Map date: 7/4/2021
 Image: Google satellite 2018



Appendix E. Photos

Category I wetland. View to SE from dock.



Buffer condition west of the pond. View to NE.



Buffer condition west of the pond. View to NW.



Creek bank south of structures. View to W.



July 8, 2021

Eroding creek bank by bridge. View to NE.



Fenced livestock area near creek. View to E.



Open area south of structures. View to NE.



View of wetland from road. View to SE.



Appendix F. Large-format Delineation Map

