



Local Wetland Inventory Report
Mill City
Linn and Marion Counties, Oregon

Prepared for Lane Council of Governments
and Mill City

SWCA[®]

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October 2011
SWCA Project 16272

This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement WC-00J05001 to Lane Council of Governments. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency.

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1 INTRODUCTION

SWCA Environmental Consultants contracted with the Lane Council of Governments (LCOG) to conduct a Local Wetland Inventory (LWI) for each of five cities in the southern Willamette Valley (Adair Village, Monroe, Harrisburg, Mill City, and Scio). This report documents the LWI for Mill City, Linn and Marion Counties, Oregon. The LWI was conducted according to Oregon Administrative Rules (OAR) 141-086-0180 through 141-086-0350 (Appendix A). A list of acronyms used in this study and selected definitions are included in Appendix B.

SWCA determined the location and size of wetlands throughout the study area. The quality and condition of wetlands were determined by applying the Oregon Freshwater Wetland Assessment Methodology (OFWAM) and then determining whether wetlands were locally significant by applying the criteria in State Administrative Rules (OAR 141-86-300-350). This report presents the results of the wetland inventory and assessment as well as the identification of streams within the study area.

2 GENERAL DESCRIPTION OF THE STUDY AREA

The study area for Mill City includes 925 acres within the Urban Growth Boundary (UGB) and 187 acres of future growth area for a total study area of 1,112 acres. The study area is located in Sections 25 and 36 in Township 9 South, Range 2 East, and Sections 29, 30, 31, and 32, in Range 3 East, Linn County, Willamette Meridian, Oregon. Section 36 in Range 2 East is shared between Linn and Marion County. Background figures for this project are included in Appendix C. Figure 1 shows the site location on the U.S. Geological Survey topographic base map. Figure 2 shows the National Wetlands Inventory (NWI) map. Figure 3 shows the Natural Resources Conservation Service (NRCS) soil map.

2.1 Landscape Setting, Topography, and Land Use

Mill City is located along the North Santiam River which provides the county dividing line between Marion County to the north and Linn County to the south. Mill City is at an elevation of 862 feet above sea level in the Santiam Canyon. Oregon State Highway 22 provides an east-west connection, along with Lyons-Mill City Drive. Santiam State Forest lands are present north and south of town. Topography within the town is relatively flat, with steep mountain ranges occurring to the north and south. Soils in wetland areas of the study area formed in clayey or loamy and sandy mixed alluvium with some areas dominated by sedimentary or basic igneous materials on stream terraces, narrow flood plains, and fans. Soils north of the river formed in colluvium and glacial till derived from mixed materials on terraces and mountain footslopes. The town is mostly developed into residences with rural agricultural activities (mostly grazing or haying) occurring at the outer edges of the southern study area. A large mill site is still active in the western portion of the study area; two log ponds are present within the mill site. The North Santiam River is bridged once for vehicular traffic; the old railroad bridge has been turned into a pedestrian pathway.

2.2 Watershed

Mill City is located along the North Santiam River (approximate river mile 45.5 to 48), which flows west into the Willamette River. The study area is contained entirely within the North Santiam river-Walker Creek 6th field hydrologic unit code (HUC) watershed (170900050404). The watershed is 28.12 square miles in size and has an average slope of 16.25 percent. Several tributaries to the North Santiam River are present within the study area, including Cow Creek in the west (tributary to Walker Creek), Snake Creek, DeFord Creek (tributary to Snake Creek), Elizabeth Creek, Cedar Creek, and five No Name Creeks. Rock Creek is located to the east of the study area.

2.3 Growing Season

The growing season for Mill City is January 28 through December 23 as documented at the Detroit Dam WETS Station in Linn County, located east of the study area at an elevation of 1,220 feet. Average annual rainfall is 89.80 inches.

2.4 Sensitive Species and Water Quality Data

The Oregon Natural Heritage Information Center (now known as the Oregon Biodiversity Information Center) provided a list of sensitive species occurring within two miles of the study area on March 22, 2010. These species include:

- Steelhead (Upper Willamette River ESU, winter run) in the North Santiam River and Snake Creek
- Chinook salmon (Upper Willamette River ESU, spring run) in the North Santiam River and Snake Creek
- bull trout in the North Santiam River
- Harlequin duck
- Northern spotted owl
- Oregon slender salamander
- long-legged myotis (bat)

While surveys for sensitive species were not part of this inventory, any wildlife or wildlife sign observed in the field were noted on the wetland summary sheets included in the appendix.

The Oregon Department of State Lands (DSL) website provided essential salmonid habitat (ESH) maps, showing the North Santiam River and Snake Creek as ESH. Data sources used for gathering water quality data within the study area include Oregon Department of Environmental Quality (DEQ) 1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution and current DEQ website (see useful websites for wetland assessment at the end of the References section). Additional information was gathered from the Oregon Explorer Website.

The North Santiam River is water quality limited for temperature up to river mile 45.3. Mill city is located at river mile 45.5 to 48. The North Santiam River is also listed as being in moderate water quality condition for pesticides, bacteria/viruses, and excessive plant growth.

3 WETLAND INVENTORY PROCESS AND METHODOLOGY

3.1 Public Involvement

LCOG organized the public outreach efforts for this project. Letters explaining the project and seeking permission for access were sent to all property owners whose tax lots intercepted hydric soil layers and/or National Wetland Inventory (NWI) mapped wetlands and streams, or showed a potential wetland signature in the aerial photographs. SWCA reviewed the base maps and added additional tax lots that had a hydrologic signature or that provided access to tax lots that might have potential wetlands.

The initial public kickoff meeting was held in Mill City on February 22, 2010 from 6 to 8 p.m. at the Middle School on 450 SW Evergreen Street. Approximately 25 members of the public attended the meeting. The number of parcels requested for access within the study area was 224. Access was granted to 63, a 28% permission rate (includes 15 city owned parcels).

The final public meeting to present the results of the LWI for Mill City was held on May 5, 2011 at 6:00 pm at the Middle School. Stacey Reed of SWCA and Jacob Callister of LCOG presented the results; and Peter Ryan represented DSL. Dave Kinney, Planning Consultant, was present. Twenty-one people signed in; approximately 30 to 35 people were observed to be present.

3.2 Local Wetlands Inventory and Assessment Methodology

Wetlands are those areas that are inundated or saturated by surface water or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Both on-site and off-site methods of the LWI are geared towards determining if a site contains wetland soils, hydrology, and vegetation.

Wetland determination methodology followed the routine approach of the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Western Mountains, Valleys, and Coast Region, as adopted by the Oregon Department of State Lands (DSL) and the U.S. Army Corps of Engineers. (Fieldwork was conducted prior to the adoption of Version 2.0 of the Supplement.)

Creation of base maps support the initial screening for potential wetlands, as well as both the on- and off-site wetland determination work. LCOG prepared the base maps for this project including mapped NWI wetlands, NRCS-mapped hydric soils and soils with hydric inclusions, Federal Emergency Management Agency (FEMA) 100-year floodplain, 2-foot contours derived from light detection and ranging (LiDAR) data, tax lots from county geographic information system (GIS) departments, study area boundary, and summer 2005 or 2008 aerial photographs. Black and white aerial photographs dating from spring 2000 were also received from LCOG, and historic aerials were obtained from the U.S. Army Corps of Engineers for agricultural sites.

3.2.1 Off-site and Probable Wetland Determination Procedures

Where access was not granted wetlands were determined to be present by visually confirming the presence of hydrology and/or hydrophytic vegetation where possible from adjacent areas (roads,

public property, sites with access, etc.). Wetland boundaries mapped on these sites were based primarily on aerial photograph interpretation and the extent of mapped hydric soils.

Wetlands less than 0.5 acres (148 by 148 feet) were mapped when possible where property access was not granted. Off-site wetlands less than 0.5 acre were either mapped as a polygon or as a point labeled Probable Wetland (“PW”). “PW” means an area noted during the course of LWI development that appears to meet wetland criteria but is less than one half of an acre in size or is small and of undetermined size, and is mapped as a point rather than a polygon on the LWI maps. These areas were identified based on 1) the presence of wetland (hydrophytic) vegetation as documented in aerial photographs or via binoculars from off-site viewing locations; 2) an aerial signature showing saturation or ponding (a hydrologic signature); or 3) the presence of mapped hydric soils.

3.2.2 On-site Wetland Determination Procedures

Where property access permission was granted, each wetland was verified with at least one sample plot that best characterized the wetland. SWCA used a resource-grade Trimble GeoExplorer XT global positioning system (GPS) unit to collect wetland determination sample plot locations in the field. Field-collected data were downloaded into a GIS format using the industry standard ESRI ArcGIS software, version 9.3.

Wetlands were determined to be present by documenting hydrophytic vegetation, hydric soils, and wetland hydrology. Each potential wetland where land use activities such as ditching, water diversion, or agricultural practices are likely to have significantly altered site conditions was verified with at least one sample plot. Any potential wetlands with unreliable indicators (e.g., a dominant plant that grows in both wetlands and non-wetlands, such as reed canarygrass, *Phalaris arundinacea*) were verified with at least one sample plot. Wetland determination data forms are included in Appendix D.

Any previously mapped wetlands no longer apparent in aerial photos were verified with a sample plot or, where access was not obtained, their absence was visually confirmed. All newly identified wetlands were verified.

Where property access was granted, all wetlands 0.1 acre (66 by 66 feet) or greater were field mapped. (This differs from the LWI rule, which states all wetlands greater than or equal to 0.5 acre must be mapped.).

3.3 Wetland Quality Assessment

3.3.1 The Oregon Freshwater Wetland Assessment Methodology

Wetlands are grouped into assessment units based on their close proximity, similar vegetation characteristics and similar hydrologic characteristics. The quality of wetlands in the study area was assessed using the *Oregon Freshwater Wetland Assessment Methodology* (OFWAM; Roth et al. 1996). OFWAM is used to evaluate the relative quality of wetlands primarily for planning and educational purposes. OFWAM evaluates wildlife habitat, fish habitat, water quality, and hydrologic control functions. Where applicable, other measures to determine Locally Significant Wetlands were implemented, as discussed later in this report.

Wetland Functions and Values

Wetlands vary greatly by type and location; therefore not all perform the same functions and not all are equally valued. Wetland assessment may involve one or all of the following aspects:

- ◆ Functions—the ecological processes in wetlands, such as nitrogen cycling
- ◆ Values—the societal importance attached to those functions, such as water quality improvement
- ◆ Condition—the degree to which a wetland is altered or degraded, generally by human impacts

The Oregon Freshwater Wetland Assessment Methodology uses indicators that allow an evaluation of the extent to which a specific wetland may perform a given function, and help compare wetlands and evaluate their relative importance (value). Wetland functions evaluated by OFWAM include:

Wildlife habitat: Wetlands provide essential water, food, cover, and reproductive areas for many wildlife species. OFWAM evaluates the habitat diversity for species usually associated with wetlands, without emphasizing one particular species.

Fish habitat: OFWAM evaluates how a wetland provides fish habitat in streams, ponds or lakes associated with a wetland. The questions are suitable for both warm water and coldwater fish, and no particular species is emphasized.

Water Quality: Wetlands are highly effective at removing nitrogen and phosphorous, some chemicals, heavy metals, and other pollutants from water. For this reason, artificial wetlands are often constructed for cleaning stormwater runoff and for tertiary treatment (polishing) of wastewater. Wetlands bordering streams and rivers and those that intercept runoff from fields and roads may provide this function.

Hydrologic control: Wetlands can hold water during storm events reducing flooding impacts. OFWAM evaluates the effectiveness of a wetland to reduce downstream flood peaks and store floodwaters.

The OFWAM methodology for this study was streamlined to include only those wetland characterization questions that were relevant for determining whether the wetlands were Locally Significant Wetlands. Therefore, questions 39-58 of the methodology were not included.

3.3.2 Wetlands of Special Interest for Protection

The first filter of OFWAM is to determine 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 ten questions places the wetland into the “special interest for protection” category. Wetlands of Special Interest for Protection do not need to be labeled on the LWI maps. According to OFWAM, Wetlands of Special Interest for Protection indicate that management decisions should be made to protect the site. The worksheet regarding wetlands of special interest for protection is found in Appendix E.

3.4 Riparian Stream Reach Designation

Riparian stream reaches were to be determined based on the methodology contained in the Urban Riparian Inventory and Assessment Guide (Pacific Habitat Services, Inc. 1998). Riparian stream reaches generally have homogeneous physical characteristics; new reaches were defined by changes in vegetation type, slope, geomorphic stream features (pool, riffle, run), and/or by changes in land use. Each reach has a left and right side, looking downstream. Since Ms. Liz Redon has conducted a Riparian Inventory for Mill City, SWCA has not designated stream reaches within the study area boundary. There may be further work done here in the areas included in our study area boundary that were outside of the city limits and UGB and not included in Ms. Redon's study.

4 MAPPING AND MAP TRANSFER PROCEDURES

Base maps were prepared by LCOG and transferred digitally to SWCA. Base data included aerial photograph imagery from summer 2008, with 6-inch resolution. The base maps were printed at a scale of 1 inch = 200 feet on a D size map (22 by 34 inches) for field use. The field maps included the following layers:

- 2009 color aerial photograph imagery from the National Agricultural Inventory Project (NAIP; 1 meter resolution)
- Parcel ID
- Parcels coded with permission to access granted, call first before accessing, and no access (no response or not contacted)
- NWI-mapped wetlands
- Hydric soils, soils with hydric inclusions, and upland soils (polygons and unit ID numbers)
- DSL wetland determination / delineation polygons (digitized by LCOG)
- LWI study area
- Urban growth boundary
- City limits
- Streams (combination of National Hydrography Dataset data and county GIS, supplied by LCOG)
- Streets and street names
- 4th Field HUC ID and boundary line, where applicable
- County line, where applicable

Accuracy for the GPS-mapped features is estimated at one meter or less based on the manufacturer's reported tolerance for the instrument and the post-processing report. Mapping and initial cartography were completed in ArcGIS 9.3. Wetlands were mapped in the field by hand drawing on the field maps, and then wetland boundaries, stream banks, ditch centerlines, and photo points were digitized in the office by the wetland field personnel. SWCA GIS staff developed a geodatabase for the five-city LWI project. The digital data were then exported to LCOG for final map development.

Each wetland unit was labeled with a unique code in each identified polygon. Each wetland code label point has attribute data including its site code, on-site/off-site determination, prior determination or delineation DSL file number, Cowardin classification and modifiers,

Hydrogeomorphic Method of Wetland Assessment (HGM) classification, and Locally Significant Wetland determination. Attribute data were provided to LCOG by SWCA in an Excel spreadsheet.

LCOG provided second-draft digital maps in PDF format to SWCA for review; edited maps were submitted to DSL and to the city for review before presentation at a second public meeting and final submittal to DSL for approval. Public and local government comments on draft LWI products were provided to DSL. DSL reviewed the final products to ensure that requested changes were adequately addressed.

In addition to the March 31st and April 1st, 2000 black and white aerial photographs received from LCOG, which showed hydrology signatures and were printed to a scale of 1 inch = 400 feet, historic aerials were received from the Corps of Engineers for February 1967 and April 1959. Google Earth aerials were also reviewed for hydrology and ditching patterns; photo dates included August 14, 2005, July 30, 2005, August 4, 2000, July 28, 2000, and July 16, 1994.

5 LOCAL WETLAND INVENTORY RESULTS

5.1 Wetland Acreage and Distribution

The total acreage of the Mill City study area is 1,112. The total number of wetlands identified within the study area was 12, totaling 52.22 acres (not including rivers and streams, deepwater habitats, or artificially created ponds such as log ponds, detention ponds, or treatment lagoons). Nearly half of the wetlands within the Mill City study were emergent. Forested and scrub shrub wetlands make up the remaining half of wetlands, with less than 1 percent of wetlands with open water. Wetland Summary Sheets for each wetland are found in Appendix F. No probable wetlands were identified within the study area, although three of the identified wetlands are less than one half acre in size.

5.2 Wetland Classification

Each wetland was classified according to the classification of wetlands as defined by plants, soils, and the frequency of flooding known as the “Cowardin system” (see Appendix B). The following tables summarize the wetland classifications for the LWI study area. Table 5.1 is a break down of wetland class by acres and percent of total wetlands. Table 5.2 includes the total acres for each wetland broken into Cowardin class.

Table 5.1. Types of Wetlands within the Mill City LWI Study Area

Wetland Classification	Classification Description	Area (acres)	Percent of Wetlands
Palustrine Emergent Wetland (PEM)	Wetlands with rooted herbaceous vegetation that stand erect above the water or ground surface.	25.55	49%
Palustrine Scrub-shrub Wetland (PSS)	Wetlands dominated by shrubs and tree saplings less than 20 feet high.	11.43	22%
Palustrine Forested Wetland (PFO)	Wetlands dominated by trees that are greater than 20 feet high.	14.39	28%
Palustrine Open Water Wetland (POW), Aquatic Bed Wetland (PAB), and Unconsolidated Bottom Wetland (PUB)	POW: Permanent or intermittent shallow water bodies; PAB: Greater than 30% vegetation cover, growing on or below the water's surface for most of the growing season most years; PUB: At least 25% cover of particles smaller than stones, and a vegetative cover less than 30%.	0.85	1%
Total		52.22	100%

Table 5.2. USFWS Cowardin Classification of Mill City Wetlands

Wetland Code	PEM	PSS	PFO	POW/PAB/PUB	Total Acreage
MC-1	1.50	0.68	0	0	2.18
MC-2	17.74	2.19	4.18	0	24.11
MC-3	0.71	0.18	0.78	0	1.67
MC-4	0.20	0	0.93	0.15	1.28
MC-5	0.59	0		0.30	0.89
MC-6	1.27	0	0.91	0	2.18
MC-7	0.48	0.12	0	0	0.61
MC-8	0	0	0	0.17	0.17
MC-9	2.65	8.25	7.42	0	18.32
MC-10	0	0	0	0.23	0.23
MC-11	0.41	0	0	0	0.41
MC-12	0	0	0.17	0	0.17
Total	25.55	11.43	14.39	0.85	52.22

5.3 NWI Verification

Confirmed NWI-mapped wetlands in Mill City consist of the following:

- PUBFh pond in MC-5 (offsite)
- Two PUBFx log ponds in mill site (offsite; smaller than mapped on NWI)
- Two PSSC wetlands below Ordinary High Water of the North Santiam River (no sample plots)
- PEMA wetland in MC-9 (offsite)
- all NWI-mapped streams

Four NWI-mapped wetlands were not confirmed and were found to be absent:

- PSSC wetland south of MC-4 (offsite but visible)
- PUBFh pond north of Lyons-Mill City Drive north of mill site (offsite, no sight distance, no aerial photograph signature)
- PEMC wetland and PUSC_x pond east of MC-9 documented at sample plot MCP-2 (ponds are present immediately south of study area)

6 OREGON FRESHWATER WETLAND ASSESSMENT RESULTS

6.1 Wetland Quality Assessment

The Oregon Freshwater Wetland Assessment Method (OFWAM) provides qualitative information on the relative value of wetlands. Categories of “H” (high), “M” (medium) and “L” (low) were assigned to the assessment criteria to easily compare the results. “H” was assigned to wetlands receiving the highest function or condition result (e.g., intact, diverse), “L” was assigned to the wetlands receiving the lowest result (lost or not present), and “M” was assigned to the results which do not fit the other criteria (impacted or degraded, potential). This system is summarized in Table 6.1.

Table 6.1. Key to OFWAM Ranking

Wildlife Habitat	H. Wetland provides diverse wildlife habitat M. Wetland provides habitat for some wildlife species L. Wetland does not provide wildlife habitat
Fish Habitat	H. Wetland’s fish habitat function is intact M. Wetland’s fish habitat function is impacted or degraded L. Wetland’s fish habitat function is lost or not present
Water Quality	H. Wetland’s water-quality function is intact M. Wetland’s water-quality function is impacted or degraded L. Wetland’s water quality function is lost or not present
Hydrologic Control	H. Wetland’s hydrologic control function is intact M. Wetland’s hydrologic control function is impacted or degraded L. Wetland’s hydrologic control function is lost or not present

Modified from *Pacific Habitat Services, Inc. 2010*

6.2 OFWAM Results

OFWAM results for each wetland are shown in Table 6.2. There are no known Wetlands of Special Interest for Protection within Mill City. Wetland MC-6 is located near Snake Creek and has the potential for containing threatened Chinook salmon and steelhead. OFWAM questions regarding Wetlands of Special Interest for Protection are included in Appendix E.

Table 6.2. OFWAM Ranking Results for the Mill City LWI

Wetland Code	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Size (acres)
MC-1	H	M	M	M	2.18
MC-2	H	M	M	M	24.11
MC-3	M	NA	M	M	1.67
MC-4	H	M	M	M	1.28
MC-5	H	M	M	M	0.89
MC-6	H	H	M	M	2.18
MC-7	M	M	M	L	0.61
MC-8	-	-	-	-	0.17
MC-9	H	M	M	M	18.32
MC-10	-	-	-	-	0.23
MC-11	M	M	M	L	0.41
MC-12	-	-	-	-	0.17

NA means not applicable and indicates that no streams or ponds are associated with the wetland.

MC-1 and MC-5 were grouped together for OFWAM ranking. Details of OFWAM function questions and rationale are included in Appendix G. OFWAM wetland characterization questions, function answer sheets, and function and condition summary are included in Appendix H.

7 SIGNIFICANT WETLANDS DETERMINATION

7.1 Goal 5 Locally Significant Wetlands Criteria

Wetlands are determined to be Locally Significant Wetlands (LSWs) based on Oregon Administrative Rules for Identifying Significant Wetlands (OAR 141-86-300 through 141-86-350). If the assessed wetland unit provides “diverse” wildlife habitat, “intact” fish habitat, “intact” water quality function, or “intact” hydrologic control function, then the wetland is locally significant. Table 7.1 provides the criteria for determining whether a wetland is Locally Significant. All wetlands, even those not determined to be Locally Significant, may still be regulated by the DSL and the U.S. Army Corps of Engineers.

Wetlands determined to be Locally Significant are listed in Table 7.2. Refer to Appendix I for details of each wetland.

Table 7.1. Criteria for Determining Goal 5 Locally Significant Wetlands

<p>Exclusions: A wetland cannot be designated as significant if the answer to any of the criteria below is "Yes".</p>
<p>1 Is this wetland artificially created entirely from upland and:</p> <ul style="list-style-type: none"> a. created for the purpose of controlling, storing, or maintaining storm water b. is used for active surface mining or as a log pond c. is a ditch without a free and open connection to natural waters of the state and does not contain food or game fish d. is less than 1 acre and created unintentionally from irrigation or construction e. created for the purpose of wastewater treatment, cranberry production, farm watering, sediment settling, cooling industrial water, or a golf hazard <p>2 Is the wetland or portion of the wetland contaminated by hazardous substances, materials or wastes as per the conditions of ORS 141-86-350 1(b)</p>
<p>Mandatory Locally Significant Wetland Criteria: A wetland is locally significant if "Yes" is the answer to any of the criteria below.</p>
<p>1 Does the wetland provide <i>diverse wildlife habitat</i>?</p> <p>2 Is the wetland's <i>fish habitat function intact</i>?</p> <p>3 Is the wetland's <i>water quality function intact</i>?</p> <p>4 Is the wetland's <i>hydrologic control function intact</i>?</p> <p>5 Is the wetland less than 1/4 mile from a water body listed by DEQ as a water quality limited water body (303(d) list) <u>and</u> is the wetland's <i>water quality function intact, or impacted or degraded</i>?</p> <p>6 Does the wetland contain a rare plant community?</p> <p>7 Is the wetland inhabited by any species listed federally as threatened or endangered, or state listed as sensitive, threatened or endangered?</p> <p>8 Does the wetland have a direct surface water connection to a stream segment mapped by ODFW as habitat for indigenous anadromous salmonids <u>and</u> is the wetland's <i>fish habitat function intact, or impacted or degraded</i>?</p>
<p>Optional Locally Significant Wetland Criteria: Local governments may identify a wetland as significant if "Yes" is the answer to the criteria below</p>
<p>1 Does the wetland represent a locally unique native plant community <u>and</u> provides <i>diverse wildlife habitat or habitat for some species</i> <u>or</u> has a <i>intact, or impacted or degraded fish habitat function</i> <u>or</u> has a <i>intact, or impacted or degraded water quality function</i> <u>or</u> has a <i>intact, or impacted or degraded hydrologic control function</i>.</p> <p>2 Is the wetland publicly owned and used by a school or organization <u>and</u> does the wetland provide <i>educational uses</i>?</p>

Pacific Habitat Services, Inc. 2010

7.2 Significance Determination

Eight wetlands (MC-1, MC-2, MC-4, MC-5, MC-6, MC-7, MC-9, and MC-11) were determined to be locally significant using the required criteria. Two of these wetlands (MC-7 and MC-11) did not meet the first tier criteria of high-functioning Wildlife Habitat, intact Fish Habitat, intact Water Quality, or intact Hydrologic Control functions. These two wetlands were determined to

be Locally Significant due to their close proximity to the North Santiam River which provides Essential Salmonid Habitat for the threatened steelhead, Chinook salmon, and bull trout coupled with their impacted Fish Habitat function. Wetlands MC-1 and MC-5 were combined for assessment due to their connection and similar characteristics. Three wetlands less than half an acre were not assessed. Water bodies excluded include the two log ponds located in the west end of the study area.

Table 7.2. Locally Significant Wetland Determination

Wetland Code	Locally Significant Wetland?	Reason
MC-1	Yes	Provides Diverse Wildlife Habitat
MC-2	Yes	Provides Diverse Wildlife Habitat
MC-3	No	Does not meet criteria
MC-4	Yes	Provides Diverse Wildlife Habitat
MC-5	Yes	Provides Diverse Wildlife Habitat
MC-6	Yes	Provides Diverse Wildlife Habitat and Intact Fish Habitat
MC-7	Yes	Impacted Fish Habitat with connection to the North Santiam River
MC-8	No	Too small
MC-9	Yes	Provides Diverse Wildlife Habitat
MC-10	No	Too small
MC-11	Yes	Impacted Fish Habitat with connection to the North Santiam River
MC-12	No	Too small

8 CONCLUSION

Twelve wetland units were documented in this study totaling 52.22 acres. Wetlands were assessed using OFWAM, and eight of the twelve wetlands were determined to be Locally Significant. Inventory and assessment forms in the appendices E-I provide specific wetland data. Local wetland inventory maps are found in Appendix K.

Once the inventory is approved by DSL, then it can be incorporated into the State Wetlands Inventory (and posted on the Oregon Explorer Website). It can then be used in lieu of the NWI for wetland land use notification purposes, and by the city for Goal 5 and/or Goal 6 purposes and for other statewide planning goals.

Staff qualifications are included in Appendix J.

