Jason Smith
Environmental Consulting
849 Woodpecker Dr
Kelso, WA 98626

Environmental Services
Planning & Permitting
Assessment & Analysis
Project Management

April 22, 2022

SUBJ: Locally Significant Wetlands analysis for 7928 SE 190th Drive, Pleasant Valley

SCOPE

Wetlands delineated by Castle-Rose Environmental (CRE; November 2021) and Schotts and Associates (S&A; April 2019) are analyzed for Locally Significant Wetland Criteria (LSW) in accordance with Oregon Administrative Rule (OAR) 141-086-0350.

OAR LSW criteria include exclusions, mandatory criteria and optional criteria. The conditions for potential exclusion from designation as a locally-significant wetland may apply to the CRE-delineated wetland on the basis of being less than one acre in size and unintentionally created due to construction of SE 190th Drive. However, concurrence for those conditions is still pending from the Oregon Department of State Lands (DSL). The S&A-delineated wetlands included in this scope are also under jurisdictional review.

Due to the ongoing jurisdictional review, all wetlands from both delineations are reviewed for locally-significant wetland criteria.

OAR-141-086-0350 provides three conditions for Local Significance evaluation:

1) Excluded
2) Mandatory
3) Optional

The Excluded category is not applied at this time. All wetlands required evaluation for LSW criteria using the Oregon Freshwater Wetland Assessment Methodology (OFWAM).

FINDINGS

The OFWAM method documentation is attached and includes analysis of the following functions and conditions:

Table 1: OFWAM Functions and Conditions Summary of Findings

Function	CRE Wetland Conditions	S&A Wetlands Conditions
Wildlife Habitat	Some habitat	Some habitat
Fish Habitat	Not present	Not present
Water Quality	Impacted/Degraded	Impacted/Degraded
Hydrologic Control	Not Present	Impacted/Degraded
Sensitivity to Impact	Potentially sensitive	Potentially sensitive
Enhancement Potential	Wetland has little enhancement potential	Wetland has little enhancement potential

Education	Not appropriate for education	Not appropriate for education
Recreation	No recreational opportunity	No recreational opportunity
Aesthetic Quality	Not pleasing	Not pleasing

The first set of mandatory LSW criteria are:

Table 2: Mandatory Criteria 141-086-0350(2)(a)			
Function	Condition Criteria	CRE Condition	S&A Condition
Wildlife Habitat	Diverse	Some	Some
Fish Habitat	Intact	Not Present	Not Present
Water Quality	Intact	Impacted/Degraded	Impacted/Degraded
Hydrologic Control	Intact	Not Present	Impacted/Degraded

The second set of mandatory criteria (OAR 141-086-0350(2)(b)) is triggered by proximity (1/4-mile) to a 303(d)-listed stream combined with an OFWAM Water Quality condition of Intact or Impacted/Degraded. The wetlands are within ¼-mile of Kelley Creek – but Kelley Creek is not listed on the 303(d) list for Oregon.

Optional Criteria

At the discretion of the City of Gresham, a wetland may be designated as locally significant if it meets any of the following criteria:

- Wetland must represent a locally unique native plant community or must represent the only occurrence of a particular native plant community within the UGB/UUC
    - **These conditions are not met**
- Wetland is publicly owned and determined to have educational uses under OFWAM
    - **These conditions are not met**.

Conclusion & Recommendation

The wetlands delineated by CRE and S&A on the subject property do not meet Mandatory or Conditional Locally-significant Wetland criteria.

Respectfully,

Jason Smith, MS
Analyst

ENCL: Figure 1A and 1B: Wetland Maps
Figure 2: 303(d) Map
OFWAM Documentation

ORWAP Report

Appendix A

Figures

GreshamGIS Map

August 23, 2021

- High Value Resource Area
- Resource Area
- Potential Resource Area

Study Area = 38 acres

7928 SE 190th Drive, Gresham OR 97080
Parcel #: R340789

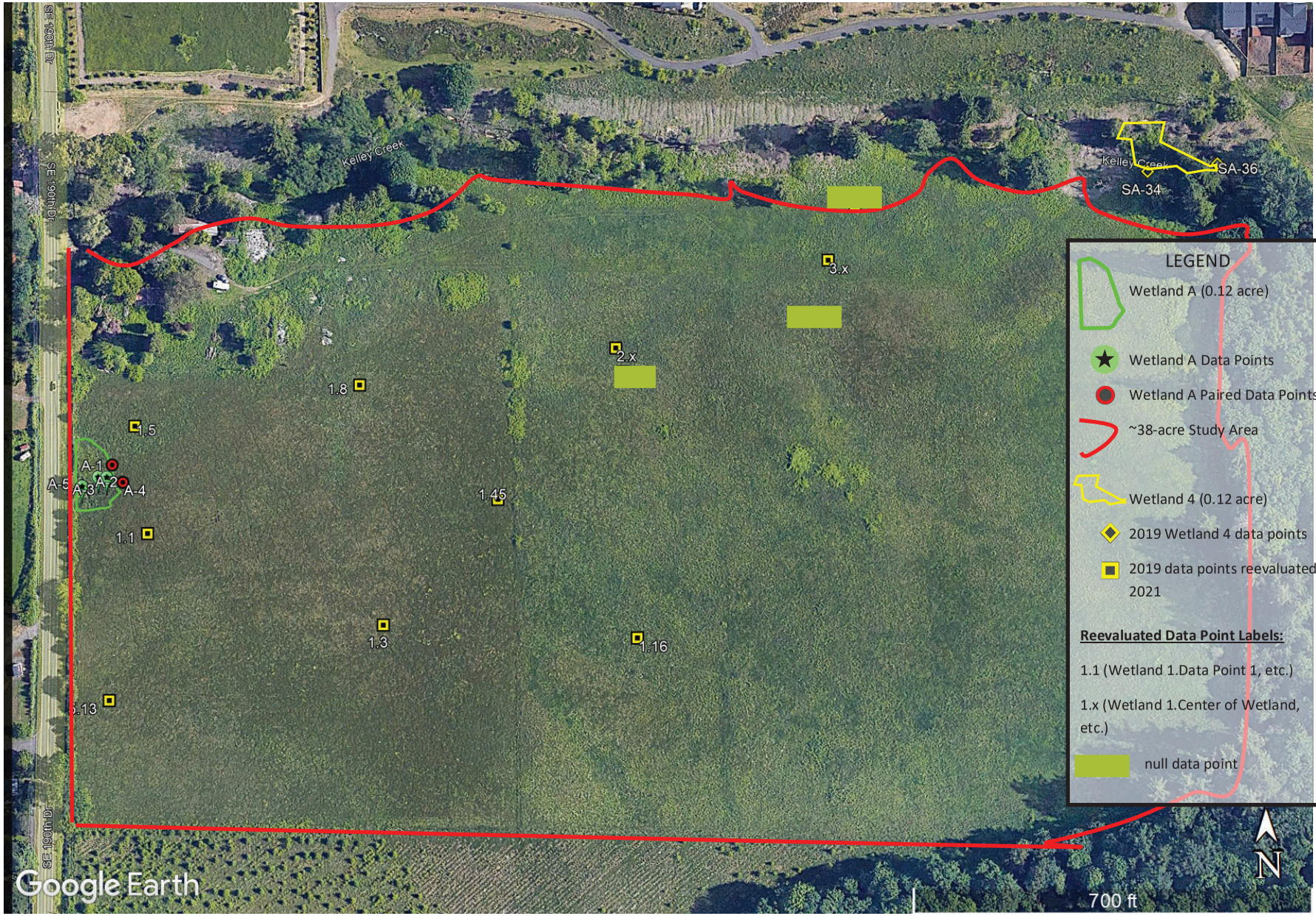
1:2,400

0 0.03 0.06 0.12 mi

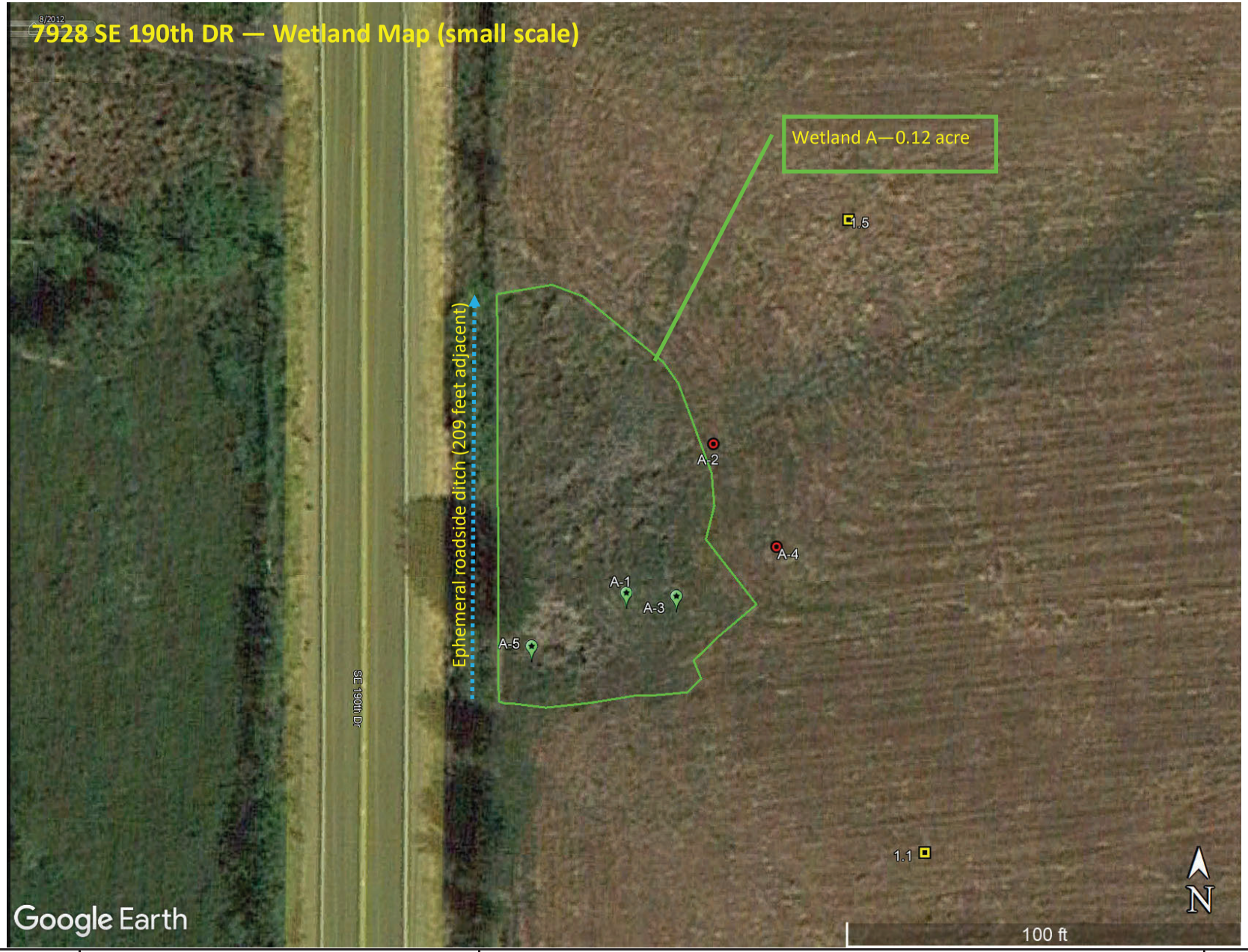
0 0.0475 0.095 0.19 km

Gresham GIS

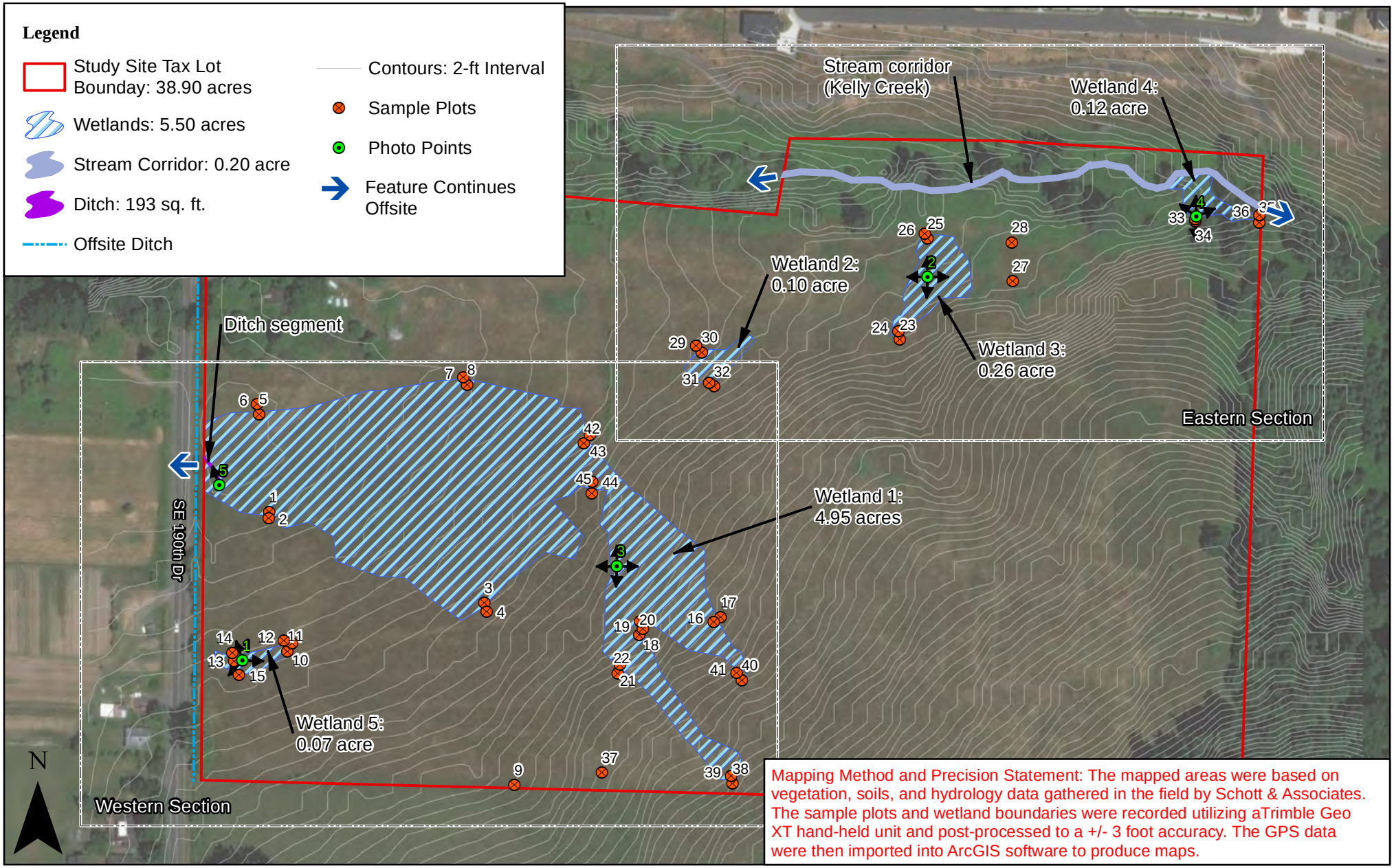
7928 SE 190th DR — Wetland Map (Large Scale)



	Project	NOTES	Date
CASTLE-ROSE ENVIRONMENTAL	Veranda Wetland Delineation 7928 SE 190th Dr Gresham, OR	*Image date is May 10, 2021. Mapping accuracy is GNSS submeter for Wetland A data points. Original accuracy for April 2019 report data points was +/- 3 feet. The April 2019 data points relocated using sub-centimeter local control survey methods. The Wetland A polygon relative accuracy is +/- 3 feet or better (boundary size and position relative to aerial imagery features).*	22NOV2021



