INTERSTATE 5 COLUMBIA RIVER CROSSING

Wetlands Technical Report

May 2008

Columbia River CROSSING

TO: Readers of the CRC Technical Reports

FROM: CRC Project Team

SUBJECT: Differences between CRC DEIS and Technical Reports

The I-5 Columbia River Crossing (CRC) Draft Environmental Impact Statement (DEIS) presents information summarized from numerous technical documents. Most of these documents are discipline-specific technical reports (e.g., archeology, noise and vibration, navigation, etc.). These reports include a detailed explanation of the data gathering and analytical methods used by each discipline team. The methodologies were reviewed by federal, state and local agencies before analysis began. The technical reports are longer and more detailed than the DEIS and should be referred to for information beyond that which is presented in the DEIS. For example, findings summarized in the DEIS are supported by analysis in the technical reports and their appendices.

The DEIS organizes the range of alternatives differently than the technical reports. Although the information contained in the DEIS was derived from the analyses documented in the technical reports, this information is organized differently in the DEIS than in the reports. The following explains these differences. The following details the significant differences between how alternatives are described, terminology, and how impacts are organized in the DEIS and in most technical reports so that readers of the DEIS can understand where to look for information in the technical reports. Some technical reports do not exhibit all these differences from the DEIS.

Difference #1: Description of Alternatives

The first difference readers of the technical reports are likely to discover is that the full alternatives are packaged differently than in the DEIS. The primary difference is that the DEIS includes all four transit terminus options (Kiggins Bowl, Lincoln, Clark College Minimum Operable Segment (MOS), and Mill Plain MOS) with each build alternative. In contrast, the alternatives in the technical reports assume a single transit terminus:

- Alternatives 2 and 3 both include the Kiggins Bowl terminus
- Alternatives 4 and 5 both include the Lincoln terminus

In the technical reports, the Clark College MOS and Mill Plain MOS are evaluated and discussed from the standpoint of how they would differ from the full-length Kiggins Bowl and Lincoln terminus options.

Difference #2: Terminology

Several elements of the project alternatives are described using different terms in the DEIS than in the technical reports. The following table shows the major differences in terminology.

DEIS terms	Technical report terms
Kiggins Bowl terminus	I-5 alignment
Lincoln terminus	Vancouver alignment
Efficient transit operations	Standard transit operations
Increased transit operations	Enhanced transit operations

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Difference #3: Analysis of Alternatives

The most significant difference between most of the technical reports and the DEIS is how each structures its discussion of impacts of the alternatives. Both the reports and the DEIS introduce long-term effects of the full alternatives first. However, the technical reports then discuss "segment-level options," "other project elements," and "system-level choices." The technical reports used segment-level analyses to focus on specific and consistent geographic regions. This enabled a robust analysis of the choices on Hayden Island, in downtown Vancouver, etc. The system-level analysis allowed for a comparative evaluation of major project components (replacement versus supplemental bridge, light rail versus bus rapid transit, etc). The key findings of these analyses are summarized in the DEIS; they are simply organized in only two general areas: impacts by each full alternative, and impacts of the individual "components" that comprise the alternatives (e.g. transit mode).

Difference #4: Updates

The draft technical reports were largely completed in late 2007. Some data in these reports have been updated since then and are reflected in the DEIS. However, not all changes have been incorporated into the technical reports. The DEIS reflects more recent public and agency input than is included in the technical reports. Some of the options and potential mitigation measures developed after the technical reports were drafted are included in the DEIS, but not in the technical reports. For example, Chapter 5 of the DEIS (Section 4(f) evaluation) includes a range of potential "minimization measures" that are being considered to reduce impacts to historic and public park and recreation resources. These are generally not included in the technical reports. Also, impacts related to the stacked transit/highway bridge (STHB) design for the replacement river crossing are not discussed in the individual technical reports, but are consolidated into a single technical memorandum.

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Cover Sheet

Interstate 5 Columbia River Crossing

Wetlands Technical Report:

Submitted By:

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ACRONYMS

Acronym	Description
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
APE	Area of Potential Effect
API	Area of Potential Impact
BLM	Bureau of Land Management
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe Railroad
BRT	Bus Rapid Transit
CAO	Critical Areas Ordinance
CBD	Central Business District
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
COE	U.S. Army Corps of Engineers
CPC	City of Portland Code
CRC	Columbia River Crossing
CWA	Clean Water Act
DCNP	Depressional, Closed, Non-Permanently Flooded Wetland
DCP	Depressional, Closed, Permanently Flooded Wetland
DEIS	Draft Environmental Impact Statement
DEQ	Oregon Department of Environmental Quality
DLCD	Department of Land Conservation and Development
DOGAMI	Oregon Department of Geology and Mineral Industries
DOI	U.S. Department of Interior
DSL	Oregon Department of State Lands
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESH	Essential Salmonid Habitat
ESU	Evolutionarily Significant Unit
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
Ft	feet/foot
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
GIS	Geographic Information System
GMA	Growth Management Act
GPS	Global Positioning System
HAZMAT	Hazardous Materials/Incidents

Acronym	Description
HCT	High-Capacity Transit
HGM	Hydrogeomorphic
HPA	Hydraulic Permit Approval
HUC	Hydrological Unit Code
InterCEP	Interstate Collaborative Environmental Process
JARPA	Join Aquatic Resource Permits Application
LRT	Light Rail Transit
MOA	Memorandum of Agreement
MP	Milepost
Mph	Miles per hour
MPO	Metropolitan Planning Organization
MSFCMA	Magnuson-Stevens Fisheries Conservation and Management Act
MTIP	Metropolitan Transportation Improvement Plan
MTP	Metropolitan Transportation Plan
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration for Fisheries (NMFS)
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRMP	Natural Resource Management Plan
NWI	National Wetlands Inventory
OAR	Oregon Administrative Rule
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish & Wildlife
ODOT	Oregon Department of Transportation
ONHP	Oregon Natural Heritage Program
ORNHIC	Oregon Natural Heritage Information Center
OHW	Ordinary High Water Line
ORS	Oregon Revised Statutes
PEMA	Palustrine Emergent Temporarily Flooded
PEMC	Palustrine Emergent Seasonally Flooded
PFOC	Palustrine Forested Seasonally Flooded
PJWA	Potentially Jurisdictional Water Area
PSSC	Palustrine Scrub-Shrub Seasonally Flooded
PUBHx	Palustrine Unconsolidated Bottom, Permanently Flooded, Excavated
RCW	Revised Code of Washington
RI	Riverine Impounding
RLIS	Regional Land Information System
ROD	Record of Decision
SEPA	State Environmental Policy Act
SOC	Federal Species of Concern

Acronym	Description
SOI	Species of Interest
SMA	Shoreline Management Act
SRA	Sensitive Resource Areas
SRSAM	Salmon Resource Sensitive Area Mapping project
TDM	Transportation Demand Management
TSM	Transportation System Management
UGA	Urban Growth Area
UGB	Urban Growth Boundary
UPRR	Union Pacific Railroad
USBR	U.S. Bureau of Reclamation
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMC	Vancouver Municipal Code
WAC	Washington Administrative Code
WRD	Oregon Department of Water Resources
WSDOT	Washington State Department of Transportation

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1. Summary

1.1 Introduction

The Wetlands Technical Report will discuss existing conditions within areas that will potentially be affected by the CRC project; compare and contrast long-term, temporary, and cumulative impacts from project alternatives; and provide potential mitigation measures for project impacts. Wetland surveys were performed within the primary area of potential impact (primary API) as well as base maintenance stations.