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Removal/Fill: http://arcweb.sos.state.or.us/rules/OARS_100/OAR_141/141_085.html
Goal 5: http://arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_023.html
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Useful Websites for Wetland Assessment:

Oregon Explorer: <http://oregonexplorer.info/wetlands/orwap/>

DEQ: <http://deq12.deq.state.or.us/lasar2/data.aspx?dt=0&mw=889&mh=432>

DEQ: <http://www.deq.state.or.us/WQ/assessment/docs/rpt98.pdf>

ESH Maps: <http://www.oregon.gov/DSL/PERMITS/esshabitat.shtml> and

http://www.oregon.gov/DSL/PERMITS/counties_ess.shtml

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APPENDIX A
Oregon LWI Administrative Rules

The Oregon Administrative Rules contain OARs filed through January 15, 2010

DEPARTMENT OF STATE LANDS

DIVISION 86

Local Wetlands Inventory (LWI) Standards and Guidelines

141-086-0180

Purpose

Pursuant to ORS 196.674 pertaining to the Statewide Wetlands Inventory (SWI), these rules establish a system for uniform wetland identification and comprehensive mapping. These rules also establish wetlands inventory standards for cities or counties developing a wetland conservation plan (WCP) pursuant to ORS 196.678. A Local Wetlands Inventory (LWI) is developed for all or a portion of a city or county according to the standards and guidelines contained in these rules (OAR 141-086-0180 through 141-086-0240).

Stat. Auth.: ORS 196.674 – 196.681 & 196.692

Stats. Implemented: ORS 196.668 – 196.692

Hist.: LB 11-1991, f. & cert. ef. 11-15-91; LB 9-1994, f. & cert. ef. 12-15-94; DSL 2-2001, f. & cert. ef. 2-26-01

141-086-0185

Applicability

- (1) Once approved by the Department of State Lands (Department), the LWI must be used in place of the National Wetlands Inventory (NWI) and is incorporated into the SWI.
- (2) The approved LWI must be used by cities and counties in lieu of the NWI for notifying the Department of land use applications affecting mapped wetlands and other waters (ORS 215.418 and ORS 227.350).
- (3) An LWI fulfills the wetlands inventory requirements for Goal 5 and Goal 17 (OAR 660-015 and 660-023). An LWI that meets the additional WCP requirements specified in these rules must be used as the wetlands inventory basis for a WCP.
- (4) A wetland function and condition assessment of mapped wetlands must be conducted as part of the LWI using the *Oregon Freshwater Wetland Assessment Methodology (OFWAM)* published by the Department in 1996. An equivalent functional assessment methodology may be used or adjustments may be made to OFWAM upon written approval by the Director. The assessment results are used to determine the relative quality (functions, values, and condition) of the mapped wetlands and to designate significant wetlands (OAR 141-086-0300 through 141-086-0350) as required for Goal 5, or to assess wetland functions and values for a WCP.

(5) An LWI is used by the Department, other agencies and the public to help determine if wetlands or other waters are present on particular land parcels.

(6) An LWI provides information for planning purposes on the location of potentially regulated wetlands and other waters such as lakes and streams, but is not of sufficient detail for permitting purposes under the state Removal-Fill Law (ORS 196.800 through 196.990). Smaller wetlands may not be mapped, and wetlands may be missed due to lack of onsite access, tree canopy cover and other constraints. A wetland delineation or determination report may be needed for parcels without LWI-mapped wetlands. A Department-approved wetland delineation report for wetlands identified in an LWI is usually needed prior to site development.

(7) All wetlands inventory procedures and products are subject to review and approval by the Department before the products:

(a) Are incorporated into the SWI;

(b) Can be used in lieu of the NWI for Wetland Land Use Notification purposes; or

(c) Can be used by a city or county for Goal 5, Goal 17 or WCP purposes.

[Publications: Publications referenced are available from the agency.]

Stat. Auth.: ORS 196.674 - 196.681 & 196.692

Stats. Implemented: ORS 196.668 - 196.692

Hist.: LB 11-1991, f. & cert. ef. 11-15-91; LB 9-1994, f. & cert. ef. 12-15-94, Renumbered from 141-086-0190(1) & (4); DSL 2-2001, f. & cert. ef. 2-26-01; DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

141-086-0200

Definitions

(1) "Cowardin class or subclass" means the wetland classification according to the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States*, Cowardin et al., 1979.

(2) "Director" means the Director of the Oregon Department of State Lands or designee.

(3) "Department" means the Oregon Department of State Lands.

(4) "Georeferenced" means linking geographic data to known coordinates on the surface of the earth.

(5) "GIS" or "Geographic Information System" means a system of hardware, software and data storage that allows for the analysis and display of information that has been geographically referenced.

- (6) "HGM class and subclass" means the hydrogeomorphic classification of the wetland based upon its landscape position and hydrology characteristics, according to the HGM classification developed by the Department.
- (7) "Indicator" means the soil, vegetation, and hydrology characteristics or other field evidence that indicate that wetlands are present.
- (8) "Inventory" means a systematic survey of an area to identify, classify and map the approximate boundaries of wetlands, and includes the supporting documentation required by these rules.
- (9) "Mapping" means representing the identified wetlands and their approximate boundaries on a map.
- (10) "Offsite Determination" means a wetland determination conducted without field verification using NWI maps, soils maps, and aerial photographs.
- (11) "Other Waters" means waters of the state other than wetlands, such as streams and non-vegetated ponds.
- (12) "Probable Wetland" or "PW" means an area noted during the course of LWI development that appears to meet wetland criteria but is less than one half of an acre in size or is small and of undetermined size, and is mapped as a point rather than a polygon on the LWI maps.
- (13) "Sample Plot" means a specific area on the ground where soils, vegetation and hydrology data are recorded on a field data form per OAR 141-90-0035(14) in order to make a wetland determination.
- (14) "Statewide Wetlands Inventory" or "SWI" means an inventory that contains at minimum the location, type (e.g. classification) and approximate extent of wetlands in the State of Oregon. This inventory is continually revised as additional information is received or obtained by the Department.
- (15) "Stream" means a watercourse created by natural processes, or one that would be in a natural state if it were not for human-caused alterations. Stream includes a channelized or relocated stream.
- (16) "Visually confirm" or "visual confirmation" means to walk over and/or visually check an area to make a wetland determination and map wetlands and other waters.
- (17) "Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (ORS 196.800(16)).
- (18) "Wetland Delineation Report" means a written document that contains the methods, data, conclusions and maps used to determine if wetlands and/or other waters of the state are present

on a land parcel and, if so, describes and maps their location and geographic extent. A wetland determination report documenting wetland presence or absence is included within this definition (OAR 141-090 et seq.).

(19) "Wetland Determination" means a decision that a site may, does, is unlikely to, or does not contain wetlands. A determination does not include the precise location or boundaries of any wetlands determined to be present (OAR 141-090 et seq.).

(20) "Wetland Mosaic" means a complex of several wetlands that are interspersed between areas of non-wetland each less than one half of an acre in size, or less than one tenth of an acre in size for a WCP, making them difficult to map.

Stat. Auth.: ORS 196.674 - 196.681 & 196.692

Stats. Implemented: ORS 196.668 - 196.692

Hist.: LB 11-1991, f. & cert. ef. 11-15-91; LB 9-1994, f. & cert. ef. 12-15-94; DSL 2-2001, f. & cert. ef. 2-26-01; DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

141-086-0210

Inventory Development Process and Standards

(1) Wetland determinations conducted for the purpose of developing the LWI must be conducted according to the criteria, methodologies and guidance currently accepted by the Department (OAR 141-090 et seq.).

(2) Sources of inventory information must include:

(a) U.S.D.A. Natural Resources Conservation Service county soil survey and county list of hydric soils and soils with hydric inclusions, or other available soil surveys;

(b) NWI maps;

(c) USGS topographic maps;

(d) Federal Emergency Management Act floodplain maps, where available;

(e) Other available local wetlands inventories or wildlife habitat inventories that include wetlands;

(f) Department wetland determination/delineation files; and

(g) High resolution (1 meter or finer) color and color infrared (where available) aerial photos taken within five years of inventory initiation. The minimum photo scale must be 1 inch = 200 feet unless another scale is approved by the Department.

(3) Sources of inventory information may include but are not limited to:

- (a) LIDAR (Light Detection and Ranging) topographic data;
 - (b) Irrigation drainage district maps;
 - (c) Local knowledge of area (e.g., residents);
 - (d) Oregon State University Institute for Natural Resources Oregon Explorer data;
 - (e) Department permit files; and
 - (f) Resource agencies, including the Oregon Department of Fish and Wildlife and U.S. Fish and Wildlife Service.
- (4) Before beginning fieldwork, prepare a field map using an aerial photograph and include the approximate location of:
- (a) Any wetlands, deepwater habitats, and streams from the NWI;
 - (b) Any wetlands from the Department's wetland determination/delineation files or from other inventories;
 - (c) Hydric soils and soils with hydric inclusions (each coded separately);
 - (d) Wetlands or potential wetlands identified on aerial photos;
 - (e) Sites to visually confirm based on other leads; and
 - (f) Properties where access was granted.
- (5) Aerial photo interpretation must be tested early in the inventory process by interpreting several wetland types, ground truthing the interpretations, and then completing the aerial photo interpretations.
- (6) The local government must be responsible for requesting property access permission from landowners in the study area for parcels identified by inventory staff and/or the Department as possibly containing wetlands.
- (7) All potential wetlands that are not assessed with a sample plot and other waters identified through the process described in OAR 141-086-0210(1) through (4) must be visually confirmed to the extent practicable.
- (8) Where property access is granted, sample plot data must be provided according to the following minimum standards:
- (a) Verify each wetland with at least one sample plot that best characterizes the wetland;

(b) Verify with at least one sample plot each potential wetland where land use activities such as ditching, water diversion, or agricultural practices are likely to have significantly altered site conditions, making observations from a distance or a site walk-over unreliable; and

(c) Verify with at least one-sample plot potential wetlands with unreliable indicators (e.g., one dominant plant that grows in both wetlands and non-wetlands, such as *Phalaris arundinacea*).

(9) If the LWI will be used for a WCP, in addition to the requirements in OAR 141-086-0210(7) and (8), a minimum of one sample plot must be provided that best characterizes each dominant wetland plant community.

(10) If the landowner denies access permission and if visual confirmation from an adjacent property or road is not possible, employ off-site wetland determination methods.

(11) All wetlands greater than or equal to one half of an acre and all wetlands identified in a Department-approved wetland delineation report must be identified and mapped as polygons. Wetlands that are less than one half of an acre may be mapped as polygons or as probable wetlands. Probable wetlands must be represented as points on the appropriate parcel(s) and should be labeled as "PW" on the maps. No further characterization or assessment is required for probable wetlands in the LWI. Probable wetlands will trigger cities and counties to notify the Department of proposed land use activities affecting mapped wetlands and other waters (ORS 215.418 and 227.350). For a WCP, all wetlands one-tenth acre and larger shall be identified and mapped as polygons.

(12) The aim of the LWI is to map the location of wetlands at an accuracy of approximately 5 meters (16.4 feet). However, the actual accuracy may be less for some wetlands such as seasonal or forested wetlands that could not be visually confirmed.

(13) Each wetland must be assigned a unique identification code.

(14) All previously delineated wetlands from the Department's files must be field-verified, if possible, to determine if wetlands are still present and are approximately the same size and configuration as when delineated.

(15) All identified wetlands must be classified:

(a) To the class level of Cowardin (and to subclass for scrub-shrub and forested classes) and must include water regime and special modifiers (e.g., "farmed" or "diked/impounded"); and

(b) By dominant HGM class and subclass.

(16) When a wetland contains more than one adjoining Cowardin classification, different classes or subclasses greater than 0.25 acres in size must be mapped and labeled as separate polygons.

(17) Artificially created wetlands or other waters (such as irrigation canals and drains, industrial ponds, log ponds, golf course features, and storm water detention ponds that are greater than one

half of an acre in size) must be included in the inventory regardless of their jurisdictional status, and their original purpose must be labeled on the inventory maps.

(18) Where a wetland mosaic occurs, the site must be labeled as a wetland/upland mosaic on all inventory maps and so described on the wetland summary sheet.

(19) Streams and other waters must be mapped, but no further documentation such as wetland summary sheets or OFWAM assessment is required. If an existing stream geospatial dataset is used, it may be necessary to adjust the layer to align with riparian or other linear wetlands.

(20) Using OFWAM, each wetland in its entirety must be assessed for all four ecological functions: water quality, hydrologic control, wildlife habitat and fish habitat. Any wetlands that may qualify as a Locally Significant Wetland due to education or recreation use must also be evaluated for those social functions (values) in OFWAM. The remaining functions and conditions in OFWAM do not need to be applied to any of the wetland assessment units. Contiguous wetlands or those in close proximity and assigned different codes may be grouped into a single OFWAM assessment unit based upon the guidance in OFWAM and/or in consultation with the Department.

[Publications: Publications referenced are available from the agency.]

Stat. Auth.: ORS 196.674 - 196.681 & 196.692

Stats. Implemented: ORS 196.668 - 196.692

Hist.: LB 11-1991, f. & cert. ef. 11-15-91; LB 9-1994, f. & cert. ef. 12-15-94; DSL 2-2001, f. & cert. ef. 2-26-01; DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

141-086-0220

LWI Reports

(1) A report that meets the requirements in OAR 141-086-0220 (2) and (3) must be developed and submitted to the Department for approval. A minimum of two sets of the final Department-approved LWI report in both paper and electronic format (.pdf file format) must be prepared; one set must be provided to the Department for inclusion in the SWI and the other must be provided to the local government.

(2) The report must document the inventory and mapping processes and results, and include the following information:

(a) A general description of the study area including a description of the landscape setting;

(b) A description of the wetland inventory process including the public involvement process; the inventory methods including the date(s) and scale(s) of source maps and aerial photos used; the offsite and onsite wetland determination procedures including procedures used for visual confirmation and probable wetland identification; and all mapping and map transfer procedures used;

(c) A summary of the inventory results including the total acreage of the study area and the total number and acreage of wetlands identified within the study area, excluding the acreage of deepwater habitat and artificially created wetlands such as detention ponds or aggregate extraction ponds;

(d) A discussion of the OFWAM assessment process (e.g. how assessment units were defined) and the results;

(e) A summary of Locally Significant Wetlands, if identified (may be in table format); and

(f) All figures, with the study area clearly outlined.

(3) Appendices must include:

(a) Sample plot data on standard field data forms per OAR 141-090 et seq.

(b) A summary sheet for each wetland that must at a minimum include:

(A) The unique wetland code;

(B) Street address or equivalent location description;

(C) Township, Range, Section, Quarter Quarter Section and tax lot(s) that contain the mapped wetland;

(D) Approximate wetland size (in acres);

(E) Cowardin classification(s);

(F) HGM classification(s);

(G) Mapped soil unit(s);

(H) Watershed boundaries at the 6th field Hydrologic Unit Code scale as defined by the US Geological Survey or finer;

(I) Sample plot numbers, if any;

(J) Department wetland determination or delineation file numbers, where applicable;

(K) Scientific and common names of dominant plant species;

(L) Primary hydrology sources;

(M) Sampling or visual confirmation date(s) and method;

(N) Locally Significant Wetland determination, if made; and

(O) Comments that describe the wetland, including topographic position, land uses and significant alterations (including agricultural).

(c) OFWAM assessment results for each wetland assessment unit that must include:

(A) Wetlands of Special Interest for Protection (OFWAM, Chapter Five);

(B) Wetland Characterization results (OFWAM, Appendix B);

(C) Assessment results represented in table format;

(D) Answer sheets for all wetland assessment questions (OFWAM, Appendix C);

(E) Function and condition summary sheets for fish habitat, wildlife habitat, water quality, hydrologic control and, if applicable, education and recreation (OFWAM, Appendix C); and

(F) Watershed summary sheet (OFWAM, Appendix C).

(d) Technical staff members and qualifications.

[Publications: Publications referenced are available from the agency.]

Stat. Auth.: ORS 196.674 - 196.681 & 196.692

Stats. Implemented: ORS 196.668 - 196.692

Hist.: LB 11-1991, f. & cert. ef. 11-15-91; LB 9-1994, f. & cert. ef. 12-15-94; DSL 2-2001, f. & cert. ef. 2-26-01; DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

141-086-0222

Paper Map Standards

(1) Maps that meet the requirements in OAR 141-086-0222 (2) through (5) must be developed and submitted to the Department for approval. A minimum of two sets of the final Department-approved LWI maps in both paper and electronic format (.pdf file) must be prepared; one set must be provided to the Department for inclusion in the SWI and the other must be provided to the local government.

(2) If the study area is covered by more than one wetland map, a single, smaller scale reference map of the complete study area is required. The reference map shall be indexed to the individual, large-scale maps and show, at a minimum, the Public Land Survey System grid, the location and code of all identified wetlands, streams, the study area boundary, and major, named streets.

(3) Wetland maps must include:

(a) Map name;

(b) Scale bar;

- (c) Geographic reference to the Public Land Survey System;
 - (d) Roads, with major roads named, and railroads;
 - (e) Streams and stream names;
 - (f) Artificially created wetlands and other waters labeled with their purpose (e.g. storm water pond);
 - (g) Tax lot lines;
 - (h) Watershed boundaries at the 6th field Hydrologic Unit Code scale as defined by the US Geological Survey or finer;
 - (i) Legend that explains all map symbols, line work, and patterns;
 - (j) Map date (month and year final map prepared);
 - (k) All wetlands, clearly and accurately drawn and clearly identified by a unique wetland code that relates each wetland to field data forms, tables, databases, wetland summary sheets, and OFWAM summary forms;
 - (l) Cowardin classification(s) of each wetland per 141-086-0210(15a & 16);
 - (m) Disclaimer that reads: "Information shown on this map is for planning purposes, represents the conditions that exist at the map date, and is subject to change. The location and extent of wetlands and other waters is approximate. There may be unmapped wetlands and other waters present that are subject to regulation. A current Oregon Department of State Lands-approved wetland delineation is required for state removal-fill permits. You are advised to contact the Department of State Lands and the U.S. Army Corps of Engineers with any regulatory questions."
 - (n) Numbered sample plots; and
 - (o) Study area boundary as defined by the local government.
- (4) Minimum map scale must be 1 inch = 200 feet (1:2,400).

Stat. Auth.: ORS 196.674 - 196.681 & 196.692
Stats. Implemented: ORS 196.668 - 196.692
Hist.: DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

141-086-0225

Digital Data Standards

(1) A minimum of two sets of the final Department-approved LWI geospatial datasets must be prepared; one set must be provided to the Department for inclusion in the SWI and the other must be provided to the local government.

(2) A georeferenced ArcGIS compatible dataset with attribute tables and metadata must be developed for each of the following:

(a) Wetland polygons with a unique wetland identification label, Cowardin classification code(s) and modifiers, HGM classification, approximate wetland size, Locally Significant Wetland significance determination (if made), whether it was visually confirmed, and the Department's wetland delineation report file number, if any.

(b) Probable wetland points with PW label;

(c) Streams with unique identification labels and, where available, names;

(d) Other natural bodies of water with names;

(e) Artificially created wetlands and water features (such as irrigation canals and ditches, industrial ponds, log ponds, golf course features, and storm water detention ponds) uniquely identified and purpose of artificially-created feature, if known;

(f) Watershed boundaries (6th order Hydrologic Unit Code scale or finer);

(g) Study area boundary;

(h) Tax lot lines and numbers;

(i) Sample plot dataset with unique identification labels that correspond to the field data form; and

(j) Major streets with name labels.

(3) All georeferenced data sets must be projected using the Oregon Geographic Information Council-endorsed state standard: Oregon Lambert conformal conic (Datum: NAD 83; Units: International feet: 3.28084; Spheroid: GRS1980).

(4) Metadata must be completed for each layer, conform to the current Oregon Geographic Information Council Metadata Standard, and must include a disclaimer as described in OAR 141-086-0222(3m).

Stat. Auth.: ORS 273.045

Stats. Implemented: ORS 196.668 - 196.686 & 196.692

Hist.: DSL 2-2001, f. & cert. ef. 2-26-01; DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

141-086-0228

Review and Approval Process

(1) A draft of all the LWI products required in OAR 141-086-0210 through – 0225 of these rules must be provided to the Department (if the inventory was not developed by the Department) and the local government(s) for review.

(2) The local government must provide opportunity for public review of and comment on the draft LWI products.

(3) Public and local government comments on draft LWI products must be provided to the Department. The Department will request in writing from the party responsible for preparing the LWI any revisions or additions required in order for the LWI to be approved.

(4) The Department will review final products to ensure that all changes requested by the Department have been adequately addressed.

(5) If the final LWI products meet the requirements in these rules, the Department will send a letter of approval to the local government.

Stat. Auth.: ORS 273.045

Stats. Implemented: ORS 196.668 - 196.686 & 196.692

Hist.: DSL 2-2001, f. & cert. ef. 2-26-01; DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

141-086-0230

Revisions

(1) A city or county may elect to or may be required by the Department of Land Conservation and Development (DLCDD) to revise their LWI. An LWI revision consists of either expanding the study area of an existing LWI or incorporating new wetland location and information into an existing LWI study area. The provisions in subsections (a) through (d) must be followed when an LWI is being revised.

(a) All Urban Growth Boundary expansion areas or other areas not included in the original LWI study area must be inventoried according to the requirements in these rules. If the original LWI area is not updated at the same time, it may still be necessary to update the LWI area adjacent to the new LWI area in order to align wetlands that are continuous between the two areas.

(b) When an LWI is being updated, newly identified wetlands or wetland boundary changes equal to or greater than one half of an acre must be identified, mapped and assessed using OFWAM.

(c) Sources of information for review of the previous study area to update the LWI must at a minimum include:

(A) Wetland delineation reports approved by the Department or map errors verified by the Department after the date of the approved LWI;

(B) Aerial photos approved by the Department, taken within five years of inventory revision initiation; and

(C) A field reconnaissance of the study area.

(d) Wetlands not previously mapped on the LWI must be verified by establishing a sample plot or by visual confirmation as required in OAR 141-086-0210(7) and (8) of this rule; previously mapped wetlands no longer apparent on aerial photos must also be verified with a sample plot or visually confirmed as necessary to confirm their absence.

(2) A draft of the revised LWI products as required in OAR 141-086-0228 (1) through (5) must be provided to the Department and is subject to Department review and approval.

(3) If the LWI was used as the basis for an approved WCP, the local jurisdiction must instead:

(a) Provide to the Department, as part of the annual report (OAR 141-086-0035), a revised map and report indicating wetlands filled and wetlands restored, enhanced or created for mitigation; and

(b) Every five years, in conjunction with the Department's five year WCP review (ORS 196.684(6)), conduct an LWI review and incorporate new information, as required in OAR 141-086-0230(1)(b) through (1)(d).

(4) Newly-identified wetlands as identified by a Department-approved wetland delineation report or a removal-fill permit must not be added to the Department-approved Local Wetlands Inventory map without following the procedures outlined by OAR 141-086-0230(1)(a) through (d).

(5) Refinements to the location, extent, and/or absence of wetlands mapped on the LWI, as identified by a Department-approved wetland delineation or a Department wetland determination report, may be made at any time through an administrative process, by annotating the approved LWI or by creating a separate geospatial dataset containing the boundary adjustments, preserving the approved LWI mapping.

Stat. Auth.: ORS 196.674 - 196.681 & 196.692

Stats. Implemented: ORS 196.668 - 196.692

Hist.: LB 11-1991, f. & cert. ef. 11-15-91; LB 9-1994, f. & cert. ef. 12-15-94; DSL 2-2001, f. & cert. ef. 2-26-01; DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

141-086-0240

Landowner Notification

(1) When the LWI is approved by the Department, the local jurisdiction must notify by mail within one hundred twenty (120) calendar days all landowners of record whose parcel contains or abuts a mapped wetland or probable wetland.

(2) The local jurisdiction must provide one copy of the landowner notification letter to the Department.

Stat. Auth.: ORS 196.674 - 196.681 & 196.692

Stats. Implemented: ORS 196.668 - 196.692

Hist.: LB 11-1991, f. & cert. ef. 11-15-91; LB 9-1994, f. & cert. ef. 12-15-94; DSL 2-2001, f. & cert. ef. 2-26-01; DSL 11-2008, f. 12-12-08, cert. ef. 1-1-09

Identifying Significant Wetlands

141-086-0300

Purpose

[ORS 197.279](#) (3) directs the Division of State Lands to establish these criteria and procedures for the identification of significant wetlands under Statewide Planning Goal 5. Local governments will use these technical standards to complete their planning responsibilities for wetlands, which are established by the Land Conservation and Development Commission (OAR 660-023-0100).

Stat. Auth.: [ORS 273.360](#)

Stats. Implemented: [ORS 197.299](#)

Hist.: LB 7-1996, f. 12-13-96, cert. ef. 1-1-97

141-086-0310

Policy

To protect the state's wetland resources, the functions and services they provide, and all interests, it is important that clear and consistent criteria be used to identify significant wetlands for planning purposes.

Stat. Auth.: : [ORS 273.360](#)

Stats. Implemented: [ORS 197.299](#)

Hist.: LB 7-1996, f. 12-13-96, cert. ef. 1-1-97

141-086-0320

Uses and Applicability

(1) These rules provide standard criteria for local governments to use to meet their obligations for freshwater wetland planning as set forth by the Land Conservation and Development Commission (LCDC) in Goal 5. These rules do not address planning requirements for estuarine wetlands, which are covered under Statewide Planning Goal 16.

(2) Local governments shall apply the criteria for identifying locally significant wetlands (LSW). As specified in LCDC's Goal 5 rules (OAR 660-023-0100), the use of these criteria is required within urban growth boundaries (UGBs) and urban unincorporated communities (UUCs). The

Goal 5 rules also authorize an option for counties to conduct detailed wetland planning in areas outside of UGBs and UUCs. Should a county choose to do so, the same rules and procedures as for UGBs and UUCs shall apply, including these criteria for significant wetlands.

(3) As provided by LCDC's Goal 5 rules (OAR Chapter 660, Division 23), local government planning and zoning responsibilities include the determination, designation, and protection of significant wetlands. A community that has identified significant wetlands prior to this rule should proceed under the provisions of OAR 660-023-0250.

Stat. Auth.: [ORS 273.360](#)

Stats. Implemented: [ORS 197.299](#)

Hist.: LB 7-1996, f. 12-13-96, cert. ef. 1-1-97

141-086-0330

Definitions

(1) "Director" means the Director of the Division of State Lands or the Director's designee.

(2) "Division" means the Division of State Lands.

(3) "Indigenous Anadromous Salmonids" are chum, sockeye, Chinook and Coho salmon, and steelhead and cutthroat trout, that are members of the family Salmonidae and are listed as sensitive, threatened or endangered by a state or federal authority.

(4) "Inhabited by" means that a plant or animal species uses the site for rearing, feeding, or breeding or as a migration or dispersal corridor. This does not include incidental use of the site by an animal species.

(5) "Locally Significant Wetlands" or "LSW" are those wetland sites that provide functions or exhibit characteristics that are pertinent to community planning decisions made at a local scale, for example within a UGB. These wetland sites shall be identified by local governments according to the criteria and procedures in sections 141-086-0340 and 141-086-0350.

(6) "Native Plant Community" is used here to indicate a recognized assemblage of plant species indigenous to Oregon. All such wetland plant communities are listed in the most recent version of Classification and Catalog of Native Wetland Plant Communities in Oregon (Oregon Natural Heritage Program).