	Project	NOTES	Date
	Veranda Wetland Delineation 7928 SE 190th Dr Gresham, OR	*Image date = August 15, 2012. Hydrology is wetter than normal. 2012 imagery used to demarcate Wetland A boundary due to high contrast between wetland and non-wetland hydrology indicators.*	23NOV2021



Date: 4/8/2019

Data Source: ESRI, 2019; Gresham View, 2019; USGS, NED, 2013

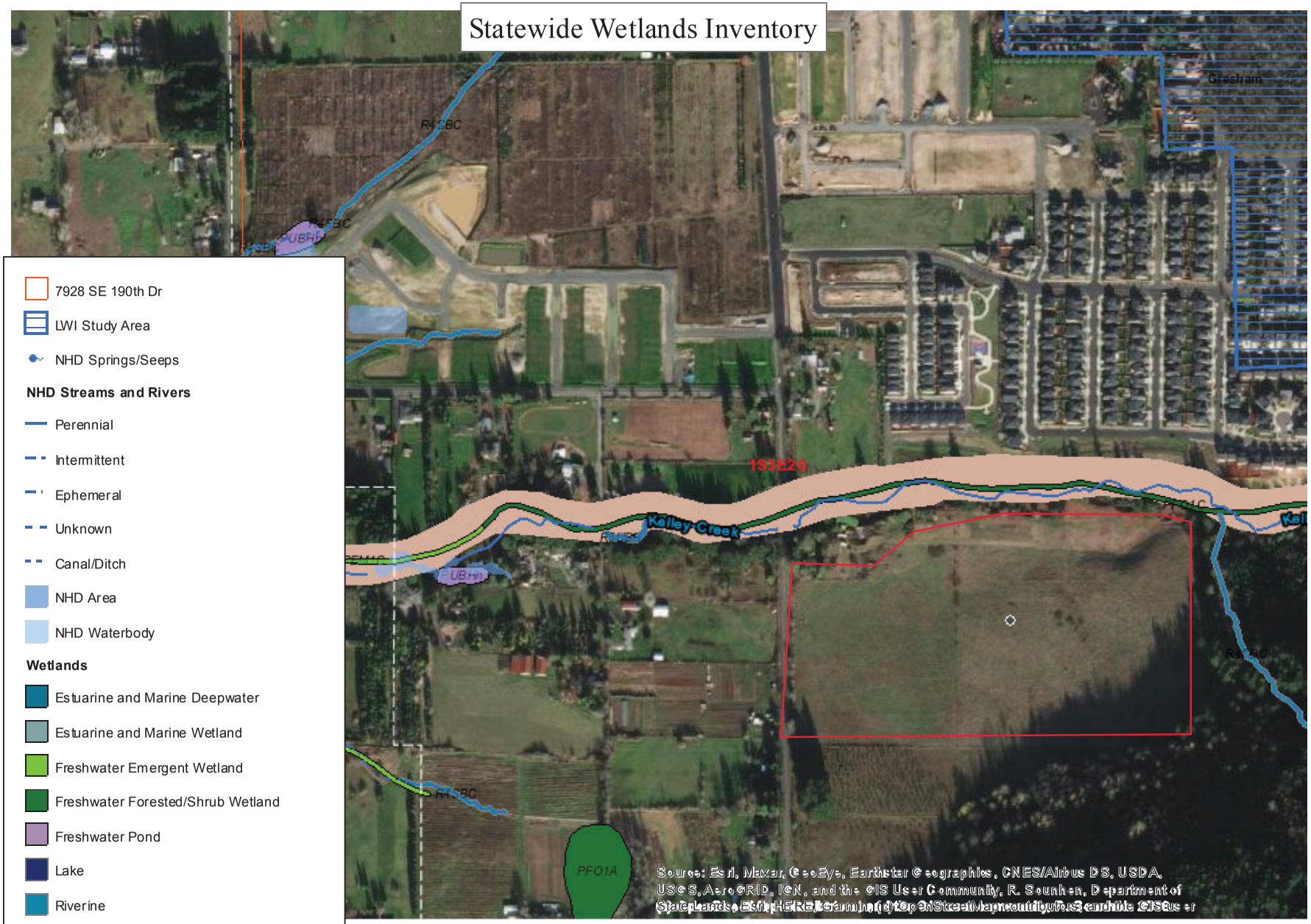
Figure 6a. Wetland Delineation Map - Overview

SCHOTT & ASSOCIATES, Inc.

Pleasant Valley Project Site: S&A #2558

0 150 300 600 Feet

Statewide Wetlands Inventory



- 7928 SE 190th Dr
- LWI Study Area
- NHD Springs/Seeps

NHD Streams and Rivers

- Perennial
- Intermittent
- Ephemeral
- Unknown
- Canal/Ditch
- NHD Area
- NHD Waterbody

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- NRCS Predominantly Hydric Soil Map Units
- NRCS Agate-Winlo Soils in Jackson County

1 inch = 0.14 miles

0 0.05 0.1 0.2 0.3 0.4 mi

The Statewide Wetlands Inventory (SWI) represents the best data available at the time this map was published and is updated as new data becomes available. In all cases, actual field conditions determine the presence, absence and boundaries of wetlands and waters (such as creeks and ponds). An onsite investigation by a wetland professional can verify actual field conditions.

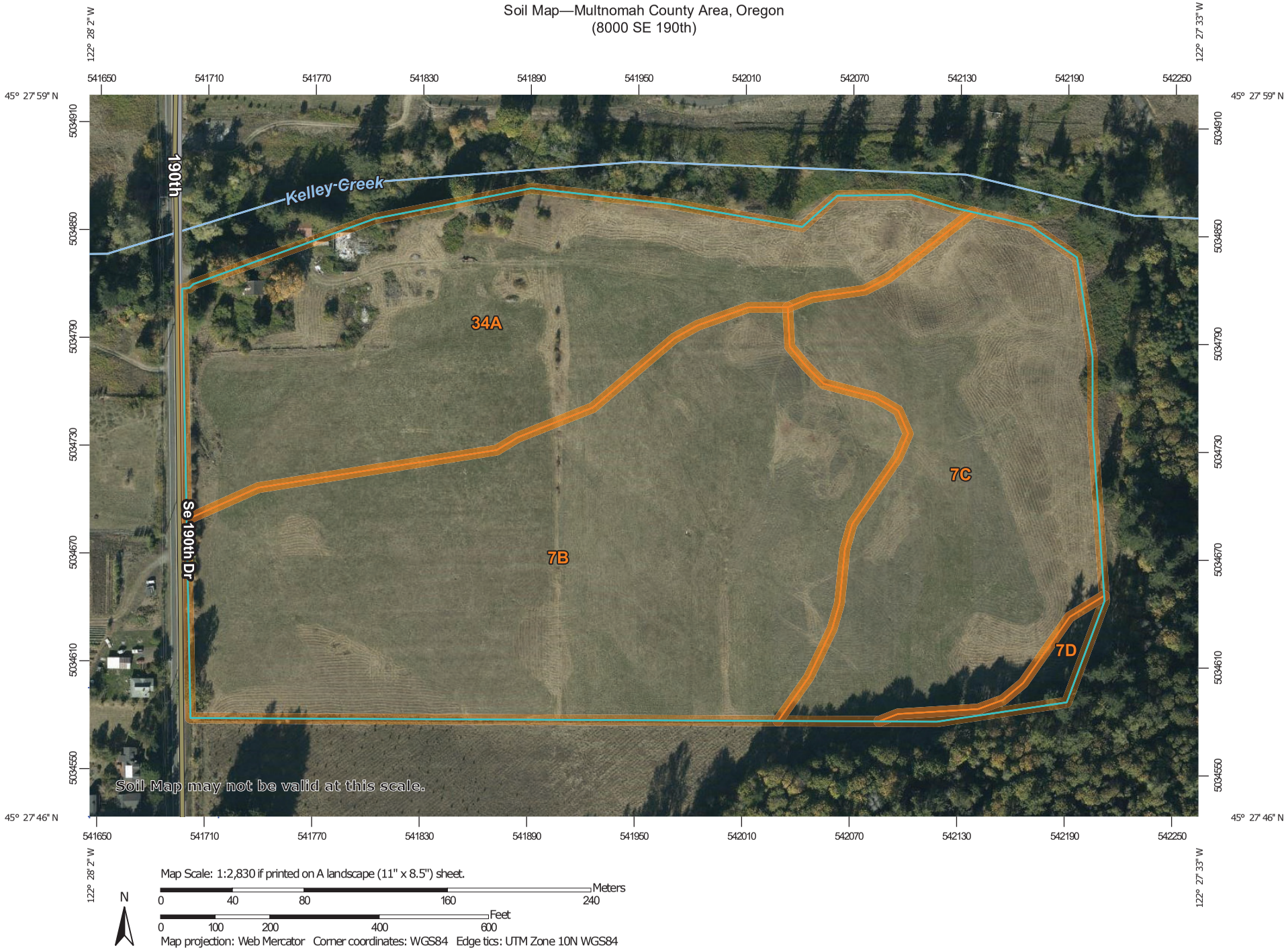
N

Date: 8/23/2021

State of Oregon
Department of State Lands
775 Summer Street, NE, Ste 100
Salem, OR. 97301-1279
(503) 986-5200

https://www.oregon.gov/dsl/WW/Pages/SWI.aspx

Soil Map—Multnomah County Area, Oregon
(8000 SE 190th)



Map Scale: 1:2,830 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 40 80 160 240

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Multnomah County Area, Oregon
Survey Area Data: Version 18, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 15, 2018—Oct 18, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7B	Cascade silt loam, 3 to 8 percent slopes	15.3	43.8%
7C	Cascade silt loam, 8 to 15 percent slopes	8.7	24.9%
7D	Cascade silt loam, 15 to 30 percent slopes	0.4	1.2%
34A	Powell silt loam, 0 to 3 percent slopes	10.5	30.1%
Totals for Area of Interest		**34.9**	**100.0%**

FIGURE 1: LOCATION MAP

Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Powell silt loam, 0 to 3 percent slopes
Soil Symbol	34A
Hydric Rating	No
Hydric Percent	3
Percent Area	27.6%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Cascade silt loam, 8 to 15 percent slopes
Soil Symbol	7C
Hydric Rating	No
Hydric Percent	0
Percent Area	24.1%
Erosion Hazard	Severe
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Wapato silt loam
Soil Symbol	55
Hydric Rating	Yes
Hydric Percent	93
Percent Area	10.5%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Cascade silt loam, 15 to 30 percent slopes
Soil Symbol	7D
Hydric Rating	No

Hydric Percent	0
Percent Area	2.7%
Erosion Hazard	Severe
Dom. Cond. Non-irrigated Capability Class	Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Soil Name	Powell silt loam, 3 to 8 percent slopes
Soil Symbol	34B
Hydric Rating	No
Hydric Percent	3
Percent Area	0.1%
Erosion Hazard	Moderate
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Watershed Information

HUC Best

HUC Code	HUC Name	Is HUC Best?	Greatest Criteria met	FW, s/f, lg (Acres)	FW, em, lg (Acres)	EST, em, lg (Acres)	EST, s/f, lg (Acres)
HUC8: 17090012	Lower Willamette	No	n/a	253.9	124.6	0	0
HUC10: 1709001201	Johnson Creek	No	n/a	18.7	8.5	0	0
HUC12: 170900120101	Upper Johnson Creek	No	n/a	18.7	4.8	0	0

[abbreviations: FW- freshwater (wetland); em- Emergent; lg- largest; s/f- Shrub/Forested; EST- Estuarine (wetland)

HUC 12 Functional Deficit

HUC Code	HUC Name	WS	SR	NT	WC	INV	AM	FH	WB
HUC12: 170900120101	Upper Johnson Creek								WB

[abbreviations: WS= Water Storage, SR= Sediment Retention, NT= Nutrient Retention (PR or NR), WC= Water Cooling (Thermoregulation), INV= Invertebrate Habitat, AM= Amphibian Habitat, FH= Fish Habitat (FA or FR), WB= Waterbird Habitat (WBF or WBN)]

Rare Species Scores

Rare Species Type	Maximum score	Sum Score	Rating
Non-anadromous Fish Species	0	0	None
Amphibian & Reptile Species	0.33	0.33	Intermediate
Feeding Waterbirds	0	0	None
Nesting Waterbirds	0	0	None
Songbirds, Raptors, and Mammals	0	0	None
Invertebrate Species	0	0	None
Plant Species	0	0	None

Scores have taken into account several factors for each rare species record contained in the official database of the Oregon Biodiversity Information Center (ORBIC): (a) the regional rarity of the species, (b) their proximity to the point of interest, and (c) the "certainty" that ORBIC assigns to each of those records.

Element of Occurrence (Rare Species)

View wildlife list for Upper Johnson Creek (170900120101)

Within Assessment Area	1 EO Records
Within 1 mile	1 EO Records
In HUC12 watershed	7 EO Records

Element of Occurrence Record(s) in HUC12

1 Coho salmon (Lower Columbia River ESU)
[1 occurences]
Oncorhynchus kisutch pop. 1
ORBIC State Status: S2
ORBIC Global Status: G5T2Q
ODFW Strategy Species: No

2 Painted turtle
[1 occurences]
Chrysemys picta
ORBIC State Status: S2
ORBIC Global Status: G5
ODFW Strategy Species: Yes

3 Steelhead (Lower Columbia River ESU, winter run)
[4 occurences]
Oncorhynchus mykiss pop. 27
ORBIC State Status: S2
ORBIC Global Status: G5T2Q
ODFW Strategy Species: Yes

4 Pacific lamprey
[1 occurences]
Entosphenus tridentatus
ORBIC State Status: S1S2
ORBIC Global Status: G4
ODFW Strategy Species: No

• *HUC Best: Oregon watersheds (HUC8, HUC10, HUC12) with greatest type diversity, proportional area, or density of wetlands according to available National Wetland Inventory maps.*

"Type diversity" is the number of unique NWI codes in the watershed (e.g., PEMA, PEMC, PEMCx) and excluded types that have no vegetation component (e.g., PUBH, R3US2).

"Density" is the number of vegetated NWI polygons divided by the acreage of the watershed; many of these polygons may be contiguous with each other, forming a single wetland.

"Proportional Area" is the proportion of the watershed's total area occupied by vegetated wetlands as mapped by NWI.