1.2 Description of the Alternatives

The alternatives being considered for the CRC project consist of a diverse range of highway, transit and other transportation choices. Some of these choices – such as the number of traffic lanes across the river – could affect transportation performance and impacts throughout the bridge influence area or beyond. These are referred to as "system-level choices." Other choices – such as whether to run high-capacity transit (HCT) on Washington Street or Washington and Broadway Streets – have little impact beyond the area immediately surrounding that proposed change and no measurable effect on regional impacts or performance. These are called "segment-level choices." This report discusses the impacts from both system- and segment-level choices, as well as "full alternatives." The full alternatives combine system-level and segment-level choices for highway, transit, pedestrian, and bicycle transportation. They are representative examples of how project elements may be combined. Other combinations of specific elements are possible. Analyzing the full alternatives allows us to understand the combined performance and impacts that would result from multimodal improvements spanning the bridge influence area.

Following are brief descriptions of the alternatives being evaluated in this report, which include:

- System-level choices,
- Segment-level choices, and
- Full alternatives.

1.2.1 System-Level Choices

System-level choices have potentially broad influence on the magnitude and type of benefits and impacts produced by this project. These options may influence physical or operational characteristics throughout the project area and can affect transportation and other elements outside the project corridor as well. The system-level choices include:

- River crossing type (replacement or supplemental)
- High-capacity transit mode (bus rapid transit or light rail transit)
- Tolling (no toll, I-5 only, I-5 and I-205, standard toll, higher toll)

This report compares replacement and supplemental river crossing options. A replacement river crossing would remove the existing highway bridge structures across the Columbia River and replace them with three new parallel structures – one for I-5 northbound traffic, another for I-5 southbound traffic, and a third for HCT, bicycles, and pedestrians. A supplemental river crossing would build a new bridge span downstream of the existing I-5 bridge. The new supplemental bridge would carry southbound I-5 traffic and HCT, while the existing I-5 bridge would carry northbound I-5 traffic, bicycles, and pedestrians. The replacement crossing would include three through-lanes and two auxiliary lanes for I-5 traffic in each direction. The supplemental crossing would include three through-lanes and one auxiliary lane in each direction.

Two types of HCT are being considered – bus rapid transit and light rail transit. Both would operate in an exclusive right-of-way through the project area, and are being evaluated for the same alignments and station locations. The HCT mode – LRT or BRT – is evaluated as a system-level choice. Alignment options and station locations are discussed as segment-level choices. BRT would use 60-foot or 80-foot long articulated buses in lanes separated from other traffic. LRT would use one- and two-car trains in an extension of the MAX line that currently ends at the Expo Center in Portland.

Under the efficient operating scenario, LRT trains would run at approximately 7.5 minute headways during the peak periods. BRT would run at headways between 2.5 and 10 minutes depending on the location in the corridor. BRT would need to run at more frequent headways to match the passenger-carrying capacity of the LRT trains. This report also evaluates performance and impacts for an increased operations scenario that would double the number of BRT vehicles or the number of LRT trains during the peak periods.

1.2.2 Segment-Level Choices

1.2.2.1 Transit Alignments

The transit alignment choices are organized into three corridor segments. Within each segment the alignment choices can be selected relatively independently of the choices in the other segments. These alignment variations generally do not affect overall system performance but could have important differences in the impacts and benefits that occur in each segment. The three segments are:

- Segment A1 – Delta Park to South Vancouver
- Segment A2 – South Vancouver to Mill Plain District
- Segment B – Mill Plain District to North Vancouver

In Segment A1 there are two general transit alignment options - offset from, or adjacent to, I-5. An offset HCT guideway would place HCT approximately 450 to 650 feet west of I-5 on Hayden Island. An adjacent HCT guideway across Hayden Island would locate HCT immediately west of I-5. The alignment of I-5, and thus the alignment of an adjacent HCT guideway, on Hayden Island would vary slightly depending upon the river crossing and highway alignment, whereas an offset HCT guideway would retain the same station location regardless of the I-5 bridge alignment.

HCT would touch down in downtown Vancouver at Sixth Street and Washington Street with a replacement river crossing. A supplemental crossing would push the touch down location north to Seventh Street. Once in downtown Vancouver, there are two alignment options for HCT – a two-way guideway on Washington Street or a couplet design that would place southbound HCT on Washington Street and northbound HCT on Broadway. Both options would have stations at Seventh Street, 12th Street, and at the Mill Plain Transit Center between 15th and 16th Streets.

From downtown Vancouver, HCT could either continue north on local streets or turn east and then north adjacent to I-5. Continuing north on local streets, HCT could either use a two-way guideway on Broadway or a couplet on Main Street and Broadway. At 29th Street, both of these options would merge to a two-way guideway on Main Street and end at the Lincoln Park and Ride located at the current WSDOT maintenance facility. Once out of downtown Vancouver, transit has two options if connecting to an I-5 alignment: head east on 16th Street and then through a new tunnel under I-5, or head east on McLoughlin Street and then through the existing underpass beneath I-5. With either option HCT would connect with the Clark College Park and Ride on the east side of I-5, then head north along I-5 to about SR 500 where it would cross back over I-5 to end at the Kiggins Bowl Park and Ride.

There is also an option, referred to as the minimum operable segments (MOS), which would end the HCT line at either the Mill Plain station or Clark College. The MOS options provide a lower cost, lower performance alternative in the event that the full-length HCT lines could not be funded in a single phase of construction and financing.

1.2.2.2 Highway and Bridge Alignments

This analysis divides the highway and bridge options into two corridor segments, including:

- Segment A – Delta Park to Mill Plain District
- Segment B – Mill Plain District to North Vancouver

Segment A has several independent highway and bridge alignment options. Differences in highway alignment in Segment B are caused by transit alignment, and are not treated as independent options.

The replacement crossing would be located downstream of the existing I-5 bridge. At the SR 14 interchange there are two basic configurations being considered. A traditional configuration would use ramps looping around both sides of the mainline to provide direct connection between I-5 and SR 14. A less traditional design could reduce right-of-way requirements by using a “left loop” that would stack both ramps on the west side of the I-5 mainline.

1.2.3 Full Alternatives

Full alternatives represent combinations of system-level and segment-level options. These alternatives have been assembled to represent the range of possibilities and total impacts at the project and regional level. Packaging different configurations of highway,

transit, river crossing, tolling and other improvements into full alternatives allows project staff to evaluate comprehensive traffic and transit performance, environmental impacts and costs.

Exhibit 1-1 summarizes how the options discussed above have been packaged into representative full alternatives.