(7) "Rare Plant Community" is defined as relictual, uncommon or unique in Oregon, determined by number of occurrences and threats following national heritage program criteria (i.e., rarity ranking of G1-G3 or S1-S3). The most concise listing of wetland plant communities in Oregon that meet this standard for rarity is found in Appendix G of the Oregon Freshwater Wetland Assessment Methodology (Oregon Division of State Lands, 1996). The rarity rank of all wetland plant communities is also listed in the most recent version of Classification and Catalog of Native Wetland Plant Communities in Oregon (Oregon Natural Heritage Program).

(8) "Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Stat. Auth.: [ORS 273.360](#)

Stats. Implemented: [ORS 197.299](#)

Hist.: LB 7-1996, f. 12-13-96, cert. ef. 1-1-97

141-086-0340

Procedures for Identifying Locally Significant Wetlands

(1) LSW criteria are applied by the local government.

(2) The following base information is required prior to applying the LSW criteria:

(a) An approved Local Wetlands Inventory (OAR 141-086-0110 through 141-086-0240) covering the plan area; and

(b) A function and quality assessment of all inventoried wetlands using the Oregon Freshwater Wetland Assessment Methodology (OFWAM; Oregon Division of State Lands, 1996). Functional assessment descriptors from OFWAM appear in quotation marks in section 146-086-0350 of these rules. An equivalent functional assessment methodology may be used, or adjustments may be made, upon written approval by the Director. If a different assessment methodology is approved, then equivalent terminology will be set out in the Division's letter of approval.

Stat. Auth.: [ORS 273.360](#)

Stats. Implemented: [ORS 197.299](#)

Hist.: LB 7-1996, f. 12-13-96, cert. ef. 1-1-97

141-086-0350

Locally Significant Wetland Criteria

(1) Exclusions. Regardless of their standing in relation to the criteria in OAR 141-086-0350(2) or (3) of these rules, wetlands shall not be designated as locally significant if they fall within any one of the following categories:

(a) Wetlands artificially created entirely from upland that are:

(A) Created for the purpose of controlling, storing, or maintaining stormwater; or

(B) Active surface mining or active log ponds; or

(C) Ditches without a free and open connection to natural waters of the state (as defined in OAR 141-085-0010(9)) and which do not contain food or game fish (as defined in [ORS 496.009](#)); or:

(D) Less than one acre in size and created unintentionally as the result of:

(i) Irrigation water overflow or leakage; or

(ii) Construction activity not related to compensatory mitigation for permitted wetland impacts;
or

(E) Of any size and created for the purpose of wastewater treatment, cranberry production, farm or stock watering, settling of sediment, cooling industrial water, or as a golf course hazard.

(b) Wetlands or portions of wetlands that are contaminated by hazardous substances, materials or wastes as per the following conditions:

(A) The wetland is documented as contaminated on either the U.S. Environmental Protection Agency's (EPA) National Priority List (NPL, also known as the "superfund list"), or the Department of Environmental Quality's (DEQ) Inventory of Hazardous Substance Sites ([ORS 465.225](#)).

(B) Only the portion of the wetland affected by such hazardous substances or wastes shall be excluded from the LSW analysis. Affected portions shall be delineated in consultation with EPA and DEQ, and shall include areas potentially disturbed by clean-up activities.

(C) Contaminated wetlands that have subsequently been removed from the NPL or DEQ Inventory following clean-up shall be re-evaluated under the LSW criteria at the next periodic review.

(2) Mandatory LSW Criteria. A local government shall identify a wetland as locally significant if it meets one or more of the following criteria:

(a) The wetland performs any of the following functions at the levels indicated below using the Oregon Freshwater Wetland Assessment Methodology:

(A) "Diverse" wildlife habitat; or

(B) "Intact" fish habitat; or

(C) "Intact" water quality function; or

(D) "Intact" hydrologic control function.

(b) The wetland or a portion of the wetland occurs within a horizontal distance less than one-fourth mile from a water body listed by the Department of Environmental Quality as a water quality limited water body (303 (d) list), and the wetland's water quality function is described as "intact" or "impacted or degraded" using OFWAM. The 303(d) list specifies which parameters (e.g., temperature, pH) do not meet state water quality standards for each water body. A local government may determine that a wetland is not significant under this subsection upon

documentation that the wetland does not provide water quality improvements for the specified parameter(s).

(c) The wetland contains one or more rare plant communities, as defined in this rule.

(d) The wetland is inhabited by any species listed by the federal government as threatened or endangered, or listed by the state as sensitive, threatened or endangered, unless the appropriate state or federal agency indicates that the wetland is not important for the maintenance of the species.

(A) The use of the site by listed species must be documented, not anecdotal. Acceptable sources of documentation may include but are not limited to: field observations at the wetland sites during the local wetlands inventory and functional assessments, and existing information on rare species occurrences at agencies such as the Oregon Natural Heritage Program, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture and the U.S. Fish and Wildlife Service.

(B) Input originating from other locally knowledgeable sources constitutes "documentation" if verified by one of the above agencies or a university or college reference collection.

(e) The wetland has a direct surface water connection to a stream segment mapped by the Oregon Department of Fish and Wildlife as habitat for indigenous anadromous salmonids, and the wetland is determined to have "intact" or "impacted or degraded" fish habitat function using OFWAM.

(3) Optional LSW Criteria. At the discretion of the local government, wetlands that meet one or more of the following criteria may be identified as locally significant wetlands:

(a) The wetland represents a locally unique native plant community: wetland is or contains the only representative of a particular native wetland plant community in the UGB/UUC, which is only applicable if the entire UGB/UUC is inventoried. To be identified as a LSW, such a wetland must also have been assessed to perform at least one of the following functions at the levels indicated below using OFWAM:

(A) Its wildlife habitat descriptor is either "provides diverse habitat", or "provides habitat for some wildlife species"; or

(B) Its fish habitat descriptor is either "intact", or "impacted or degraded"; or

(C) Its water quality function descriptor is either "intact", or "impacted or degraded"; or

(D) Its hydrologic control function descriptor is either "intact", or "impacted or degraded".

(b) The wetland is publicly owned and determined to "have educational uses" using OFWAM, and such use by a school or organization is documented for that site.

Stat. Auth.: [ORS 273.360](#)
Stats. Implemented: [ORS 197.299](#)
Hist.: LB 7-1996, f. 12-13-96, cert. ef. 1-1-97

141-086-0360

Purpose

Pursuant to ORS 197.279, 196.672 and 196.674, these rules establish procedures and criteria for identifying wetlands of statewide significance, called "outstanding state wetlands." These rules complement the rules for identifying locally significant wetlands (OAR 141-086-0300 through 141-086-0350).

Stat. Auth.: [ORS 273.045](#) & [ORS 273.051](#)
Stats. Implemented: [ORS 197.279\(3\)](#), [ORS 196.672](#) & [ORS 196.674](#)
Hist.: LB 4-1997, f. 4-15-97, cert. ef. 5-1-97

141-086-0370

Definitions

- (1) "**Classification**" means the designation of wetlands into hydrogeomorphic classes and subclasses. For example, "riverine" would be one class of wetlands.
- (2) "**Director**" means the Director of the Division of State Lands or the Director's designee.
- (3) "**Division**" means the Division of State Lands.
- (4) "**Functional Assessment**" means the process by which the capacity of a wetland to perform a certain function or group of functions is measured. Such functions would include but are not limited to: surface water storage, sediment removal, and maintenance of characteristic plant communities.
- (5) The "**Hydrogeomorphic Method**" or "**HGM**" is a scientific method of wetland classification and functional assessment based on a wetland's location in the landscape and the sources and duration of water flow. The HGM approach identifies the wetland classes present in each region, defines the functions that each class of wetlands performs, and establishes reference sites to define the range of functioning of each wetland class.
- (6) "**Outstanding State Wetlands**" or "**OSWs**" are reference standard wetlands identified within each Oregon region.
- (7) "**Reference Standard Wetlands**" are one component of an HGM and, for the purposes of these rules, are those sites that best exhibit the highest sustainable level of functional capacity for the functions performed by the regional wetland class or subclass.

(8) "**Region**" means an ecosystem-based geographical subdivision of the state, such as the Level III and IV Ecoregions of Oregon (e.g., the Willamette Valley) mapped by the U. S. Environmental Protection Agency.

(9) "**Wetlands**" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Stat. Auth.: [ORS 273.045](#) & [ORS 273.051](#)

Stats. Implemented: [ORS 197.279\(3\)](#), [ORS 196.672](#) & [ORS 196.674](#)

Hist.: LB 4-1997, f. 4-15-97, cert. ef. 5-1-97

141-086-0380

Applicability

(1) These rules set forth the criteria and procedures by which the Division will identify outstanding state wetlands and provide the information to local governments. Due to the state's interest in OSWs and the expertise required for their identification, the Division is responsible for applying these rules.

(2) The Land Conservation and Development Commission will determine any local land use planning responsibilities regarding OSWs identified by the Division.

(3) OSWs identified according to these rules become part of the Statewide Wetlands Inventory.

Stat. Auth.: [ORS 273.045](#) & [ORS 273.051](#)

Stats. Implemented: [ORS 197.279\(3\)](#), [ORS 196.672](#) & [ORS 196.674](#)

Hist.: LB 4-1997, f. 4-15-97, cert. ef. 5-1-97

141-086-0390

Criteria and Procedures

(1) A wetland shall be identified as an OSW if it is judged by the Division to be a reference standard wetland as defined in sections 141-086-0370(7).

(2) The Division may convene one or more technical panel(s) of wetland scientists with expertise in wetland functions, wetland classification, and/or regional wetland types in Oregon. The technical panel(s) will assist the Division in developing the hydrogeomorphic classification and functional assessment method (HGM) for Oregon, identifying the regional wetland classes and subclasses, primary functions, and reference standard wetlands. The Oregon HGM will be developed in stages, region by region, as resources allow. The Oregon HGM will be developed in cooperation with the Army Corps of Engineers, Environmental Protection Agency, Natural Resources Conservation Service, state resource agencies, and others as appropriate, and will incorporate protocols developed by the U.S. Army Corps of Engineers Waterways Experiment Station (for example, Technical Report WRP-DE-9, R. D. Smith et al., 1995).

(3) Prior to designating a reference standard wetland as an OSW, the Division shall:

(a) Identify and map site boundaries;

(b) Develop management recommendations to conserve and protect the documented wetland functions of the site;

(c) Develop draft findings describing how the site has met the standards for an OSW;

(d) Provide public notice on the draft findings to the local government, affected landowners and land managers and other interested parties, and provide a 45-day public comment period;

(e) Hold at least one public meeting within the area of the proposed OSW(s) during the comment period; and

(f) Finalize the findings and site boundaries after consideration of public comment.

(4) The Division shall provide all maps, criteria findings and supporting information regarding an identified OSW to the appropriate local government(s) for their use in land use planning activities.

Stat. Auth.: [ORS 273.045](#) & [ORS 273.051](#)

Stats. Implemented: [ORS 197.279\(3\)](#), [ORS 196.672](#) & [ORS 196.674](#)

Hist.: LB 4-1997, f. 4-15-97, cert. ef. 5-1-97

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Printed 2/2/2010

APPENDIX B
Acronyms and Definitions

ACRONYMS

DEQ	Department of Environmental Quality
DSL	Department of State Lands
DLCD	Department of Land Conservation and Development
ESH	Essential Salmonid Habitat
FEMA	Federal Emergency Management Agency
FH	Fish Habitat
FIRM	Flood Insurance Rate Map
HC	Hydrologic Control
HGM	Hydrogeomorphic Method of Wetland Assessment
HUC	Hydrologic Unit Code
LCDC	Land Conservation and Development Commission
LWI	Local Wetland Inventory
LSW	Locally Significant Wetland
NAIP	National Agriculture Imagery Program (supplied by USDA Farm Service Agency)
NHD	National Hydrography Dataset (supplied by USGS)
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OAR	Oregon Administrative Rule
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
OFWAM	Oregon Freshwater Wetland Assessment Method
ORWAP	Oregon Rapid Wetland Assessment Protocol
PAB	Palustrine Aquatic Bed Wetland
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
POW	Palustrine Open Water Wetland
PSS	Palustrine Scrub-Shrub Wetland
PUB	Palustrine Unconsolidated Bottom Wetland
PW	Probable Wetland
SCS	Soil Conservation Service
UGB	Urban Growth Boundary
URIAG	Urban Riparian Inventory & Assessment Guide
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WETS	Precipitation and Temperature Station Data, short for wetlands climate analysis
WH	Wildlife Habitat
WQ	Water Quality

DEFINITIONS

Wetlands

Wetlands are federally defined as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (Environmental Laboratory 1987). In other words, wetlands typically display three wetland criteria: a predominance of hydrophytic (wetland) vegetation, the presence of hydric (wet) soils, and wetland hydrology (ponding or near-surface saturated soils for at least 5% of the growing season; typically 11 to 14 consecutive days during the growing season).

Goal 5

Goal 5 is one of Oregon’s Statewide Planning Goals and Guidelines for Natural Resources, Scenic and Historic Areas, and Open Spaces (OAR 660-015-0000(5) and 660-023-0000). To protect natural resources and conserve scenic and historic areas and open spaces, local governments shall adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations. These resources promote a healthy environment and natural landscape that contributes to Oregon’s livability. The following resources shall be inventoried:

- a. Riparian corridors, including water and riparian areas and fish habitat;
- b. Wetlands;
- c. Wildlife Habitat;
- d. Federal Wild and Scenic Rivers;
- e. State Scenic Waterways;
- f. Groundwater Resources;
- g. Approved Oregon Recreation Trails;
- h. Natural Areas;
- i. Wilderness Areas;
- j. Mineral and Aggregate Resources;
- k. Energy sources; and
- l. Cultural areas.

Following procedures, standards, and definitions contained in commission rules, local governments shall determine significant sites for inventoried resources and develop programs to achieve the goal.

Goal 5 Safe Harbor provides an inventory method for riparian corridors, including water and riparian areas and fish habitat, wetlands, and wildlife habitat. A “safe harbor” approach allows local governments to identify “significant” habitats using the safe harbor criteria, which, for example, has required buffer setbacks from streams based on water flow and fish presence. The rule states:

As a safe harbor in order to address the requirements under OAR 660-023-0030, a local government may determine the boundaries of significant riparian corridors within its jurisdiction using a standard setback distance from all fish-bearing lakes and streams shown on ODF stream classification maps, USGS 7.5-minute quadrangle maps, NWI maps, ODFW maps indicating

fish habitat, FEMA flood maps; and/or aerial photographs, as follows (http://arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_023.html):

- (a) Along all streams with average annual stream flow greater than 1,000 cubic feet per second (cfs) the riparian corridor boundary shall be 75 feet upland from the top of each bank.
- (b) Along all lakes, and fish-bearing streams with average annual stream flow less than 1,000 cfs, the riparian corridor boundary shall be 50 feet from the top of bank.
- (c) Where the riparian corridor includes all or portions of a significant wetland as set out in OAR 660-023-0100, the standard distance to the riparian corridor boundary shall be measured from, and include, the upland edge of the wetland.
- (d) In areas where the top of each bank is not clearly defined, or where the predominant terrain consists of steep cliffs, local governments shall apply OAR 660-023-0030 rather than apply the safe harbor provisions of this section.

Cowardin Wetland Classification (adapted from Cowardin et al., 1979)

Palustrine System

Definition. The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ‰. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2 m at low water; and (4) salinity due to ocean-derived salts less than 0.5 ‰.

Limits. The Palustrine System is bounded by upland or by any of the other four systems: Marine (ocean), Estuarine (estuary), Riverine (freshwater rivers and their tributaries), or Lacustrine (open water greater than 8 ha (20 acres) in size).

Description. The Palustrine System was developed to group the vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the United States. It also includes the small, shallow, permanent or intermittent water bodies often called ponds. Palustrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. They may also occur as islands in lakes or rivers. The erosive forces of wind and water are of minor importance except during severe floods.

The emergent vegetation adjacent to rivers and lakes is often referred to as “the shore zone” or the “zone of emergent vegetation”, and is generally considered separately from the river or lake. As an example, one researcher wrote in reference to riverine habitats, “We will not here consider the long list of emergent plants which may occur along the banks out of the current, as they do not belong, strictly speaking, to the running water habitat.” There are often great similarities between wetlands lying adjacent to lakes or rivers and isolated wetlands of the same class in basins without open water.

Subsystems. None.

Classes. Rock Bottom, Unconsolidated Bottom, Aquatic Bed, Unconsolidated Shore, Moss-Lichen Wetland, Emergent Wetland, Scrub-Shrub Wetland, and Forested Wetland.

Classes

Emergent Wetland

Definition. The Emergent Wetland Class is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. All water regimes are included except subtidal and irregularly exposed.

Description. In areas with relatively stable climatic conditions, Emergent Wetlands maintain the same appearance year after year. In other areas, such as the prairies of the central United States, violent climatic fluctuations cause them to revert to an open water phase in some years. Emergent Wetlands are found throughout the United States and occur in all Systems except the Marine. Emergent Wetlands are known by many names, including marsh, meadow, fen, prairie pothole, and slough. Areas that are dominated by pioneer plants which become established during periods of low water are not Emergent Wetlands and should be classified as Vegetated Unconsolidated Shores or Vegetated Streambeds.

Subclasses and Dominance Types:

Persistent (1). Persistent Emergent Wetlands are dominated by species that normally remain standing at least until the beginning of the next growing season. This Subclass is found only in the Estuarine and Palustrine Systems.

Persistent Emergent Wetlands dominated by saltmarsh cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*S. patens*), big cordgrass (*S. cynosuroides*), needlerush (*Juncus roemerianus*), narrowleaved cattail (*Typha angustifolia*), and southern wild rice (*Zizaniopsis miliacea*) are major components of the Estuarine systems of the Atlantic and Gulf Coasts of the United States. On the Pacific Coast, common pickleweed (*Salicornia virginica*), sea blite (*Suaeda californica*), arrow grass (*Triglochin maritimum*), and California cordgrass (*Spartina foliosa*) are common dominants.

Palustrine Persistent Emergent Wetlands contain a vast array of grass-like plants such as cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), saw grass (*Cladium jamaicense*), sedges (*Carex* spp.); and true grasses such as reed (*Phragmites australis*), manna grasses (*Glyceria* spp.), slough grass (*Beckmannia syzigachne*), and whitetop (*Scolochloa festucacea*). There is also a variety of broadleaved persistent emergents such as purple loosestrife (*Lythrum salicaria*), dock (*Rumex mexicanus*), waterwillow (*Decodon verticillatus*), and many species of smartweeds (*Polygonum*).

Nonpersistent (2). Wetlands in this Subclass are dominated by plants which fall to the surface of the substrate or below the surface of the water at the end of the growing season so that, at certain seasons of the year, there is no obvious sign of emergent vegetation. For example, wild rice (*Zizania aquatica*) does not become apparent in the North Central States until midsummer and fall, when it may form dense emergent stands. Nonpersistent emergents also include species such as arrow arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), and arrowheads (*Sagittaria* spp.). Movement of ice in Estuarine, Riverine, or Lacustrine Systems often removes

all traces of emergent vegetation during the winter. Where this occurs the area should be classified as Nonpersistent Emergent Wetland.

Scrub-Shrub Wetland

Definition. The Class Scrub-Shrub Wetland includes areas dominated by woody vegetation less than 6 meters (m [20 feet]) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. All water regimes except subtidal are included.

Description. Scrub-Shrub Wetlands may represent a successional stage leading to Forested Wetland, or they may be relatively stable communities. They occur only in the Estuarine and Palustrine Systems, but are one of the most widespread classes in the United States. Scrub-Shrub Wetlands are known by many names, such as shrub swamp, shrub carr, bog, and pocosin. For practical reasons the class also includes forests composed of young trees less than 6 m tall.

Subclasses and Dominance Types:

Broad-leaved Deciduous (1). In Estuarine System Wetlands the predominant deciduous and broadleaved trees or shrubs are plants such as sea-myrtle (*Baccharis halimifolia*) and marsh elder (*Iva frutescens*). In the Palustrine System typical Dominance Types are alders (*Alnus* spp.), willows (*Salix* spp.), buttonbush (*Cephalanthus occidentalis*), red-osier dogwood (*Cornus stolonifera*), honeycup (*Zenobia pulverulenta*), spirea (*Spiraea douglasii*), bog birch (*Betula pumila*), and young trees of species such as red maple (*Acer rubrum*) or black spruce (*Picea mariana*).

Needle-leaved Deciduous (2). This Subclass, consisting of wetlands where trees or shrubs are predominantly deciduous and needleleaved, is represented by young or stunted trees such as tamarack or bald cypress (*Taxodium distichum*).

Broad-leaved Evergreen (3). In the Estuarine System, vast wetland acreages are dominated by mangroves (*Rhizophora mangle*, *Languncularia racemosa*, *Conocarpus erectus*, and *Avicennia germinans*) that are less than 6 m tall. In the Palustrine System, the broad-leaved evergreen species are typically found on organic soils. Northern representatives are labrador tea (*Ledum groenlandicum*), bog rosemary (*Andromeda glaucophylla*), bog laurel (*Kalmia polifolia*), and the semi-evergreen leatherleaf (*Chamaedaphne calyculata*). In the south, fetterbush (*Lyonia lucida*), coastal sweetbells (*Leucothoe axillaris*), inkberry (*Ilex glabra*), and the semi-evergreen black ti-ti (*Cyrilla racemiflora*) are characteristic broad-leaved evergreen species.

Needle-leaved Evergreen (4). The dominant species in Needle-leaved Evergreen Wetlands are young or stunted trees such as black spruce or pond pine (*Pinus serotina*).

Dead (5). Dead woody plants less than 6 m tall dominate Dead Scrub-Shrub Wetlands. These wetlands are usually produced by a prolonged rise in the water table resulting from impoundment of water by landslides, man, or beavers. Such wetlands may also result from various other factors such as fire, salt spray, insect infestation, air pollution, and herbicides.

Forested Wetland

Definition. The Class Forested Wetland is characterized by woody vegetation that is 6 m tall or taller. All water regimes are included except subtidal.

Description. Forested Wetlands are most common in the eastern United States and in those sections of the West where moisture is relatively abundant, particularly along rivers and in the mountains. They occur only in the Palustrine and Estuarine Systems and normally possess an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer. Forested Wetlands in the Estuarine System, which include the mangrove forests of Florida, Puerto Rico, and the Virgin Islands, are known by such names as swamps, hammocks, heads, and bottoms. These names often occur in combination with species names or plant associations such as cedar swamp or bottomland hardwoods.

Subclasses and Dominance Types:

Broad-leaved Deciduous (1). Dominant trees typical of Broadleaved Deciduous Wetlands, which are represented throughout the United States, are most common in the South and East. Common dominants are species such as red maple, American elm (*Ulmus americana*), ashes (*Fraxinus pennsylvanica* and *F. nigra*), black gum (*Nyssa sylvatica*), tupelo gum (*N. aquatica*), swamp white oak (*Quercus bicolor*), overcup oak (*Q. lyrata*), and basket oak (*Q. michauxii*). Wetlands in this subclass generally occur on mineral soils or highly decomposed organic soils.

Needle-leaved Deciduous (2). The southern representative of the Needle-leaved Deciduous Subclass is bald cypress (*Taxodium distichum*), which is noted for its ability to tolerate long periods of surface inundation. Tamarack is characteristic of the Boreal Forest Region, where it occurs as a dominant on organic soils. Relatively few other species are included in this Subclass.

Broad-Leaved Evergreen (3). In the Southeast, Broadleaved Evergreen Wetlands reach their greatest development. Red bay (*Persea borbonia*), loblolly bay (*Gordonia lasianthus*), and sweet bay (*Magnolia virginiana*) are prevalent, especially on organic soils. This Subclass also includes red mangrove, black mangrove (*Avicennia germinans*), and white mangrove (*Languncularia racemosa*), which are adapted to varying levels of salinity.

Needle-leaved Evergreen (4). Black spruce, growing on organic soils, represents a major dominant of the Needle-leaved Evergreen Subclass in the North. Though black spruce is common on nutrient poor soils, Northern white cedar (*Thuja occidentalis*) dominates northern wetlands on more nutrient rich sites. Along the Atlantic Coast, Atlantic white cedar (*Chamaecyparis thyoides*) is one of the most common dominants on organic soils. Pond pine is a common needle-leaved evergreen found in the Southeast in association with dense stands of broad-leaved evergreen and deciduous shrubs.

Dead (5). Dead Forested Wetlands are dominated by dead woody vegetation taller than 6 m (20 feet). Like Dead Scrub-Shrub Wetlands, they are most common in, or around the edges of, man-made impoundments and beaver ponds. The same factors that produce Dead Scrub-Shrub Wetlands produce Dead Forested Wetlands.

Aquatic Bed and Open Water

Definition. The Class Aquatic Bed includes wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Water regimes include subtidal, irregularly exposed, regularly flooded, permanently flooded, intermittently exposed, semi-permanently flooded, and seasonally flooded. While the Class Open Water is not used in the Cowardin classification system, it is used on NWI

maps to indicate areas of water where there are no beds of emergent, submergent or floating vegetation.

Description. Aquatic Beds represent a diverse group of plant communities that requires surface water for optimum growth and reproduction. They are best developed in relatively permanent water or under conditions of repeated flooding. The plants are either attached to the substrate or float freely in the water above the bottom or on the surface.

Unconsolidated Bottom

Definition. The Class Unconsolidated Bottom includes all wetland and deepwater habitats with at least 25% cover of particles smaller than stones, and a vegetative cover less than 30%. Water regimes are restricted to subtidal, permanently flooded, intermittently exposed, and semi-permanently flooded.

Description: Unconsolidated Bottoms are characterized by the lack of large stable surfaces for plant and animal attachment. They are usually found in areas with lower energy than Rock Bottoms and may be very unstable. Exposure to wave and current action, temperature, salinity, and light penetration determines the composition and distribution of organisms. Most macroalgae attach to the substrate by means of basal hold-fast cells or discs; in sand and mud, however, algae penetrate the substrate and higher plants can successfully root if wave action and currents are not too strong. Most animals in unconsolidated sediments live within the substrate, e.g., *Macoma* and the amphipod *Melita*. Some, such as the polychaete worm *Chaetopterus*, maintain permanent burrows, and others may live on the surface, especially in coarse-grained sediments.

In the Marine and Estuarine Systems, Unconsolidated Bottom communities are relatively stable. They vary from the Arctic to the tropics, depending largely on temperature, and from the open ocean to the upper end of the estuary, depending on salinity.

In the Riverine System, the substrate type is largely determined by current velocity, and plants and animals exhibit a high degree of morphologic and behavioral adaptation to flowing water. Certain species are confined to specific substrates and some are at least more abundant in one type of substrate than in others. One researcher commented "The larger the stones, and hence the more complex the substratum, the more diverse is the invertebrate fauna."

In the Lacustrine and Palustrine Systems, there is usually a high correlation, within a given water body, between the nature of the substrate and the number of species and individuals. For example, in the profundal bottom of eutrophic lakes where light is absent, oxygen content is low, and carbon dioxide concentration is high, the sediments are ooze-like organic materials and species diversity is low. Each substrate type typically supports a relatively distinct community of organisms.