• *The digital maps used to determine this do not show many wetlands or cover the entire state. Data were compiled only from watersheds that have been at least 90% mapped by NWI (see worksheets for HUC8, 10, and 12). Data were received in November 2008 from ORBIC.*

• *METHODS: The above 3 metrics can be strongly correlated with watershed size and with each other. To minimize that bias, the rankings of the residuals from a regression analysis were used, rather than simply the top-ranking watersheds, to identify the most "important" watersheds for each metric at each scale. That is, the watersheds were identified that were in the top 5% in terms of variety of mapped wetland types for watersheds of that size, the largest area of mapped wetlands as a proportion of the watershed area for watersheds of that size, and/or the greatest number of mapped wetland polygons for watersheds with that much wetland area.*

• *Global rank. ORBIC participates in an international system for ranking rare, threatened and endangered species throughout the world. The system was developed by The Nature Conservancy and is now maintained by NatureServe in cooperation with Heritage Programs or Conservation Data Centers (CDCs) in all 50 states, in 4 Canadian provinces, and in 13 Latin American countries. The ranking is a 1-5 scale, primarily based on the number of known occurrences, but also including threats, sensitivity, area occupied, and other biological factors. In this book, the ranks occupy two lines. The top line is the Global Rank and begins with a "G". If the taxon has a trinomial (a subspecies, variety or recognized race), this is followed by a "T" rank indicator. A "Q" at the end of this line indicates the taxon has taxonomic questions. The second line is the State Rank and begins with the letter "S". The ranks are summarized as follows: 1 = Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences; 2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences; 3 = Rare, uncommon or threatened, but not immediately imperiled, typically with 21-100 occurrences; 4 = Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences; 5 = Demonstrably widespread, abundant, and secure; H = Historical Occurrence, formerly part of the native biota with the implied expectation that it may be rediscovered; X = Presumed extirpated or extinct; U = Unknown rank; ? = Not yet ranked, or assigned rank is uncertain.*

• *This report contains both centroid-based and polygon-based data. The Location Information and Watershed Information sections of the report contain centroid based data (determined by the center point of the polygon), while the remaining sections are polygon-based (determined from the entire polygon).*

• *The rare species results in this report are based on a subset of the ORBIC rare species dataset. The ORWAP tool only reports on rare species that meet the following criteria: wetland habitat species that are tracked by ORBIC, excluding historical or extirpated sites or those with low mapping accuracy. More information about specific sites and additional species can be obtained from ORBIC through data requests, see* https://inr.oregonstate.edu/orbic/data-requests *for details.*

Wetlands of Special Interest for Protection

The first filter in the Oregon Method is to see whether the wetland is in a management plan, is protected by regulatory rules or statutes, or is uncommon in Oregon. A "yes" answer to any of the following questions will place the wetland into this category and management decisions should be made to protect the site. You still may want to evaluate the functions and conditions of each wetland to give you an overall evaluation of the wetlands in your assessment area. You should note on the Function and Condition Summary Sheet (Chapter VI and Appendix C) the information from this section. You do not need to contact every agency listed, but all those listed have all or some of the information you need.

Question 1

Does the wetland contain threatened, endangered or sensitive species of wildlife, plants, invertebrates or fish? (Either federal- or state-listed. Include species.) If yes, list.

a. Yes
b. No
c. Unknown
List:

Information source

Oregon Natural Heritage Program, The Nature Conservancy, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture.

Question 2

Is the wetland designated as critical habitat or essential habitat for federal- or state-listed threatened or endangered species of wildlife, plants, invertebrates or fish? If yes, list species.

a. Yes
b. No
c. Unknown
List:

Information source

U.S. Fish and Wildlife Service, National Marine Fisheries Service, The Nature Conservancy.

	Wetland 1	*Wetland 2*	*Wetland 3*
Question 1	No		
Question 2	No		

		Wetland 1	*Wetland 2*	*Wetland 3*
Question 3 Is the wetland a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or a Nature Conservancy Preserve? ***Information source*** The Nature Conservancy, the Oregon Natural Heritage Program, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service and Corps of Engineers.	a. Yes b. No c. Unknown List which it is:	No		
Question 4 Is the wetland of regional or national significance for migratory birds? ***Information source*** U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife.	a. Yes b. No c. Unknown List which species:	No		
Question 5 Is the wetland protected in a local wetland conservation plan or a local comprehensive plan as a Goal 5 or Goal 17 resource? ***Information source*** Local planning office.	a. Yes b. No c. Unknown	No		
Question 6 Is the wetland a designated State Outstanding Resource Water? ***Information source*** Oregon Department of Environmental Quality. (As of 1996, DEQ has not made any such designations.)	a. Yes b. No c. Unknown	No		

Question 7

Is the wetland a protected area in a recognized federal, state or local management plan, e.g., for a park, refuge or scenic river?

a. Yes
b. No
c. Unknown
List name:

Information source

Oregon Department of Fish and Wildlife, State Parks, U.S. Fish and Wildlife Service, Bonneville Power Administration, Bureau of Land Management, National Park Service, METRO, local parks department.

Question 8

Is the wetland a *protected* mitigation site for a removal-fill permit, federal 404 fill permit, or enforcement action? Protected means there is a legal instrument, such as a conservation easement, that will preclude a wetland impact permit from being issued for this site.

a. Yes
b. No
c. Unknown

Information source

Oregon Division of State Lands, Corps of Engineers, Environmental Protection Agency.

Question 9

Is the wetland a restoration or protected area included in the wetland reserve program administered by the Natural Resources Conservation Service? The length of protection may vary depending on landowner agreements.

a. Yes
b. No
c. Unknown

Information source

Natural Resources Conservation Service, Consolidated Farm Services Agency.

	Wetland 1	Wetland 2	Wetland 3
Question 7	No		
Question 8	No		
Question 9	No		

Question 10

Is the wetland considered rare or unique in Oregon? Examples include bogs, vernal pools and old growth forested wetlands (See Appendix G).

a. Yes
b. No
c. Unknown

Information source

The Nature Conservancy, Oregon Division of State Lands, the Oregon Natural Heritage Program.

Wetland 1	Wetland 2	Wetland 3
No		

Wetland Characterization

The Wetland Characterization is designed for information collection in a systematic manner. The Characterization is divided into a landscape section, for which all the information can be gathered in the office with appropriate maps and references (and maybe a few phone calls), and a site-specific section, which requires field observation and measurement. (*Questions that must be answered in the field are marked with a check.*) You may want to record the observation, not just the letter answer, when given the choice, because you might find the descriptive information useful later. Also, take some blank sheets of paper into the field for making sketches of the wetland area that you can refer to later. Another alternative is to put an overlay on an aerial photo and sketch and note information on the overlay. If done thoroughly, this should prevent you from having to return to the field or having to seek additional information when completing the assessment.

Watershed Notes

The information gathered is used to answer function and condition assessment questions (copies of these questions appear directly following the Characterization). The Characterization should not lead you to any conclusions; this will be done as the assessment sheets are completed.

What you need to take with you into the field:

- Clipboard
- Pencils (various colors for sketching)
- Blank paper to sketch on
- Long tape measure (200 feet if you have one), or measure your pace before going into the field
- Aerial photos (you may want to attach a mylar overlay to draw on)
- Ruler
- Base maps (optional or make copies)
- Binoculars (optional)

Watershed setting

All questions pertaining to the watershed can be answered in the office from aerial photographs, U.S. Geological Service topographical maps, and other reference materials. (See Appendix A.) The answers to these questions are used to give decision makers a broader understanding of ecological functions and land uses in the watershed. The answers are summarized on the Watershed Summary Sheet at the end of the Assessment Questions section.

Drainage basin

The Oregon Water Resources Department has divided the state into 18 drainage basins. Check the map in Appendix H to see which drainage basin contains the study site.

1. What is the name of the drainage basin that contains your assessment area?

Physical characteristics of the watershed being assessed (within the drainage basin)

Topography

2. What is the watershed's area in square miles? The watershed area is often much smaller than the drainage basin (see Appendix E).
3. Calculate the average slope of the watershed (see Appendix F).

Hydrologic profile

4. Is the stream flow in the watershed modified by dams, channelization or levees? (Choose all that are appropriate.)
   a. Tributary streams to the main stem stream are modified.
   b. Main stem stream is modified.
   c. Stream flow is not modified (free-flowing.)
5. Is water being taken out of the stream(s) through active diking, drainage or irrigation districts in the watershed upstream of the assessment area?
   a. Yes.
   b. No.

Watershed Notes

Upper Johnson Creek

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area?
   a. Urban.
   b. Urbanizing (mix of urban, agriculture and forest uses).
   c. Agriculture (farming, ranching or grazing).
   d. Forested or natural area.

Water quality *(Use more specific water quality information, if available. Contact local DEQ office, or call the DEQ lab at (503) 229-5983 for sampling information.)*

7. Consult the most recent State of Oregon Department of Environmental Quality 305(b) Report to determine whether any streams in the study area are listed as a *water quality limited.* (You may want to ask DEQ whether there are any proposed changes.) This information is included in Clean Water Act section 303(d) reporting.
   a. Streams or portions of streams within the study area are listed as *water quality limited.*
   b. No streams or portions of streams within the study area are listed as *water quality limited.*

8. Consult the most recent *Oregon Statewide Assessment of Nonpoint Sources of Water Pollution* to determine the water quality condition of stream reaches in the watershed upstream from the assessment area. (If both "b" and "c" apply, choose "c.")
   a. All upstream reaches are listed as *no problem* (or no data available).
   b. One or more upstream reaches are listed in *moderate* water quality condition.
   c. One or more upstream reaches are listed in *severe* water quality condition.

Watershed Notes

Biological characteristics of the watershed

9. Fisheries: Select all that are appropriate and list type if known. (Contact local Oregon Department of Fish and Wildlife office for this information.)

Type

a. Cold water.
b. Warm water.
c. Anadromous.
d. Wild population.
e. Introduced or hatchery populations.
f. None.
g. Other (list).

10. Are known sensitive, threatened or endangered fish species present in the watershed? If so, list which species.

Species

a. Yes.
b. No.
c. Unknown.

11. Wildlife species: Select all that are appropriate and list species if known. (Contact local Oregon Department of Fish and Wildlife office for this information.)

Species

a. Migratory birds.
b. Big game.
c. Nesting birds.

12. Are known sensitive, threatened or endangered plant species or wildlife species other than fish present in the watershed? If so, list which species. (Contact local ODFW office or Natural Heritage Council for this information.)

Species

a. Yes.
b. No.
c. Unknown.

Watershed Notes

See attached ORWAP report for species info

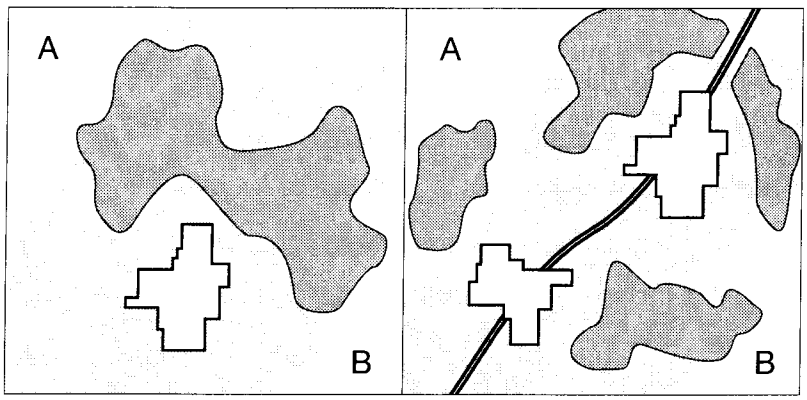


Figure 1. Watersheds as corridors for wildlife movement.
Areas A and B are the end points of a movement corridor through the watershed. Natural areas are shaded darkly, the irregular polygons represent highly developed areas, and the thick black line represents an impassable barrier such as an interstate highway. In the first part of the illustration, the contiguous natural area connects both ends of the corridor. The developed area is a barrier, but it does not obstruct species movement. The second half of the illustration shows fragmented natural areas with an impassable barrier. If the barrier stopped at the smaller developed area and did not continue off the lower left, species movement would still be possible.

13. Does the watershed provide a natural corridor for fish or wildlife movement? (Observe from aerial photographs.) **List whether for fish, wildlife or both.** Consider fences, dams and other barriers to travel. Aerial photographs of the watershed area are the best source of information. Fragmented systems have barriers to movement or a section where the natural area is broken by developed area.

    A corridor is a landscape feature that enables fish or wildlife species to travel between broad geographical areas. (See Figure 1.)

    a. There are contiguous natural areas that allow species movement, and if barriers exist, they do not stop animal or fish movement.
    b. The natural areas are fragmented, but species movement is still possible.
    c. The habitat system is fragmented, and there are barriers to species movement.

14. What are the landscape features at both ends of the movement corridor? (These may lie outside the assessment area.) From an aerial photo, observation or local knowledge, determine whether there are large natural areas at either end of the movement corridor. The natural area does not have to be a wetland.

    a. Large natural habitat areas are at both ends.
    b. One end has a natural habitat area and the other end is developed.
    c. Both ends are developed.

Watershed Notes

a.

b.

Individual wetland sites

Fill out this part of the characterization for each wetland in the assessment area. Some of the information can be gathered in the office; some must be gathered at the site. You may want to do a rough sketch of the site (doesn't have to be to scale) to refer to back in the office.

Wetland structure and relation to surrounding landscape

	Wetland 1	Wetland 2	Wetland 3
✓15. What percentage of the area within 500 feet of the wetland's edge is dedicated to the land uses listed below? (From overlay 2 or in the field.)			
It is best to determine the land uses from a recent aerial photo. If an aerial photo is not available, measure 500 feet in the field to get an idea of distance to evaluate. Use the following ranges for your answers for each land-use category:			
a. Less than 20%.			
b. Between 20% and 50%.			
c. Greater than 50%.			
1. Open Space (includes natural areas, parks and developed recreation areas, but not land designated for Exclusive Forest Use).	1. <20%		
2. Agriculture (pasture, cropped lands, orchards, range land).	2. >50%		
3. Exclusive Forest Use lands.	3. <20%		
4. Developed uses (residential, commercial or industrial—rural and urban).	4. <20%		
5. Other (list).			
✓16. What is the dominant existing land use within 500 feet of the wetland on the **downstream or down-slope edge** of the wetland? Use the same land-use categories as question 15.	Agricultural		
17. What is the wetland's area in acres? (Measure the entire area of contiguous wetland, not just the portion within the assessment area. Use the dimensions of the wetland as outlined on the base map.)			
a. Greater than 5 acres.			
b. Between 0.5 acres and 5 acres.		S&A b. >0.5 < 5	
c. Less than 0.5 acres.	CRE c. <0.5 acres		

✓ *Questions preceded by a check mark can be completed in the field.*

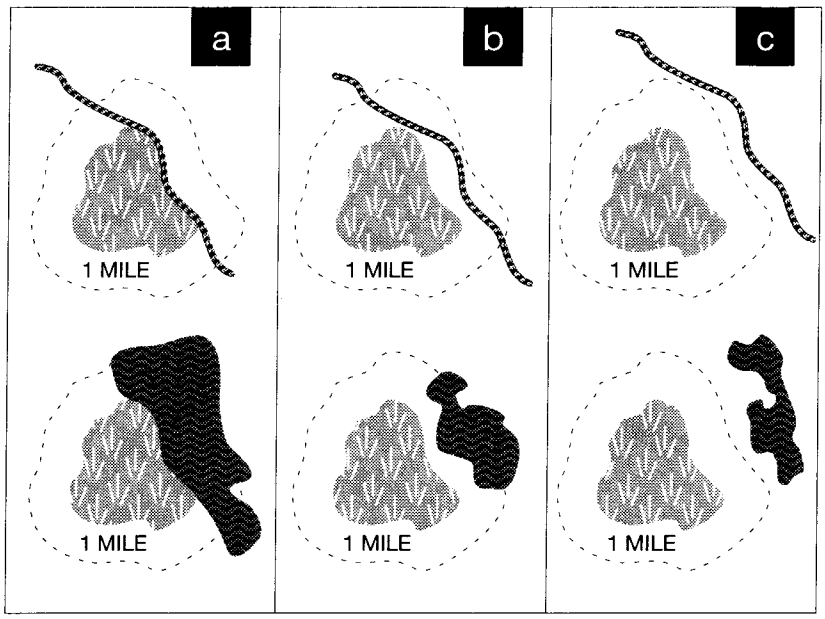


Figure 2. Connectivity to streams, lakes and ponds.
The lightly shaded area represents a wetland, the darkly shaded area represents a lake or pond and the dark line represents a stream. Part "a" shows the wetland connected to a stream, lake or pond, part "b" shows a stream, lake or pond within 1 mile but no surface connection, and part "c" shows no stream, lake or pond within 1 mile and no surface connection.