Exhibit 1-1. Full Alternatives

	Packaged Options				
Full Alternative	River Crossing Type	HCT Mode	Northern Transit Alignment	TDM/TSM Type	Tolling Method[a]
1	Existing	None	N/A	Existing	None
2	Replacement	BRT	I-5	Aggressive	Standard Rate
3	Replacement	LRT	I-5	Aggressive	Two options[b]
4	Supplemental	BRT	Vancouver	Very Aggressive	Higher rate
5	Supplemental	LRT	Vancouver	Very Aggressive	Higher rate

[a] In addition to different tolling rates, this report evaluates options that would toll only the I-5 river crossing and options that would toll both the I-5 and I-205 crossings.
[b] Alternative 3 is evaluated with two different tolling scenarios, tolling and non-tolling.

Modeling software used to assess alternatives' performance does not distinguish between smaller details, such as most segment-level transit alignments. However, the geographic difference between the Vancouver and I-5 transit alignments is significant enough to warrant including this variable in the model. All alternatives include Transportation Demand Management (TDM) and Transportation System Management (TSM) measures designed to improve efficient use of the transportation network and encourage alternative transportation options to commuters such as carpools, flexible work hours, and telecommuting. Alternatives 4 and 5 assume higher funding levels for some of these measures.

Alternative 1: The National Environmental Policy Act (NEPA) requires the evaluation of a No-Build or "No Action" alternative for comparison with the build alternatives. The No-Build analysis includes the same 2030 population and employment projections and the same reasonably foreseeable projects assumed in the build alternatives. It does not include any of the I-5 CRC related improvements. It provides a baseline for comparing the build alternatives, and for understanding what will happen without construction of the I-5 CRC project.

Alternative 2: This alternative would replace the existing I-5 bridge with three new bridge structures downstream of the existing bridge. These new bridge structures would carry Interstate traffic, BRT, bicycles, and pedestrians. There would be three through-lanes and two auxiliary lanes for I-5 traffic in each direction. Transit would include a BRT system that would operate in an exclusive guideway from Kiggins Bowl in Vancouver to the Expo Center station in Portland. Express bus service and local and feeder bus service would increase to serve the added transit capacity. BRT buses would

turn around at the existing Expo Station in Portland, where riders could transfer to the MAX Yellow Line.

Alternative 3: This is similar to Alternative 2 except that LRT would be used instead of BRT. This alternative is analyzed both with a toll collected from vehicles crossing the Columbia River on the new I-5 bridge, and with no toll. LRT would use the same transit alignment and station locations. Transit operations, such as headways, would differ, and LRT would connect with the existing MAX Yellow Line without requiring riders to transfer.

Alternative 4: This alternative would retain the existing I-5 bridge structures for northbound Interstate traffic, bicycles, and pedestrians. A new crossing would carry southbound Interstate traffic and BRT. The existing I-5 bridges would be re-striped to provide two lanes on each structure and allow for an outside safety shoulder for disabled vehicles. A new, wider bicycle and pedestrian facility would be cantilevered from the eastern side of the existing northbound (eastern) bridge. A new downstream supplemental bridge would carry four southbound I-5 lanes (three through-lanes and one auxiliary lane) and BRT. BRT buses would turn around at the existing Expo Station in Portland, where riders could transfer to the MAX Yellow Line. Compared to Alternative 2, increased transit service would provide more frequent service. Express bus service and local and feeder bus service would increase to serve the added transit capacity.

Alternative 5: This is similar to Alternative 4 except that LRT would be used instead of BRT. LRT would have the same alignment options, and similar station locations and requirements. LRT service would be more frequent (approximately 3.5 minute headways during the peak period) compared to 7.5 minutes with Alternative 3. LRT would connect with the existing MAX Yellow Line without requiring riders to transfer.

1.3 Long-Term Effects

The long-term effects to wetlands resulting from the project include decreased wetland and vegetated wetland buffer areas, increased impervious surface areas, and the placement of fill and other alterations into wetlands and other waters of the State and U.S.

1.3.1 Regional Effects

The project area has a growing population with increased development demands. The historic and recent development in the Portland-Vancouver metropolitan area has changed the region from an extensive bottomland with numerous wetlands, sloughs, and marshes to a highly developed urban area. The CRC alternatives would have small, mitigatible impacts on local, isolated wetlands but would have little or no direct impact on regional wetland conditions. Induced effects from the project include increased pressure on wetlands areas due to larger areas of impervious surfaces and less overall vegetated cover.

Within the project area, waters of the State and U.S. have become highly modified systems, controlled by levees, diking, pumping, etc. The project will have both short and long-term impacts to water through the placement of temporary and permanent piers, the use of construction equipment within and around active channels, and increased areas of impervious surface.

1.3.2 Segment-Level Effects

See Exhibit 1-2 for a map of the project area and segment boundaries.

1.3.2.1 Segment A

Under current designs, Wetland System L/M and its buffer would be impacted by BRT but not by LRT. A replacement crossing would have less impact to Wetland System L/M and its buffer than a supplemental crossing. All build alternatives would have the same impact to the Wetland D buffer. A replacement crossing would result in a greater volume of fill material within the Columbia River than a supplemental crossing.

The replacement crossing will reduce local traffic congestion and delay times more than the supplemental crossing. The likelihood of indirect impacts to water quality within wetlands and other waters of the State and U.S. increase with traffic and long delay times.

Currently, untreated stormwater enters the Columbia River directly through drains on the bridges. Both the replacement and supplemental crossings will treat stormwater from the new bridges.

The No-Build Alternative would not result in direct impacts to wetlands or other waters of the State and U.S. However, increased traffic delay times and continued untreated stormwater discharge may result in a greater level of indirect impacts to wetlands and other waters through decreased water quality.

1.3.2.2 Segment B

Under current designs, a replacement crossing would impact PJWA G less than a supplemental crossing.

The North I-5 transit alignment would impact the Wetland H buffer but the Vancouver transit alignment would not. All options with the Kiggins Bowl Park and Ride would impact the stormwater feature that drains to PJWA I.

The replacement crossing will reduce local traffic congestion and delay times more than the supplemental crossing. The likelihood of indirect impacts to water quality within wetlands and other waters of the State and U.S. increases with traffic and long delay times.

The No-Build Alternative would not result in direct impacts to wetlands or other waters of the State and US. However, increased traffic delay times and continued untreated stormwater discharge may result in a greater level of indirect impacts to wetlands and other waters through decreased water quality