Nontidal Water Regime Modifiers

Though not influenced by oceanic tides, nontidal water regimes may be affected by wind or seiches in lakes. Water regimes are defined in terms of the growing season, which we equate to the frost-free period. The rest of the year is defined as the dormant season, a time when even extended periods of flooding may have little influence on the development of plant communities.

Permanently Flooded (H). Water covers the land surface throughout the year in all years. Vegetation is composed of obligate hydrophytes.

Intermittently Exposed (Z). Surface water is present throughout the year except in years of extreme drought.

Semi-permanently Flooded (F). Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

Seasonally Flooded (C). Surface water is present for extended periods especially early in the growing season, but is absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface.

Saturated (B). The substrate is saturated to the surface for extended periods during the growing season, but surface water is seldom present.

Temporarily Flooded (A). Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season. Plants that grow both in uplands and wetlands are characteristic of the temporarily flooded regime.

Intermittently Flooded (J). The substrate is usually exposed, but surface water is present for variable periods without detectable seasonal periodicity. Weeks, months, or even years may intervene between periods of inundation. The dominant plant communities under this regime may change as soil moisture conditions change. Some areas exhibiting this regime do not fall within our definition of wetland because they do not have hydric soils or support hydrophytes.

Artificially Flooded (K). The amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams. The vegetation growing on these areas cannot be considered a reliable indicator of water regime. Examples of artificially flooded wetlands are some agricultural lands managed under a rice-soybean rotation, and wildlife management areas where forests, crops, or pioneer plants may be flooded or dewatered to attract wetland wildlife. Neither wetlands within or resulting from leakage from man-made impoundments, nor irrigated pasture lands supplied by diversion ditches or artesian wells, are included under this modifier.

Special Modifiers

Many wetlands and deepwater habitats are man-made, and natural ones have been modified to some degree by the activities of man or beavers. Since the nature of these modifications often greatly influences the character of such habitats, special modifying terms have been included here to emphasize their importance. The following modifiers should be used singly or in combination wherever they apply to wetlands and deepwater habitats.

Excavated (x)

Lies within a basin or channel excavated by man.

Impounded (h)

Created or modified by a barrier or dam which purposefully or unintentionally obstructs the outflow of water. Both man-made dams and beaver dams are included.

Diked (h)

Created or modified by a man-made barrier or dike designed to obstruct the inflow of water.

Partially drained/ditched (d)

The water level has been artificially lowered, but the area is still classified as wetland because soil moisture is sufficient to support hydrophytes. Drained areas are not considered wetlands if they can no longer support hydrophytes.

Farmed (f)

The soil surface has been mechanically or physically altered for production of crops, but hydrophytes will become reestablished if farming is discontinued.

Artificial substrate (r)

Refers to substrates classified as Rock Bottom, Unconsolidated Bottom, Rocky Shore, and Unconsolidated Shore that were emplaced by man, using either natural materials such as dredge spoil or synthetic materials such as discarded automobiles, tires, or concrete. Jetties and breakwaters are examples of Artificial Rocky Shores. Man-made reefs are an example of Artificial Rock Bottoms.

HGM Wetland Classification - Key to Oregon Subclasses

(Key from the Guidebook for Hydrogeomorphic (HGM)–based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles by Adamus, P.R. 2001)

Note: Frequently, areas belonging to one HGM subclass will be situated within or adjacent to an area belonging to another HGM subclass. Normally, each area should be assessed separately. However, for practical purposes the areas may be combined into one site (assessment unit) if the smaller of the two areas comprises less than 20% of their total combined acreage. An example is a perennial channel (Riverine Flow-through subclass) that bisects an ash swale (Slope subclass) and which, even including the channel’s 2-year floodplain, occupies less than 20% of their combined acreage. In this example, for most purposes the entire site should be classified as Slope.

1. Exposed at least annually to tidal surface water. Note that salinity is not considered in this determination.
YES: **Estuarine** class, go to 2 (Note that salinity is not considered in this determination).
NO: Go to 3
2. Site receives significant marine-sourced water during all or part of the year. Often located within or along the fringes of a major estuarine embayment or a slough off the embayment, rather than adjacent to a narrower tidal river channel. Typically located within zones classified as “Marine” or “Brackish” on maps published by Hamilton (1984), the National Estuarine Inventory (NOAA 1988), and/or as “Estuarine” on maps of the National Wetland Inventory. The site and its immediate receiving waters have one or more of the following indicators suggestive of marine water: barnacles, stranded seaweed, salt marsh plant species, springtide high tide minimum salinities of >5 ppt, or a preponderance (in adjacent flats) of rounded sediment particles indicative of recent marine-derived sediments
YES: Estuarine Marine-sourced (EMS) subclasses (High Marsh EMS and Low Marsh EMS)
NO: Estuarine River-sourced (EMR) subclass
3. Closely associated with a channel or floodplain. Upland wetted edge of site expands at least once every other year (biennial flood) primarily as a result of overbank flow, channel inflow, or pumped water from a nearby and/or connected or bisecting channel. Includes active(2-yr) floodplain wetlands, sloughs, and riparian areas.

On NWI maps, includes many sites labeled R or PUB, PEM, PSS, or PFO with -A, -C, -F, or -H water regime codes appended, and others.

YES: **Riverine** class, Go to 4

NO: Go to 5

4. Water throughout most of site flows visibly during most of wet season. The site may be a channel, an island in a channel, or border a channel or ditch. It should include any channel to the 2 m depth. It often bisects or is bordered by a wetland in another HGM subclass.
YES: **Riverine Flow-through (RFT)** subclass, Figure 2
Includes scoured floodplains with no seasonal ponding of floodwater, wetlands that comprise entire islands within channels, and some ditches and channels.
NO: **Riverine Impounding (RI)** subclass, Figure 2
Includes sloughs connected (seasonally or permanently) to main channels, channels dammed by beavers or humans (such wetlands may be broader at their downhill/ outlet side), wetlands sustained primarily by water diverted or pumped from offsite channels, river alcoves with seasonally stagnant conditions, and depressions or temporarily ponded areas within active biennial floodplains.
5. Consists mostly of permanent or seasonal standing water with pH>8. Situated in a depression or lake basin without an outlet channel. Includes areas that are shallower than 2 m during annual maximum inundation.
YES: **Depressional Alkaline (DA)** subclass
NO: Go to 6
6. Located on margin of or within a lake, i.e., a body of permanent standing water that is deeper than 2 m over an area of >8 hectares (20 acres).
On NWI maps, includes most sites labeled "L" and others with -A, -C, -F, or -H water regime codes that border an L site.
YES: **Lacustrine Fringe** class, go to 7
NO: Go to 8
7. Located in headwater position (i.e., closer to a region's major drainage divides than to lowlands in the region) and usually higher than the mean elevation of the region¹.
YES: **Lacustrine Fringe Headwater (LFH)** subclass
NO: **Lacustrine Fringe Valley (LFV)** subclass
8. Consists of >10% cover of Sphagnum moss over an area of >0.25 acre, and has a mean annual water pH of <5.5. Usually situated in a depression with little if any standing water.
YES: **Depressional Bog (DB)** subclass
NO: Go to 9
9. Lacks permanent inlet channel. Has a surface water outlet that connects to a permanent river or lake less than once every 2 years. Not located on a noticeable slope. Water level fluctuations are mainly in response to runoff and direct precipitation.
YES: **Depressional Outflow (DO)** subclass
NO: Go to 10
10. Located on, or near base of, a slope, but the slope may be barely perceptible. Inlet channel absent or very short. Outlet channel frequently present. Downhill-flowing sheet flow may be visible at land surface, especially during wet months. Downhill side of site sometimes partly blocked by berm or dam (natural or manmade). Fed by runoff and precipitation but with a proportionally large (compared with other wetlands) component of lateral subsurface flow or discharging groundwater. Soil moisture (and surface water, if present and shallow) tends to persist more into the summer than in other wetlands of similar size, depth, climate, and soil type. Ratio of wetland surface area to area of the apparently contributing watershed is relatively large.

¹ Approximate mean elevations of regions (in meters): Blue Mountains= 1351, Basin & Range= 1515, Columbia Basin= 539, Coast/Range= 256, East Cascades Slope= 1435, Klamath Mountains= 734, High Lava Plains= 1179, Owyhee Uplands= 1269, West Cascade Slope= 1037, Western Interior (Willamette) Valley= 191.

Includes springs, seeps, sites sustained in summer mainly by seepage (not runoff) from upslope irrigated fields, some sites with water impounded seasonally by push-up dams at their downhill side, and some ash swales.

On NWI maps, includes many sites labeled PEM, PSS, or PFO with –B water regime codes, and less often with –A, –C, or –F codes.

YES: **Slope** class, Go to 11

NO: Go to 12.

11. Outlet channel is present (but may be small and partly dammed by beaver, roads, slides). Slope may be slight but is always noticeable. No inlet channel. Located in topographically high or intermediate positions such as stream heads, montane wet meadows, avalanche chutes. Usually closer to a region's major drainage divides than to lowlands in the region, and usually higher than the average elevation of the region.

YES: **Slope Headwater (SH)**

NO: **Slope Valley (SV)**

12. Fed mainly by direct precipitation, secondarily by lateral subsurface flow or surface runoff. Precipitation may be "ponded" at the site due to surrounding natural levees, ridge-swale topography, hummocks or constructed dikes; and/or due to soils with subsurface layers that strongly impede infiltration; and/or due to high water table due to subsurface seepage from nearby river, lake, or irrigated fields. Usually in a shallow (<2 ft.) basin situated on a broad flat terrace. Includes wet prairie, wet wooded flats, some fens and some ash swales. On NWI maps, includes many sites labeled PUS, PEM, PFO, or PSS with –A, –B, or –C water regime codes.

YES: **Flats class**. No subclasses defined yet.

Many are inundated only seasonally. Altered (diked) flats sites may function similar to depressional class sites, but their only significant water comes from runoff from dike surfaces and precipitation.

NO: **Depressional class**, Go to 13

Fed mainly by overland runoff (sheet flow) which enters from all 3 or 4 compass directions, and/or by stormwater pipes, drainage ditches. Usually in a deep (>2 ft.) basin, which may have been deepened by excavation. Usually is inundated permanently. Often in natural depressions in rolling or mountainous terrain. On NWI maps, includes many of the sites labeled PUB or PAB, some L, and a few others.

13. More than 0.25 acre of standing water remains in the basin during the driest season of most years.

YES: **Depressional Closed Permanent (DCP)** subclass

OFWAM Functions

Diverse Wildlife Habitat. Two or more Cowardin wetland classes (i.e., Forested, Scrub-Shrub, Emergent) are present; woody vegetation is the dominant wetland vegetation cover type; there is high interspersed among Cowardin classes; more than 1 acre of open water is present; the wetland is connected to other wetlands or bodies of water by surface water (stream, lake, pond, ditch, or culvert); no upstream or adjacent stream reaches are listed as water quality limited; the dominant existing land use within 500 feet of the wetland's edge is exclusive forest use or open space; and greater than 40% of the wetland's edge is bordered by a vegetated buffer at least 25 feet wide.

Intact Fish Habitat. More than 75% of the stream is shaded by stream-side (riparian) vegetation; the stream is in a natural channel, or modified portions of the stream are returning to a natural channel; more than 25% of the entire stream contains instream structures such as large woody debris, floating submerged vegetation, large rocks, or boulders; no upstream or adjacent stream reaches are listed as water quality limited; the dominant existing land use within 500 feet of the wetland's edge is exclusive forest use or open space; and salmon, trout or sensitive species are present in a stream, lake or pond associated with the wetland at some time during the year.

Intact Water Quality Protection. The wetland's primary source of water is surface flow, including streams and ditches, or precipitation; there is evidence of flooding or ponding during a portion of the growing season; wetland vegetation cover is greater than 60%; the wetland is greater than 5 acres in size or is between 0.5 acre and 5 acres in size and is connected to other wetlands within a 3-mile radius by surface water (stream, ditch, canal or lake); the dominant existing land use within 500 feet of the wetland's edge is developed uses or agriculture; and one or more upstream or adjacent stream reaches are listed as water quality limited.

Intact Hydrologic Control. The wetland is located within the 100-year floodplain or within an enclosed basin; there is evidence of flooding or ponding during a portion of the growing season; the wetland is greater than 5 acres in size; waterflow out of the wetland is restricted (beaver dam, concrete structure, undersized culvert) or the wetland has no outlet; woody vegetation is the dominant wetland vegetation cover type; the dominant existing land use within 500 feet of the wetland on the downstream or downslope edge of the wetland is developed uses; and the dominant land use in the watershed upstream from the assessment area is urban or urbanizing.

Riparian Corridor Goal 5 Definitions

Riparian area is the area adjacent to a river, lake, or stream, consisting of the area of transition from an aquatic ecosystem to a terrestrial ecosystem.

Riparian corridor is a Goal 5 resource that includes the water areas, fish habitat, adjacent riparian areas, and wetlands within the riparian area boundary.

Riparian corridor boundary is an imaginary line that is a certain distance upland from the top of bank.

APPENDIX C

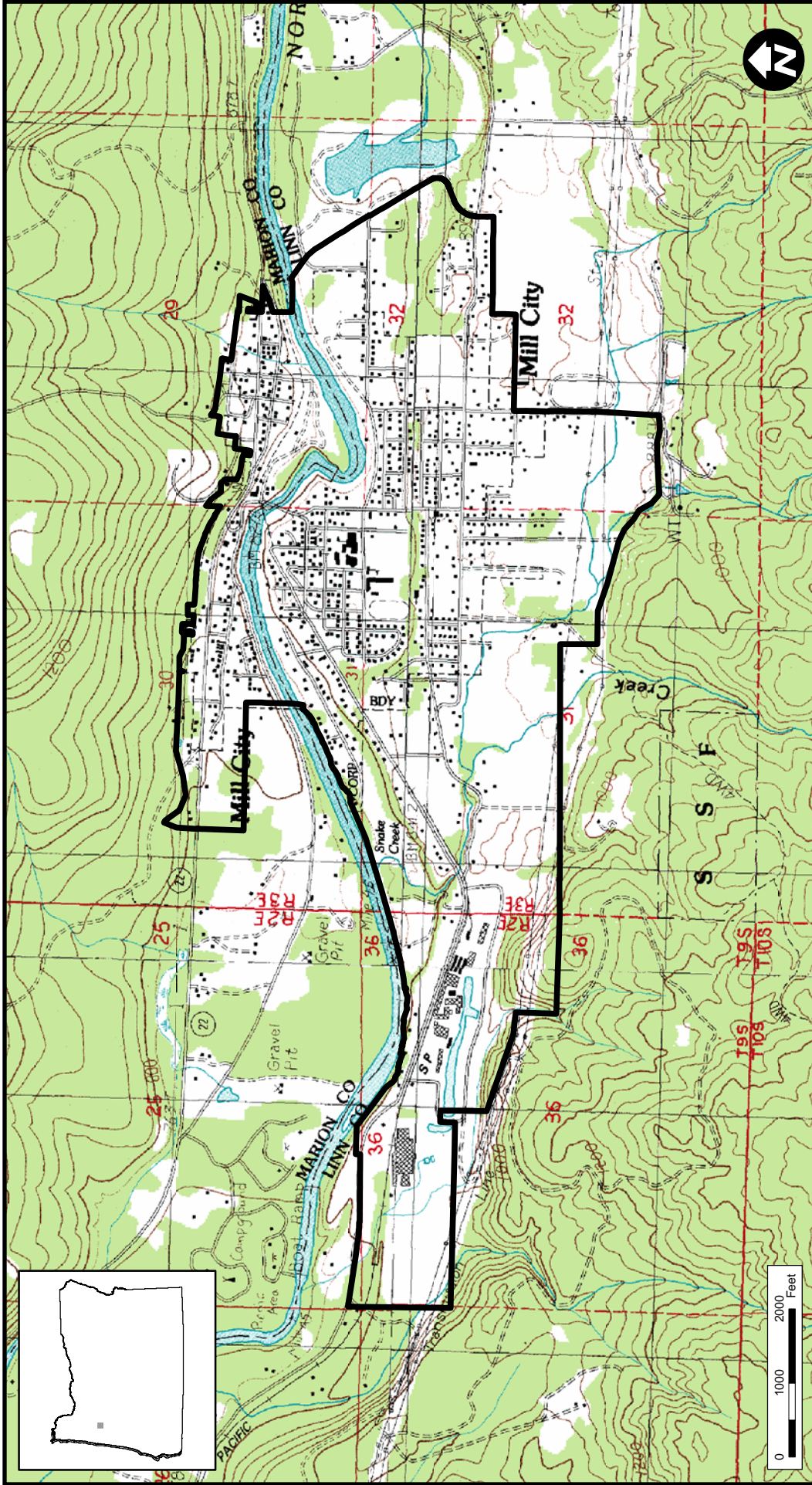
Figures


Figure 1. Site Location Map (USGS base)

Figure 2a. National Wetland Inventory Map – Paper Scan

Figure 2b. National Wetland Inventory Map – Digital Base

Figure 3. Soils Map



Legend
 Study Area Boundary

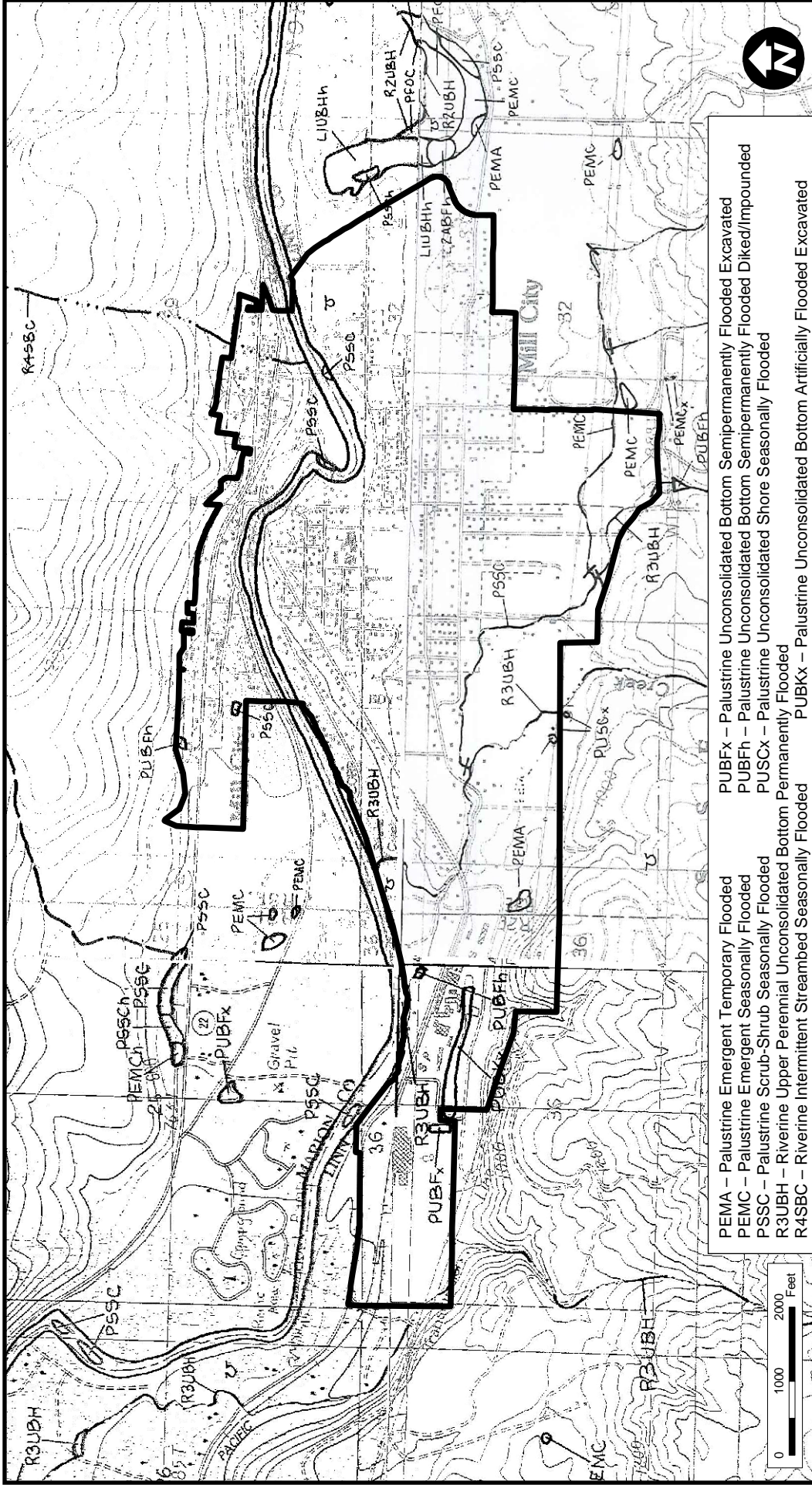
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Local Wetland Inventory
 Mill City, Linn & Marion Counties, Oregon

Figure 1. Site Location Map

Project 16272
 June, 2010

Source: USGS 7.5' topographic quadrangles: Lyons, Mill City North, Mill City South, and Snow Peak, OR (1985). Data downloaded from the Oregon Geospatial Enterprise Office: <http://www.oregon.gov/DAS/EISPD/GEO/index.shtml>



- PEMA – Palustrine Emergent Temporary Flooded
- PEMCh – Palustrine Emergent Seasonally Flooded
- PSSC – Palustrine Scrub-Shrub Seasonally Flooded
- R3UBH – Riverine Upper Perennial Unconsolidated Bottom Permanently Flooded
- R4SBC – Riverine Intermittent Streambed Seasonally Flooded
- PUBFh – Palustrine Unconsolidated Bottom Semipermanently Flooded Excavated
- PUBFCh – Palustrine Unconsolidated Bottom Semipermanently Flooded Diked/Impounded
- PUSC – Palustrine Unconsolidated Shore Seasonally Flooded
- PUBKx – Palustrine Unconsolidated Bottom Artificially Flooded Excavated

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Legend
 Study Area Boundary

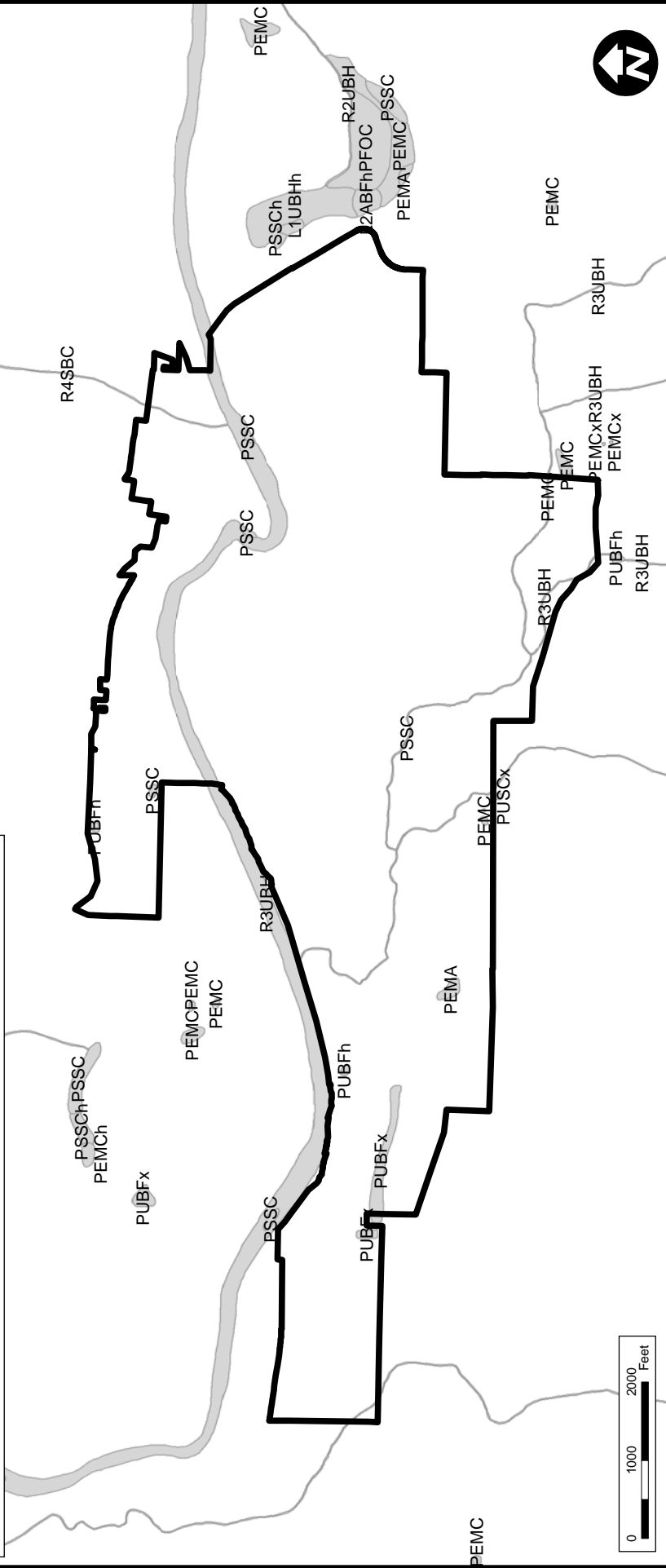
Source: U.S. Fish & Wildlife Service National Wetland Inventory, Mill City North, Mill City South, Lyons, and Snow Peak, Oregon quadrangles. 1994. Color infra-red aerial photography flown 7/82 at 1:58,000.