	Wetland 1	*Wetland 2*	*Wetland 3*
18. How is the wetland connected to another body of water, such as a stream, lake or pond? (See Figure 2.) a. The wetland is connected by surface water to another body of water. This may be by a culvert, irrigation ditch, intermittent stream or perennial stream. b. No surface-water connection exists to another body of water, but other bodies of water lie within 1 mile of the wetland. c. No surface-water connection exists to another body of water, and no other bodies of water lie within 1 mile of the wetland.	A		
19. Is all or part of the wetland located within the 100-year floodplain (use floodplain maps to determine) or within an enclosed basin? An enclosed basin has no inlet or outlet. a. Yes. b. No.	ditch/culvert (obstructed) No		

	Wetland 1	*Wetland 2*	*Wetland 3*
20. What percentage of the area within 500 feet of the wetland's edge is **zoned** for each of the land uses listed below?			
Use the following ranges for your answers:			
a. Less than 20%			
b. Between 20% and 50%			
c. Greater than 50%.			
1. Open Space (includes natural areas, parks and developed recreation areas, but not lands zoned for Exclusive Forest Use).	1. <20%		
2. Agriculture (pasture, cropped lands, orchards, range land).	2. >50%		
3. Exclusive Forest Use lands.	3. <20%		
4. Developed uses (residential, commercial, industrial).	4. <20%		
5. Other (list).			

Wetland habitat

✓21. What percentage of the wetland's area is covered by the following Cowardin wetland classes? (Cowardin wetland classes refer to a classification of wetland type by vegetation cover. See Appendix D.) Only list those that compose 10% or more of the overall wetland.			
The percentages can be estimated in the field or from aerial photographs. Use the following categories for your answers:			
a. Between 70% and 100%.			
b. 50% or more, but less than 70%.			
c. 20% or more, but less than 50%.			
d. 10% or more, but less than 20%.			
1. Open water (deep water habitat, greater than or equal to 6.6 feet or 2 meters).	1.		
2. Emergent (includes floating aquatics—herbaceous plants that can tolerate flooding and living in wet soils).	2. 70% - 100%		
3. Scrub-shrub (woody vegetation under 20 feet tall).	3.		
4. Forested (woody vegetation 20 feet or taller).	4.		
✓22. For urban areas, how many wetland plant species are present? (You need not list the species name.)			
a. More than 5 plant species.			
b. Between 2 and 5 plant species.			
c. 1 plant species (monotypic).			
✓23. What is the dominant wetland vegetation cover type?			
a. Woody vegetation (forested and scrub-shrub).	c. emergent vegetation only or wet meadow		
b. Emergent vegetation and ponding, or open water only.			
c. Emergent vegetation only or wet meadow.			

	Wetland 1	Wetland 2	Wetland 3
✔24. Refer to the diagrams in Figure 3 and select the one that most closely resembles the interspersion of Cowardin wetland classes and, if present, upland inclusions. (An upland inclusion is an island or an upland area surrounded on three sides by wetland.).			

Wetlands composed of only one wetland class or with two wetland classes and a simple pattern have low interspersion. Wetland and upland complexes that have at least two wetland classes and a complex pattern have a moderate interspersion pattern. Wetlands with two or more wetland classes or upland inclusions with a complex pattern and lots of edge have a high interspersion pattern. If the wetland you are observing does not reflect any of the diagrams, use the above guidance to determine the complexity of the interspersion pattern and draw a sketch of the wetland.

a. High.

b. Moderate.

c. Low.

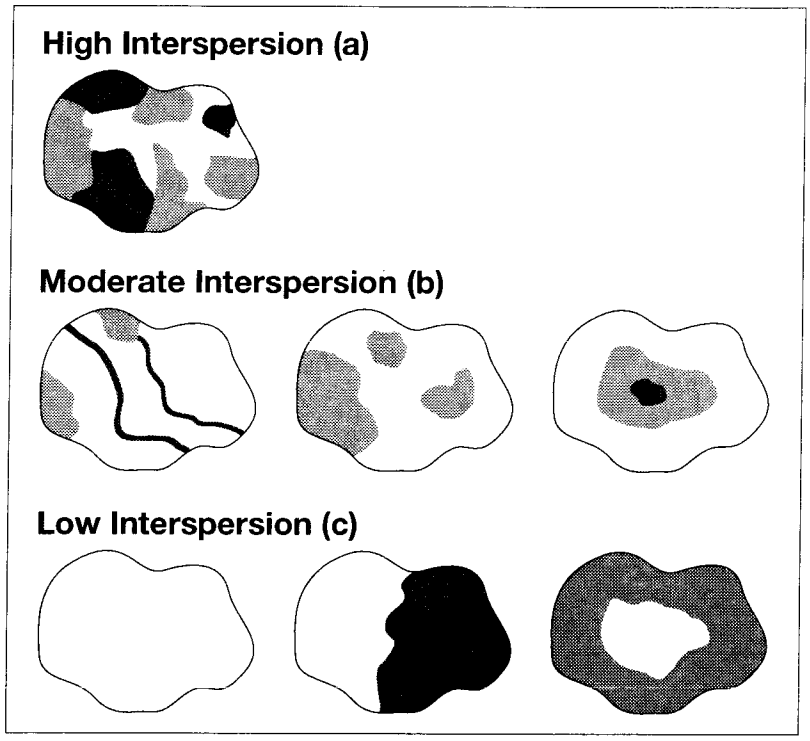


Figure 3. Interspersion of Cowardin classes and upland inclusions.

c. low interspersion

	Wetland 1	*Wetland 2*	*Wetland 3*
✓25. For **rural areas:** What percentage of the wetland's edge is bordered by upland wildlife habitat that is at least 150 feet wide? Brush, woodland, non-farmed agricultural land and range land are considered upland habitat for this question. Actively farmed lands are not considered wildlife habitat. (See Figure 4.) a. Greater than 40%. b. Between 10% and 40%. c. Less than 10%.	c. <10%		
✓26. For **urban areas:** What percentage of the wetland's edge is bordered by a vegetative buffer at least 25 feet wide? A vegetative buffer consists of trees, bushes or vegetation that is not regularly mowed or farmed. (See Figure 5.) a. Greater than 40%. b. Between 10% and 40%. c. Less than 10%.			
27. How is the wetland connected to other wetlands? (Look at an aerial photo or map to determine this.) a. Connected to other wetlands within a 3-mile radius by a perennial or intermittent stream, irrigation or drainage ditch, culvert, canal or lake. b. Not connected by surface waters, but other unconnected wetlands lie within a 3-mile radius. c. Not connected to other wetlands by surface waters, and no other unconnected wetlands lie within a 3-mile radius.	b. not connected by surface water but other wetlands within 3-mile radius		
28. Estimate the area of unvegetated, open water within the wetland. a. More than 3 acres. b. Greater than 1 acre, up to 3 acres. c. Between 0.5 acre and 1 acre. d. Less than 0.5 acre.	CRE d. <0.5 acre (0%)		S&A c. >0.5 < 5

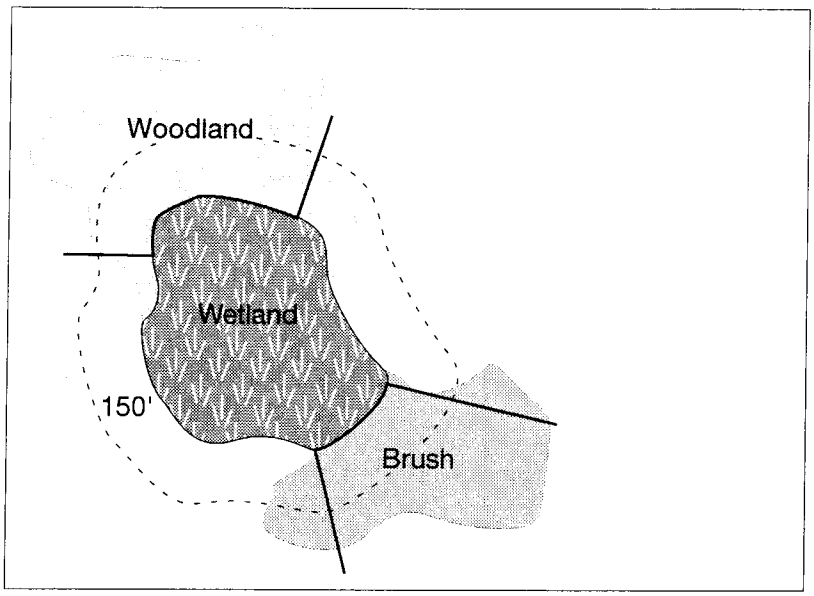


Figure 4. Percent of wetland edge bordered by upland habitat (for Question 25).
The dashed line delineates the area within 150 feet of the wetland; the "woodland" and "brush" areas are upland habitat; and the lines perpendicular to the wetland edge indicate where the upland habitat adjacent to the wetland habitat is at least 150 feet wide. The dark lines (portions of the wetland bordered by upland habitat at least 150 feet wide) make up roughly one-third (between 10% and 40%) of the wetland perimeter.

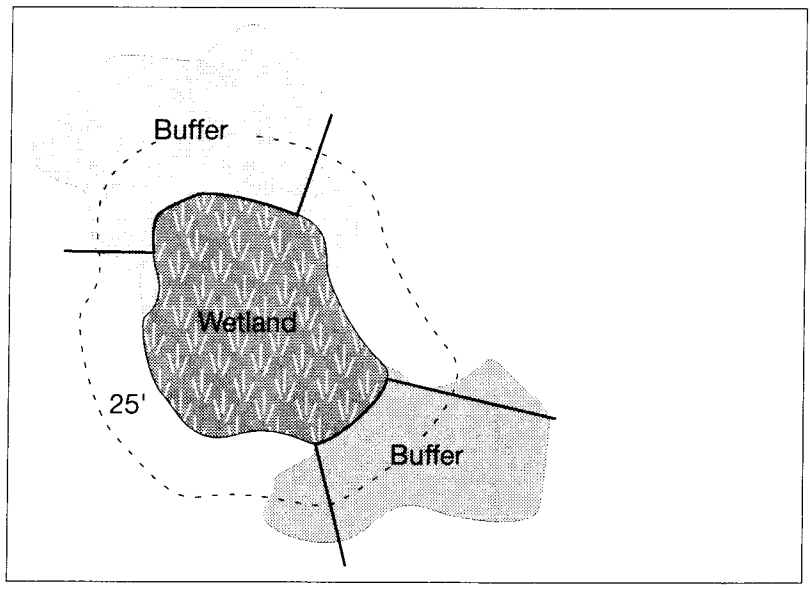
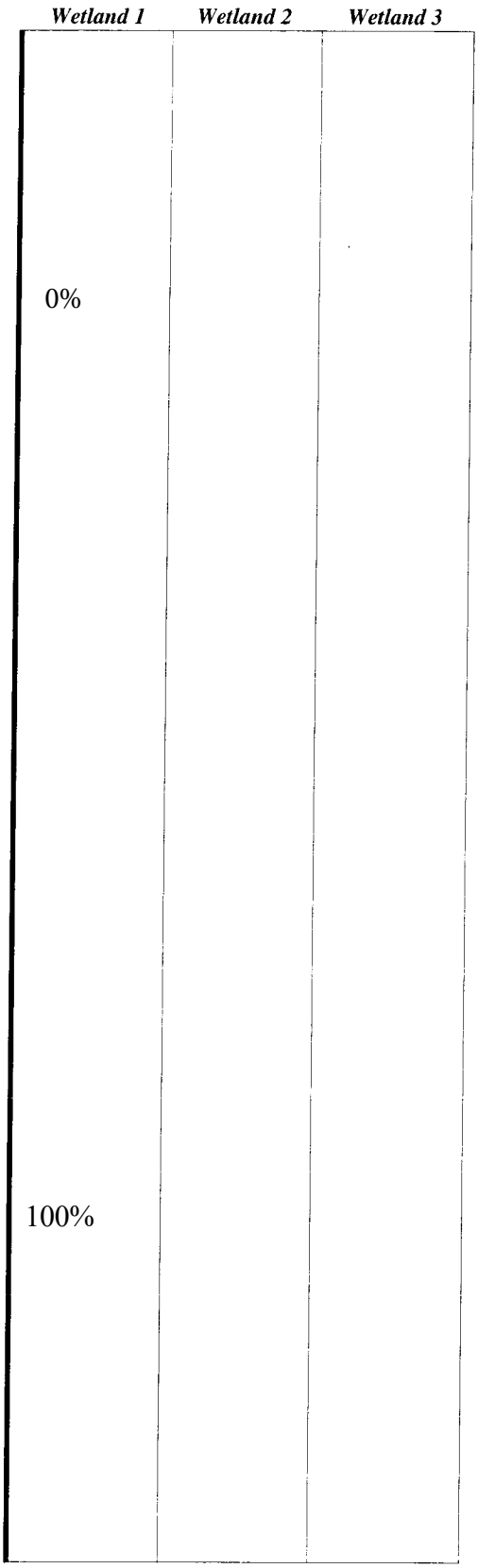


Figure 5. Percent of wetland edge bordered by vegetative buffer (for Question 26).
The dashed line delineates the area within 25 feet of the wetland; the vegetative buffer areas are labeled "buffer"; and the lines perpendicular to the wetland edge indicate where the vegetative buffer adjacent to the wetland habitat is at least 25 feet wide. The dark lines (portions of the wetland bordered by a vegetative buffer at least 25 feet wide) make up roughly one-third (between 10% and 40%) of the wetland perimeter.



	Wetland 1	Wetland 2	Wetland 3
c. No species any time of year			

Fisheries habitat

29. Are fish present in a stream, lake or pond connected to the wetland.
    a. Salmon, trout or sensitive species are present at some time during the year.
    b. Species not covered in "a" are present at some time during the year.
    c. No species are present at any time during the year.

Streams connected to the wetland

Complete this section only if the wetland being assessed has an unimpeded surface water connection to a stream.

✓30. What is the physical character of the stream channel? To observe stream channel modifications, look for built rock banks, cement sides, straightened areas or other human-created features.
    a. The stream is in a natural channel, or modified portions of the stream are returning to a natural channel.
    b. Only portions of the stream are modified.
    c. The stream is extensively modified or confined in a non-vegetated channel or pipe.

✓31. What percentage of the stream is shaded by streamside (riparian) vegetation?
    a. Greater than 75%.
    b. Between 50 and 75%.
    c. 25% or more, but less than 50%.
    d. Less than 25%.

✓32. What percentage of the stream contains instream structures such as large woody debris, floating or submerged vegetation, large rocks or boulders?
    a. Greater than 25%.
    b. Between 10% and 25%.
    c. Less than 10%.

Lakes or ponds (entire lake or pond and wetland complex)

Complete this section only if the wetland being assessed has a surface water connection to a lake or pond.

33. Does the lake or pond contain areas of deep and shallow water? ("Deep" is defined as more than 6.5 feet deep.)
    a. Yes.
    b. Cannot be determined.
    c. No.