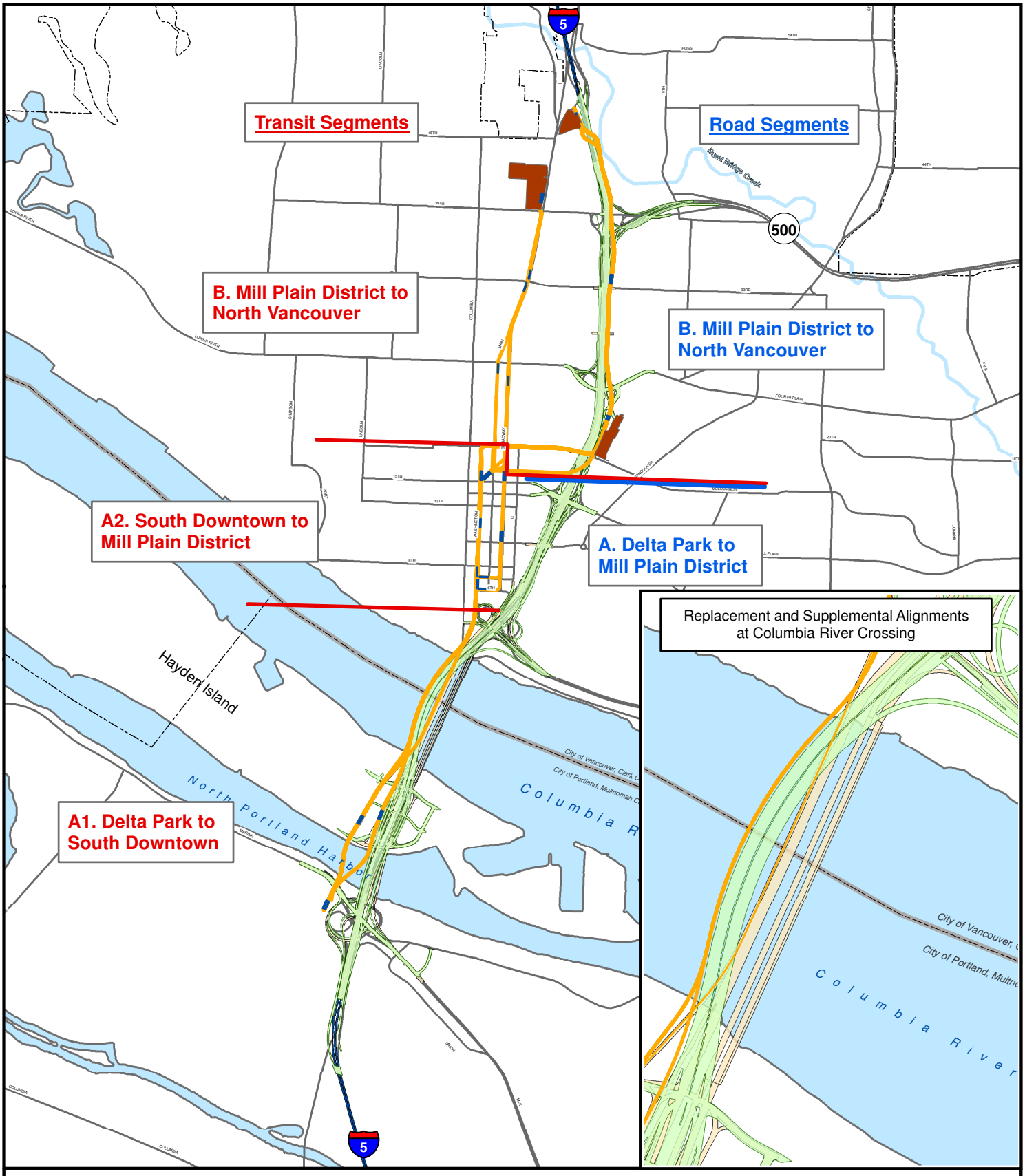


Exhibit 1-2: Project Area and Alternatives

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Aug.-2007; Plot Date: Dec.-2007; File Name: JH_014_8x11.mxd

1.4 Temporary Effects

Temporary construction impacts are expected to occur where project construction is in the vicinity of wetlands or their vegetated buffers and in waters of the State and U.S. Because best management practices will be employed during construction, temporary effects to wetlands can be largely avoided. However, all wetlands and other waters that are directly impacted may have some unavoidable temporary impacts such as disrupted wildlife activity and reduced water quality.

Temporary effects to the Columbia River are unavoidable for the Build Alternative and depend on construction methods and timing. For greater discussion of temporary effects to the Columbia River, refer to the Ecosystems and Water Quality Technical Reports.

The No-Build Alternative would result in no temporary effects to wetlands and other waters of the State and US.

1.5 Mitigation

Mitigation of impacts to wetlands and other jurisdictional waters may take the form of best management practices (BMPs), conservation measures, avoidance/minimization measures, or creation, restoration, or enhancement of wetlands or waters to offset losses due to the project. Standard construction BMPs and conservation measures would be implemented in the build alternatives to avoid impacts to wetlands and waters from construction activities. Designs have avoided and minimized impacts to existing wetland and water resources. Mitigation to offset losses will be explored in detail after the locally preferred alternative has been identified. Mitigation opportunities in existing or newly acquired DOT right-of-way will be explored. Mitigation would likely occur on areas with existing hydric soils that are in close proximity to existing wetland resources, and that are not proposed for development.

2. Methods

2.1 Introduction

The purpose of this section is to describe the methods that were used to collect data and evaluate impacts to jurisdictional wetlands and waters for the Interstate 5 (I-5) Columbia River Crossing (CRC) project. The analysis was developed to comply with the National Environmental Policy Act (NEPA), applicable state environmental policy legislation, and local and state policies, standards and regulations.

This section addresses the following questions:

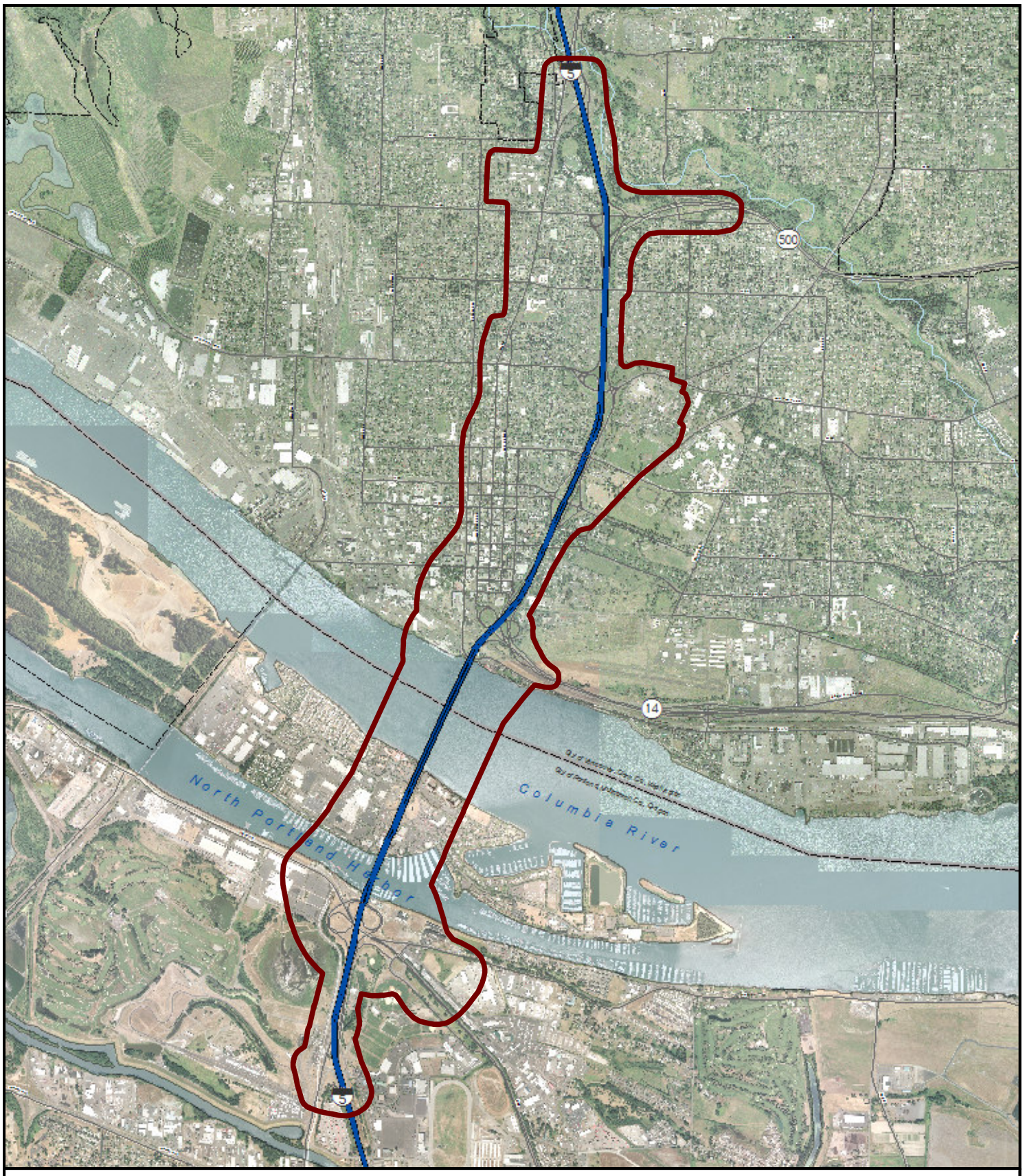
- How was the study area, the Area of Potential Impact (API), defined?
- What methods and data were used to determine the location and function of jurisdictional wetlands and waters within the API?
- How were potential short- and long-term impacts on jurisdictional wetlands and waters identified and analyzed, and what constitutes a significant impact?
- How were mitigation measures identified and analyzed?