Local Wetland Inventory
 Mill City, Linn & Marion Counties, Oregon

Figure 2a. National Wetlands Inventory Map

Project 16272
 June, 2010



- PEMA – Palustrine Emergent Temporary Flooded
- PEMC – Palustrine Emergent Seasonally Flooded
- PSSC – Palustrine Scrub-Shrub Seasonally Flooded
- PUBFh – Palustrine Unconsolidated Bottom Semipermanently Flooded Diked/Impounded
- PUBFx – Palustrine Unconsolidated Bottom Semipermanently Flooded Excavated
- PUSC – Palustrine Unconsolidated Shore Seasonally Flooded
- R3UBH – Riverine Upper Perennial Unconsolidated Bottom Permanently Flooded
- R4SBC – Riverine Intermittent Streambed Seasonally Flooded



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Legend

-  Study Area Boundary
-  National Wetland Inventory

Source: U.S. Fish and Wildlife Service. 2009. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. <http://www.fws.gov/wetlands/>

Local Wetland Inventory
 Mill City, Linn & Marion Counties, Oregon

Figure 2b. National Wetlands Inventory Map

Project 16272
 June, 2010

Linn County Soils

- 17C – Bull Run silt loam, 3-15% slopes
- 17E – Bull Run silt loam, 15-30% slopes
- 18 – Camas gravelly sandy loam (includes 5% Riverwash)
- 21 – Chehalis silty clay loam
- 23 – Clackamas gravelly silt loam (hydric Awbrig, Conser, and Courtney inclusions)
- 26 – Coburg silty clay loam (hydric Awbrig, Conser, and Courtney inclusions)
- 36D – Dupee silt loam, 3-20% slopes (hydric Panther inclusions)
- 64 – Malabon variant loam
- 67 – McBee silty clay loam (hydric Wapato inclusions)
- 73 – Newberg fine sandy loam
- W – Water

- 74H – Ochrepts, very steep (includes 1% Aquepts, seeps)
 - 92 – Sifton variant gravelly loam
 - 98 – Waldo silty clay loam (hydric)
- Marion County Soils**
- Ad – Alluvial land (hydric)
 - Ca – Camas gravelly sandy loam
 - HSC – Horeb gravelly silt loam, gravelly substratum, 0-15% slopes
 - HSE – Horeb gravelly silt loam, gravelly substratum, 15-35% slopes
 - MmE – McCully very stony clay loam, 2-30% slopes
 - MYB – Minniece silty clay loam, 0-8% slopes (hydric)



Legend

- Study Area Boundary
- Linn and Marion County Soils

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Local Wetland Inventory
 Mill City, Linn & Marion Counties, Oregon

Figure 3. Soils Map

Project 16272
 June, 2010

Source: NRCS SSURGO data for Linn and Marion County (2010); USA Prime Imagery, ESRI Online Service (© 2009 i-cubed, ESRI, AND, TANA)

APPENDIX D

Sample Plot Data—Wetland Determination Data Forms

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

Project/Site: Mill City Local Wetland Inventory City/County: Mill City / Marion Sampling Date: 3/16/2010
 Applicant/Owner: Mill City and LCOG State: Oregon Sampling Point: MCP-1
 Investigator(s): Mirth Walker and Stacey Reed Section, Township, Range: #1142 093E30DB00600
 Landform (hillslope, terrace, etc.): Footslope Local relief (concave, convex, none) None Slope (%): <3
 Subregion (LRR): A, Northwest Forests and Coast Lat: 44.7579 Long: -122.4858 Datum: NAD 1983
 Soil Map Unit Name: (HSC) Horeb gravelly silt loam, gravelly substratum, 0-15% slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present?
 Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	
Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation). Precipitation prior to fieldwork: Showers day of field in Mill City and 1.44-inches of rainfall two weeks prior in Salem. Wetland MC-1 Map B (original parcel ID #212 = new parcel ID #1142 - see Section, Township, Range for tax lot ID)			

VEGETATION

<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
0% = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>10' r</u>)				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u>
1. <u>Fraxinus latifolia</u>	<u>5%</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Physocarpus capitatus</u>	<u>5%</u>	<u>Yes</u>	<u>FACW</u>	OBL species <u>90</u> x 1 = <u>90</u>
3. <u>Rubus armeniacus</u>	<u>5%</u>	<u>Yes</u>	<u>FACU</u>	FACW species <u>15</u> x 2 = <u>30</u>
4. _____	_____	_____	_____	FAC species <u>5</u> x 3 = <u>15</u>
5. _____	_____	_____	_____	FACU species <u>5</u> x 4 = <u>20</u>
15% = Total Cover				UPL species <u>0</u> x 5 = <u>0</u>
<u>Herb Stratum</u> (Plot size: <u>5' r</u>)				Column Totals: <u>115</u> (A) <u>155</u> (B)
1. <u>Scirpus microcarpus</u>	<u>50%</u>	<u>Yes</u>	<u>OBL</u>	Prevalence Index = B/A = <u>1.35</u>
2. <u>Carex obnupta</u>	<u>40%</u>	<u>Yes</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators:
3. <u>Equisetum arvense</u>	<u>5%</u>	<u>No</u>	<u>FAC</u>	
4. <u>Juncus effusus</u>	<u>5%</u>	<u>No</u>	<u>FACW</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
5. _____	_____	_____	_____	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
6. _____	_____	_____	_____	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
7. _____	_____	_____	_____	<input type="checkbox"/> Wetland Non-Vascular Plants ¹
8. _____	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
100% = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present.
<u>Woody Vine Stratum</u> (Plot size: <u>10' r</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0% = Total Cover				
Remarks: *identifies indicator status is tentative <u>Thuja plicata</u> shrub nearby.				Entered by: <u>SAR</u> QC by: <u>cmw</u>

SOIL

Sampling Point: **MCP-1**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/2	80	7.5YR 4/6	20	C	M&PL	sicl	ORC
6-18	10YR 4/1	85	7.5YR 4/6	15	C	M	sic	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)			Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)			
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)(except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)				
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.			
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)				
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)				
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)				

Restrictive Layer (if present):	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____	
Depth (inches): _____	

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

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

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>11</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u> (includes capillary fringe)	

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

Remarks: Sidewall seeps at 7-inches bgs. Entered by: SAR QC by: cmw

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

Project/Site: Mill City Local Wetland Inventory City/County: Mill City / Linn Sampling Date: 3/16/2010
 Applicant/Owner: Mill City and LCOG State: Oregon Sampling Point: MCP-2 (U)
 Investigator(s): Mirth Walker and Stacey Reed Section, Township, Range: #94 09S03E31 01003
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none) None Slope (%): <3
 Subregion (LRR): A, Northwest Forests and Coast Lat: 44.7445 Long: -122.4892 Datum: NAD 1983
 Soil Map Unit Name: (64) Malabon variant loam NWI classification: PEMC
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present?
 Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u> X </u> No <u> </u> Hydric Soil Present? Yes <u> </u> No <u> X </u> Wetland Hydrology Present? Yes <u> </u> No <u> X </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u> X </u>
Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation). Precipitation prior to fieldwork: Showers day of field in Mill City and 1.44-inches of rainfall two weeks prior in Salem. Map D.	

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30' r</u>)					
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u> 1 </u> (A) Total Number of Dominant Species Across All Strata: <u> 1 </u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
0% = Total Cover				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u> 0 </u> x 1 = <u> 0 </u> FACW species <u> 0 </u> x 2 = <u> 0 </u> FAC species <u> 80 </u> x 3 = <u> 240 </u> FACU species <u> 10 </u> x 4 = <u> 40 </u> UPL species <u> 0 </u> x 5 = <u> 0 </u> Column Totals: <u> 90 </u> (A) <u> 280 </u> (B) Prevalence Index = B/A = <u> 3.11 </u>	
Sapling/Shrub Stratum (Plot size: <u>10' r</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
0% = Total Cover					
Herb Stratum (Plot size: <u>5' r</u>)					
1. <u>Agrostis species</u>	60%	Yes	FAC ?	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.	
2. <u>Trifolium repens</u>	10%	No	FAC*		
3. <u>Cirsium arvense</u>	10%	No	FACU		
4. <u>Plantago lanceolata</u>	10%	No	FAC		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
90% = Total Cover					
Woody Vine Stratum (Plot size: <u>10' r</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
0% = Total Cover					
% Bare Ground in Herb Stratum <u> 10% </u>				Hydrophytic Vegetation Present? Yes <u> X </u> No <u> </u>	
Remarks: *identifies indicator status is tentative Vegetation had been grazed.				Entered by: <u>SAR</u> QC by: <u>cmw</u>	

SOIL

Sampling Point: **MCP-2 (U)**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10YR 3/2	100					sil	
16-20	10YR 4/1	95	7.5YR 4/6	5	C	M	sil	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)(except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	wetland hydrology must be present,
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	unless disturbed or problematic.

Restrictive Layer (if present):	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Type: _____	
Depth (inches): _____	

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

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

Field Observations:	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>>20</u>	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>>20</u> (includes capillary fringe)	

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

Remarks: _____ Entered by: SAR QC by: cmw

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

Project/Site: Mill City Local Wetland Inventory City/County: Mill City / Marion Sampling Date: 3/16/2010
 Applicant/Owner: Mill City and LCOG State: Oregon Sampling Point: MCP-3
 Investigator(s): Mirth Walker and Stacey Reed Section, Township, Range: # 1134 093E30CA01400
 Landform (hillslope, terrace, etc.): Broad swale Local relief (concave, convex, none) Concave Slope (%): <3
 Subregion (LRR): A, Northwest Forests and Coast Lat: 44.7570 Long: -122.4904 Datum: NAD 1983
 Soil Map Unit Name: (HSC) Horeb gravelly silt loam, gravelly substratum, 0-15% slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present?
 Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	
Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation). Precipitation prior to fieldwork: Showers day of field in Mill City and 1.44-inches of rainfall two weeks prior in Salem. Wetland MC-4 Map B			

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
0% = Total Cover				Total % Cover of: <u> </u> Multiply by: <u> </u>
<u>Sapling/Shrub Stratum</u> (Plot size: <u>10' r</u>)				OBL species <u>0</u> x 1 = <u>0</u>
1. _____	_____	_____	_____	FACW species <u>80</u> x 2 = <u>160</u>
2. _____	_____	_____	_____	FAC species <u>20</u> x 3 = <u>60</u>
3. _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>
4. _____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>
5. _____	_____	_____	_____	Column Totals: <u>100</u> (A) <u>220</u> (B)
0% = Total Cover				Prevalence Index = B/A = <u>2.20</u>
<u>Herb Stratum</u> (Plot size: <u>5' r</u>)				Hydrophytic Vegetation Indicators:
1. <u>Alopecurus pratensis</u>	<u>80%</u>	<u>Yes</u>	<u>FACW</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
2. <u>Poa species</u>	<u>20%</u>	<u>Yes</u>	<u>FAC ?</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. _____	_____	_____	_____	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____	_____	_____	_____	<input type="checkbox"/> Wetland Non-Vascular Plants ¹
5. _____	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present.
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
100% = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
<u>Woody Vine Stratum</u> (Plot size: <u>10' r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0% = Total Cover				
% Bare Ground in Herb Stratum <u>0%</u>				
Remarks: *identifies indicator status is tentative				Entered by: <u>SAR</u> QC by: <u>cmw</u>

SOIL

Sampling Point: **MCP-3**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/2	80	7.5YR 4/4	20	C	M	sil	
6-18	10YR 4/1	80	7.5YR 4/6	20	C	M	sicl	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)			Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)			
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)(except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)				
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.			
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)				
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)				
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)				

Restrictive Layer (if present):	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____	
Depth (inches): _____	

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

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

Field Observations:				Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	_____	
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	7"	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	surface	

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

Remarks: 2 inches deep upstream. Entered by: SAR QC by: cmw

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

Project/Site: Mill City Local Wetland Inventory City/County: Mill City / Marion Sampling Date: 3/16/2010
 Applicant/Owner: Mill City and LCOG State: Oregon Sampling Point: MCP-4
 Investigator(s): Mirth Walker and Stacey Reed Section, Township, Range: #1129 093E30CA00400
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none) Concave Slope (%): <3
 Subregion (LRR): A, Northwest Forests and Coast Lat: 44.7581 Long: -122.4906 Datum: NAD 1983
 Soil Map Unit Name: (HSC) Horeb gravelly silt loam, gravelly substratum, 0-15% slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present?
 Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	
Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation). Precipitation prior to fieldwork: Showers day of field in Mill City and 1.44-inches of rainfall two weeks prior in Salem. Wetland MC-5 Map B			

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
0% = Total Cover				Total % Cover of: <u> </u> Multiply by: <u> </u>
<u>Sapling/Shrub Stratum</u> (Plot size: <u>10' r</u>)				OBL species <u>0</u> x 1 = <u>0</u>
1. _____	_____	_____	_____	FACW species <u>60</u> x 2 = <u>120</u>
2. _____	_____	_____	_____	FAC species <u>40</u> x 3 = <u>120</u>
3. _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>
4. _____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>
5. _____	_____	_____	_____	Column Totals: <u>100</u> (A) <u>240</u> (B)
0% = Total Cover				Prevalence Index = B/A = <u>2.40</u>
<u>Herb Stratum</u> (Plot size: <u>5' r</u>)				Hydrophytic Vegetation Indicators:
1. <u>Agrostis species</u>	<u>40%</u>	<u>Yes</u>	<u>FAC ?</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
2. <u>Phalaris arundinacea</u>	<u>40%</u>	<u>Yes</u>	<u>FACW</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. <u>Juncus effusus</u>	<u>10%</u>	<u>No</u>	<u>FACW</u>	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. <u>Juncus tenuis</u>	<u>10%</u>	<u>No</u>	<u>FACW</u>	<input type="checkbox"/> Wetland Non-Vascular Plants ¹
5. _____	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present.
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
100% = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
<u>Woody Vine Stratum</u> (Plot size: <u>10' r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0% = Total Cover				
% Bare Ground in Herb Stratum <u>0%</u>				
Remarks: *identifies indicator status is tentative				Entered by: <u>SAR</u> QC by: <u>cmw</u>

SOIL

Sampling Point: **MCP-4**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/2	95	7.5YR 4/6	5	C	M	sil	
5-16	10YR 4/1	80	10YR 6/1	10	C	M	sicl	
			7.5YR 4/6	5	C	M		
			7.5YR 3/4	5	C	PL		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)(except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)		³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		wetland hydrology must be present,
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		unless disturbed or problematic.

Restrictive Layer (if present):	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____	
Depth (inches): _____	

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

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

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>9</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u>	
(includes capillary fringe)	

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

Remarks: Sidewall seeps at 4-inches bgs. Entered by: SAR QC by: cmw

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

Project/Site: Mill City Local Wetland Inventory City/County: Mill City / Linn Sampling Date: 3/16/2010
 Applicant/Owner: Mill City and LCOG State: Oregon Sampling Point: MCP-5 (U)
 Investigator(s): Mirth Walker and Stacey Reed Section, Township, Range: #667 09S03E31BA00405
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none) Concave Slope (%): <3
 Subregion (LRR): A, Northwest Forests and Coast Lat: 44.7513 Long: -122.4919 Datum: NAD 1983
 Soil Map Unit Name: (18) Camas gravelly sandy loam NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present?
 Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	
Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation). Precipitation prior to fieldwork: Showers day of field in Mill City and 1.44-inches of rainfall two weeks prior in Salem. Map B			

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30' r</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>90</u> x 3 = <u>270</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>100</u> (A) <u>310</u> (B) Prevalence Index = B/A = <u>3.10</u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0% = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>10' r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
0% = Total Cover				
Herb Stratum (Plot size: <u>5' r</u>)				
1. <u>Agrostis species</u>	30%	Yes	FAC ?	
2. <u>Poa species</u>	30%	Yes	FAC ?	
3. <u>Trifolium repens</u>	30%	Yes	FAC*	
4. <u>Taraxacum officinale</u>	10%	No	FACU	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
100% = Total Cover				
Woody Vine Stratum (Plot size: <u>10' r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0% = Total Cover				
% Bare Ground in Herb Stratum <u>0%</u>				
Remarks: *identifies indicator status is tentative Vegetation had been grazed.				

Entered by: SAR QC by: cmw

SOIL

Sampling Point: **MCP-5 (U)**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-21	10YR 3/2	100					sal	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)(except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		

Restrictive Layer (if present):	Hydric Soil Present? Yes _____ No X
Type: _____	
Depth (inches): _____	

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

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

Field Observations:				Wetland Hydrology Present? Yes _____ No X
Surface Water Present?	Yes _____ No X	Depth (inches):	_____	
Water Table Present?	Yes _____ No X	Depth (inches):	<u>>21</u>	
Saturation Present? (includes capillary fringe)	Yes X No _____	Depth (inches):	<u>20</u>	

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

Remarks: _____ Entered by: SAR QC by: cmw

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

Project/Site: Mill City Local Wetland Inventory City/County: Mill City / Linn Sampling Date: 3/16/2010
 Applicant/Owner: Mill City and LCOG State: Oregon Sampling Point: MCP-6
 Investigator(s): Mirth Walker and Stacey Reed Section, Township, Range: #82 09S03E31 00200
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none) Concave Slope (%): <3
 Subregion (LRR): A, Northwest Forests and Coast Lat: 44.7497 Long: -122.4944 Datum: NAD 1983
 Soil Map Unit Name: (73) Newberg fine sandy loam NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present?
 Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Remarks: NA means Not Applicable (used on plowed and planted agricultural crop sites in reference to the vegetation). Precipitation prior to fieldwork: Showers day of field in Mill City and 1.44-inches of rainfall two weeks prior in Salem. Wetland MC-6 Map B	

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status	
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet:
0% = Total Cover				Total % Cover of: _____ Multiply by: _____
<u>Sapling/Shrub Stratum</u> (Plot size: <u>10' r</u>)				OBL species <u>30</u> x 1 = <u>30</u>
1. _____	_____	_____	_____	FACW species <u>30</u> x 2 = <u>60</u>
2. _____	_____	_____	_____	FAC species <u>0</u> x 3 = <u>0</u>
3. _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>
4. _____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>
5. _____	_____	_____	_____	Column Totals: <u>60</u> (A) <u>90</u> (B)
0% = Total Cover				Prevalence Index = B/A = <u>1.50</u>
<u>Herb Stratum</u> (Plot size: <u>5' r</u>)				Hydrophytic Vegetation Indicators:
1. <u>Carex obnupta</u>	<u>30%</u>	<u>Yes</u>	<u>OBL</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
2. <u>Ranunculus repens</u>	<u>30%</u>	<u>Yes</u>	<u>FACW</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. _____	_____	_____	_____	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____	_____	_____	_____	<input type="checkbox"/> Wetland Non-Vascular Plants ¹
5. _____	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present.
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
60% = Total Cover				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
<u>Woody Vine Stratum</u> (Plot size: <u>10' r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0% = Total Cover				
% Bare Ground in Herb Stratum <u>40%</u>				
Remarks: *identifies indicator status is tentative Plot also had 40% unidentifiable grasses due to heavy grazing.				Entered by: <u>SAR</u> QC by: <u>cmw</u>

SOIL

Sampling Point: **MCP-6**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/2	100					sicl	
5-11	10YR 4/1	80	10YR 3/1	10	C	M	sil	
			7.5YR 4/6	10	C	M		
11-16	10YR 4/1	60	5YR 3/4	40	C	M	sal	
16-20	10YR 4/1	80	7.5YR 4/6	20	C	M	sic	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)(except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		³ Indicators of hydrophytic vegetation and
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		wetland hydrology must be present,
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		unless disturbed or problematic.

Restrictive Layer (if present):	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____	
Depth (inches): _____	

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
 Pieces of charcoal and wood in surface 11-inches of profile.

HYDROLOGY

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

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>7</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u> (includes capillary fringe)	

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

Remarks: Entered by: SAR QC by: cmw
 Approx. 2-inch deep ponding near plot in wetland.

APPENDIX E

Watershed Summary and Wetlands of Special Interest for Protection

LCOG LWI Watershed Setting

City of Mill City

OFWAM Questions 1-4 and 9-14 (see Wetland Characterization Sheets for the remaining questions 5-8 and 15-40)

1. Middle Willamette Drainage Basin Watershed Name

North Santiam River-Walker Creek

2. Watershed size in square miles

28.12

3. Average slope

16.25 percent

4. Is the stream flow in the watershed modified by dams, channelization or levees?

- a. Tributary streams to the main stem stream are modified.
- b. Main stem stream is modified.
- c. Stream flow is not modified (free-flowing).

a and b (Detroit Reservoir upstream of Mill City)

5. Is water being taken out of the streams through active diking, drainage or irrigation districts upstream of the assessment area?

Yes

see note above for Qs 6-8

9. Fisheries - list type if known.

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

a, b, c, d, e

10. List any known sensitive, threatened or endangered fish species present in the watershed.

Steelhead (Upper Willamette River ESU, winter run)
Chinook salmon (Upper Willamette River ESU, spring run)
Bull trout (Willamette SMU)

11. Wildlife species: Select all that are appropriate and list species if known.

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

a, b, c

12. List any known sensitive, threatened or endangered plant species or wildlife species present in the watershed.

petalled mouse lichen (no State or Federal listing - only SRANK 1 and NHP List 3)
Harlequin duck
Northern spotted owl
Oregon slender salamander
long-legged myotis (bat)

13. Does the watershed provide a natural corridor for fish or wildlife movement?

- 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.

a.

14. What are the landscape features at both ends of the movement corridor?

- 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.

a.

City of Mill City

Common Name	Scientific Name
Steelhead (Upper Willamette River ESU, winter run)	<i>Oncorhynchus mykiss pop. 33</i>
Chinook salmon (Upper Willamette River ESU, spring run)	<i>Oncorhynchus tshawytscha pop. 23</i>
Bull trout (Willamette SMU)	<i>Salvelinus confluentus pop. 17</i>

petalled mouse lichen	<i>Pannaria rubiginella</i>
Harlequin duck	<i>Histrionicus histrionicus</i>
Northern spotted owl	<i>Strix occidentalis caurina</i>
Oregon slender salamander	<i>Batachoseps wrightorum</i>
long-legged myotis (bat)	<i>Myotis volans</i>

LCOG LWI Wetlands of Special Interest for Protection		MC-1, 5	MC-2	MC-3	MC-4	MC-6	MC-7	MC-9	MC-11
Q1	Wetland: Does the wetland contain threatened, endangered or sensitive species of wildlife, plants, invertebrates or fish? (Either federal- or state-listed.) Yes/No/Unknown	No	No	No	No	No	No	No	No
	If yes, list species: nr Snake Ck.								
Q2	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? Yes/No/Unknown	No	No	No	No	No	No	No	No
Q3	If yes, list species: 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? Yes/No/Unknown	No	No	No	No	No	No	No	No
Q4	If yes, list which it is: Is the wetland of regional or national significance for migratory birds? Yes/No/Unknown	No	No	No	No	No	No	No	No
Q5	If yes, list which species: Is the wetland protected in a local wetland conservation plan or a local comprehensive plan as a Goal 5 or Goal 17 resource? Yes/No/Unknown	No	No	No	No	No	No	No	No
Q6	Is the wetland protected a designated State Outstanding Resource Water? Yes/No/Unknown	No	No	No	No	No	No	No	No
Q7	Is the wetland a protected area in a recognized federal, state or local management plan, e.g., for a park, refuge or scenic river? Yes/No/Unknown	No	No	No	No	No	No	No	No
	If yes, list name:								

LCOG LWI Wetlands of Special Interest for Protection		MC-1, 5	MC-2	MC-3	MC-4	MC-6	MC-7	MC-9	MC-11
	Wetland:								
Q8	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. Yes/No/Unknown	No	No	No	No	No	No	No	No
Q9	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. Yes/No/Unknown	No	No	No	No	No	No	No	No
Q10	Is the wetland considered rare or unique in Oregon? Examples include bogs, vernal pools and old growth forested wetlands (See OFWAM Appendix G). Yes/No/Unknown	No	No	No	No	No	No	No	No

APPENDIX F
Wetland Summary Sheets

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Marion Wetland Code: MC-1

Street Address: 751 NW SANTIAM BV; 400 NW SANTIAM BV

T, R, S, tax lots: 093E30DB 400, 500, 600, 800, 1400, 1500, 1700; 093E30DA 200 and 400

Investigators: Stacey Reed, Mirth Walker Sampling Date: 3/16/2010 Sample Plot Numbers: MCP-1

Onsite? Yes Observation Point: OBS-MC-1 Photopoint Numbers: PP-1, PP-2, PP-3, PP-4

Onsite parcels: (1142) 093E30DB00600, (1143) 093E30DB00800

Offsite parcels: (1139) 093E30DB00300, (1140) 093E30DB00400, (1141) 093E30DB00500, (1364) 093E30DB01400, (1365) 093E30DB01500, (1367) 093E30DB01700, (1335) 093E30DA00200, (1337) 093E30DA00400

Map: B Site #: 1139, 1140, 1141, 1142, 1143, 1364, 1365, 1367, 1335, 1337

Cowardin Class (%): 68 PEM 32 PSS PFO POW PUBH PABH Wetland Size (ac): 2.18

SS, FO subclass: X 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B X C D E F G H J K

 W Y Z U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated, F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded, W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f h r s x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: X riverine flowthrough riverine impounding lake fringe depressional slope flats

Mapped Soil Unit(s): (HSC) Horeb gravelly silt loam, gravelly substratum, 0-15% slopes

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: 2 groundwater 1 stream inflow 3 overbank flooding runoff precipitation

Topographic position: hillslope X toeslope depression flood plain terrace valley bottom

 swale ridgetop

Onsite land uses: Residential

Surrounding land uses: Forest and Residential

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Mowing

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? **Yes**

H Wildlife Habitat M Fish Habitat M Water Quality M Hydrologic Control Other:

Comments: No Name (NN) Stream #5 flows west through wetland. NN#5 provides a surface water connection to Wetland MC-5 to the west. Stream has been channelized (3-5 feet wide, 1-1.5 feet deep).

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree

Shrub

Fraxinus latifolia Oregon ash

Alnus rubra red alder

Herb

Scirpus microcarpus small-fruited bulrush

Carex obnupta slough sedge

Lysichiton americanus skunk cabbage

Callitriche species water-starwort in stream

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Linn Wetland Code: MC-2

Street Address: SE portion of study area; West of 4th to Tuers

T, R, S, tax lots: 09S03E31 1204, 1600, 1700, 1800; 09S03E31AD 1209; 09S03E32 1804, 2200, 2300, 2402

Investigators: Stacey Reed, Mirth Walker Sampling Date: 3/24&4/1/10 Sample Plot Numbers: None

Onsite? No Observation Point: N/A Photopoint Numbers: PP-20 (4/1/2010)

Onsite parcels: None

Offsite parcels: All

Map: D/E Site #: 96, 97, 98, 99, 112, 136, 140, 141, 142

Cowardin Class (%): 74 PEM 9 PSS 17 PFO POW PUBH PABH Wetland Size (ac): 24.11

SS, FO subclass: X 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B X C D E F G H J K

 W Y Z U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated, F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded, W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f h r s x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: riverine flowthrough riverine impounding lake fringe depressional X slope flats

Mapped Soil Unit(s): Waldo silty clay loam

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: 1 groundwater 2 stream inflow 3 overbank flooding runoff precipitation

Topographic position: hillslope X toeslope depression flood plain terrace valley bottom

 swale ridgetop

Onsite land uses: Pasture

Surrounding land uses: Residential

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Grazing and Mowing

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? **Yes**

H Wildlife Habitat M Fish Habitat M Water Quality M Hydrologic Control Other:

Comments: North Fork DeFord Creek flows westerly through wetland within ditched channel. Used historic aerial photographs to map wetland boundary; includes upland island. Agricultural use of wetlands date back to 1940's.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree	
<i>Fraxinus latifolia</i>	Oregon ash
<i>Populus balsamifera</i>	black cottonwood
Shrub	
<i>Spiraea douglasii</i>	Douglas' spirea
<i>Salix species</i>	willow
<i>Rubus armeniacus</i>	Himalayan blackberry
Herb	
<i>Phalaris arundinacea</i>	reed canarygrass
<i>Juncus effusus</i>	soft rush
<i>Scirpus microcarpus</i>	small-fruited bulrush
unknown grasses	

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Linn Wetland Code: MC-3

Street Address: East of Tuers and south of Kingwood

T, R, S, tax lots: 09S03E31 tax lots 1200, 1204; 09S03E31AD01400

Investigators: Stacey Reed, Mirth Walker Sampling Date: 3/16/2010 Sample Plot Numbers: None

Onsite? No Observation Point: _____ Photopoint Numbers: _____

Onsite parcels: None

Offsite parcels: All

Map: D Site #: 95, 96, 115

Cowardin Class (%): 43 PEM 10 PSS 47 PFO _____ POW _____ PUBH _____ PABH Wetland Size (ac): 1.67

SS, FO subclass: X 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: _____ A _____ B X C _____ D _____ E _____ F _____ G _____ H _____ J _____ K

_____ W _____ Y _____ Z _____ U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated,
F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded,
W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: _____ b _____ d _____ f _____ h _____ r _____ s _____ x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: _____ riverine flowthrough _____ riverine impounding _____ lake fringe _____ depressional X slope _____ flats

Mapped Soil Unit(s): McBee silty clay loam and Sifton variant gravelly loam

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: X groundwater _____ stream inflow _____ overbank flooding _____ runoff _____ precipitation

Topographic position: _____ hillslope _____ toeslope _____ depression _____ flood plain X terrace _____ valley bottom

_____ swale _____ ridgetop

Onsite land uses: Pasture

Surrounding land uses: Rural Residential and Pasture

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Grazed

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? No

M Wildlife Habitat NA Fish Habitat M Water Quality M Hydrologic Control Other: None.