	Wetland 1	Wetland 2	Wetland 3
✓34. What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation? a. 60% or more. b. 20% or more, but less than 60%. c. Less than 20%.			
✓35. What percentage of the wetland complex contains cover objects such as submerged logs, floating or submerged vegetation, large rocks or boulders? a. Greater than 25% b. Between 10 and 25% c. Less than 10%			
Wetland hydrology			
36. What is the wetland's **primary** source of water? (Determine in the field or in the office. This may be difficult to determine. If a surface water connection exists—stream, lake, ditch—use it as the primary source. If no surface water connection is present, talk to local natural resource people for hints.) a. Surface flow, including streams and ditches. b. Precipitation or sheet flow. c. Groundwater, including springs or seeps.	b. precipitation or sheet flow		
✓37. Is there evidence of flooding or ponding during a portion of the growing season? Look for evidence of water fluctuation such as sediment stains on trees, drift lines, surface scour or sediment deposits. Also look at the location of the wetland. Is it in a distinct topographic depression or adjacent to a stream that is known to flood or fluctuate because of storm pulses? a. Yes (describe). b. Unable to determine or not applicable. c. No.	c. No		
✓38. Is water flow out of the wetland restricted (e.g., beaver dam, concrete structure, undersized culvert)? a. Yes, the outlet is restricted or the wetland has no outlet. b. Minor restrictions slow down the water (e.g., undersized culvert). c. No, the outlet has unrestricted flow.	a. Yes, outlet is restricted		

	Wetland 1	Wetland 2	Wetland 3
✓39. If the primary source of water is surface flow, is the water flow into the wetland restricted? a. Flow is not restricted, or if blocked, the obstruction can be removed easily. b. Permanent blockage to the flow exists but may be breached or a new flow channel created (engineering or earth moving solution). c. Flow is restricted and cannot be restored.	a. Flow not restricted		
40. Has the stream flow or stream bank been modified by human activities less than 1 mile above the wetland? Modifications include dams, channelizations and levees, and confinement of the stream in a pipe. a. Yes. b. No.	a. Yes - flow into wetland modified by tiling		
Public access to wetland site *(select an appropriate area to observe the wetland to answer these questions.)* 41. Is the wetland site open to the public for direct access or observation? a. Yes, the wetland is open to the public. b. Yes, but wetland access is allowed only by permission of the landowner or managing entity. c. No, access is not allowed.	c. No - no access allowed		
✓42. Are there visible hazards to the public at the wetland site? (Examples: busy road adjacent to the site, and no buffer or sidewalk exists; steep embankment; and contaminated water.) a. No. b. One or two visible safety hazards exist (describe). c. More than two visible safety hazards exist (describe).	b. busy road adjacent to site		
✓43. Are there other natural landscape features, such as a stream, lake, pond, forest or agricultural land contiguous or adjacent to the wetland? a. Yes. (List type and extent.) b. No.	b. Yes - agricultural		

	Wetland 1	Wetland 2	Wetland 3
✓44. Is there existing physical public access to features listed in Question 43? If not, can such access be created easily, or can other habitats be observed from the site? For a stream, pond or lake, access may require dry ground to the water's edge. Stream access could also be at a road crossing, but consider the safety at such locations a. Public access to other habitats exists or can be created easily. b. Public access doesn't exist and can't be created easily, but observation of other features can be made from the site. c. Public access doesn't exist and can't be created easily. In addition, observation of other features can't be made from the site.	b. No public access; wetland can be observed from the city street		
✓45. Does it appear that access to a viewing spot or wetland edge is available for individuals with limited mobility? (To see whether the site meets ADA requirements, a more thorough examination should be done.) a. Yes. b. No. (List physical barriers.)	b. No. SE 190th is not accessible via ADA pedestrian resources along this reach		
✓46. Is there a public access point within 250 feet of the wetland's edge? Access points include parking lots, transit stops, bike lanes, trails and water courses. Maintained means that the area is designated as a car or transit area by the managing entity. Unmaintained would be a road pull-off or other area that people use but is not designated for such use. Describe the type of access. a. Yes, a maintained access point exists (describe). b. Yes, an unmaintained access point exists (describe). c. No access point exists, or the access point is hazardous.	c. No		
Recreation			
✓47. Is the wetland accessible by boat? a. Boat launching areas or access points exist on site or within 1/2 mile on a connected lake, river, bay or other body of water. b. Potential to develop boat launching areas or access points exists, or such features are more than 1/2 mile but less than 1 mile from the wetland. c. No boat launching areas or access points exist within 1 mile of the wetland, and potential to develop launching areas or access points is limited.	Not applicable		

	Wetland 1	Wetland 2	Wetland 3
✓48. Are there trails, viewing areas or other structures that guide user movement to a particular area or areas in or around the wetland? a. Yes, developed or maintained trails or viewing areas exist. b. Yes, undeveloped trails or viewing areas exist that do not disrupt wildlife or plant habitat. c. No trails or viewing areas exist, or those that do disrupt wildlife or plant habitat.	c. None		
49. Is fishing allowed at the wetland or connected water body? (Contact local Oregon Department of Fish and Wildlife office.) Answer "not applicable" if question 18 was answered "b" or "c," unless question 21 indicates that 10% or more of the wetland's area is covered by open water. a. Yes (either all or part of the year). b. No. c. Not applicable.	c. Not applicable		
50. Is hunting allowed at the wetland? (If the wetland is within the city limits, hunting is not allowed. Otherwise, contact the local Oregon Department of Fish and Wildlife office for this information.) a. Yes (either all or part of the year). b. No.	c. No		
Aesthetics			
✓51. For **rural areas**, what is the extent of visual contrast with the surrounding landscape? (See Figure 6.) a. Significant contrast with surrounding landscape. b. Limited contrast with surrounding landscape. c. Little or no contrast with surrounding landscape.	c. Little or no contrast with surrounding landscape		
✓52. For **urban areas,** what is the visual character of the surrounding area? (See Figure 7.) a. Open space or naturally landscaped areas. b. Areas landscaped or manipulated by people. c. Developed with no landscaping.			
✓53. Are there visual detractors at the wetland site such as abandoned cars, litter, shopping carts or other objects that distract the viewer from the wetland? a. Yes. b. No.	a. Yes - junk from previous residence		
✓54. If the wetland contains visual detractors, as indicated in question 53, can they be removed easily? a. Yes. b. No.	a. Yes		

Locate the primary viewing area(s) for the following four questions (be sure to indicate the location on the overlay).

✓55. What odors are present at the primary viewing location(s)?

a. Natural, pleasant odors only.

b. Unpleasant odors such as automobile exhaust or stench from a sewage treatment plant are present at certain times.

c. Unpleasant odors are distinct and continuously present.

	Wetland 1	*Wetland 2*	*Wetland 3*
a. Natural, pleasant odors only			

Figure 6. Visual contrast.
The top part of the figure shows a wetland with significant visual contrast with the surrounding landscape. The bottom part shows a wetland with little or no visual contrast with the surrounding landscape.

	Wetland 1	Wetland 2	Wetland 3
✓56. What noises are audible at the primary viewing location(s)? a. Bird and wildlife noises and other naturally occurring sounds. b. Some traffic and other similar background sounds are audible in addition to naturally occurring sounds. c. Continuous traffic or other intrusive noise is audible in addition to naturally occurring sounds. d. Continuous traffic or other intrusive noise is audible, but no naturally occurring sounds are.			c. Continuous traffic and natural
✓57. How much of the wetland is visible from the viewing area(s)? Describe the view. a. Greater than 50%. b. Between 25% and 50%. c. Less than 25%.			c. No viewing area except side of hazardous road
✓58. How many Cowardin classes are visible from the primary viewing area(s)? (See question 21 for list of Cowardin classes to use.) a. More than two. b. Two c. One			c. One

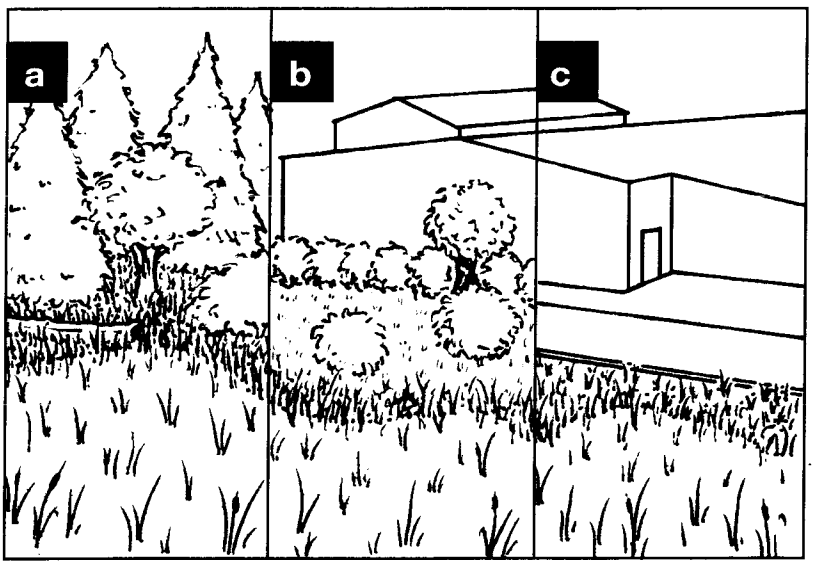


Figure 7. Visual character of urban wetlands.
Beginning with the left part, this figure shows an urban wetland with naturally landscaped areas, areas landscaped by people and with unlandscaped developed areas.

Function & condition assessment questions

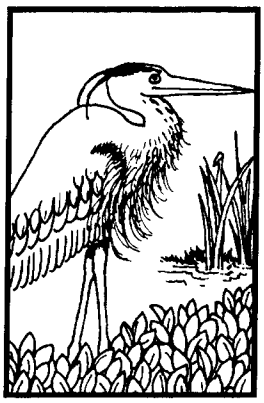
This chapter includes a set of **assessment questions** for each of the nine functions and conditions evaluated using the Oregon Method.

Listed after each assessment question you will find **directions** explaining which questions from the Wetland Characterization you should refer to when determining your answer. Some of the questions are followed by examples.

Then, following the directions for each question, is a **rationale** paragraph that explains the importance of the information you are asked to gather.

Duplicates of all question sets—without the rationales—appear in Appendix C. *Once you are familiar with the directions and rationale for each question, detach the appendix and photocopy it for use in the field.* This will reduce the possibility of losing portions of the main document.

At the end of the chapter (and in Appendix C) is an **answer sheet**, where you can enter your responses to all assessment questions, as well as a **function and condition summary sheet,** where you can enter the results of the assessment criteria for each function and condition and where you can write an overall description of a wetland's functions and conditions. The **watershed summary sheet** is also included at the end of this chapter.



Wildlife habitat

Wetlands provide habitat for many wildlife species. A single wetland often cannot satisfy all requirements for wildlife use, so its proximity to other bodies of water or upland areas is important. Buffers and corridors are also essential for this reason, and they reduce human disturbance as well. Many species also have special habitat requirements: Good water quality is necessary for amphibians and mammals; structural diversity is important for birds; and a combination of open water and grazing areas is important for waterfowl.

For this assessment, **urban wetlands are those within urban growth boundaries or urban or rural service areas.** Because of the impacts of human activities, urban wetlands may not satisfy as many habitat requirements as wetlands in undeveloped areas. This should not be interpreted to mean that urban wetlands have limited value for all wildlife. The importance of an urban wetland may be increased because of its location and surroundings.

Assessment questions

Question 1

How many Cowardin wetland classes are present?

Directions

See question 21 in the Wetland Characterization. Count only those Cowardin classes for which you answered "a," "b" or "c." For urban areas, also consider the mix of species (Question 22 in the Wetland Characterization.)

Rural areas:

a. Three or four.

b. Two.

c. One.

Urban areas:

a. Two or more.

b. One class with more than five plant species.

c. One class with five or fewer plant species.

Rationale

In Northwest wetlands, vegetation is the most important component of wildlife habitat. It is widely recognized that plant community diversity increases animal community diversity. The existence of two Cowardin classes adjacent to each other may also improve wildlife habitat value because some wetland wildlife species use the edge between plant communities. ("Edge" describes the border between vegetation types or between a vegetation type and open water.)

Structural diversity is also important. If several layers of vegetation are present, more diverse habitat types are provided. (Different birds nest in different layers.) In addition, the number of layers affects the amount of natural debris, which is necessary for amphibians and other wildlife.

Notes

c. Rural - one

Question 2

What is the dominant wetland vegetation cover type?

a. Woody vegetation.
b. Emergent vegetation and ponding, or open water only.
c. Emergent vegetation or wet meadow.

Directions

See question 23 in the Wetland Characterization.

Rationale

Wooded and shrub wetlands provide habitat for the largest overall species assemblages. Emergent wetlands associated with open water are also an essential habitat for a large number of wetland species, particularly waterfowl, amphibians and wading birds. Emergent wetlands without open water provide habitat for wetland species to a lesser degree.

Notes

c. Emergent vegetation or wet meadow

Question 3

What is the degree of Cowardin class interspersion for the wetland being observed?

a. High.
b. Moderate.
c. Low.

Directions

See question 24 in the Wetland Characterization.

Rationale

Interspersion occurs when two or more wetland types or upland inclusions create a mosaic or pattern. In a wetland composed of approximately concentric bands of vegetation, such as cattails ringed by shrubs, interspersion is low. At the opposite extreme, small patches of shrubs scattered throughout an emergent marsh represent a high degree of interspersion.

When two or more vegetation types are highly interspersed, a great deal of edge is created. Edge is important because many wildlife species are edge dwellers. Generally, the greater the edge, the greater the diversity of wildlife.

c. Low

Question 4

If the wetland contains unvegetated open water, how many acres of unvegetated open water are present?

Directions

See question 28 in the Wetland Characterization.

Rural areas:

a. More than 3 acres .

b. Between 0.5 and 3 acres.

c. Less than 0.5 acres.

Urban areas:

a. More than 1 acre.

b. Between 0.5 and 1 acre.

c. Less than 0.5 acres.

Rationale

Open water is essential to a number of wetland wildlife species, including waterfowl, wading birds, amphibians and some reptiles.

Question 5

How is the wetland connected to another body of water, such as a stream, lake or pond?

Directions

See question 18 in the Wetland Characterization.

a. The wetland is connected by surface water to another body of water.

b. No surface water connection exists to another body of water, but other bodies of water lie within 1 mile of the wetland.

c. No surface-water connection exists to another body of water, and no other bodies of water lie within 1 mile of the wetland.

Rationale

Wetland wildlife species will often use surface water to travel between a wetland and deep water. Also, water must be available during critical phases for the wildlife that use it. Water available during the nesting season is more valuable to wildlife than water available only during the winter.

Notes

b. no surface connection; other wetlands within 1-mile

Question 6 *(for Western OR only)*

How is the wetland connected to other wetlands?

Directions

See question 27 in the Wetland Characterization.

a. Connected to other wetlands within a 3-mile radius by a perennial or intermittent stream, irrigation or drainage ditch, culvert, canal or lake.
b. Not connected by surface waters, but other unconnected wetlands lie within a 3-mile radius.
c. Not connected to other wetlands by surface waters, and no other unconnected wetlands lie within a 3-mile radius.

Rationale

Proximity to other wetlands increases a wetland's utility as habitat. Nearby wetlands sometimes contain features absent from the assessment wetland. For example, birds such as the great blue heron may roost near one wetland but travel to another to fish if the wetland where they roost doesn't have an ample supply of fish.

This criterion applies only in western Oregon. Because of the dry climate in eastern Oregon, isolated wetlands provide important habitat to both local and migratory species.

Notes

b. not connected - other wetlands within 3 miles

Question 7

What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland?

Directions

See questions 7 and 8 in the Wetland Characterization. If both "a" and "b" apply, choose "a."

a. No upstream or adjacent reaches are listed as *water quality limited,* and all upstream or adjacent reaches are listed as *no problem* (or no data available) for nonpoint source pollutants.
b. One or more upstream or adjacent reaches are listed in *moderate* water quality condition for nonpoint source pollutants.
c. One or more upstream or adjacent reaches are listed as *water quality limited* or in *severe* water quality condition for nonpoint source pollutants.