2.2 Study Area

This evaluation used two study areas to identify environmental effects: the primary and secondary areas of potential impact (APIs). In addition, two potential maintenance base sites were evaluated. The primary API addresses direct impacts and is similar across technical disciplines. Secondary APIs, the analysis areas for indirect impacts, may vary by discipline. The APIs used for this analysis are shown in Exhibit 2-1 and are described below. These areas may change during the course of the analysis as project alternatives mature and as technical studies evolve. Maintenance bases include one site in Vancouver and one site in Gresham (Ruby Junction) for LRT or BRT.

2.2.1 Primary API

The primary API contains the natural resources most likely to experience direct impacts from the construction and operation of proposed project alternatives. Direct physical changes in the landscape will likely be limited to this area, though mitigation strategies can be applied outside of it.



Primary API

Exhibit 2-1: Area of Potential Impact

N
W E
S

0 0.25 0.5
Miles

Columbia River CROSSING

Analysis by Analyst name; Analysis Date: Aug.-2007; Plot Date: Aug.-2007; File Name: Exhibit1_ProjCorr_JL083.mxd

As currently defined, the primary API extends about five miles from north to south. It starts at the I-5/SR 500 interchange in Washington, and extends just south of the I-5/Marine Drive interchange in Oregon. At its northern end the API expands west into downtown Vancouver, and east near Clark College to include potential high-capacity transit alignments and park and ride locations. Heading south along the existing bridge alignment, the primary API extends 0.25 mile from either side of the I-5 river crossing. South of the river crossing, this width narrows to 300 feet on either side of the I-5 right-of-way.

2.2.2 Secondary API

The secondary API represents the area where CRC alternatives could influence travel patterns, and therefore the area where indirect impacts (e.g., traffic and development changes) could occur from the proposed project alternatives. The study team relied primarily on existing data sources to evaluate indirect project impacts.

The secondary API, over 15 miles long, starts one mile north of the I-5/I-205 interchange and ends near the I-5/I-84 interchange. The secondary API also extends one mile east and west of the I-5 right-of-way. Traffic projections for alternative alignments will continue to help determine the geographic extent of potential indirect impacts.

2.2.3 Maintenance Bases

Ruby Junction (LRT): Ruby Junction is an existing TriMet Operations and Maintenance Facilities is located in Gresham along NW Eleven Mile Ave, south of E Burnside. The expansion of the current Ruby Junction maintenance facility for the CRC project would require the acquisition of up to 15 parcels. These parcels are zoned for heavy industrial, yet currently support residential, commercial, and light industrial uses.

Vancouver (BRT): An existing C-TRAN East Vancouver (NE 65th Ave) Maintenance Facility is located northeast of the intersection of NE 65th Ave and NE 18th St in Vancouver. The expansion of the current C-TRAN Maintenance Facility would require the acquisition of five parcels. These parcels are zoned for light industrial use, yet currently support residential uses as well.

2.3 Effects Guidelines

The project team coordinated with federal, state, and local resource agencies to determine the significance of impacts to jurisdictional wetlands and waters. Indicators of potentially significant impacts include the following:

- If modification of hydrologic regimes, destruction of a wetland or its designated buffer vegetation, and/or destruction or fill of the wetland results in:
- Any significant adverse change in function of the wetland or its designated buffer.
- Significant degradation in the quality of the wetland or its designated buffer.
- If substantial disturbance occurs within a wetland or its designated buffer that provides habitat for a special-status species.

- If the loss of wetland represents a substantial portion of the total area of wetlands within the primary API.
- If impacts to a wetland or its designated buffer cannot be mitigated.
- If the project causes a net loss of wetland function.

2.4 Data Collection Methods

Jurisdictional wetlands and waters within the primary API were identified, and wetland conditions characterized, as the basis for evaluating potential project impacts. Boundaries of jurisdictional wetlands and waters within the primary API were delineated (COE 1987) and wetland functional assessments were performed. Wetlands extending outside of the API boundary were considered in their entirety. Methods suitable for delineating wetlands in both Oregon and Washington were implemented. Wetland boundaries were recorded with a high-accuracy (sub-meter) GPS receiver and wetlands were classified using the Cowardin (Cowardin et al. 1979) classification method. The indicator status of vegetation within sample areas was determined using the *List of Plant Species that Occur in Wetlands* (USFWS 1988[1]). Wetland functions were assessed using the Washington rating system and the Oregon Hydrogeomorphic (HGM) (Judgmental Method), as described in Hruby (2004) and Adamus (2001). Current literature on wetland resources was reviewed, including information on existing compensatory wetland mitigation sites.

Using the information gathered from existing maps, literature, field delineation, and spot verification, revised wetlands maps were produced showing wetland boundaries within the primary API.

2.5 Analysis Methods

Potential cumulative effects from this project are evaluated in the Cumulative Effects Technical Report. Please refer to this report for an evaluation of possible cumulative effects.

2.5.1 Identifying Long-Term Operational Impacts

The following process was used to determine long-term operational impacts on jurisdictional wetlands and waters:

- Maps and spatial data of delineated wetland boundaries, protected wetlands, and designated buffers were used to determine sensitive areas that may be impacted by the project.
- The area of impacts to wetlands and designated buffers was quantified and compared to the area of undisturbed wetlands within the APIs.

[1] A list of plant species synonyms using the USDA Plants database is provided in Appendix A.

- The Oregon HGM and Washington wetland rating systems were used during delineations to provide numerical measures for wetland function. These measures were then used for quality comparisons and impact analysis.
- Local, state, and federal biologists were consulted to discuss potential impacts.
- Potential beneficial impacts of the proposed alternatives were identified.