Comments: Isolated.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree

Fraxinus latifolia Oregon ash

Shrub

Rosa species rose

Spiraea douglasii Douglas' spirea

Herb

Phalaris arundinacea reed canarygrass

Agrostis species bentgrass

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Marion Wetland Code: MC-4

Street Address: 28340 NORTH SANTIAM HY SE

T, R, S, tax lots: 093E30CA 1400, 1300, 1200; 093E30C00602, 093E30DB 3700 and 4401

Investigators: Stacey Reed, Mirth Walker Sampling Date: 3/16 & 4/1/10 Sample Plot Numbers: MCP-3

Onsite? Yes Observation Point: OBS-MC-3 Photopoint Numbers: PP-5-7, 22 & 24 (3/16/10) 11 (4/1/10)

Onsite parcels: (1134) 093E30CA01400

Offsite parcels: (1133) 093E30CA01300, (1125) 093E30C00602, (1132) 093E30CA01200,
(1146) 093E30DB03700, (1149) 093E30DB04401

Map: B Site #: 1125, 1133, 1132, 1134, 1146, 1149

Cowardin Class (%): 15 PEM 73 PSS 12 PFO 12 POWH PUBH PABH Wetland Size (ac): 1.28

SS, FO subclass: X 1 2 3 4 5 6 7
1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B X C D E F G X H J K
 W Y Z U
A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated, F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded, W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f X h r s x
b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: X riverine flowthrough X riverine impounding lake fringe depressional slope flats

Mapped Soil Unit(s): Horeb gravelly silt loam, gravelly substratum, 0-15% slopes

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: 2 groundwater 1 stream inflow overbank flooding runoff precipitation

Topographic position: hillslope X toeslope depression flood plain terrace valley bottom
 swale ridgetop

Onsite land uses: Pasture, Residential

Surrounding land uses: Residential, Pasture
urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Grazing, Diked for irrigation
agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? **Yes**

H Wildlife Habitat M Fish Habitat M Water Quality M Hydrologic Control Other:

Comments: Seasonal NN#4 flows westerly through wetland into excavated and diked irrigation pond on #1134. Outflow culverted under North Sanitam Hwy. Wetland also receives runoff from spring in the NE corner of #1134. NWI mapped PSSC on ID#1225 does not appear to be present.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree	
<i>Fraxinus latifolia</i>	Oregon ash
Shrub	
<i>Rubus armeniacus</i>	Himalayan blackberry
Herb	
<i>Alopecurus pratensis</i>	meadow foxtail
<i>Equisetum telmateia</i>	giant horsetail

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Marion Wetland Code: MC-5

Street Address: 28399 NORTH SANTIAM HY SE

T, R, S, tax lots: 093E3000400; 093E30CA 300, 400 and 500

Investigators: Stacey Reed, Mirth Walker Sampling Date: 3/16/2010 Sample Plot Numbers: MCP-4

Onsite? Yes Observation Point: N/A Photopoint Numbers: PP-25

Onsite parcels: (1129) 093E30CA00400

Offsite parcels: (1123) 093E3000400, (1130) 093E30CA00500, (1128) 093E30CA00300

Map: B Site #: 1123, 1129, 1130

Cowardin Class (%): 66 PEM PSS PFO POV 34 PUBF PABH Wetland Size (ac): 0.89

SS, FO subclass: 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B X C D E F G H J K

 W Y Z U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated, F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded, W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f h r s x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: X riverine flowthrough X riverine impounding lake fringe depressional slope flats

Mapped Soil Unit(s): Horeb gravelly silt loam, gravelly substratum, 0-15% slopes

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: 2 groundwater 1 stream inflow overbank flooding runoff precipitation

Topographic position: hillslope X toeslope depression flood plain terrace valley bottom

 swale ridgetop

Onsite land uses: Residential

Surrounding land uses: Residential

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Historic grazing

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? **Yes**

H Wildlife Habitat M Fish Habitat M Water Quality M Hydrologic Control Other:

Comments: NN# 5 flows westerly through wetland. Includes NWI mapped PUBFh. Connected to MC-1.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree

Shrub

Herb

Agrostis species bentgrass

Phalaris arundinacea reed canarygrass

Juncus effusus soft rush

Juncus tenuis slender rush

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Linn Wetland Code: MC-6

Street Address: 48261 LYONS

T, R, S, tax lots: 09S03E31 200 and 300

Investigators: Stacey Reed, Mirth Walker Sampling Date: 3/16/2010 Sample Plot Numbers: MCP-6

Onsite? Yes Observation Point: N/A Photopoint Numbers: PP-35, PP-37

Onsite parcels: (82) 09S03E31 00200

Offsite parcels: (86) 09S03E31 00300

Map: B Site #: 82

Cowardin Class (%): 58 PEM 42 PSS 0 PFO 0 POW 0 PUBH 0 PABH Wetland Size (ac): 2.19

SS, FO subclass: 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B X C D E F G H J K

 W Y Z U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated, F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded, W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f h r s x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: riverine flowthrough riverine impounding lake fringe depressional X slope flats

Mapped Soil Unit(s): Newberg fine sandy loam

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: X groundwater stream inflow overbank flooding runoff precipitation

Topographic position: hillslope X toeslope depression flood plain terrace valley bottom

 swale ridgetop

Onsite land uses: Grazing

Surrounding land uses: Residential and Rural Residential

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Grazing

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? **Yes**

H Wildlife Habitat H Fish Habitat M Water Quality M Hydrologic Control Other:

Comments: Water flows west through wetland from a spring at the toe of slope. Flow likely joins Snake Creek and thence into the North Santiam River.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree

Alnus rubra red alder

Shrub

Herb

Carex obnupta slough sedge

Ranunculus repens creeping buttercup

Oenanthe sarmentosa water parsley

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Linn Wetland Code: MC-7

Street Address: 47842 E LYONS

T, R, S, tax lots: 09S02E36 01303

Investigators: Stacey Reed and Jesse Wilson Sampling Date: 4/1/2010 Sample Plot Numbers: None

Onsite? No Observation Point: _____ Photopoint Numbers: _____

Onsite parcels: None

Offsite parcels: All

Map: A Site #: 5

Cowardin Class (%): 80 PEM 20 PSS _____ PFO _____ POW _____ PUBH _____ PABH Wetland Size (ac): 0.61

SS, FO subclass: 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: _____ A _____ B C _____ D _____ E _____ F _____ G _____ H _____ J _____ K

_____ W _____ Y _____ Z _____ U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated, F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded, W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: _____ b _____ d _____ f _____ h _____ r _____ s _____ x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: _____ riverine flowthrough _____ riverine impounding _____ lake fringe _____ depressional slope _____ flats

Mapped Soil Unit(s): Coburg silty clay loam

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: 1 groundwater 2 stream inflow _____ overbank flooding _____ runoff _____ precipitation

Topographic position: _____ hillslope _____ toeslope _____ depression _____ flood plain terrace _____ valley bottom

_____ swale _____ ridgetop

Onsite land uses: Lumber Mill

Surrounding land uses: Lumber Mill and Tree Farm; Railroad to south

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Untreated stormwater; Paved road

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? **Yes**

M Wildlife Habitat M Fish Habitat M Water Quality L Hydrologic Control Other: See comments.

Comments: Seasonal NN#1 flows northerly through wetland. Outflow flows north through a culvert under Lyons-Mill City Dr. Significance determination: North Santiam River is not on 303(d) list in Mill City (wetland is less than 1/4 mile away and has impacted WQ function), but the wetland has a direct surface water connection to a stream segment mapped by ODFW as habitat for indigenous anadromous salmonids (steelhead, Chinook salmon, and bull trout) and the wetland's fish habitat function is impacted.

Dominant Vegetation (Scientific and Common Name)	Entered by: sar	QC by: cmw
Tree		
Shrub		
Herb		
<i>Typha latifolia</i>	broadleaf cattail	
<i>Phalaris arundinacea</i>	reed canarygrass	

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Linn Wetland Code: MC-8

Street Address: North of Lyons-Mill City Dr and south of North Santiam River (Spring St.)

T, R, S, tax lots: 09S03E31 202, 203; 09S03E31BA00400

Investigators: Stacey Reed, Mirth Walker Sampling Date: 3/16/2010 Sample Plot Numbers: None

Onsite? Yes Observation Point: N/A Photopoint Numbers: PP-27, PP-28, PP-29, PP-31

Onsite parcels: All

Offsite parcels: None

Map: B Site #: 84, 85, 117

Cowardin Class (%): PEM PSS PFO POW PUBH 100 PABH Wetland Size (ac): 0.17

SS, FO subclass: 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B C D E F G X H J K

W Y Z U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated, F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded, W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f X h r s X x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: riverine flowthrough X riverine impounding lake fringe depressional slope flats

Mapped Soil Unit(s): Newberg fine sandy loam

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: 2 groundwater 1 stream inflow overbank flooding runoff precipitation

Topographic position: hillslope toeslope X depression flood plain terrace valley bottom

swale ridgetop

Onsite land uses: Pasture

Surrounding land uses: Residential and Pasture

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Diked for irrigation

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? No - too small.

Wildlife Habitat Fish Habitat Water Quality Hydrologic Control Other:

Comments: Springs seep from toe slope to the south. Wetlands have been excavated and diked for irrigation. Water flows westerly through ponds and into Snake Creek.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree

Shrub

Herb

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Linn Wetland Code: MC-9

Street Address: 47842 E LYONS MILL CITY DR (Lumber Company south of street)

T, R, S, tax lots: 09S02E36 01303, 09S03E31 600, 700 and 801

Investigators: Stacey Reed, Jesse Wilson Sampling Date: 4/1/2010 Sample Plot Numbers: None

Onsite? No Observation Point: _____ Photopoint Numbers: None

Onsite parcels: None

Offsite parcels: All

Map: A&D Site #: 6, 89, 90, 91

Cowardin Class (%): 15 PEM 45 PSS 40 PFO _____ POW _____ PUBH _____ PABH Wetland Size (ac): 18.32

SS, FO subclass: X 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: _____ A _____ B X C _____ D _____ E _____ F _____ G _____ H _____ J _____ K

_____ W _____ Y _____ Z _____ U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated, F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded, W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: _____ b _____ d _____ f _____ h _____ r _____ s _____ x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: _____ riverine flowthrough _____ riverine impounding _____ lake fringe _____ depressional X slope _____ flats

Mapped Soil Unit(s): Waldo silty clay loam

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: 1 groundwater 2 stream inflow _____ overbank flooding _____ runoff _____ precipitation

Topographic position: _____ hillslope X toeslope _____ depression _____ flood plain _____ terrace _____ valley bottom

_____ swale _____ ridgetop

Onsite land uses: Lumber Mill and Pasture

Surrounding land uses: Lumber Mill, Pasture, Rural Residential

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: Gravel roads

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? **Yes**

H Wildlife Habitat M Fish Habitat M Water Quality M Hydrologic Control Other: _____

Comments: Seasonal NN#1 flows westerly through wetland. Mapped wetland based on aerial photograph interpretation and hydric soil mapping. Includes NWI mapped PEMA on ID#89.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree

Shrub unknown vegetation - unable to see from street

Herb

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Linn Wetland Code: MC-10

Street Address: South Lyons-Mill City Rd and northeast of Ivy; Just south of the DeFord Bridge.

T, R, S, tax lots: 09S03E31 00900

Investigators: Stacey Reed, Jesse Wilson Sampling Date: 4/1/2010 Sample Plot Numbers: None

Onsite? No Observation Point: _____ Photopoint Numbers: PP-15, PP-16

Onsite parcels: None

Offsite parcels: All

Map: D Site #: 92

Cowardin Class (%): PEM PSS PFO POV 100 PUBH PABH Wetland Size (ac): 0.23

SS, FO subclass: 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B C D E F G X H J K
W Y Z U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated,

F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded,

W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f X h r s x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: riverine flowthrough X riverine impounding lake fringe depressional slope flats

Mapped Soil Unit(s): Malabon variant loam

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: X groundwater stream inflow overbank flooding runoff precipitation

Topographic position: hillslope toeslope depression flood plain X terrace valley bottom

swale ridgetop

Onsite land uses: None

Surrounding land uses: Residential, Snake Creek to south

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: None

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? No - too small.

Wildlife Habitat Fish Habitat Water Quality Hydrologic Control Other:

Comments: Old meander from DeFord Creek.

Dominant Vegetation (Scientific and Common Name)

Entered by: sar

QC by: cmw

Tree

Shrub

Herb

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Linn Wetland Code: MC-11

Street Address: South Lyons-Mill City Dr

T, R, S, tax lots: 09S02E36 01302

Investigators: Stacey Reed, Jesse Wilson Sampling Date: 4/1/2010 Sample Plot Numbers: None

Onsite? No Observation Point: N/A Photopoint Numbers: PP-17

Onsite parcels: None

Offsite parcels: All

Map: A Site #: 4

Cowardin Class (%): 100 PEM PSS PFO POW PUBH PABH Wetland Size (ac): 0.41

SS, FO subclass: 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B X C D E F G H J K

 W Y Z U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated,
F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded,
W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f h r s x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: riverine flowthrough riverine impounding lake fringe depressional X slope flats

Mapped Soil Unit(s): Waldo silty clay loam

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: None

Hydrology Sources: 1 groundwater 2 stream inflow overbank flooding runoff precipitation

Topographic position: hillslope toeslope depression flood plain X terrace valley bottom

 swale ridgetop

Onsite land uses: Tree farm

Surrounding land uses: Lumber mill and Tree farm

urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: None

agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? **Yes**

M Wildlife Habitat M Fish Habitat M Water Quality L Hydrologic Control Other: See comments.

Comments: Ditch flows northerly through wetland. Outflows under Lyons-Mill City Drive off-site to the north. Significance determination: North Santiam River is not on 303(d) list in Mill City (wetland is less than 1/4 mile away and has impacted WQ function), but the wetland has a direct surface water connection to a stream segment mapped by ODFW as habitat for indigenous anadromous salmonids (steelhead, Chinook salmon, and bull trout) and the wetland's fish habitat function is impacted.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree

Shrub

Rosa species rose

Herb

Schedonorus phoenix tall fescue

Agrostis species bentgrass

LOCAL WETLAND INVENTORY SUMMARY SHEET

City: Mill City County: Marion Wetland Code: MC-12

Street Address: 140 SANTIAM POINTE LP NE

T, R, S, tax lots: 093E29CC 3200 and 3300

Investigators: Stacey Reed, Jesse Wilson Sampling Date: 4/1/2010 Sample Plot Numbers: None

Onsite? No Observation Point: _____ Photopoint Numbers: PP-9

Onsite parcels: None

Offsite parcels: All

Map: C Site #: 1104 and 1105

Cowardin Class (%): PEM PSS 100 PFO POW PUBH PABH Wetland Size (ac): 0.17

SS, FO subclass: 1 2 3 4 5 6 7

1 Broad-leaved deciduous, 2 Needle-leaved deciduous, 3 Broad-leaved evergreen, 4 Needle-leaved evergreen, 5 Dead, 6 Deciduous, 7 Evergreen

Water Regime: A B X C D E F G H J K
W Y Z U

A Temporarily Flooded, B Saturated, C Seasonally Flooded, D Seasonally Flooded/Well-drained, E Seasonally Flooded/Saturated,
 F Semipermanently Flooded, G Intermittently Exposed, H Permanently Flooded, J Intermittently Flooded, K Artificially Flooded,
 W Intermittently Flooded/Temporary, Y Saturated/Semipermanent/Seasonal, Z Intermittently Exposed/Permanent, U Unknown

Special Modifier: b d f h r s x

b beaver, d partially drained/ditched, f farmed, h diked/impounded, r artificial substrate, s spoil, x excavated

HGM Class: X riverine flowthrough _____ riverine impounding _____ lake fringe _____ depressional _____ slope _____ flats

Mapped Soil Unit(s): (Ad)

Watershed Boundary (6th Field HUC) #: 170900050404 Name: North Santiam River-Walker Creek

DSL File Numbers: WD2008-0198

Hydrology Sources: 2 groundwater 1 stream inflow _____ overbank flooding _____ runoff _____ precipitation

Topographic position: X hillslope _____ toeslope _____ depression _____ flood plain _____ terrace _____ valley bottom
 _____ swale _____ ridgetop

Onsite land uses: None

Surrounding land uses: Residential, N Santiam River to south
 urban (residential / commercial buildings), agricultural, forestry, parks, natural, paved or gravel roads, parking lots

Disturbance: None
 agriculture (plowed and planted), grazing, mowing, untreated stormwater, ditching, fill, paved or gravel roads

Locally Significant Wetland Determination? No - too small.

Wildlife Habitat _____ Fish Habitat _____ Water Quality _____ Hydrologic Control _____ Other: _____

Comments: Elizabeth Creek flows southerly through wetland and outfalls to south into the North Santiam River. No change to delineated wetland boundary.

Dominant Vegetation (Scientific and Common Name) Entered by: sar QC by: cmw

Tree

<i>Populus balsamifera</i>	black cottonwood
<i>Pseudotsuga menziesii</i>	Douglas fir

Shrub

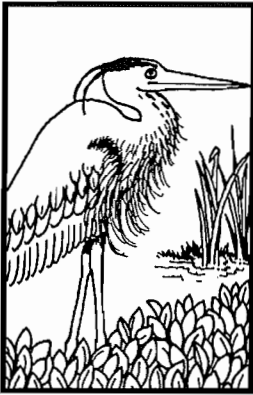
<i>Salix hookeriana</i>	Hooker willow (previously known as Piper willow)
<i>Rubus armeniacus</i>	Himalayan blackberry

Herb

<i>Oenanthe sarmentosa</i>	water parsley
<i>Agrostis species</i>	bentgrass
<i>Phalaris arundinacea</i>	reed canarygrass
<i>Veronica americana</i>	American speedwell

APPENDIX G

OFWAM Function Questions and Rationale



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:

- Three or four.
- Two.
- One.

Urban areas:

- Two or more.
- One class with more than five plant species.
- 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

looking at
vertical
strata
rather
than
social
mix

will

21 ($\geq 20\%$) + Vertical strata

p36

1090 or more

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.

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.

WH2
see 23

Notes

24

p37

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.

WHY

Notes

28

a+b

c

d

18

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.

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.

WHG

27

Notes

7+8

WHB
see 15

Notes

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.

WH 9b

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%.

Notes

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%.

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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."



Fish habitat

This index assesses the contribution of wetlands connected to streams, rivers, lakes or ponds to fish habitat. **For 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.

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.

Notes

FHS 1

31

Notes

ctd

30

Assessment questions: Part A—streams

Question 1

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

Western Oregon:

- a. More than 75%.
- b. Between 50% and 75%.
- c. Less than 50%.

Directions

See question 31 in the Wetland Characterization.

Eastern Oregon:

- a. 50% or more. *a+b*
- b. 25% or more, but less than 50%. *c*
- c. Less than 25%. *d*

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?

- 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.

Directions

See question 30 in the Wetland Characterization.

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.

FHS3

32 Notes

Question 3

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

- More than 25%.
- Between 10% and 25%.
- 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?

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

(7+8) = WH7

FHS 5

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

WH 8

FHS 6
29

33

FHLP?

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.

35

Notes

34

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.

(7+8) FHLP 4
Notes
= WH 7

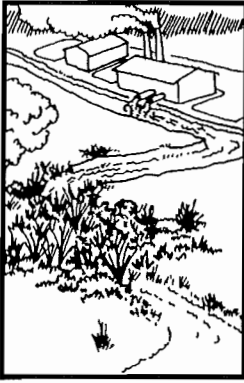
= WH 8

29

Fish habitat: assessment criteria

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

Notes



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?

- Surface flow, including streams and ditches.
- Precipitation or sheet flow.
- Groundwater, including seeps and springs.

Directions

See question 36 in the Wetland Characterization.

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

WQ1
36 me

WQ2
37

Notes

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.

Question 3

What is the degree of wetland vegetation cover?

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

21
→ OW < 40%
→ OW = 40%
→ OW > 40%

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.

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.

WQ4

17 + 27

Notes

15 or (WHB c)
same (WHB a)

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."

WQB
see 7+8

Notes

W17c

W17a



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.”

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.

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.

Notes

HC1
19

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.

HC2

37

Notes

=WQ2

17

38

Question 5

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

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.

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?

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

Directions

See question 16 in the Wetland Characterization.

Rationale

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

Question 7

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

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

Directions

See question 6 in the Wetland Characterization.

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.

HCS
23 same Notes
= WH 2

(c should have higher value than b for this rationale)

16 a. 100%

b
a/b (mostly a. in Wilsonville)
c
d in Lakeside

mostly b in Scio

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 impacted or degraded if:	Answers do not satisfy 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

APPENDIX H

OFWAM Wetland Characterization Questions, Function Answer Sheets, and Function and Condition Summary Sheets

WETLAND CHARACTERIZATION QUESTIONS

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area? (Modified for HC7)
- a. Urban or urbanizing (mix of urban, agriculture and forest uses).
 - b. Agriculture (farming, ranching or grazing).
 - c. Forested or natural area.

c	Santiam State Forest
---	----------------------

Water quality - see DEQ website

7. Consult the most recent State of Oregon DEQ 305(b) Report to determine whether any streams in the study area are listed as water quality limited (included in CWA 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.

b	North Santiam River is T° limited up to RM 45.3 (Mill City is at RM ~45.5-48)
---	---

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.

b	North Santiam River moderate for pesticides, bacteria/viruses, and excessive plant growth
---	---

Wetland Structure and Landscape

- 15 What percentage of area within 500 feet of the wetland edge is dedicated to these land uses?

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next two questions		

- 15 Modified for WH8: 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

c

- 15 Modified for WQ5: 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

a

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

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next question		

- 16 Modified for HC6: What is the dominant existing land use within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

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

a

- 17 What is the (entire) wetland acreage?

b	a. >5 acres	b. bet. 0.5 & 5 acres	c. < 0.5 acres
---	-------------	-----------------------	----------------

- 18 How is wetland connected to a stream, lake, or pond ? (see Figure, p. 35)

a	a. connected by surface water (culv., ditch, int./per. stream)	b. not connected to water body within 1 mile	c. not connected, no water bodies within 1 mile
---	--	--	---

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

b	a. yes	b. no
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Wetland Habitat

21 What is percentage wetland area by Cowardin class (10% or more)?

	a. bet. 70% & 100%	b. bet. 50% & <70%	c. bet. 20% & <50%	d. bet. 10% & <20%
Open water (OW >6.6ft)				
Emergent (EM)				
Scrub-shrub (SS)				
Forested (FO)				

21 Modified for WH1: How many Cowardin wetland classes are present?

	a. Two or more	b. One w/ > 5 species	c. One w/ < 5 species	a
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21 Modified for WQ3: What is the degree of wetland vegetation cover (a.H>60%/ b.M/ c.L<60%)?

	a
--	---

23 What is the dominant wetland vegetation cover?

b	a. woody (FO & SS)	b. emergent and ponding, or open water only (EM w/ water or OW)	c. emergent vegetation only or wet meadow (EM)
---	--------------------	---	--

24 How interspersed are the Cowardin classes (and upland inclusions)? (see Figure p. 37)

b	a. high	b. moderate	c. low
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26 For urban areas, what percentage of the wetland edge is bordered by a vegetative buffer at least 25 feet wide?

a	a. >40%	b. bet. 10% & 40%	c. <10%
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27 How is the wetland connected to other wetlands?

a	a. connected within 3 miles by surface water	b. not connected; wetlands present within 3 miles	c. not connected, no other wetlands within 3 miles
---	--	---	--

28 Estimate area of unvegetated, open water within the wetland.

a	a. >1 acres	b. bet. 0.5 and 1 acre	c. <0.5 acre
---	-------------	------------------------	--------------

Fisheries Habitat

29 Are fish present in a stream, lake or pond connected to the wetland?

c	a. salmon, trout or sensitive species are present at some time during the year	b. other fish species are present at some time during the year	c. no species are present at any time during the year
---	--	--	---

Streams connected to the wetland

30 What is the physical character of the stream channel?

b	a. natural channel, or modified portions are returning to a natural channel	b. only portions of stream modified	c. extensively modified or confined in a non-vegetated channel or pipe
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31 What percentage of the stream is shaded by riparian vegetation?

b	a. >75%	b. bet. 50% & 75%	c. <50%
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32 What percentage of the stream contains instream structures such as large woody debris, floating/submerged vegetation, large rocks or boulders?

c	a. >25%	b. bet. 10% & 25%	c. <10%
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Lakes or ponds (entire lake or pond and wetland complex)

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

	a. yes	b. cannot be determined	c. no
--	--------	-------------------------	-------

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

	a. 60% or more	b. bet. 20% & <60%	c. <20%
--	----------------	--------------------	---------

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

	a. >25%	b. bet. 10% & 25%	c. <10%
--	---------	-------------------	---------

Wetland Hydrology

36 What is the wetland's primary source of water? (emphasis on primary)

a	a. surface flow, including streams and ditches	b. precipitation or sheet flow	c. groundwater, including springs or seeps
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37 Is there evidence of flooding or ponding during a portion of the growing season?

c	a. yes (describe)	b. unable to determine or not applicable	c. no
---	-------------------	--	-------

38 Is the water flow out of the wetland restricted (beaver dam, concrete structure, undersized culvert)?

b	a. yes, restricted or no outlet	b. minor restrictions slow down the water (i.e., undersized culvert)	c. no, outlet has unrestricted flow
---	---------------------------------	--	-------------------------------------

(bold questions =field; office review important for 15, 16, 26)

WETLAND CHARACTERIZATION QUESTIONS

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area? (Modified for HC7)
- a. Urban or urbanizing (mix of urban, agriculture and forest uses).
 - b. Agriculture (farming, ranching or grazing).
 - c. Forested or natural area.

c	Santiam State Forest
---	----------------------

Water quality - see DEQ website

7. Consult the most recent State of Oregon DEQ 305(b) Report to determine whether any streams in the study area are listed as water quality limited (included in CWA 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.

b	North Santiam River is T ^o limited up to RM 45.3 (Mill City is at RM ~45.5-48)
---	---

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.

b	North Santiam River moderate for pesticides, bacteria/viruses, and excessive plant growth
---	---

Wetland Structure and Landscape

15 What percentage of area within 500 feet of the wetland edge is dedicated to these land uses?

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next two questions		

15 Modified for WH8: 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

b

15 Modified for WQ5: What is the dominant existing land use within 500 feet of the wetland's edge?

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

b

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

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next question		

16 Modified for HC6: What is the dominant existing land use within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

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

b

17 What is the (entire) wetland acreage?

b	a. >5 acres	b. bet. 0.5 & 5 acres	c. < 0.5 acres
---	-------------	-----------------------	----------------