Rationale

Poor water quality can harm many terrestrial and aquatic species. The character of a wetland ecosystem can change when exposed to nutrients and other chemicals beyond tolerable limits. Excess nutrients, for example, can cause oxygen deficiencies, which in turn can cause a change in the species composition of both plant and animal communities. Studies in Washington and elsewhere have indicated that amphibians are especially sensitive to water quality.

c. Upper Johnson Creek watershed listed as water quality impaired (temperature; banned pesticides)

Question 8

What is the dominant existing land use within 500 feet of the wetland's edge?

a. Exclusive Forest Use or Open Space.
b. Agriculture.
c. Developed uses.

Directions

See question 15 in the Wetland Characterization. If the responses you gave to question 15 in the Characterization indicate that two or more land-use categories are equally dominant, pick the one that will yield the lowest letter response for this question. (Example: In question 15 of the Wetland Characterization, you responded "b. Between 20% and 50%" to both *Exclusive Forest Use lands* and *developed uses,* and the remainder of your responses to question 15 were "a. Less than 20%." For this Wildlife Habitat question, you would respond "a. .Exclusive Forest Use or Open Space.")

Rationale

Wildlife habitat generally deteriorates as land use changes from forested land to agricultural land to urban land. Certain game species, such as deer and some waterfowl, may benefit from land clearing. However, the majority of wildlife species are affected adversely when the land is developed because of fencing, lighting and loss of habitat.

Notes

b. Agriculture

Question 9a

For **rural areas:** What percentage of the wetland's edge is bordered by upland wildlife habitat that is at least 150 feet wide?

a. Greater than 40%.
b. Between 10% and 40%.
c. Less than 10%.

Question 9b

For **urban areas:** What percent of the wetland's edge is bordered by a vegetative buffer at least 25 feet wide?

a. Greater than 40%.
b. Between 10 and 40%.
c. Less than 10%.

Directions

For rural areas, see question 25 in the Wetland Characterization. For urban areas, see question 26 in the Wetland Characterization.

Rationale

A buffer zone, an uncut or undisturbed area of vegetation providing wildlife cover, increases a wetland's wildlife habitat potential. It provides habitat for both upland animals and wetland dependent species that require upland habitat for parts of their life cycle. A buffer zone also decreases the impacts of disturbance on the wetland. This is particularly important for nesting birds, which may be disturbed by people and household pets.

Well-vegetated buffer areas and corridors are particularly significant in urban areas because of their beneficial effect on water quality as well as their value for wildlife.

Wildlife habitat: assessment criteria

The wetland provides diverse wildlife habitat if:	At least four questions are answered "a," and no more than one is answered "c."
The wetland provides habitat for some wildlife species if:	Answers do not satisfy the above- or below-listed criteria.
The wetland's wildlife habitat function is lost or not present if:	All questions are answered "c."

Notes

c. <10%

Wetland provides habitat for some wildlife species

Fish habitat

This index assesses the contribution of wetlands connected to streams, rivers, lakes or ponds to fish habitat. **or this index, "connected to" implies a surface-water connection.** The assessment should be done on the reach of the stream or on a section of lake that actually borders the wetland or is contained within the wetland.

Notes

A stream is defined as a waterbody with a distinct channel and flow. Examples include sloughs, perennial streams and intermittent streams. If dikes or berms have been built on the stream banks between the stream and wetland that do not allow continual exchange of surface water, do not complete this index. If both a stream and lake are present, choose the one with the longest wetland surface connection.

Wetlands that contribute to habitat for fish include areas with dense, overhanging vegetation. This vegetation provides shade, cover and food sources to related waterways and lakes. Wetlands also provide spawning, rearing and resting opportunities for fish. However, a wetland need not actually contain fish to contribute to fish habitat because wetlands may perform important functions for fish-bearing waters downstream.

The assessment of fish habitat is divided into two parts. Part A evaluates the wetland habitat connected to rivers and streams. If there is no stream or river associated with the wetland, then leave Part A out of the assessment. Part B evaluates the wetland habitat connected to ponds (water greater than 6 feet deep) and lakes. If there is no lake or pond connected to the wetland, then leave Part B out of the assessment. If no stream, river, pond or lake is connected to the wetland, then leave this index out of the assessment altogether.

Assessment questions: Part A—streams

Question 1

What percentage of the stream is shaded by stream-side (riparian) vegetation?

Directions

See question 31 in the Wetland Characterization.

Western Oregon:

a. More than 75%.

b. Between 50% and 75%.

c. Less than 50%.

Eastern Oregon:

a. 50% or more.

b. 25% or more, but less than 50%.

c. Less than 25%.

Rationale

Many Oregon streams are unsuitable for anadromous and resident fish because riparian vegetation has been cleared. High water temperatures that result from removal of stream-side vegetation can make a stream unsuitable for some fish species. Salmonids and some resident fish are particularly susceptible to elevated water temperatures. The amount and type of stream-bank cover also affects the amount of large woody debris in the stream or river system. In addition, stream-bank vegetation provides habitat for insects, an important food source for salmonids.

Question 2

What is the physical character of the stream channel?

Directions

See question 30 in the Wetland Characterization.

a. The stream is in a natural channel, or modified portions of the stream are returning to a natural channel.

b. Only portions of the stream channel are modified.

c. The stream is extensively modified or confined in a non-vegetated channel or pipe.

Rationale

Although the species or age composition of low- and high-gradient streams is different, both can provide habitat for fish. Artificially channelized or extensively modified streams, however, usually do not provide fish habitat as well as natural stream channels.

Notes

No adjacent stream or fish habitat

Question 3

What percentage of the entire stream contains instream structures such as large woody debris, floating submerged vegetation, large rocks or boulders?

a. More than 25%.
b. Between 10% and 25%.
c. Less than 10%.

Directions

See question 32 in the Wetland Characterization.

Rationale

Cover is essential for good fish habitat. It provides refuge from predators and serves as substrate for insect larva, which are a good food source for some fish species. The presence of large pieces of woody material in pools is essential for providing adequate winter habitat for salmonid species. In addition, large pieces of woody material contribute to bank stability, dissipate energy, generate pool formation and encourage meandering. The breakdown of this material is also important in the nutrient cycle of the stream or river.

Question 4

What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland?

a. No upstream or adjacent reaches are listed as *water quality limited,* and all upstream or adjacent reaches are listed as *no problem* (or no data available) for nonpoint source pollutants.
b. One or more upstream or adjacent reaches are listed in *moderate* water quality condition for nonpoint source pollutants.
c. One or more upstream or adjacent reaches are listed as *water quality limited* or in *severe* water quality condition for nonpoint source pollutants.

Directions

See questions 7 and 8 in the Wetland Characterization. If both "a" and "b" apply, choose "a."

Rationale

Poor water quality can harm many aquatic species. The whole character of a wetland ecosystem can change when it is exposed to nutrients and other chemicals beyond tolerable limits. Excess nutrients, for example, can cause oxygen deficiencies, which in turn can cause a species composition change in both plant and animal communities.

Notes

Question 5

What is the dominant existing land use within 500 feet of the wetland's edge?

a. Exclusive Forest Use or Open Space.
b. Agriculture.
c. Developed uses.

Directions

Refer to the directions for question 8 of the wildlife habitat assessment questions.

Rationale

Fish habitat generally deteriorates as land use becomes more intensive, e.g., changes from forested land to agricultural land (including rangeland) to urban land. The change in intensity often changes the structure of the habitat and increases runoff, pollutant loading and sedimentation.

Question 6

Are fish present in a stream, lake or pond associated with the wetland?

a. Salmon, trout or sensitive species are present at some time during the year.
b. Species not covered in "a" are present at some time during the year.
c. No species are present at any time during the year.

Directions

See question 29 in the Wetland Characterization.

Rationale

The potential for a wetland to benefit fish is directly related to the presence of fish in the stream or river reach within or adjacent to the wetland.

Part B—lakes and ponds

Question 1

Does the lake or pond contain areas of both deep and shallow water?

a. Yes.
b. Cannot be determined.
c. No.

Directions

See question 33 in the Wetland Characterization.

Rationale

The depth of the pond or lake is important for spawning and may be important for rearing. A mixture of shallow, medium and deeper water is optimum to provide different habitat types.

Notes

Question 2

What percentage of the wetland complex contains cover objects such as submerged logs, floating or submerged vegetation, large rocks or boulders?

a. More than 25%.
b. Between 10% and 25%.
c. Less than 10%.

Directions

See question 35 in the Wetland Characterization.

Rationale

Cover is essential for good fish habitat. It provides refuge from predators and serves as substrate for insect larva, which are a food source for some fish species. The presence of large pieces of woody material in wetlands is essential for providing adequate winter habitat for salmonid species. In addition, large pieces of woody material contribute to bank stability and dissipate energy. The breakdown of this material is also important in the nutrient cycle of the pond or lake.

Question 3

What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation?

a. 60% or more.
b. 20% or more, but less than 60%.
c. Less than 20%.

Directions

See question 34 in the Wetland Characterization.

Rationale

Shoreline cover provides shading, which moderates water temperature in lakes and ponds. High water temperatures that result from removal of lake-side vegetation can make a lake unsuitable for some fish species. Shoreline vegetation also provides food, large pieces of woody debris and cover from predators. Woodland and scrubland vegetation provides more shading than herbaceous vegetation.

Notes

Question 4

What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland?

Directions

See questions 7 and 8 in the Wetland Characterization. If both "a" and "b" apply, choose "a."

a. No upstream or adjacent reaches are listed as *water quality limited,* and all upstream or adjacent reaches are listed as *no problem* (or no data available) for nonpoint source pollutants.
b. One or more upstream or adjacent reaches are listed in *moderate* water quality condition for nonpoint source pollutants.
c. One or more upstream or adjacent reaches are listed as *water quality limited* or in *severe* water quality condition for nonpoint source pollutants.

Rationale

See Part A question 4.

Question 5

What is the dominant existing land use within 500 feet of the wetland's edge?

Directions

Refer to the directions for question 8 of the wildlife habitat assessment questions.

a. Exclusive Forest Use or Open Space.
b. Agriculture.
c. Developed uses.

Rationale

See Part A question 5.

Question 6

Are fish in a stream, lake or pond associated with the wetland?

Directions

See question 29 in the Wetland Characterization.

a. Salmon, trout or sensitive species are present at some time during the year.
b. Species not covered in "a" are present at some time during the year.
c. No species are present at any time during the year.

Rationale

The potential for a wetland to benefit fish is directly related to the presence of fish in the pond or lake.

Notes

Fish habitat: assessment criteria

The wetland's fish habitat function is intact if:	Any three questions are answered "a," and no more than one is answered "c."
The wetland's fish habitat function is impacted or degraded if:	Answers do not satisfy the above- or below-listed criteria.
The wetland's fish habitat function is lost or not present if:	All questions are answered "c."

Notes

No stream or pond within or adjacent to stream. No fish habitat.

Water quality (pollutant removal)

Sediment trapping

During periods of heavy rainfall, water runoff may cause erosion and increase solids suspended in receiving surface waters. The excess sediment entering water systems can damage aquatic ecosystems. For example, sediment accumulation in stream bottoms can smother spawning areas and kill aquatic insect larvae. It can also reduce the storage capacity of downstream water supply reservoirs.

Wetlands perform an important function by trapping sediment from waters that pass through them. As water flows through wetlands, it is slowed by vegetation, and sediment settles to the bottom before the water moves farther downstream. As much as 90% of the solids suspended in the water may be removed as the water moves through wetlands, resulting in cleaner water entering streams, rivers, lakes and estuaries.

Nutrient attenuation

Nitrogen and phosphorus are the two nutrients most often associated with water pollution. They are also main ingredients of fertilizers used on agricultural fields and lawns, and both are found in high concentrations in discharges from sewage treatment plants and livestock operations. Excessive amounts of nitrogen and phosphorus in lakes and slow-moving streams can cause algal blooms and subsequent oxygen deficiencies, which may kill fish and reduce water quality. The processes that occur as a result of excess nutrients are lumped together under the term "eutrophication." Within limits, wetlands can reduce nutrient levels so that the effects of eutrophication on downstream areas are prevented or reduced. This index considers only point and non-point pollutant sources that are due to land uses in the watershed.

Assessment questions

Question 1

What is the wetland's primary source of water?

Directions

See question 36 in the Wetland Characterization.

a. Surface flow, including streams and ditches.
b. Precipitation or sheet flow.
c. Groundwater, including seeps and springs.

Rationale

Wetlands bordering a perennial or intermittent stream or lake are areas into which floodwaters spread during periods of high runoff, enabling the wetlands to remove pollutants.

Notes

b. Precipitation or sheet flow

Question 2

Is there evidence of flooding or ponding during a portion of the growing season?

a. Yes.
b. Unable to determine or not applicable.
c. No.

Directions

See question 37 in the Wetland Characterization.

Rationale

Water level fluctuation in the wetland indicates the ability to retain water. Impounded or standing water acts as a sediment trap because it greatly slows the flow of the incoming water, allowing suspended solids to settle out. Additionally, the slower velocity increases the contact time of the water with vegetation, resulting in uptake of nutrients by the vegetation. These actions function to reduce pollutant loads.

Notes

c. No

Question 3

What is the degree of wetland vegetation cover?

a. High (greater than 60%).
b. Moderate (approximately 60%).
c. Low (less than 60%).

Directions

See question 21 in the Wetland Characterization. Add the lower end of the ranges for forest, scrub-shrub and emergent vegetation to get the result. If the result is 60% or more, answer "high." If the result is 60%, answer "moderate." Answer "low" for other results.

Rationale

The more dense the vegetation, the greater the wetland's ability to take up nutrients. A dense stand of persistent emergent plants (such as cattail and rush) along with floating and submerged aquatics would tend to provide maximum nutrient uptake during the growing season. Wooded and scrub-shrub wetlands remove nutrients mainly through settling of suspended solids in runoff and flood waters.

a. High

Question 4

What is the wetland's area in acres?

Directions

See questions 17 and 27 in the Wetland Characterization.

a. More than 5 acres.

b. Between 0.5 acres and 5 acres; or wetland area is less than 0.5 acres, and the wetland is connected to other wetlands within a 3-mile radius by a perennial or intermittent stream, irrigation or drainage ditch, canal or lake.

c. Less than 0.5 acres, and the wetland is not connected to other wetlands within a 3-mile radius by a perennial or intermittent stream, irrigation or drainage ditch, canal or lake.

Rationale

The larger the wetland, the greater its capacity and ability to filter pollutants. Small wetlands connected by surface water act as a series of filters and thus function similarly to a larger wetland.

Question 5

What is the dominant, existing land use within 500 feet of the wetland's edge?

Directions

Refer to the directions for question 8 of the wildlife habitat assessment questions.

a. Developed uses.

b. Agriculture.

c. Exclusive Forest Use or Open Space.

Rationale

Urbanized areas have more impervious surface areas and concentrate pollution sources. Wetlands in urban areas are important for filtering the runoff water before it enters a stream.

Notes

b. <0.5 acres; connected to Kelley Creek by a drainage ditch

b. Agriculture

Question 6

What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland?

Directions

See questions 7 and 8 in the Wetland Characterization. If both "a" and "b" apply, choose "a."

a. One or more upstream or adjacent reaches are listed as *water quality limited* or in *severe* water quality condition for nonpoint source pollutants.

b. One or more upstream or adjacent reaches are listed in *moderate* water quality condition for nonpoint source pollutants.

c. No upstream or adjacent reaches are listed as *water quality limited,* and all upstream or adjacent reaches are listed as *no problem* (or no data available) for nonpoint source pollutants.

Rationale

A watershed with upstream pollutant loading sources needs wetlands to reduce pollutant levels in water before it is delivered downstream.