2.5.2 Identifying Short-Term Construction Impacts

The following process was used to determine short-term construction impacts on jurisdictional wetlands and waters:

- Maps and spatial data of delineated wetland boundaries, protected wetlands, and designated buffers were used to determine sensitive areas that may be impacted by the project.
- The Oregon HGM and Washington wetland rating systems were used during delineations to provide numerical measures for wetland function. These measures were then used for quality comparisons and impact analysis.
- The area of high quality wetlands and designated buffers affected by the proposed alternatives was quantified.
- Local, state, and federal biologists were interviewed to discuss potential impacts.

2.5.3 Identifying Cumulative Impacts

Cumulative impacts may occur when a project's effects are combined with those from past, present, and reasonably foreseeable future projects. They can also result from individually small but collectively significant actions that occur over a long period of time.

2.5.4 Identifying Mitigation Measures

Bi-state coordination occurred to identify best mitigation measures for impacts to jurisdictional wetlands and waters. The intent of this analysis was to explore mitigation measures that are consistent with the mitigation policies and requirements of both states. This analysis involved exploring the following strategies for mitigating impacts on jurisdictional wetlands and waters:

- Avoid the impact through design modification or by not taking a certain action or parts of an action.
- Identify and evaluate ways to minimize impacts to wetlands. Research and identify best management practices (BMPs).
- Consider BMPs and potential mitigation needs with input from local, state, and federal agencies.
- Rectify temporary impacts by repairing, rehabilitating, or restoring the affected resource.

- Reduce or eliminate the impact over time by preservation and maintenance operations.
- Compensate for permanent impacts by replacing, enhancing, or providing substitute resources or environments.

Compensation for unavoidable impacts will be consistent with U.S. Army Corps of Engineers (COE), Oregon Department of State Lands (DSL), Washington Department of Ecology (Ecology), the City of Portland, Clark County, and the City of Vancouver rules for wetland mitigation. Priority will be given to on-site compensatory mitigation first, but will also consider off-site mitigation options where appropriate. In choosing between the two options, the likelihood for success, ecological sustainability, practicability of long-term monitoring and maintenance, and relative costs will be evaluated. The mitigation goal is to fully replace wetland functions and values; emphasis will also be put on preserving and restoring wetlands that provide habitat for fish and wildlife.

3. Coordination

The CRC project team, together with state and federal resource agencies, FHWA and FTA, formed the Interstate Collaborative Environmental Process (InterCEP) Agreement, in order to coordinate various state and federal environmental regulatory issues through the NEPA process. Through the InterCEP, coordination with representatives of DSL, Ecology, and COE, among others, occurred over several meetings between 2005 and 2008. The three agencies named above agreed upon the methodology to be used for wetlands fieldwork and reporting.

The InterCEP process also gave these agencies the opportunity to review and comment on, and ultimately concur with project Evaluation Criteria used to screen alternatives, and the Range of Alternatives carried into the DEIS.

Additional coordination with DSL, Ecology, and COE will occur in order to determine jurisdiction of wetlands and waters within the project area.

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4. Affected Environment

4.1 Introduction

The project area is located in northwestern Oregon and southwestern Washington, bisected by the Columbia River. Exhibit 4-1 shows the project area, including the primary API and secondary API.

4.2 Regional Conditions

The central project area is highly urbanized with some remnant wetlands and other waters. Natural Resources Conservation Service (NRCS) soils maps (Exhibits 4-2 and 4-3) show large areas of hydric soils, especially in the North Portland area. The National Wetlands Inventory (NWI) maps wetlands throughout the region (Exhibits 4-4 and 4-5).

West of the project area there are large wetland systems including the Vanport Wetland, Force Lake, Smith and Bybee Lakes, West Hayden Island wetlands, and Vancouver Lake wetlands. Southeast of the project area, the Columbia Slough watershed has substantial wetlands and other waters present within the urban matrix. The Salmon Creek watershed, north of the project, has similar characteristics. These large systems are remnants of the historic system of wetlands, sloughs, and marshes that once occupied most of the project area. Although they are somewhat cut off from each other and the larger Columbia River system due to urbanization of the area, they perform many functions and have a high value due to their rarity and wildlife value.

4.3 Segment A Delta Park to Mill Plain District

4.3.1 Mapped Soils

In Oregon, soils mapped within Segment A include Pilchuck Urban land complex, 0 to 3 percent slopes (33A); Rafton silt loam, protected (40); and Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes (47A). In Washington mapped soils include Fill land (Fn); Lauren gravelly loam, 0 to 8 percent slopes (LgB); Lauren gravelly loam, 8 to 20 percent slopes (LgD); and Sauvie silt loam, 0 to 3 percent slopes (SmA) (Exhibit 4-2).

Rafton silt loam, protected and Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes are hydric soils.