18 How is wetland connected to a stream, lake, or pond ? (see Figure, p. 35)

a	a. connected by surface water (culv., ditch, int./per. stream)	b. not connected to water body within 1 mile	c. not connected, no water bodies within 1 mile
---	--	--	---

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

b	a. yes	b. no
---	--------	-------

Wetland Habitat

21 What is percentage wetland area by Cowardin class (10% or more)?

	a. bet. 70% & 100%	b. bet. 50% & <70%	c. bet. 20% & <50%	d. bet. 10% & <20%
Open water (OW >6.6ft)				
Emergent (EM)				
Scrub-shrub (SS)				
Forested (FO)				

21 Modified for WH1: How many Cowardin wetland classes are present?

				a
--	--	--	--	---

a. Two or more b. One w/ > 5 species c. One w/ < 5 species

21 Modified for WQ3: What is the degree of wetland vegetation cover (a.H>60%/ b.M/ c.L<60%)?

				a
--	--	--	--	---

23 What is the dominant wetland vegetation cover?

a	a. woody (FO & SS)	b. emergent and ponding, or open water only (EM w/ water or OW)	c. emergent vegetation only or wet meadow (EM)
---	--------------------	---	--

24 How interspersed are the Cowardin classes (and upland inclusions)? (see Figure p. 37)

b	a. high	b. moderate	c. low
---	---------	-------------	--------

26 For urban areas, what percentage of the wetland edge is bordered by a vegetative buffer at least 25 feet wide?

b	a. >40%	b. bet. 10% & 40%	c. <10%
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27 How is the wetland connected to other wetlands?

a	a. connected within 3 miles by surface water	b. not connected; wetlands present within 3 miles	c. not connected, no other wetlands within 3 miles
---	--	---	--

28 Estimate area of unvegetated, open water within the wetland.

a	a. >1 acres	b. bet. 0.5 and 1 acre	c. <0.5 acre
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Fisheries Habitat

29 Are fish present in a stream, lake or pond connected to the wetland?

c	a. salmon, trout or sensitive species are present at some time during the year	b. other fish species are present at some time during the year	c. no species are present at any time during the year
---	--	--	---

Streams connected to the wetland

30 What is the physical character of the stream channel?

b	a. natural channel, or modified portions are returning to a natural channel	b. only portions of stream modified	c. extensively modified or confined in a non-vegetated channel or pipe
---	---	-------------------------------------	--

31 What percentage of the stream is shaded by riparian vegetation?

b	a. >75%	b. bet. 50% & 75%	c. <50%
---	---------	-------------------	---------

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

c	a. >25%	b. bet. 10% & 25%	c. <10%
---	---------	-------------------	---------

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

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

	a. yes	b. cannot be determined	c. no
--	--------	-------------------------	-------

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

	a. 60% or more	b. bet. 20% & <60%	c. <20%
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35 What percentage of the wetland complex contains cover objects such as submerged logs, floating or submerged vegetation, large rocks or boulders?

	a. >25%	b. bet. 10% & 25%	c. <10%
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Wetland Hydrology

36 What is the wetland's primary source of water? (emphasis on primary)

a	a. surface flow, including streams and ditches	b. precipitation or sheet flow	c. groundwater, including springs or seeps
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37 Is there evidence of flooding or ponding during a portion of the growing season?

c	a. yes (describe)	b. unable to determine or not applicable	c. no
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38 Is the water flow out of the wetland restricted (beaver dam, concrete structure, undersized culvert)?

b	a. yes, restricted or no outlet	b. minor restrictions slow down the water (i.e., undersized culvert)	c. no, outlet has unrestricted flow
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(bold questions =field; office review important for 15, 16, 26)

**Oregon Freshwater Wetland Assessment Function Questions
Answer Sheet**

11/11/2010 cmw

WETLAND MC-1, 5

Wildlife Habitat		
1	a	
2	b	
3	b	
4	a	
5	a	
6	a	
7	b	
8	c	
9b	a	
provides diverse		

WETLAND MC-4

Wildlife Habitat		
1	a	
2	a	
3	b	
4	a	
5	a	
6	a	
7	b	
8	b	
9b	b	
provides diverse		

Fish Habitat		
Streams and Rivers		
1	b	
2	b	
3	c	
4	b	
5	c	
6	c	
Lakes and Ponds		
1		
2		
3		
4		
5		
6		
impacted or degraded		

Fish Habitat		
Streams and Rivers		
1	b	
2	b	
3	c	
4	b	
5	b	
6	c	
Lakes and Ponds		
1		
2		
3		
4		
5		
6		
impacted or degraded		

Water Quality (pollutant removal)		
1	a	
2	c	
3	a	
4	b	
5	a	
6	b	
impacted or degraded		

Water Quality (pollutant removal)		
1	a	
2	c	
3	a	
4	b	
5	b	
6	b	
impacted or degraded		

Hydrologic Control (flood control & water supply)		
1	b	
2	c	
3	b	
4	b	
5	b	
6	a	
7	c	
impacted or degraded		

Hydrologic Control (flood control & water supply)		
1	b	
2	c	
3	b	
4	b	
5	a	
6	b	
7	c	
impacted or degraded		

**Oregon Freshwater Wetland Assessment
Function and Condition Summary Sheet**

Wetland identification: MC-1, 5

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	provides diverse	Two vegetation classes, water present.
Fish Habitat	impacted or degraded	Channelized stream.
Water Quality	impacted or degraded	No evidence of flooding.
Hydrologic Control	impacted or degraded	Not in 100-year floodplain.
Narrative description of overall wetland functions and conditions		

Wetland identification: MC-4

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	provides diverse	Three vegetation classes present.
Fish Habitat	impacted or degraded	Portions of stream modified.
Water Quality	impacted or degraded	No evidence of flooding.
Hydrologic Control	impacted or degraded	Not in 100-year floodplain.
Narrative description of overall wetland functions and conditions		

WETLAND CHARACTERIZATION QUESTIONS

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area? (Modified for HC7)
- a. Urban or urbanizing (mix of urban, agriculture and forest uses).
 - b. Agriculture (farming, ranching or grazing).
 - c. Forested or natural area.

c	Santiam State Forest
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Water quality - see DEQ website

7. Consult the most recent State of Oregon DEQ 305(b) Report to determine whether any streams in the study area are listed as water quality limited (included in CWA 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.

b	North Santiam River is T° limited up to RM 45.3 (Mill City is at RM ~45.5-48)
---	---

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.

b	North Santiam River moderate for pesticides, bacteria/viruses, and excessive plant growth
---	---

Wetland Structure and Landscape

- 15 What percentage of area within 500 feet of the wetland edge is dedicated to these land uses?

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next two questions		

- 15 Modified for WH8: 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

b (and a, c)

- 15 Modified for WQ5: What is the dominant existing land use within 500 feet of the wetland's edge?

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

b (and c, a)

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

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next question		

- 16 Modified for HC6: What is the dominant existing land use within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

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

b (and a, c)

- 17 What is the (entire) wetland acreage?

a	a. >5 acres	b. bet. 0.5 & 5 acres	c. < 0.5 acres
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- 18 How is wetland connected to a stream, lake, or pond ? (see Figure, p. 35)

a	a. connected by surface water (culv., ditch, int./per. stream)	b. not connected to water body within 1 mile	c. not connected, no water bodies within 1 mile
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19 Is all or part of the wetland located within the 100-year floodplain or within an enclosed basin?

b	a. yes	b. no
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Wetland Habitat

21 What is percentage wetland area by Cowardin class (10% or more)?

	a. bet. 70% & 100%	b. bet. 50% & <70%	c. bet. 20% & <50%	d. bet. 10% & <20%
Open water (OW >6.6ft)				
Emergent (EM)				
Scrub-shrub (SS)				
Forested (FO)				

21 Modified for WH1: How many Cowardin wetland classes are present?

	a. Two or more b. One w/ > 5 species c. One w/ < 5 species			a
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21 Modified for WQ3: What is the degree of wetland vegetation cover (a.H>60%/ b.M/ c.L<60%)?

	a
--	---

23 What is the dominant wetland vegetation cover?

b	a. woody (FO & SS)	b. emergent and ponding, or open water only (EM w/ water or OW)	c. emergent vegetation only or wet meadow (EM)
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24 How interspersed are the Cowardin classes (and upland inclusions)? (see Figure p. 37)

a	a. high	b. moderate	c. low
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26 For urban areas, what percentage of the wetland edge is bordered by a vegetative buffer at least 25 feet wide?

b	a. >40%	b. bet. 10% & 40%	c. <10%
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27 How is the wetland connected to other wetlands?

a	a. connected within 3 miles by surface water	b. not connected; wetlands present within 3 miles	c. not connected, no other wetlands within 3 miles
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28 Estimate area of unvegetated, open water within the wetland.

c	a. >1 acres	b. bet. 0.5 and 1 acre	c. <0.5 acre
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Fisheries Habitat

29 Are fish present in a stream, lake or pond connected to the wetland?

c	a. salmon, trout or sensitive species are present at some time during the year	b. other fish species are present at some time during the year	c. no species are present at any time during the year
---	--	--	---

Streams connected to the wetland

30 What is the physical character of the stream channel?

b	a. natural channel, or modified portions are returning to a natural channel	b. only portions of stream modified	c. extensively modified or confined in a non-vegetated channel or pipe
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31 What percentage of the stream is shaded by riparian vegetation?

c	a. >75%	b. bet. 50% & 75%	c. <50%
---	---------	-------------------	---------

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

c	a. >25%	b. bet. 10% & 25%	c. <10%
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Lakes or ponds (entire lake or pond and wetland complex)

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

	a. yes	b. cannot be determined	c. no
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34 What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation?

	a. 60% or more	b. bet. 20% & <60%	c. <20%
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35 What percentage of the wetland complex contains cover objects such as submerged logs, floating or submerged vegetation, large rocks or boulders?

	a. >25%	b. bet. 10% & 25%	c. <10%
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Wetland Hydrology

36 What is the wetland's primary source of water? (emphasis on primary)

c	a. surface flow, including streams and ditches	b. precipitation or sheet flow	c. groundwater, including springs or seeps
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37 Is there evidence of flooding or ponding during a portion of the growing season?

c	a. yes (describe)	b. unable to determine or not applicable	c. no
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38 Is the water flow out of the wetland restricted (beaver dam, concrete structure, undersized culvert)?

b	a. yes, restricted or no outlet	b. minor restrictions slow down the water (i.e., undersized culvert)	c. no, outlet has unrestricted flow
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(bold questions =field; office review important for 15, 16, 26)

WETLAND CHARACTERIZATION QUESTIONS

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area? (Modified for HC7)
- Urban or urbanizing (mix of urban, agriculture and forest uses).
 - Agriculture (farming, ranching or grazing).
 - Forested or natural area.

c	Santiam State Forest
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Water quality - see DEQ website

7. Consult the most recent State of Oregon DEQ 305(b) Report to determine whether any streams in the study area are listed as water quality limited (included in CWA 303(d) reporting).
- Streams or portions of streams within the study area are listed as water quality limited.
 - No streams or portions of streams within the study area are listed as water quality limited.

b	North Santiam River is T° limited up to RM 45.3 (Mill City is at RM ~45.5-48)
---	---

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.")
- All upstream reaches are listed as no problem (or no data available).
 - One or more upstream reaches are listed in moderate water quality condition.
 - One or more upstream reaches are listed in severe water quality condition.

b	North Santiam River moderate for pesticides, bacteria/viruses, and excessive plant growth
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Wetland Structure and Landscape

- 15 What percentage of area within 500 feet of the wetland edge is dedicated to these land uses?

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space	see next two questions		
2. Agriculture			
3. Exclusive Forest Use			
4. Developed uses			
5. Other			

- 15 Modified for WH8: What is the dominant existing land use within 500 feet of the wetland's edge?

- Exclusive Forest Use or Open Space b
- Agriculture
- Developed uses

- 15 Modified for WQ5: What is the dominant existing land use within 500 feet of the wetland's edge?

- Exclusive Forest Use or Open Space b
- Agriculture
- Developed uses

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

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space	see next question		
2. Agriculture			
3. Exclusive Forest Use			
4. Developed uses			
5. Other			

- 16 Modified for HC6: What is the dominant existing land use within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

- Developed uses b
- Agriculture
- Exclusive Forest Use or Open Space

- 17 What is the (entire) wetland acreage?

b	a. >5 acres	b. bet. 0.5 & 5 acres	c. < 0.5 acres
---	-------------	-----------------------	----------------

- 18 How is wetland connected to a stream, lake, or pond ? (see Figure, p. 35)

b	a. connected by surface water (culv., ditch, int./per. stream)	b. not connected to water body within 1 mile	c. not connected, no water bodies within 1 mile
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19 Is all or part of the wetland located within the 100-year floodplain or within an enclosed basin?

b	a. yes	b. no
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Wetland Habitat

21 What is percentage wetland area by Cowardin class (10% or more)?

	a. bet. 70% & 100%	b. bet. 50% & <70%	c. bet. 20% & <50%	d. bet. 10% & <20%
Open water (OW >6.6ft)				
Emergent (EM)				
Scrub-shrub (SS)				
Forested (FO)				

21 Modified for WH1: How many Cowardin wetland classes are present?

				a
--	--	--	--	---

a. Two or more b. One w/ > 5 species c. One w/ < 5 species

21 Modified for WQ3: What is the degree of wetland vegetation cover (a.H>60%/ b.M/ c.L<60%)?

				a
--	--	--	--	---

23 What is the dominant wetland vegetation cover?

a	a. woody (FO & SS)	b. emergent and ponding, or open water only (EM w/ water or OW)	c. emergent vegetation only or wet meadow (EM)
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24 How interspersed are the Cowardin classes (and upland inclusions)? (see Figure p. 37)

b	a. high	b. moderate	c. low
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26 For urban areas, what percentage of the wetland edge is bordered by a vegetative buffer at least 25 feet wide?

c	a. >40%	b. bet. 10% & 40%	c. <10%
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27 How is the wetland connected to other wetlands?

b	a. connected within 3 miles by surface water	b. not connected; wetlands present within 3 miles	c. not connected, no other wetlands within 3 miles
---	--	---	--

28 Estimate area of unvegetated, open water within the wetland.

c	a. >1 acres	b. bet. 0.5 and 1 acre	c. <0.5 acre
---	-------------	------------------------	--------------

Fisheries Habitat

29 Are fish present in a stream, lake or pond connected to the wetland?

NA	a. salmon, trout or sensitive species are present at some time during the year	b. other fish species are present at some time during the year	c. no species are present at any time during the year
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Streams connected to the wetland

30 What is the physical character of the stream channel?

	a. natural channel, or modified portions are returning to a natural channel	b. only portions of stream modified	c. extensively modified or confined in a non-vegetated channel or pipe
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31 What percentage of the stream is shaded by riparian vegetation?

	a. >75%	b. bet. 50% & 75%	c. <50%
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32 What percentage of the stream contains instream structures such as large woody debris, floating/submerged vegetation, large rocks or boulders?

	a. >25%	b. bet. 10% & 25%	c. <10%
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Lakes or ponds (entire lake or pond and wetland complex)

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

	a. yes	b. cannot be determined	c. no
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34 What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation?

	a. 60% or more	b. bet. 20% & <60%	c. <20%
--	----------------	--------------------	---------

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

	a. >25%	b. bet. 10% & 25%	c. <10%
--	---------	-------------------	---------

Wetland Hydrology

36 What is the wetland's primary source of water? (emphasis on primary)

c	a. surface flow, including streams and ditches	b. precipitation or sheet flow	c. groundwater, including springs or seeps
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37 Is there evidence of flooding or ponding during a portion of the growing season?

c	a. yes (describe)	b. unable to determine or not applicable	c. no
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38 Is the water flow out of the wetland restricted (beaver dam, concrete structure, undersized culvert)?

a	a. yes, restricted or no outlet	b. minor restrictions slow down the water (i.e., undersized culvert)	c. no, outlet has unrestricted flow
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(bold questions =field; office review important for 15, 16, 26)

**Oregon Freshwater Wetland Assessment Function Questions
Answer Sheet**

11/11/2010 cmw

WETLAND MC-2

Wildlife Habitat		
1	a	
2	b	
3	a	
4	c	
5	a	
6	a	
7	b	
8	b (and a, c)	
9b	b	
provides diverse		

WETLAND MC-3

Wildlife Habitat		
1	a	
2	a	
3	b	
4	c	
5	b	
6	b	
7	b	
8	b	
9b	c	
provides habitat for some wildlife species		

Fish Habitat		
Streams and Rivers		
1	c	
2	b	
3	c	
4	b	
5	b (and a, c)	
6	c	
Lakes and Ponds		
1		
2		
3		
4		
5		
6		
impacted or degraded		

Fish Habitat		
Streams and Rivers		
1		
2		
3		
4		
5		
6		
Lakes and Ponds		
1		
2		
3		
4		
5		
6		
not applicable		

Water Quality (pollutant removal)		
1	c	
2	c	
3	a	
4	a	
5	b (and c, a)	
6	b	
impacted or degraded		

Water Quality (pollutant removal)		
1	c	
2	c	
3	a	
4	b	
5	b	
6	b	
impacted or degraded		

Hydrologic Control (flood control & water supply)		
1	b	
2	c	
3	a	
4	b	
5	b	
6	b (and a, c)	
7	c	
impacted or degraded		

Hydrologic Control (flood control & water supply)		
1	b	
2	c	
3	b	
4	a	
5	a	
6	b	
7	c	
impacted or degraded		

**Oregon Freshwater Wetland Assessment
Function and Condition Summary Sheet**

Wetland identification: MC-2

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	provides diverse	North Fork DeFord Creek, large size, interspersed habitat, forest.
Fish Habitat	impacted or degraded	Channelized.
Water Quality	impacted or degraded	Groundwater input.
Hydrologic Control	impacted or degraded	Not in floodplain.
Narrative description of overall wetland functions and conditions		

Wetland identification: MC-3

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	provides habitat for some wildlife species	Small size, isolated.
Fish Habitat	not applicable	
Water Quality	impacted or degraded	Groundwater.
Hydrologic Control	impacted or degraded	Not in floodplain.
Narrative description of overall wetland functions and conditions		

WETLAND CHARACTERIZATION QUESTIONS

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area? (Modified for HC7)
- a. Urban or urbanizing (mix of urban, agriculture and forest uses).
 - b. Agriculture (farming, ranching or grazing).
 - c. Forested or natural area.

c	Santiam State Forest
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Water quality - see DEQ website

7. Consult the most recent State of Oregon DEQ 305(b) Report to determine whether any streams in the study area are listed as water quality limited (included in CWA 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.

b	North Santiam River is T° limited up to RM 45.3 (Mill City is at RM ~45.5-48)
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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.

b	North Santiam River moderate for pesticides, bacteria/viruses, and excessive plant growth
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Wetland Structure and Landscape

- 15 What percentage of area within 500 feet of the wetland edge is dedicated to these land uses?

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space	see next two questions		
2. Agriculture			
3. Exclusive Forest Use			
4. Developed uses			
5. Other			

- 15 Modified for WH8: What is the dominant existing land use within 500 feet of the wetland's edge?

- a. Exclusive Forest Use or Open Space c (and a)
- b. Agriculture
- c. Developed uses

- 15 Modified for WQ5: What is the dominant existing land use within 500 feet of the wetland's edge?

- c. Exclusive Forest Use or Open Space a (and c)
- b. Agriculture
- a. Developed uses

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

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space	see next question		
2. Agriculture			
3. Exclusive Forest Use			
4. Developed uses			
5. Other			

- 16 Modified for HC6: What is the dominant existing land use within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

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

- 17 What is the (entire) wetland acreage?

b	a. >5 acres	b. bet. 0.5 & 5 acres	c. < 0.5 acres
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- 18 How is wetland connected to a stream, lake, or pond ? (see Figure, p. 35)

a	a. connected by surface water (culv., ditch, int./per. stream)	b. not connected to water body within 1 mile	c. not connected, no water bodies within 1 mile
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19 Is all or part of the wetland located within the 100-year floodplain or within an enclosed basin?

b	a. yes	b. no
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Wetland Habitat

21 What is percentage wetland area by Cowardin class (10% or more)?

	a. bet. 70% & 100%	b. bet. 50% & <70%	c. bet. 20% & <50%	d. bet. 10% & <20%
Open water (OW >6.6ft)				
Emergent (EM)				
Scrub-shrub (SS)				
Forested (FO)				

21 Modified for WH1: How many Cowardin wetland classes are present?

	a. Two or more b. One w/ > 5 species c. One w/ < 5 species			a
--	--	--	--	---

21 Modified for WQ3: What is the degree of wetland vegetation cover (a.H>60%/ b.M/ c.L<60%)?

	a
--	---

23 What is the dominant wetland vegetation cover?

b	a. woody (FO & SS)	b. emergent and ponding, or open water only (EM w/ water or OW)	c. emergent vegetation only or wet meadow (EM)
---	--------------------	---	--

24 How interspersed are the Cowardin classes (and upland inclusions)? (see Figure p. 37)

b	a. high	b. moderate	c. low
---	---------	-------------	--------

26 For urban areas, what percentage of the wetland edge is bordered by a vegetative buffer at least 25 feet wide?

a	a. >40%	b. bet. 10% & 40%	c. <10%
---	---------	-------------------	---------

27 How is the wetland connected to other wetlands?

a	a. connected within 3 miles by surface water	b. not connected; wetlands present within 3 miles	c. not connected, no other wetlands within 3 miles
---	--	---	--

28 Estimate area of unvegetated, open water within the wetland.

c	a. >1 acres	b. bet. 0.5 and 1 acre	c. <0.5 acre
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Fisheries Habitat

29 Are fish present in a stream, lake or pond connected to the wetland?

a	a. salmon, trout or sensitive species are present at some time during the year	b. other fish species are present at some time during the year	c. no species are present at any time during the year
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Streams connected to the wetland

30 What is the physical character of the stream channel?

a	a. natural channel, or modified portions are returning to a natural channel	b. only portions of stream modified	c. extensively modified or confined in a non-vegetated channel or pipe
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31 What percentage of the stream is shaded by riparian vegetation?

a	a. >75%	b. bet. 50% & 75%	c. <50%
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32 What percentage of the stream contains instream structures such as large woody debris, floating/submerged vegetation, large rocks or boulders?

c or b	a. >25%	b. bet. 10% & 25%	c. <10%
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Lakes or ponds (entire lake or pond and wetland complex)

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

	a. yes	b. cannot be determined	c. no
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34 What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation?

	a. 60% or more	b. bet. 20% & <60%	c. <20%
--	----------------	--------------------	---------

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

	a. >25%	b. bet. 10% & 25%	c. <10%
--	---------	-------------------	---------

Wetland Hydrology

36 What is the wetland's primary source of water? (emphasis on primary)

c	a. surface flow, including streams and ditches	b. precipitation or sheet flow	c. groundwater, including springs or seeps
---	--	--------------------------------	--

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

c	a. yes (describe)	b. unable to determine or not applicable	c. no
---	-------------------	--	-------

38 Is the water flow out of the wetland restricted (beaver dam, concrete structure, undersized culvert)?

c	a. yes, restricted or no outlet	b. minor restrictions slow down the water (i.e., undersized culvert)	c. no, outlet has unrestricted flow
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(bold questions =field; office review important for 15, 16, 26)

WETLAND CHARACTERIZATION QUESTIONS

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area? (Modified for HC7)
- a. Urban or urbanizing (mix of urban, agriculture and forest uses).
 - b. Agriculture (farming, ranching or grazing).
 - c. Forested or natural area.

c	Santiam State Forest
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Water quality - see DEQ website

7. Consult the most recent State of Oregon DEQ 305(b) Report to determine whether any streams in the study area are listed as water quality limited (included in CWA 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.

b	North Santiam River is T ^o limited up to RM 45.3 (Mill City is at RM ~45.5-48)
---	---

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.

b	North Santiam River moderate for pesticides, bacteria/viruses, and excessive plant growth
---	---

Wetland Structure and Landscape

- 15 What percentage of area within 500 feet of the wetland edge is dedicated to these land uses?

a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next two questions	

- 15 Modified for WH8: What is the dominant existing land use within 500 feet of the wetland's edge?

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

- 15 Modified for WQ5: What is the dominant existing land use within 500 feet of the wetland's edge?