Water quality: assessment criteria

A wetland's water-quality function is intact if:	Question 1 is answered "a" or "b," questions 2 and 3 are answered "a," and any other question is answered "a" or "b."
A wetland's water-quality function is impacted or degraded if:	Answers do not satisfy the above- or below-listed criteria.
A wetland's water-quality function is lost or not present if:	Four out of six questions are answered "c."

Notes

a. Entire Upper Johnson Creek watershed listed as water quality limited

Water quality function is impacted or degraded

Hydrologic control
(flood control & water supply)

Wetlands function as natural water-storage areas during periods of high runoff and stream flooding. At times they act as flood regulators by holding floodwater then slowly releasing it downstream. This temporary storage reduces the amount of water downstream during floods, thereby reducing peak flows. Through this flood storage mechanism, wetlands associated with tributaries of streams or rivers can prevent water from all tributaries reaching the stream or river at the same time (this is called desynchronization). Wetlands can also act as floodwater "brakes." For example, water flowing through riverine wetlands during floods is slowed by trees, shrubs, reeds, rushes and other wetland vegetation. Wetlands acting as brakes can reduce flood peaks and thereby reduce flood damage, bank and bed erosion, and other adverse effects caused by fast moving water.

Wetlands also have long-term water holding abilities. Wetlands may store water for longer periods, sometimes for months. The slow draining of these wetlands to surface water or ground water as the water level in the wetland recedes may contribute to maintenance of baseflows in streams hydrologically connected to the wetland. The ability of this long-term water storage to maintain stream flows is called "flow conservation."

Notes

Assessment questions

Question 1

Is all or part of the wetland located within the 100-year floodplain or within an enclosed basin?

a. Yes.
b. No.

b. No

Directions

See question 19 in the Wetland Characterization.

Rationale

Wetlands located within a floodplain or enclosed basin have a greater opportunity to receive and store water from surface flows and to release it slowly downstream or into the groundwater.

Question 2

Is there evidence of flooding or ponding during a portion of the growing season?

a. Yes.
b. Unable to determine or not applicable.
c. No.

Directions

See question 37 in the Wetland Characterization.

Rationale

Water marks are valid indicators of seasonal and episodic stage fluctuations in wetlands and, as such, are strong indicators of storage function.

Question 3

What is the wetland's area in acres?

a. More than 5 acres.
b. Between .5 acres and 5 acres.
c. Less than .5 acres.

Directions

See question 17 in the Wetland Characterization.

Rationale

Generally, the larger the wetland, the greater its ability to store and attenuate flood flows.

Question 4

Is waterflow out of the wetland restricted (e.g., beaver dam, concrete structure, undersized culvert)?

a. Yes, the outlet is restricted or the wetland has no outlet.
b. Minor restrictions slow down the water (i.e., undersized culvert.)
c. No, the outlet has unrestricted flow.

Directions

See question 38 in the Wetland Characterization.

Rationale

Wetlands with no outlets or with restricted or controlled outlets generally will store greater amounts of water than wetlands with unrestricted flow outlets. Also, the wetland can store water for slower release into the water system.

Notes

c. No

CRE	S&A
c. < 0.5 acres	b. >.5 < 5

a. Yes, outlet is restricted

Question 5

What is the dominant wetland vegetation cover type?

Directions

See question 23 in the Wetland Characterization.

a. Woody vegetation.
b. Emergent vegetation and ponding, or open water only.
c. Emergent vegetation or wet meadow.

Rationale

Densely vegetated wetlands with vegetation greater than 6 feet tall are better able to control flood flows than wetlands dominated by open water or low growing vegetation, which generally offers little resistance.

Notes

c. Emergent vegetation or wet meadow

Question 6

What is the dominant existing land use, within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

Directions

See question 16 in the Wetland Characterization.

a. Developed uses.
b. Agriculture.
c. Exclusive Forest Use and Open Space.

Rationale

If the wetland is upstream from developed areas, its ability to control floods becomes more important.

b. Agriculture

Question 7

What is the dominant land use in the watershed upstream from the assessment area?

Directions

See question 6 in the Wetland Characterization.

a. Urban or urbanizing.
b. Agriculture.
c. Forested or natural area.

Rationale

Runoff volume is directly related to the level of development in the watershed: The more development, the more runoff. The opportunity for the wetland to provide flood control and flow conservation to a community is greater where runoff is greater.

c. Forested/natural

Hydrologic control: assessment criteria

A wetland's hydrologic control function is intact if:	Four or more questions are answered "a."
A wetland's hydrologic control function is is impacted or degraded if:	Answers do not satisify the above- or below-listed criteria.
A wetland's hydrologic control function is lost or not present if:	Four or more questions are answered "c."

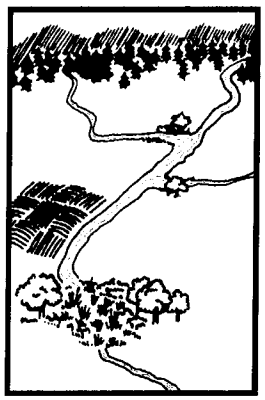
Notes

CRE

Hydrologic control function is not present

S&A

Hydrologic control impacted/degraded



Sensitivity to future impacts

The wetland's ability to provide ecological function depends on its condition. If past environmental impacts have affected its ability to sustain itself, then its ability to recover from future impacts is diminished. Factors such as vegetation type contribute to a wetland's sensitivity. Forested wetland types, for example, are considered particularly sensitive because their vegetation structure is complex and slow to recover once disturbed. Also, a wetland is considered sensitive to impact if the quantity and quality of its water supply has been altered or degraded and if the intensity of adjacent land use suggests that the impairment is permanent. Under such circumstances, the wetland will have lost some of its natural capacity to recover from impacts. Small, incremental impacts to sensitive wetlands can cause broader, secondary effects throughout the wetland system. A wetland's resilience depends on whether adverse effects caused by future impacts will be localized or will spread throughout the wetland and beyond into other ecosystems. The sensitivity to impact index is an indication of risk to the wetland because of future changes in the watershed and land surrounding it. The index gives an indication to decision makers of the future conditions of the wetland if planned activities develop.

Assessment questions

Question 1

Has the stream flow or stream bank been modified by human activities less than 1 mile above the wetland, or is the wetland isolated?

a. Yes.
b. No.

Directions

See questions 27 and 40 in the Wetland Characterization. A wetland is considered isolated if the answer to question 27 in the Wetland Characterization is "b" or "c."

Rationale

Wetlands located in areas where natural hydrologic conditions exist are more resilient than wetlands located in altered settings. Control structures such as dams can divert water toward or away from wetland ecosystems. Because plant growth and decomposition and other processes operating within wetlands are controlled in part by the water supply, changes in water distribution can disrupt ecosystem processes and reduce the wetland's capacity to recover from impact.

Notes

a. Yes

Question 2

Is water being taken out of the stream(s) through active diking, drainage or irrigation districts upstream of the assessment area, or is the wetland isolated?

a. Yes
b. No

Directions

See questions 5 and 27 in the Wetland Characterization. A wetland is considered isolated if the answer to question 27 in the Wetland Characterization is "b" or "c."

Rationale

Wetlands located in areas with natural hydrologic conditions are more resilient than wetlands located in areas where water is being removed from the active stream channel for other purposes. In areas where active draining, diking or irrigation districts exist, the amount of water available to replenish the wetland is limited, and this reduces the wetland's capacity to recover from impact.

Notes

a. Yes

Question 3

What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland?

a. One or more upstream or adjacent reaches are listed as *water quality limited* or in *severe* water quality condition for nonpoint source pollutants.
b. One or more upstream or adjacent reaches are listed in *moderate* water quality condition for nonpoint source pollutants.
c. No upstream or adjacent reaches are listed as *water quality limited,* and all upstream or adjacent reaches are listed as *no problem* (or no data available) for nonpoint source pollutants.

Directions

See questions 7 and 8 in the Wetland Characterization. If both "a" and "b" apply, choose "a."

Rationale

Ecosystem processes like nutrient cycling are controlled in part by the chemistry of water entering the system. Changes in water quality beyond a wetland's ability to adjust can disrupt ecosystem processes and threaten the wetland's existence.

a. Upper Johnson Creek watershed is water quality limited

Question 4

What is the dominant, existing land use within 500 feet of the wetland's edge?

a. Developed uses.
b. Agriculture.
c. Exclusive Forest Use or Open Space.

Directions

Refer to question 8 of the wildlife habitat assessment questions.

Rationale

The intensity of human-caused impacts to a wetland affects the wetland's capacity to absorb and withstand those impacts. Land use is an approximation of a wetland's exposure to disturbance.

Notes

b. Agriculture

Question 5

What is the dominant zoned land use within 500 feet of the wetland's edge?

a. Developed uses.
b. Agriculture.
c. Exclusive Forest Use or Open Space.

Directions

See question 20 in the Wetland Characterization. If the responses you gave to question 20 in the Characterization indicate that two or more zoned land-use categories are equally dominant, pick the one that will yield the lowest letter response for this question. (Example: In question 20 of the Wetland Characterization, you responded "b. Between 20% and 50%" to both *Exclusive Forest Use lands* and *developed uses*, and the remainder of your responses to question 15 were "a. Less than 20%." For this Sensitivity to Impact question, you would respond "a. Developed uses.")

Rationale

The duration of human-caused disturbance to a wetland also affects its capacity to absorb and withstand new or additional impacts. Zoned land-use is an approximation of the wetland's future exposure to disturbance.

b. Agriculture

Question 6

What is the dominant wetland vegetation cover type?

Directions

See question 23 in the Wetland Characterization.

a. Woody vegetation.
b. Emergent vegetation only or wet meadow.
c. Emergent vegetation and ponding, or open water only.

Rationale

The capacity of an individual type of wetland to recover from disturbance is controlled by its community structure. Woody communities exhibit higher structure and are less resilient because of their slow rate of biological turnover.

Sensitivity to impact: assessment criteria

A wetland is sensitive to future impacts if:	Questions 1, 2 and 3 are answered "a," and one other question is answered "a."
A wetland is potentially sensitive to future impacts if:	Answers do not satisfy the above- or below-listed criteria.
A wetland is not sensitive to future impacts if:	Questions 1 and 2 are answered "b", and no other questions are answered "a."

Notes

b. Emergent vegetation only or wet meadow

Wetland is potentially sensitive to future impacts

Enhancement potential

This index evaluates whether impacted or lost wetland functions can be restored at a degraded wetland site. It does **not** evaluate the enhancement potential of changing the vegetation through exotic weed removal, which is considered a management issue. Wetland enhancement provides opportunities to connect wetlands and adjacent natural areas, thus creating larger natural systems that provide corridors for animal movement. Enhancement potential represents how well a wetland might respond to the mitigation of past environmental impacts. The recovery of a wetland, and in particular its functions, depends upon the site's hydrology, its soils and substrate and the presence of environmental buffers surrounding the wetland.

For example, a wetland can be enhanced if its soils are minimally disturbed and if it can receive water from a known perennial or intermittent source. However, the enhancement potential of a site for a specific function may still be adversely impacted because of the surrounding land use. The wetland may be in an area where the source water quality is degraded and where weedy plants can invade the system.

If the wetland provides diverse wildlife habitat, do not complete the enhancement potential assessment questions. (Refer to the results of the assessment criteria for wildlife habitat.)

Assessment questions

Question 1

What are the assessment results for wildlife habitat, fish habitat, water quality and hydrologic control?

Directions

Refer to the results of the assessment criteria for each of the functions.

a. One or more of the functions is impacted or degraded.

b. The wetland has lost one or more of the functions or one or more of the functions is not present.

Rationale

The success of an enhancement project depends upon the wetland's existing capacity for providing a desired function. Wetlands that are either functionally intact or that are not functional offer little enhancement potential. Wetlands have a greater enhancement potential if their observed functions suggest that structural problems caused by previous environmental impacts can be easily remedied. For purposes of this index, a wetland that provides diverse wildlife habitat is functionally intact and efforts to enhance other functions may adversely affect the diversity of the wildlife habitat.

Notes

b.. Two or more functions not present (fish habitat and hydrologic control)

Question 2

What is the wetland's primary source of water?

Directions

See question 36 in the Wetland Characterization.

a. Surface flow, including streams and ditches.
b. Groundwater, including springs or seeps.
c. Precipitation or sheet flow.

Rationale

The success of a wetland enhancement project depends upon the ease with which local hydrologic regimes can be determined and, if needed, engineered to mitigate impaired conditions.

Notes

c. Precipitation or sheet flow

Question 3

If the primary source of water is surface flow, is the water flow into the wetland restricted?

Directions

See question 39 in the Wetland Characterization.

a. Flow is not restricted, or if blocked, the obstruction can be removed easily.
b. Permanent blockage to the flow exists, but may be breached or a new flow channel created.
c. Flow is restricted and cannot be restored.

Rationale

See rationale for question 2.

c. Flow is restricted and cannot be restored

Question 4

What is the wetland's area in acres?

Directions

See question 17 in the Wetland Characterization.

a. Greater than 5 acres.
b. Between .5 acres and 5 acres.
c. Less than .5 acres.

Rationale

The variability of environmental conditions across large wetlands is greater than in small wetlands. The opportunity for finding and working with conditions that are amenable to enhancement efforts are therefore greater in large wetlands.

CRE: c. <0.5 acres
S&A: b. >0.5 < 5 acres

Question 5a

For **rural areas:** What percentage of the wetland's edge is bordered by upland wildlife habitat that is at least 150 feet wide?

a. Greater than 40%.
b. Between 10% and 40%.
c. Less than 10%.

Question 5b

For **urban areas:** What percent of the wetland's edge is bordered by a vegetative buffer at least 25 feet wide?

a. Greater than 40%.
b. Between 10 and 40%.
c. Less than 10%.

Directions

For rural areas, see question 25 in the Wetland Characterization. For urban areas, see question 26 in the Wetland Characterization.

Rationale

Wetlands with a larger intact buffer provide better environmental buffers to work sites within the wetland (e.g., they preclude unwanted access to new water control structures).

Question 6

What is the result of the sensitivity to impact index?

a. The wetland is not sensitive to future impacts.
b. The wetland is potentially sensitive to future impacts.
c. The wetland is sensitive to future impacts.

Directions

See the results of the evaluation criteria for the sensitivity to impact index.

Rationale

The enhancement potential of a wetland for a desired functional performance is greater when the quality of its source water is not impaired. The potential for functional performance also increases when the assessed wetland is not surrounded by land uses that expose the system to future impacts.

Notes

c. Less than 10%

b. Potentially sensitive to future impacts

Enhancement potential: assessment criteria

A wetland has high enhancement potential if:	Question 1 is answered "a," and not more than one other question is answered "c."
A wetland has moderate potential for enhancement if:	Answers do not satisfy the above- or below-listed criteria.
A wetland has little enhancement potential if:	Question 1 is answered "b," and two or more other questions are answered "c."

Notes

Wetland has little enhance potential

Education

Field trips to wetlands are an important part of the educational experience. At wetland "classrooms" students can learn about ecological principles. The Oregon Method bases the educational assessment on accessibility and diversity of the wetlands. Wetlands that provide fish and wildlife habitat and permit access to other natural features allow for a broader course of study. This index evaluates whether it is possible to use the wetlands for educational purposes, not research.

Notes

Assessment questions

Question 1

Is the wetland site open to the public for direct access or observation?