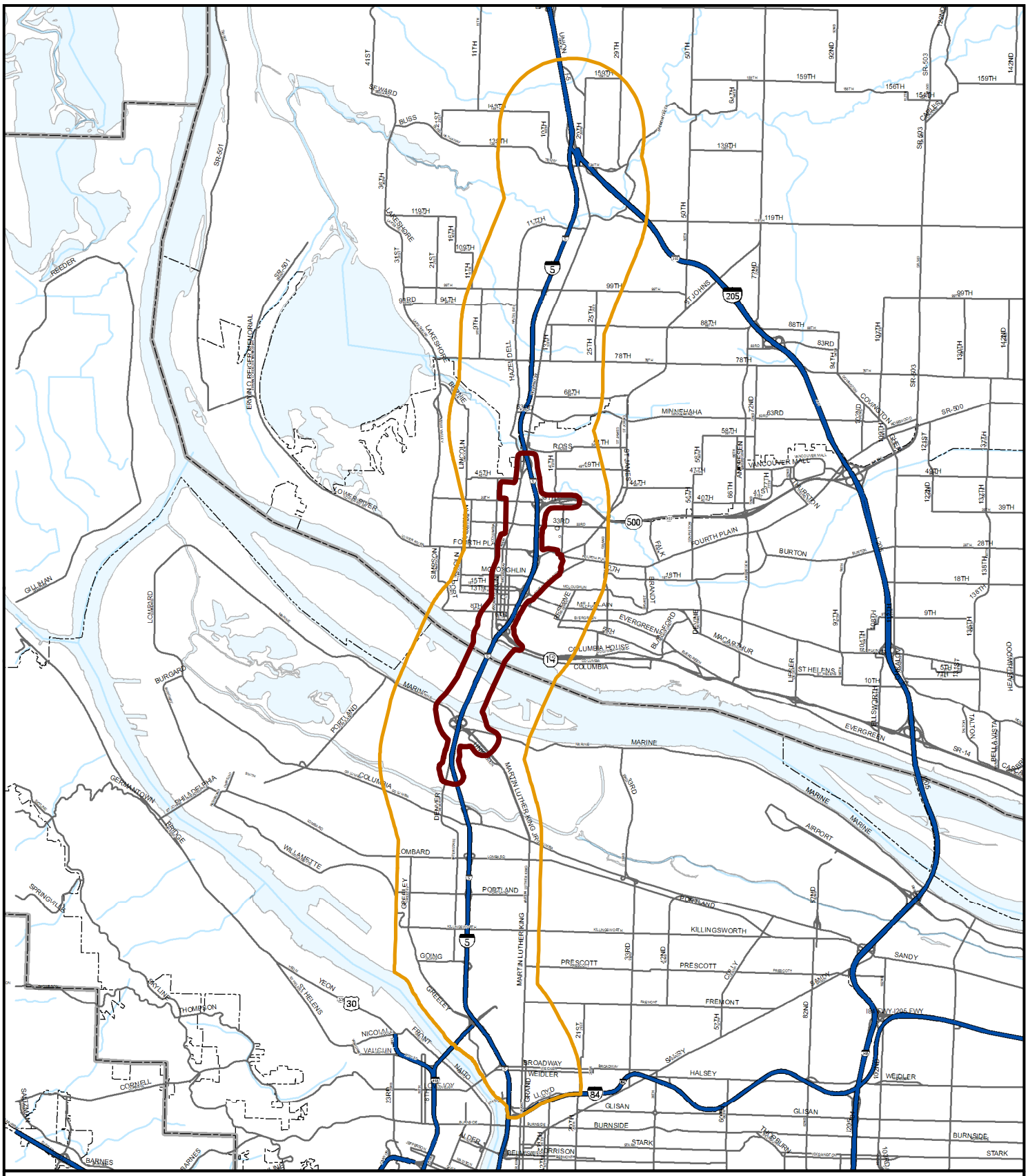


Exhibit 4-1: Project Corridor

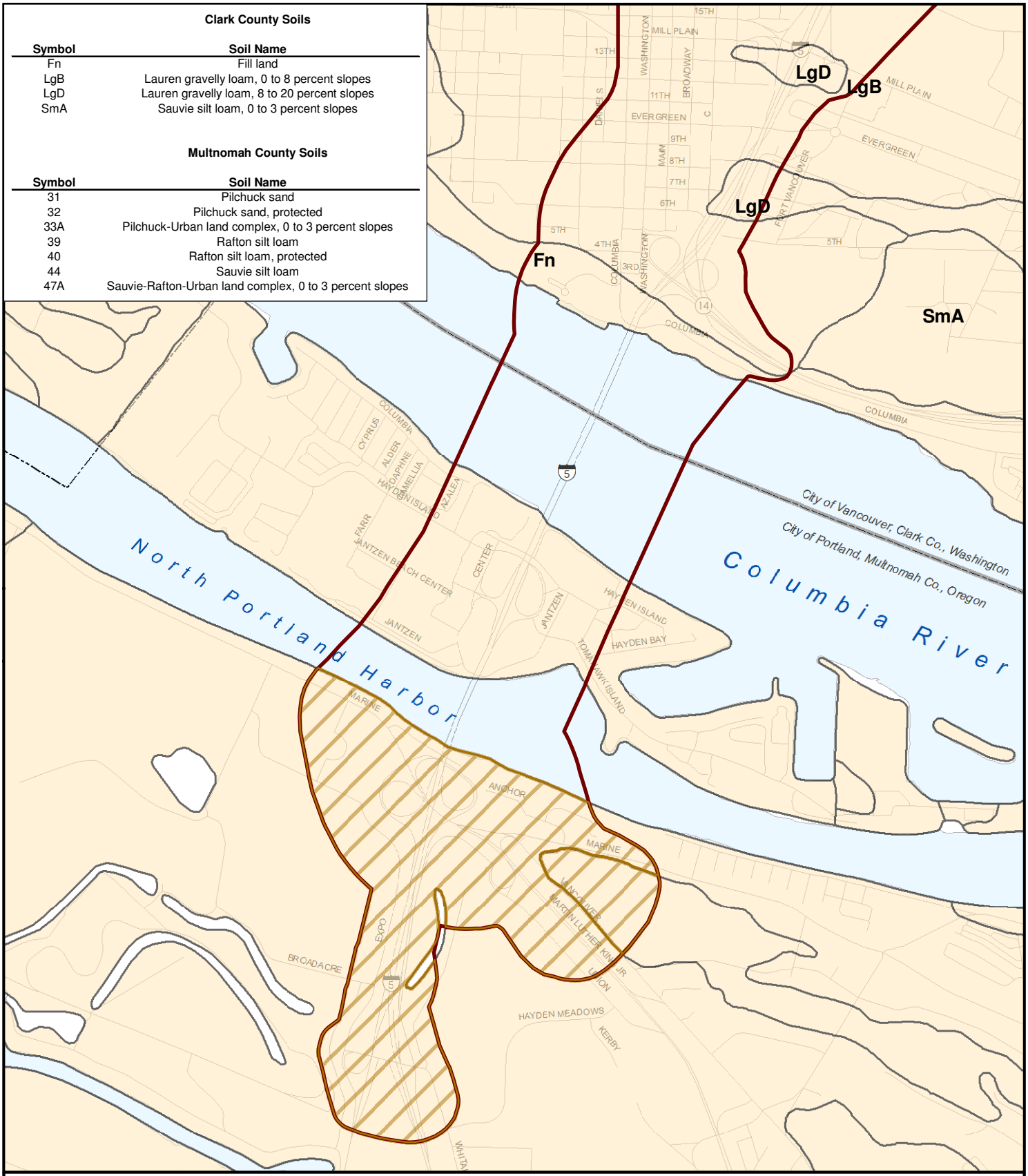
Columbia River CROSSING

Clark County Soils

Symbol	Soil Name
Fn	Fill land
LgB	Lauren gravelly loam, 0 to 8 percent slopes
LgD	Lauren gravelly loam, 8 to 20 percent slopes
SmA	Sauvie silt loam, 0 to 3 percent slopes

Multnomah County Soils

Symbol	Soil Name
31	Pilchuck sand
32	Pilchuck sand, protected
33A	Pilchuck-Urban land complex, 0 to 3 percent slopes
39	Rafton silt loam
40	Rafton silt loam, protected
44	Sauvie silt loam
47A	Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes



0 525 1,050
Feet

Primary API
Soils
Hydric or Partially Hydric Soils within API

Exhibit 4-2: Mapped Soil Series
Segment A

Columbia River CROSSING

Source: Natural Resources Conservation Service Soils Database

Analysis by C. Hainey; Analysis Date: 11/19/07; Plot Date: 11/19/07; File Name: Exhibit4_2_4_3TF072.mxd