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

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

a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next question	

- 16 Modified for HC6: What is the dominant existing land use within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

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

- 17 What is the (entire) wetland acreage?

a	a. >5 acres	b. bet. 0.5 & 5 acres	c. < 0.5 acres
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- 18 How is wetland connected to a stream, lake, or pond ? (see Figure, p. 35)

a	a. connected by surface water (culv., ditch, int./per. stream)	b. not connected to water body within 1 mile	c. not connected, no water bodies within 1 mile
---	--	--	---

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

b	a. yes	b. no
---	--------	-------

Wetland Habitat

21 What is percentage wetland area by Cowardin class (10% or more)?

	a. bet. 70% & 100%	b. bet. 50% & <70%	c. bet. 20% & <50%	d. bet. 10% & <20%
Open water (OW >6.6ft)				
Emergent (EM)				
Scrub-shrub (SS)				
Forested (FO)				

21 Modified for WH1: How many Cowardin wetland classes are present?

a	a. Two or more	b. One w/ > 5 species	c. One w/ < 5 species
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21 Modified for WQ3: What is the degree of wetland vegetation cover (a.H>60%/ b.M/ c.L<60%)?

a

23 What is the dominant wetland vegetation cover?

a	a. woody (FO & SS)	b. emergent and ponding, or open water only (EM w/ water or OW)	c. emergent vegetation only or wet meadow (EM)
---	--------------------	---	--

24 How interspersed are the Cowardin classes (and upland inclusions)? (see Figure p. 37)

a	a. high	b. moderate	c. low
---	---------	-------------	--------

26 For urban areas, what percentage of the wetland edge is bordered by a vegetative buffer at least 25 feet wide?

a	a. >40%	b. bet. 10% & 40%	c. <10%
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27 How is the wetland connected to other wetlands?

a	a. connected within 3 miles by surface water	b. not connected; wetlands present within 3 miles	c. not connected, no other wetlands within 3 miles
---	--	---	--

28 Estimate area of unvegetated, open water within the wetland.

c	a. >1 acres	b. bet. 0.5 and 1 acre	c. <0.5 acre
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Fisheries Habitat

29 Are fish present in a stream, lake or pond connected to the wetland?

c	a. salmon, trout or sensitive species are present at some time during the year	b. other fish species are present at some time during the year	c. no species are present at any time during the year
---	--	--	---

Streams connected to the wetland

30 What is the physical character of the stream channel?

b?	a. natural channel, or modified portions are returning to a natural channel	b. only portions of stream modified	c. extensively modified or confined in a non-vegetated channel or pipe
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31 What percentage of the stream is shaded by riparian vegetation?

b?	a. >75%	b. bet. 50% & 75%	c. <50%
----	---------	-------------------	---------

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

b?	a. >25%	b. bet. 10% & 25%	c. <10%
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Lakes or ponds (entire lake or pond and wetland complex)

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

	a. yes	b. cannot be determined	c. no
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34 What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation?

	a. 60% or more	b. bet. 20% & <60%	c. <20%
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35 What percentage of the wetland complex contains cover objects such as submerged logs, floating or submerged vegetation, large rocks or boulders?

	a. >25%	b. bet. 10% & 25%	c. <10%
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Wetland Hydrology

36 What is the wetland's primary source of water? (emphasis on primary)

c	a. surface flow, including streams and ditches	b. precipitation or sheet flow	c. groundwater, including springs or seeps
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37 Is there evidence of flooding or ponding during a portion of the growing season?

c	a. yes (describe)	b. unable to determine or not applicable	c. no
---	-------------------	--	-------

38 Is the water flow out of the wetland restricted (beaver dam, concrete structure, undersized culvert)?

c?	a. yes, restricted or no outlet	b. minor restrictions slow down the water (i.e., undersized culvert)	c. no, outlet has unrestricted flow
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(bold questions =field; office review important for 15, 16, 26)

**Oregon Freshwater Wetland Assessment Function Questions
Answer Sheet**

11/11/2010 cmw

WETLAND MC-6

Wildlife Habitat		
1	a	
2	b	
3	b	
4	c	
5	a	
6	a	
7	b	
8	c (and a)	
9b	a	
provides diverse		

WETLAND MC-9

Wildlife Habitat		
1	a	
2	a	
3	a	
4	c	
5	a	
6	a	
7	b	
8	a	
9b	a	
provides diverse		

Fish Habitat		
Streams and Rivers		
1	a	
2	a	
3	c or b	
4	b	
5	c (and a)	
6	a	
Lakes and Ponds		
1		
2		
3		
4		
5		
6		
intact		

Fish Habitat		
Streams and Rivers		
1	b?	
2	b?	
3	b?	
4	b	
5	a	
6	c	
Lakes and Ponds		
1		
2		
3		
4		
5		
6		
impacted or degraded		

Water Quality (pollutant removal)		
1	c	
2	c	
3	a	
4	b	
5	a (and c)	
6	b	
impacted or degraded		

Water Quality (pollutant removal)		
1	c	
2	c	
3	a	
4	a	
5	c	
6	b	
impacted or degraded		

Hydrologic Control (flood control & water supply)		
1	b	
2	c	
3	b	
4	c	
5	b	
6	c	
7	c	
impacted or degraded		

Hydrologic Control (flood control & water supply)		
1	b	
2	c	
3	a	
4	c?	
5	a	
6	a	
7	c	
impacted or degraded		

**Oregon Freshwater Wetland Assessment
Function and Condition Summary Sheet**

Wetland identification: MC-6

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	provides diverse	Two vegetation classes present, near Snake Creek.
Fish Habitat	intact	Shaded stream, near Snake Creek.
Water Quality	impacted or degraded	Groundwater driven.
Hydrologic Control	impacted or degraded	Not in 100-year floodplain.
Narrative description of overall wetland functions and conditions		

Wetland identification: MC-9

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	provides diverse	Three classes of vegetation present, large size.
Fish Habitat	impacted or degraded	Portions of channel modified.
Water Quality	impacted or degraded	Groundwater input.
Hydrologic Control	impacted or degraded	Not in 100-year floodplain.
Narrative description of overall wetland functions and conditions		

WETLAND CHARACTERIZATION QUESTIONS

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area? (Modified for HC7)
- a. Urban or urbanizing (mix of urban, agriculture and forest uses).
 - b. Agriculture (farming, ranching or grazing).
 - c. Forested or natural area.

c	Santiam State Forest
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Water quality - see DEQ website

7. Consult the most recent State of Oregon DEQ 305(b) Report to determine whether any streams in the study area are listed as water quality limited (included in CWA 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.

b	North Santiam River is T° limited up to RM 45.3 (Mill City is at RM ~45.5-48)
---	---

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.

b	North Santiam River moderate for pesticides, bacteria/viruses, and excessive plant growth
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Wetland Structure and Landscape

- 15 What percentage of area within 500 feet of the wetland edge is dedicated to these land uses?

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space	see next two questions		
2. Agriculture			
3. Exclusive Forest Use			
4. Developed uses			
5. Other			

- 15 Modified for WH8: What is the dominant existing land use within 500 feet of the wetland's edge?

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

- 15 Modified for WQ5: What is the dominant existing land use within 500 feet of the wetland's edge?

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

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

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space	see next question		
2. Agriculture			
3. Exclusive Forest Use			
4. Developed uses			
5. Other			

- 16 Modified for HC6: What is the dominant existing land use within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

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

- 17 What is the (entire) wetland acreage?

b	a. >5 acres	b. bet. 0.5 & 5 acres	c. < 0.5 acres
---	-------------	-----------------------	----------------

- 18 How is wetland connected to a stream, lake, or pond ? (see Figure, p. 35)

a	a. connected by surface water (culv., ditch, int./per. stream)	b. not connected to water body within 1 mile	c. not connected, no water bodies within 1 mile
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19 Is all or part of the wetland located within the 100-year floodplain or within an enclosed basin?

b	a. yes	b. no
---	--------	-------

Wetland Habitat

21 What is percentage wetland area by Cowardin class (10% or more)?

	a. bet. 70% & 100%	b. bet. 50% & <70%	c. bet. 20% & <50%	d. bet. 10% & <20%
Open water (OW >6.6ft)				
Emergent (EM)				
Scrub-shrub (SS)				
Forested (FO)				

21 Modified for WH1: How many Cowardin wetland classes are present?

a	a. Two or more	b. One w/ > 5 species	c. One w/ < 5 species
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21 Modified for WQ3: What is the degree of wetland vegetation cover (a.H>60%/ b.M/ c.L<60%)?

a	
---	--

23 What is the dominant wetland vegetation cover?

c	a. woody (FO & SS)	b. emergent and ponding, or open water only (EM w/ water or OW)	c. emergent vegetation only or wet meadow (EM)
---	--------------------	---	--

24 How interspersed are the Cowardin classes (and upland inclusions)? (see Figure p. 37)

c	a. high	b. moderate	c. low
---	---------	-------------	--------

26 For urban areas, what percentage of the wetland edge is bordered by a vegetative buffer at least 25 feet wide?

c	a. >40%	b. bet. 10% & 40%	c. <10%
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27 How is the wetland connected to other wetlands?

a	a. connected within 3 miles by surface water	b. not connected; wetlands present within 3 miles	c. not connected, no other wetlands within 3 miles
---	--	---	--

28 Estimate area of unvegetated, open water within the wetland.

c	a. >1 acres	b. bet. 0.5 and 1 acre	c. <0.5 acre
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Fisheries Habitat

29 Are fish present in a stream, lake or pond connected to the wetland?

c	a. salmon, trout or sensitive species are present at some time during the year	b. other fish species are present at some time during the year	c. no species are present at any time during the year
---	--	--	---

Streams connected to the wetland

30 What is the physical character of the stream channel?

b?	a. natural channel, or modified portions are returning to a natural channel	b. only portions of stream modified	c. extensively modified or confined in a non-vegetated channel or pipe
----	---	-------------------------------------	--

31 What percentage of the stream is shaded by riparian vegetation?

b?	a. >75%	b. bet. 50% & 75%	c. <50%
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32 What percentage of the stream contains instream structures such as large woody debris, floating/submerged vegetation, large rocks or boulders?

b?	a. >25%	b. bet. 10% & 25%	c. <10%
----	---------	-------------------	---------

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

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

	a. yes	b. cannot be determined	c. no
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34 What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation?

	a. 60% or more	b. bet. 20% & <60%	c. <20%
--	----------------	--------------------	---------

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

	a. >25%	b. bet. 10% & 25%	c. <10%
--	---------	-------------------	---------

Wetland Hydrology

36 What is the wetland's primary source of water? (emphasis on primary)

c	a. surface flow, including streams and ditches	b. precipitation or sheet flow	c. groundwater, including springs or seeps
---	--	--------------------------------	--

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

c	a. yes (describe)	b. unable to determine or not applicable	c. no
---	-------------------	--	-------

38 Is the water flow out of the wetland restricted (beaver dam, concrete structure, undersized culvert)?

b	a. yes, restricted or no outlet	b. minor restrictions slow down the water (i.e., undersized culvert)	c. no, outlet has unrestricted flow
---	---------------------------------	--	-------------------------------------

(bold questions =field; office review important for 15, 16, 26)

WETLAND CHARACTERIZATION QUESTIONS

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area? (Modified for HC7)
- a. Urban or urbanizing (mix of urban, agriculture and forest uses).
 - b. Agriculture (farming, ranching or grazing).
 - c. Forested or natural area.

c	Santiam State Forest
---	----------------------

Water quality - see DEQ website

7. Consult the most recent State of Oregon DEQ 305(b) Report to determine whether any streams in the study area are listed as water quality limited (included in CWA 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.

b	North Santiam River is T ^o limited up to RM 45.3 (Mill City is at RM ~45.5-48)
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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.

b	North Santiam River moderate for pesticides, bacteria/viruses, and excessive plant growth
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Wetland Structure and Landscape

- 15 What percentage of area within 500 feet of the wetland edge is dedicated to these land uses?

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next two questions		

- 15 Modified for WH8: 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

c

- 15 Modified for WQ5: 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

a

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

	a. <20%	b. bet. 20% & 50%	c. >50%
1. Open Space 2. Agriculture 3. Exclusive Forest Use 4. Developed uses 5. Other	see next question		

- 16 Modified for HC6: What is the dominant existing land use within 500 feet of the wetland on the downstream or down-slope edge of the wetland?

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

a

- 17 What is the (entire) wetland acreage?

c	a. >5 acres	b. bet. 0.5 & 5 acres	c. < 0.5 acres
---	-------------	-----------------------	----------------

- 18 How is wetland connected to a stream, lake, or pond ? (see Figure, p. 35)

a	a. connected by surface water (culv., ditch, int./per. stream)	b. not connected to water body within 1 mile	c. not connected, no water bodies within 1 mile
---	--	--	---

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

b	a. yes	b. no
---	--------	-------

Wetland Habitat

21 What is percentage wetland area by Cowardin class (10% or more)?

	a. bet. 70% & 100%	b. bet. 50% & <70%	c. bet. 20% & <50%	d. bet. 10% & <20%
Open water (OW >6.6ft)				
Emergent (EM)				
Scrub-shrub (SS)				
Forested (FO)				

21 Modified for WH1: How many Cowardin wetland classes are present?

	a. Two or more	b. One w/ > 5 species	c. One w/ < 5 species	c
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21 Modified for WQ3: What is the degree of wetland vegetation cover (a.H>60%/ b.M/ c.L<60%)?

	a
--	---

23 What is the dominant wetland vegetation cover?

c	a. woody (FO & SS)	b. emergent and ponding, or open water only (EM w/ water or OW)	c. emergent vegetation only or wet meadow (EM)
---	--------------------	---	--

24 How interspersed are the Cowardin classes (and upland inclusions)? (see Figure p. 37)

c	a. high	b. moderate	c. low
---	---------	-------------	--------

26 For urban areas, what percentage of the wetland edge is bordered by a vegetative buffer at least 25 feet wide?

c	a. >40%	b. bet. 10% & 40%	c. <10%
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27 How is the wetland connected to other wetlands?

b	a. connected within 3 miles by surface water	b. not connected; wetlands present within 3 miles	c. not connected, no other wetlands within 3 miles
---	--	---	--

28 Estimate area of unvegetated, open water within the wetland.

c	a. >1 acres	b. bet. 0.5 and 1 acre	c. <0.5 acre
---	-------------	------------------------	--------------

Fisheries Habitat

29 Are fish present in a stream, lake or pond connected to the wetland?

c	a. salmon, trout or sensitive species are present at some time during the year	b. other fish species are present at some time during the year	c. no species are present at any time during the year
---	--	--	---

Streams connected to the wetland

30 What is the physical character of the stream channel?

c	a. natural channel, or modified portions are returning to a natural channel	b. only portions of stream modified	c. extensively modified or confined in a non-vegetated channel or pipe
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31 What percentage of the stream is shaded by riparian vegetation?

c	a. >75%	b. bet. 50% & 75%	c. <50%
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32 What percentage of the stream contains instream structures such as large woody debris, floating/submerged vegetation, large rocks or boulders?

c	a. >25%	b. bet. 10% & 25%	c. <10%
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Lakes or ponds (entire lake or pond and wetland complex)

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

	a. yes	b. cannot be determined	c. no
--	--------	-------------------------	-------

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

	a. 60% or more	b. bet. 20% & <60%	c. <20%
--	----------------	--------------------	---------

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

	a. >25%	b. bet. 10% & 25%	c. <10%
--	---------	-------------------	---------

Wetland Hydrology

36 What is the wetland's primary source of water? (emphasis on primary)

c	a. surface flow, including streams and ditches	b. precipitation or sheet flow	c. groundwater, including springs or seeps
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37 Is there evidence of flooding or ponding during a portion of the growing season?

c	a. yes (describe)	b. unable to determine or not applicable	c. no
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38 Is the water flow out of the wetland restricted (beaver dam, concrete structure, undersized culvert)?

b	a. yes, restricted or no outlet	b. minor restrictions slow down the water (i.e., undersized culvert)	c. no, outlet has unrestricted flow
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(bold questions =field; office review important for 15, 16, 26)

**Oregon Freshwater Wetland Assessment Function Questions
Answer Sheet**

11/11/2010 cmw

WETLAND MC-7

Wildlife Habitat		
1	a	
2	c	
3	c	
4	c	
5	a	
6	a	
7	b	
8	c	
9b	c	
provides habitat for some wildlife species		

WETLAND MC-11

Wildlife Habitat		
1	c	
2	c	
3	c	
4	c	
5	a	
6	b	
7	b	
8	c	
9b	c	
provides habitat for some wildlife species		

Fish Habitat		
Streams and Rivers		
1	b?	
2	b?	
3	b?	
4	b	
5	c	
6	c	
Lakes and Ponds		
1		
2		
3		
4		
5		
6		
impacted or degraded		

Fish Habitat		
Streams and Rivers		
1	c	
2	c	
3	c	
4	b	
5	c	
6	c	
Lakes and Ponds		
1		
2		
3		
4		
5		
6		
impacted or degraded		

Water Quality (pollutant removal)		
1	c	
2	c	
3	a	
4	b	
5	a	
6	b	
impacted or degraded		

Water Quality (pollutant removal)		
1	c	
2	c	
3	a	
4	c	
5	a	
6	b	
impacted or degraded		

Hydrologic Control (flood control & water supply)		
1	b	
2	c	
3	b	
4	b	
5	c	
6	c	
7	c	
lost or not present		

Hydrologic Control (flood control & water supply)		
1	b	
2	c	
3	c	
4	b	
5	c	
6	a	
7	c	
lost or not present		

**Oregon Freshwater Wetland Assessment
Function and Condition Summary Sheet**

Wetland identification: MC-7

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	provides habitat for some wildlife species	Mostly composed of emergent vegetation, small size.
Fish Habitat	impacted or degraded	Channel modified.
Water Quality	impacted or degraded	Groundwater input.
Hydrologic Control	lost or not present	Not in 100-year floodplain.
Narrative description of overall wetland functions and conditions		

Wetland identification: MC-11

Function	Evaluation Descriptor	Rationale
Wildlife Habitat	provides habitat for some wildlife species	Emergent vegetation, small size.
Fish Habitat	impacted or degraded	Ditched.
Water Quality	impacted or degraded	Groundwater input.
Hydrologic Control	lost or not present	Not in 100-year floodplain.
Narrative description of overall wetland functions and conditions		

APPENDIX I

OFWAM Assessment Results and Locally Significant Wetland Determination

OFWAM Results and Locally Significant Wetland Determination City of Mill City

Wetland Code	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Other Locally Significant Features	Locally Significant Wetland?
MC-1, 5	H	M	M	M		Yes
MC-2	H	M	M	M		Yes
MC-3	M	NA	M	M	None	No
MC-4	H	M	M	M		Yes
MC-6	H	H	M	M		Yes
MC-7	M	M	M	L	North Santiam River is not on 303(d) list in Mill City (wetland is less than 1/4 mile away and has impacted WQ function), but the wetland has a direct surface water connection to a stream segment mapped by ODFW as habitat for indigenous anadromous salmonids and the wetland's fish habitat function is impacted.	Yes
MC-9	H	M	M	M		Yes
MC-11	M	M	M	L	North Santiam River is not on 303(d) list in Mill City (wetland is less than 1/4 mile away and has impacted WQ function), but the wetland has a direct surface water connection to a stream segment mapped by ODFW as habitat for indigenous anadromous salmonids and the wetland's fish habitat function is impacted.	Yes

(MC-8, 10, 12 too small)

WH:	provides diverse wildlife habitat	M	provides habitat for some wildlife species	lost or not present
FH:	intact	(Medium):	impacted or degraded	lost or not present
WQ:	intact		impacted or degraded	lost or not present
HC:	intact		impacted or degraded	lost or not present

NA: Not Applicable

APPENDIX J
Staff Qualifications

C. Mirth Walker, PWS, CWD, Senior Wetland Scientist, B.A. Biology and Psychology

Responsibilities: Mirth provided project management and quality assurance/quality review. She assisted with the field work, data entry and analysis, digitizing, and report preparation. Mirth conducted the OFWAM assessment for this project.

Mirth is certified by the Society of Wetland Scientists as a Professional Wetland Scientist (PWS #415, 1995) and provisionally certified by the Seattle District Corps of Engineers as a Certified Wetland Delineator (CWD, 1993).

Mirth Walker has been conducting wetland determinations and delineations since 1990. She joined SWCA in 1994 and is well-respected among Oregon's wetland professionals at consulting firms and agencies alike. At SWCA, she is responsible for project management and staff mentoring; conducting wetland determinations and delineations; assessing habitat, vegetation communities, and wetland functions; wetland and natural resource permit coordination at the local, state, and federal level; designing wetland mitigation plans including restoration, enhancement, and creation plans; conducting local wetland and riparian corridor inventories; and providing quality control. Mirth is an expert aerial photograph interpreter, and she has mapped wetland, riparian, and upland habitats on aerial photograph base maps and provided ground-truthing for numerous Local Wetland Inventory, Riparian Corridor Inventory, and Upland Natural Resource Inventory and Assessment projects in Oregon. Mirth routinely provides QA/QC to SWCA's wetland and natural resource projects, and SWCA's deliverables benefit greatly from her skilled eye, attention to detail, and depth of knowledge. Mirth is committed to providing high-quality service in an efficient manner, and she is very responsive to client needs.

Mirth has conducted and managed many wetland assessments and inventories at SWCA, including Ashland, Hillsboro, La Grande, Lakeside, Stayton, West King City, and Wilsonville. She also conducted wetland inventory work for Gresham, Tigard, and Tualatin, and has over 19 years experience in wetland field work. Mirth has been trained in wetland delineation (1987 Manual and Regional Supplements), HGM, and she assisted with the field verification of the OFWAM. Ms. Walker has provided review and comments to DSL rule revisions, including the LWI methods. She brings a high level of proficiency to this project and routinely manages large and complex projects with multiple team players. Her strengths include all things wetland, as well as her communication and writing skills.

Stacey Reed, Wetland Scientist, B.A. Environmental Science

Responsibilities: Stacey ran the initial public meetings, led the field crew for this project, and ensured efficiency of data collection and mapping. Stacey coordinated field access with the public, conducted field work, digitized wetland boundaries and stream banks, and entered wetland data.

Stacey Reed joined SWCA in 2005. Since 2003, she has evaluated natural ecosystem attributes in Pacific Northwest habitats. She has completed studies of biological and ecological natural functions, the influence of human development impacts, and assessment and design of restoration and mitigation solutions. Stacey's responsibilities include conducting wetland determinations and delineations and wetland functional assessments, and preparing wetland permit applications and mitigation plans. Her experience also includes performing environmental and habitat assessments in a range of Northwest ecosystems, including freshwater wetlands, streams and rivers, marine shorelines, estuarine habitats, and lowland and montane forests.

Stacey has worked on many wetland projects, specializing in soils, and recently attended the Oregon Streamflow Duration Assessment Method training from the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers Portland District. She also attended a two-day ORWAP training from the DSL and participated in the ORWAP repeatability study. In addition to her outstanding wetland identification and delineation skills and wetland assessment experience, her strengths include her excellent interpersonal skills, her enthusiastic attitude, and her willingness to do what needs to be done as efficiently as possible. She is well-organized and excels at prioritizing level of effort among multiple tasks.

Taya Cummins, Botanist / Wetlands Scientist, M.S. Biology, B.S. Forestry and Natural Resources Management

Responsibilities: Taya assisted with LWI field work and wetland data entry.

Taya Cummins joined SWCA in 2006. With more than 10 years of experience, Taya is competent in managing natural resources, including habitat restoration, native plant identification using taxonomic keys, vegetation community mapping and surveying, and the delineation of wetlands; she is trained by the Corps of Engineers in wetland delineation. She manages projects and conducts a variety of biological surveys including rare plant surveys and monitoring vegetation for mitigation projects. Prior to joining SWCA, Taya led a field crew involved in implementing a Burned Area Emergency Rehabilitation contract for the U.S. National Park Service. During this project, she mapped extensive weed populations, managed large-scale weed eradication, and conducted habitat restoration. This survey included approximately 45 million acres and over 50 National Vegetation Classification System vegetation types. Taya has authored and co-authored a variety of technical reports submitted to agencies including federal, state, and local governments. Taya's botany background combined with her recent project experience with large wetland and vegetation mapping projects made her a valuable asset to this project.

Jesse Wilson, Wetland Scientist, B.S. Biology

Responsibilities: Jesse assisted with LWI field work and wetland data entry.

Jesse Wilson joined SWCA in 2008. Jesse specializes in conducting wetland delineations and habitat assessments and preparing wetland permit applications and mitigation and restoration plans for residential, commercial/retail and public works projects. Jesse has conducted numerous wetland delineations using the wetland evaluation procedures outlined in the 1987 Army Corps of Engineers Wetland Delineation Manual and the recently adopted Regional Supplements, and has been trained in ORWAP. He is also experienced in conducting functional assessments of delineated wetlands, habitat assessments and rare, threatened and endangered species assessments. Jesse has proven experience designing and permitting wetland and habitat mitigation plans for a variety of clients and project types. In addition, Jesse has worked with many clients to develop restoration plans to resolve wetland and habitat violations, mitigate for unauthorized impacts and satisfy local, state, and federal regulations. Jesse has lead field efforts and managed data entry for several recent delineation projects ranging up to 124,000 acres.

Rafael Gutierrez, GIS Manager, B.S. Physical Geography

Responsibilities: Rafael managed the consultant's GIS portion of this project, participated in the LiDAR component of this project, and coordinated with LCOG GIS staff.

Rafael Gutierrez joined SWCA in 2001 and is SWCA's GIS manager, serving natural and cultural resource projects. Rafael's responsibilities include supervision of GIS technicians and specialists, GIS project workload, workflow planning and design, spatial database development and maintenance, maintaining interoperability between many file formats, GIS analysis and interpretation, and cartographic production. Rafael's natural resources background includes landcover mapping, habitat modeling, geoprocessing, restoration projects, wetland delineations, stream assessments and aquatic applications. Rafael also provides GPS support for the cultural and natural resource staff using ArcPad 8.0 and Application Builder to create custom applications. Rafael designs and manages projects with modeling components using current tools and techniques within the ArcGIS Geoprocessing framework. He also has a strong background in cartography, database design, and web development. He has managed the GIS portions of many large wetland inventory projects (thousands of acres) throughout Oregon and Washington.

Melissa Katz-Moye, GIS Specialist, M.S., Geological Sciences, B.S., Geology

Responsibilities: Melissa developed the geodatabase and prepared field maps for the project and coordinated with LCOG GIS staff.

Melissa Katz-Moye designs and implements sensitivity analysis models and geodatabases for natural and cultural resources projects. Other SWCA projects include, exploration of interpolation techniques for substrate mapping, site suitability planning for conceptual development and wetland mitigation, cultural resource planning and mapping, and database design and development. Melissa has worked on a variety of projects as a SWCA contractor with the U.S. Fish and Wildlife Service (USFWS). She has conducted several projects for USFWS Refuge Planning, including managing a vegetation mapping project, habitat modeling for snowy plover, ortho-rectification of current and historical imagery, and preparation of digital ortho quarter quadrangle images for every refuge in the USFWS Pacific Region (including Washington, Oregon, California, Idaho, Nevada, Hawaii, and the Remote Pacific Islands). Other USFWS projects include the design and implementation of the GIS and Spatial Data Services Branch Intranet site; a web-based project tracking log and a web-based data tracking log, both built using ColdFusion and a SQL server database; and several interactive and animated Flash applications for the visualization and organization of various data. In the past, Melissa acted as project manager for a vegetation mapping project at Humboldt Bay National Wildlife Refuge in Arcata, California. Tasks included flight planning and coordination of private, state, and federal organizations to ortho-rectification, color-balancing, and mosaicking of several sets of aerial photographs. The project also involved extensive field work, data analysis, and classification. Melissa has a strong background in both GIS and cartography, and has won several awards for both static and digital and interactive maps.

Denise Kalakay, Senior Water Resources Planner, Water Resources Team Manager, LCOG; Master, Urban and Regional Planning; Master minor, Water Resources

Responsibilities: Denise is the Project Manager for the Multi City/County Water Resource Assessment Project managing the wetland and riparian area inventories and assessment process through to the policy implementation phase. Along with Contract and Project Management, Denise coordinated LWI report revisions.

Denise Kalakay is a Senior Water Resources Planner and Water Resources Team Manager at Lane Council of Governments where she has worked since 1995. Her academic and professional background offers an array of skills related to the analytical, economic, social, scientific, and

political aspects of natural resource assessment and planning. Denise developed a blend of technical and planning skills while earning her Masters degree in Urban and Regional Planning at the University of Oregon with a Masters Minor in Water Resources from Oregon State University. Denise is a project manager in developing ground and surface water assessment and protection programs in several cities and counties in Oregon. The cornerstones of these programs are to first provide a technical assessment and analysis of resource sites and then to balance diverse land use interests to achieve a level of environmental protection that fits the needs of individual jurisdictions. Denise specializes in regional natural resource planning as the project manager for the Southern Willamette Groundwater Management Area and a regional planning effort to address total maximum daily load (TMDL) allocations in nine jurisdictions within Lane County in the Willamette River Basin.

Jacob Callister, Assistant Planner, LCOG; Master, Community and Regional Planning, B.S. Natural Resource Management

Responsibilities: Jacob prepared base maps, coordinated landowner contact and response, and prepared final LWI maps.

As a member of LCOG's Natural Resource planning group, Jacob has participated in and led a number of natural resource projects. These projects have addressed a range of resources including groundwater, wetlands, riparian systems, and open space. Jacob also has significant familiarity with land use principles and the relationship between natural resources and land use. Jacob has seven years of applied GIS experience and currently teaches a GIS course at the University of Oregon. Jacob has a Bachelors Degree in Natural Resource Management from Utah State University (2004) and has a Master's Degree in Community and Regional Planning from the University of Oregon (2007).

APPENDIX K
Local Wetland Inventory Maps