Directions

See question 41 in the Wetland Characterization.

a. Yes, the wetland is open to the public.
b. Yes, but wetland access is allowed only by permission of the landowner or managing entity.
c. No, access is not allowed.

c. No access

Rationale

Public access allows educators to use the site on an unrestricted basis. If public access to a wetland is denied, the wetland cannot be used as an educational site. If public access exists, controlling the access limits disruption of the site. If the site is in a management area, the educational opportunities could be greater because of the availability of pamphlets and brochures. Management practices themselves could be of interest to users. Indicate in the "Notes" column, whether the site is in a management area.

Question 2

Are there visible hazards to the public at the wetland site?

Directions

See question 41 in the Wetland Characterization.

a. No.
b. One or two visible safety hazards exist.
c. More than two visible safety hazards exist.

b. SE 190th Drive

Rationale

A safety hazard is an obvious drawback to an educational site or a reason not to use it.

Question 3

What are the results for the wildlife habitat and fish habitat assessment criteria?

Directions

Refer to the results of the assessment criteria for wildlife habitat and fish habitat.

a. The wetland provides diverse wildlife habitat, or the fish habitat function is intact.
b. Results for the wildlife habitat and fish habitat assessment criteria do not meet the criteria for responses "a" or "c."
c. Both wildlife habitat function and fish habitat function are lost or not present.

Rationale

The Oregon Method assumes that a user's exposure to ecological principles is greater in a naturally functioning ecosystem that is likely to contain fish or wildlife species.

Question 4

Is there existing physical public access to other features? If not, can such access be created easily, or can other habitats be observed from the site?

Directions

See question 44 in the Wetland Characterization.

a. Public access to other habitats exists or can be created easily.
b. Public access doesn't exist and can't be created easily, but observation of other features can be made from the site.
c. Public access doesn't exist and can't be created easily. In addition, observation of other features can't be made from the site.

Rationale

Access to other habitat types allows users to examine the interactive nature of upland and aquatic systems. The presence of non-wetland plant or aquatic communities increases the educational value of the wetland by allowing the learner to compare wetlands, uplands and other aquatic systems.

Notes

b.

c. No access or observation from site

Question 5

Is there a public access point within 250 feet of the wetland's edge?

Directions

See question 46 in the Wetland Characterization.

a. Yes, a maintained access point exists.
b. Yes, an unmaintained access point exists.
c. No access point exists, or the access point is hazardous.

Notes

c. No access points or hazardous

Rationale

Access points within a reasonable distance are important if a wetland is to be a good educational site. But even nearby access points are of little value if they represent a hazard to users.

Question 6

Does it appear that access to a viewing spot or wetland edge is available for individuals with limited mobility?

a. Yes.
b. No.

b. No

Directions

See question 45 in the Wetland Characterization.

Rationale

The educational potential of a wetland is increased if people with limited mobility can also use the site. Note: This question is not included in the assessment criteria, but it should still be included on the answer sheet for assessment questions.

Education: assessment criteria

A wetland has educational uses if:	Questions 1 and 2 are answered "a," and questions 3, 4 and 5 are either "a" or "b."
A wetland has potential for educational use if:	Answers do not satisfy the above- or below-listed criteria.
A wetland site is not appropriate for educational use if:	The answer to 1 or 2 is "c."

Not appropriate for educational use

Recreation

Many recreational activities take place in and around wetlands. Wetlands associated with open bodies of water also support boating and fishing. Many people simply enjoy the beauty and sounds of nature and spend time walking in or near wetlands observing plant and animal life.

This index considers the most common recreational activities associated with wetlands. It does not take into account motor-associated activities.

Assessment questions

Question 1

Is there a public access point within 250 feet of the wetland's edge?

Directions

See question 46 in the Wetland Characterization.

a. Yes, a maintained access point exists.
b. Yes, an unmaintained access point exists.
c. No access point exists, or the access point is hazardous.

Notes

c. No

Rationale

Access near the wetland is necessary to enable unloading of boats and equipment and to allow walking to trails or observation areas.

Question 2

Is the wetland accessible by boat?

Directions

See question 47 in the Wetland Characterization.

a. Boat launching areas or access points exist on site or within 1/2 mile on a connected lake, river, bay or other body of water.
b. Potential to develop boat launching areas or access points exists, or such features are more than 1/2 mile but less than 1 mile from the wetland.
c. No boat launching areas or access points exist within 1 mile of the wetland, and potential to develop launching areas or access points is limited

c. None

Rationale

Many wetlands are found along streams or lakes suitable for canoeing, kayaking or other non-motorized boating. This provides important recreational opportunities. In addition, a canoe route can provide an important viewpoint for enjoying the aesthetic beauty of a wetland.

Question 3

Are there trails, viewing areas or other structures that guide user movement to a particular area or areas in or around the wetland?

Directions

See question 48 in the Wetland Characterization.

a. Yes, developed or maintained trails or viewing areas exist.
b. Yes, undeveloped trails or viewing areas exist that do not disrupt wildlife or plant habitat.
c. No trails or viewing areas exist, or those that do disrupt wildlife or plant habitat.

Notes

c. None

Rationale

Hunting, fishing, wildlife observation, photography and plant identification are recreational activities that take place in or around wetlands. Controlled movement of users limits adverse impacts to the wetland.

Question 4

What is the result of the wildlife habitat index?

Directions

Refer to the result of the assessment criteria for wildlife habitat.

a. The wetland provides diverse wildlife habitat.
b. The wetland provides habitat for some wildlife species.
c. The wetland's wildlife habitat function is lost or not present.

b. Some

Rationale

Wetlands are likely to be ideal areas for wildlife observation and for photography if they contain diverse wildlife habitat.

Question 5

Is fishing allowed at the wetland or adjacent water body?

Directions

See question 49 in the Wetland Characterization.

a. Yes.
b. No or not applicable.

b. No

Rationale

Fishing is a popular activity associated with wetland areas and adjacent waterways.

Question 6

Is hunting allowed at the wetland?

a. Yes.
b. No.

Directions

See question 50 in the Wetland Characterization.

Rationale

Wetlands are ideal hunting areas. Although there will be game species in most wetlands, some wetlands may be closed to hunting.

Notes

b. No

Recreation: assessment criteria

The wetland provides recreational opportunities if:	Question 1 or 2 is answered "a," and at least one other question is is answered "a."
The wetland has the potential to provide recreational opportunities if:	Answers do not satisfy the above- or below- listed criteria.
The wetland is not appropriate for or does not provide recreational opportunities if:	Questions 1 and 2 are answered "c"; or questions 3 and 4 are answered "c," and 5 and 6 are answered "b."

Aesthetic quality

"Beauty is in the eye of the beholder." Although this index is subjective, it is included to assess the open space and overall pleasing qualities of wetlands to local residents and users. The assessment assumes the user will be visiting the wetland, not just driving by in a car, bus or on a bicycle.

Wetlands can be areas of scenic beauty. Most often they are viewed from along a stream, from a canoe, along a nature trail or from an overlook. Because some wetlands are large and can be viewed from several locations, it is important to note on the wetland base map which viewing location(s) are being evaluated. The assessment area may include the entire wetland or only a portion, such as an area clearly visible from a road or stream. Thus this assessment can be based on an average of several viewpoints or on one outstanding viewpoint.

Notes

Assessment questions

Question 1

How many Cowardin classes are visible from the primary viewing area(s)?

a. More than two.
b. Two.
c. One.

c. One

Directions

See question 58 in the Wetland Characterization.

Rationale

Views of wetlands with a mix of wetland types are often considered most pleasing.

Question 2

How much of the wetland is visible from the viewing area(s)?

a. Greater than 50%.
b. Between 25% and 50%.
c. Less than 25%.

a. >50%

Directions

See question 57 in the Wetland Characterization.

Rationale

The more area that is visible, the more pleasing the wetland is considered.

Question 3

What is the general appearance of the wetland as visible from primary viewing location?

Directions

See questions 53 and 54 in the Wetland Characterization.

a. No visual detractors.
b. Visual detractors exist but can be removed easily.
c. Visual detractors exist and cannot be removed easily.

Rationale

Trash and other signs of disturbance mar the aesthetics of a site, but they often can be removed or hidden. Power lines and other large, permanent structures may distract the viewer and cannot be removed.

Notes

c. Visual detractors cannot be removed easily

Question 4

What is the extent of visual contrast with the surrounding landscape (rural) or visual character of the surrounding area (urban)?

Directions

See questions 51 and 52 in the Wetland Characterization.

Rural

a. Significant contrast with surrounding landscape.
b. Limited contrast with surrounding landscape.
c. Little or no contrast with surrounding landscape.

Urban

a. Open space or naturally landscaped areas.
b. Areas landscaped or manipulated by people.
c. Developed with no landscaping.

Rationale

Wetlands, which are generally low-lying features, often contrast dramatically with the surrounding areas, or their aesthetics are enhanced by the surrounding landscape.

c. Little or no contrast

Question 5

What odors are present at the primary viewing location(s)?

Directions

See question 55 in the Wetland Characterization.

a. Natural, pleasant odors only.
b. Unpleasant odors such as automobile exhaust or stench from a sewage treatment plant are present at certain times.
c. Unpleasant odors are distinct and continuously present.

Rationale

Unnatural odors reduce the aesthetic quality of wetlands.

a. Natural, pleasant odors

Question 6

What noises are audible at the primary viewing location?

Directions

See question 56 in the Wetland Characterization.

Rural

a. Bird and wildlife noises and other naturally occurring sounds.

b. Some traffic and other similar background sounds are audible in addition to naturally occurring sounds.

c. Continuous traffic or other intrusive noise is audible in addition to naturally occurring sounds.

Urban

a. Some traffic and other similar background sounds are audible in addition to naturally occurring sounds.

b. Continuous traffic or other intrusive noise is audible in addition to naturally occurring sounds.

c. Continuous traffic or other intrusive noise is audible, but no naturally occurring sounds are.

Rationale

Subjective impressions of noise levels vary from person to person, but most agree that continual noise such as that from a busy highway detracts significantly from aesthetic appreciation of wetlands. Noise can be particularly distracting to observers who are listening for bird songs and other wildlife sounds.

Aesthetics: assessment criteria

A wetland is considered to be pleasing if:	Question 1 or 2 is answered "a," and all other questions are answered "a" or "b."
A wetland is considered to be moderately pleasing if:	Answers do not satisfy the above- or below-listed criteria.
A wetland is not pleasing if:	Two or more questions are answered "c."

Notes

a, Am l rg l sm sq rp_ddga ugrf l_rsp_j qm s l bq

Not pleasing

Answer sheets & summary sheets

Wetland Assessment Questions: Answer Sheet		
Wetland identifier	CRE - Wetland 1	S&A Wetland 1
	0.120 Acre	4.95 Acres (representative of entire delineation
Wildlife habitat		exceept wetland 4 - not in study area)
Question 1	c. Rural (one)	
Question 2	c. Emergent vegetation or wet meadow	
Question 3	c. Low	
Question 4	no open water	
Question 5	b. no surface connection (no surface water);; other wetlands within 1 mile	
Question 6	b. not connected - other wetlands within 3 miles	
Question 7	c. Upper Johnson Creek watershed is water quality limited	
Question 8	b. Agriculture	
Question 9	c. <10%	
Assessment descriptor	Wetland provides habitat for some wildlife species	
Fish habitat		
Streams and rivers	Not applicable (no adjacent streams	
Question 1		
Question 2		
Question 3		
Question 4		
Question 5		
Question 6		
Lakes and ponds	Not applicable (no lakes or ponds)	
Question 1		
Question 2		
Question 3		
Question 4		
Question 5		
Question 6		
Assessment descriptor	Not present	
Water quality		
Question 1	b. Precipitation	
Question 2	c. N	
Question 3	a.High	
Question 4	a. b <0.5 acres; connected to Kelley Creek by series of drainage ditches	
Question 5	b. Agriculture	
Question 6	a.Upper Johnson Creek watershed listed as water qualitiy limited	
Assessment descriptor	Water quality function is impacted or degraded	

Wetland Assessment Questions: Answer Sheet					
Wetland identifier	CRE - Wetland 1	S&A Wetland 1			
	0.120 Acre	4.95 Acres (representative of entire delineation			
Hydrologic control		exceept wetland 4 - not in study area)			
Question 1	b. No				
Question 2	c. No				
Question 3	c. <0.5 acres	b. >0.5 < 5 acres			
Question 4	a.Yes - outlet restricted				
Question 5	c. Emergent vegetation or wet medow				
Question 6	b. Agriculture				
Question 7	c. Forest/natural				
Assessment descriptor	Not Present	Impacted/Degraded			
Sensitivity to future impacts					
Question 1	a. Yes				
Question 2	b. Yes				
Question 3	a. Upper Johnson Creek Watershed is water quality limited				
Question 4	b. Agriculture				
Question 5	b. Agriculture				
Question 6	b. Emergent vegetation only or wet meadow				
Assessment descriptor	Wetland is potentially sensitive to future impacts				
Enhancement potential					
Question 1	b. Fish habitat not present				
Question 2	c. Precipitation or sheet flow				
Question 3	c. Flow is restricted and cannot be restored				
Question 4	c. <0.5 acre	b. >0.5 <5 acre			
Question 5	c. <10%				
Question 6	b. Potentially sensitive to future impacts				
Assessment descriptor	Wetland has little enhancement potential				
Education					
Question 1	c. No access				
Question 2	b. SE 190th Drive				
Question 3	b.				
Question 4	c. Public access does not exist and can't be created easily				
Question 5	c. No access points or access hazardous				
Question 6	b. No				
Assessment descriptor	Not appropriate for educational use				

Wetland Assessment Questions: Answer Sheet				
Wetland identifier	CRE	S&A		
Recreation				
Question 1	c. No			
Question 2	c. None			
Question 3	c. None			
Question 4	b. Some			
Question 5	b. No			
Question 6	b. No			
Assessment descriptor	Wetland does not provide recreational opportunities			
Aesthetic quality				
Question 1	c. One			
Question 2	a. >50%			
Question 3	c. Visual detractors cannot be removed easily			
Question 4	c. Little or no contrast			
Question 5	a. Natural, pleasant odors			
Question 6	c. Continuous traffic with natural sounds			
Assessment descriptor	Not Pleasing			

Function & condition summary sheet for the Oregon Method

Wetland identification:

Function	Assessment Descriptor	Rationale
Wildlife habitat	Impacted/Degraded	No surface water (not amphibian or fish habitat); Single Cowardin class (emergent) in a rural setting; no surface connection to other habitats; in a pasture
Fish habitat	Not Present	No surface water = no fish habitat; adjacent roadside ditch has no fish presence
Water quality	Impacted/Degraded	Default answer = provides habitat for some species on basis of agricultural setting
Hydrologic control	Not present or Impacted/Degraded	temporary construction ditch dug in 2018 to facilitate power pole repair is only outlet; outlet is not sized for complete drainage; wet meadow vegetation; agriculture setting; Natural/forested area upgradient
Sensitivity to future impacts	Potentially sensitive	Wetland isolated; Upper Johnson Creek watershed is water quality impacted; agriculture setting; wet meadow
Enhancement potential	No enhancement potential	No fish habitat to enhance; Precipitation/sheet flow; outflow restricted; <5 acres; <10% wildlife corridor at boundary
Education	Not appropriate	No access to the public
Recreation	No opportunity	No access to the public
Aesthetic quality	Not pleasing	Wet meadow with no contrast; no

Narrative description of overall wetland functions and conditions

Watershed summary sheet for the Oregon Method

Watershed or community identification:

Characteristic	Description
Physical characteristics of the watershed	See attached ORWAP report
Land uses within the watershed	Mixed residential development; rural residential and agriculture
Water quality	Kelley Creek within 1/4-mile of the evaluated wetlands is not on the Oregon 303(d) list
Biological characteristics of the watershed	See attached ORWAP report

Narrative summary of watershed description