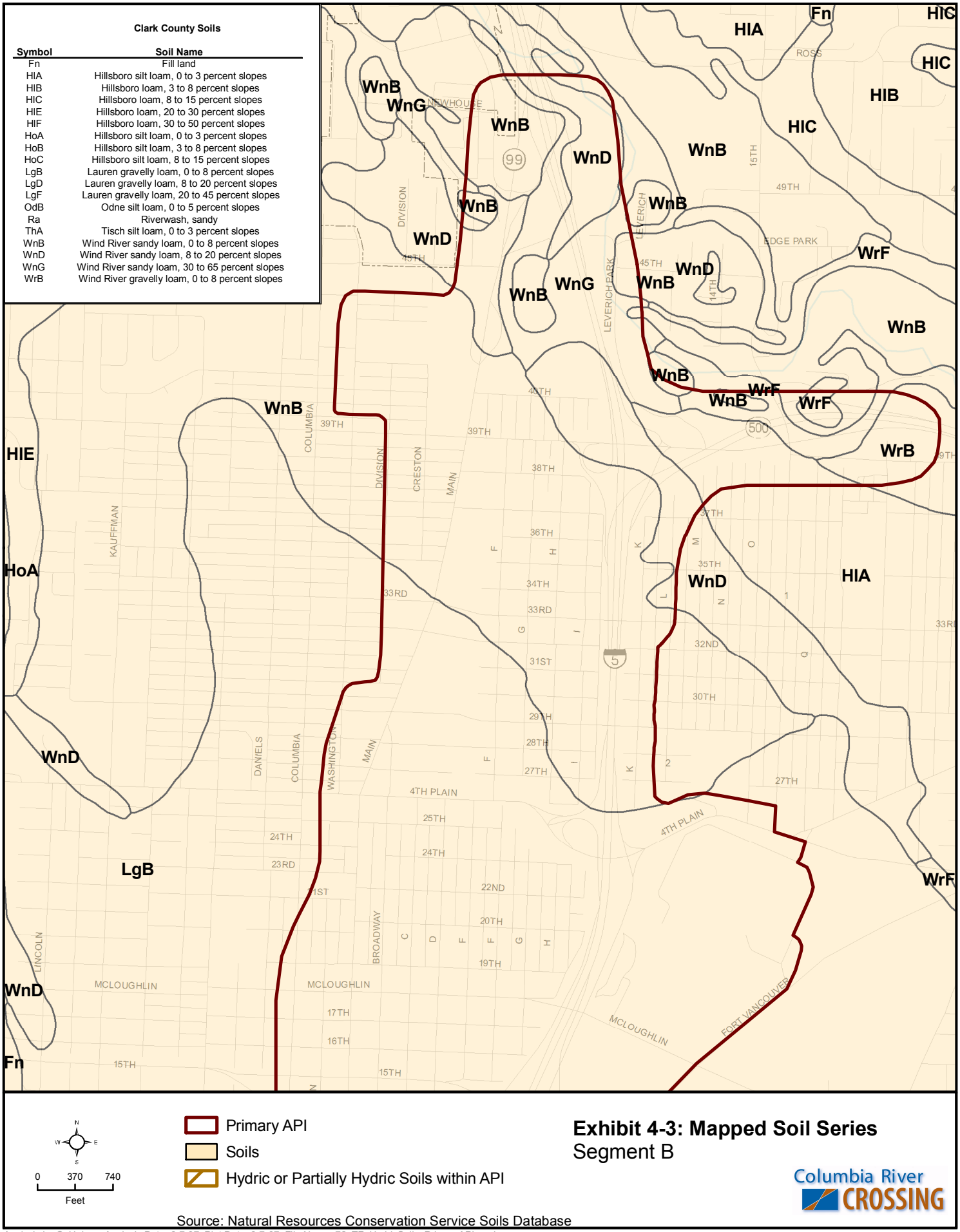


Exhibit 4-3: Mapped Soil Series
Segment B

Source: Natural Resources Conservation Service Soils Database

Analysis by C. Hainey; Analysis Date: 8-7-07; Plot Date: 8-7-07; File Name: 72_TF_HydricSoils_PrimaryAPI.mxd

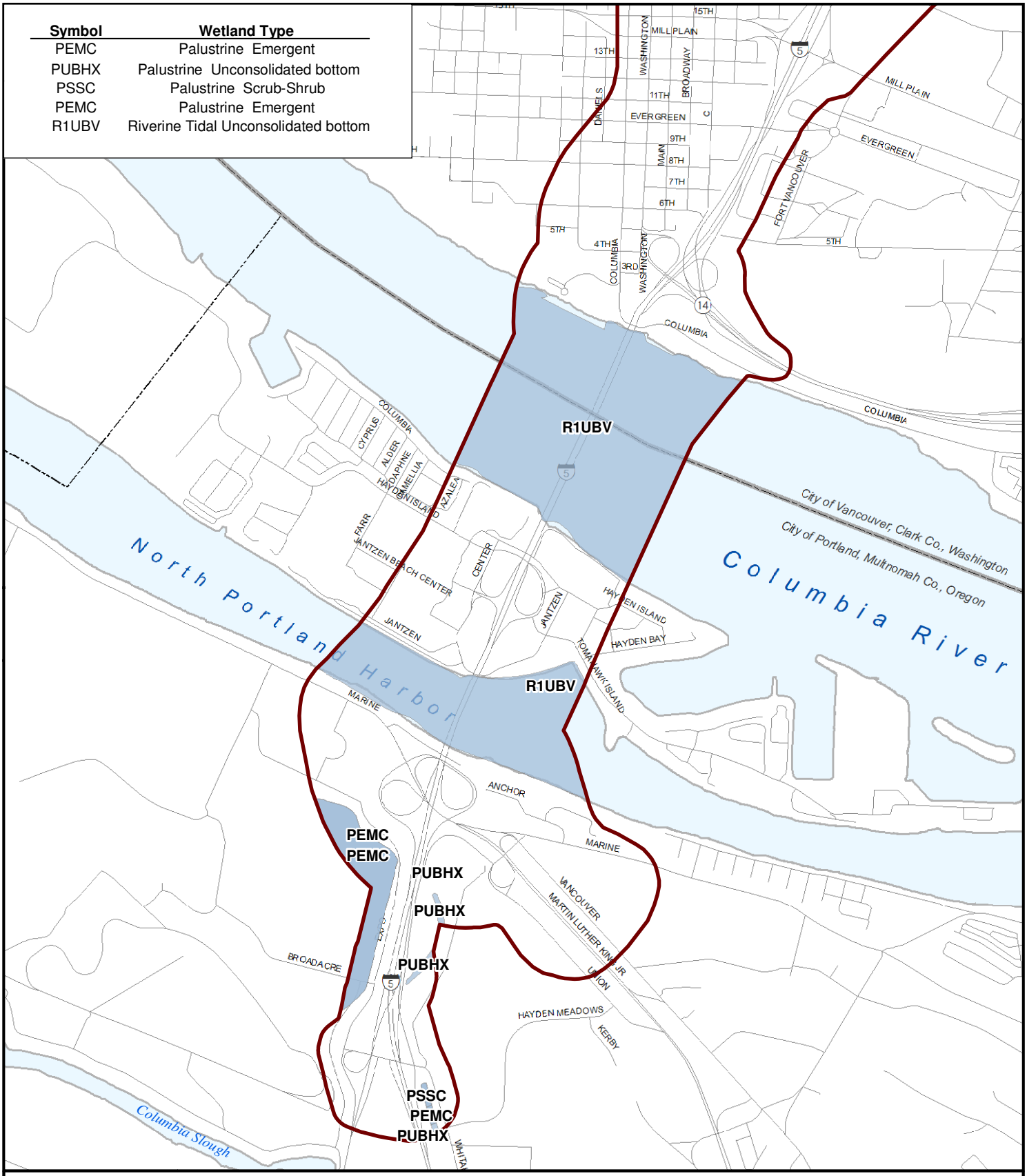


Exhibit 4-4: National Wetland Inventory Areas
Segment A

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: 8/7/07; Plot Date: 11/26/07; File Name: Exhibit4_4_5_TF072.mxd

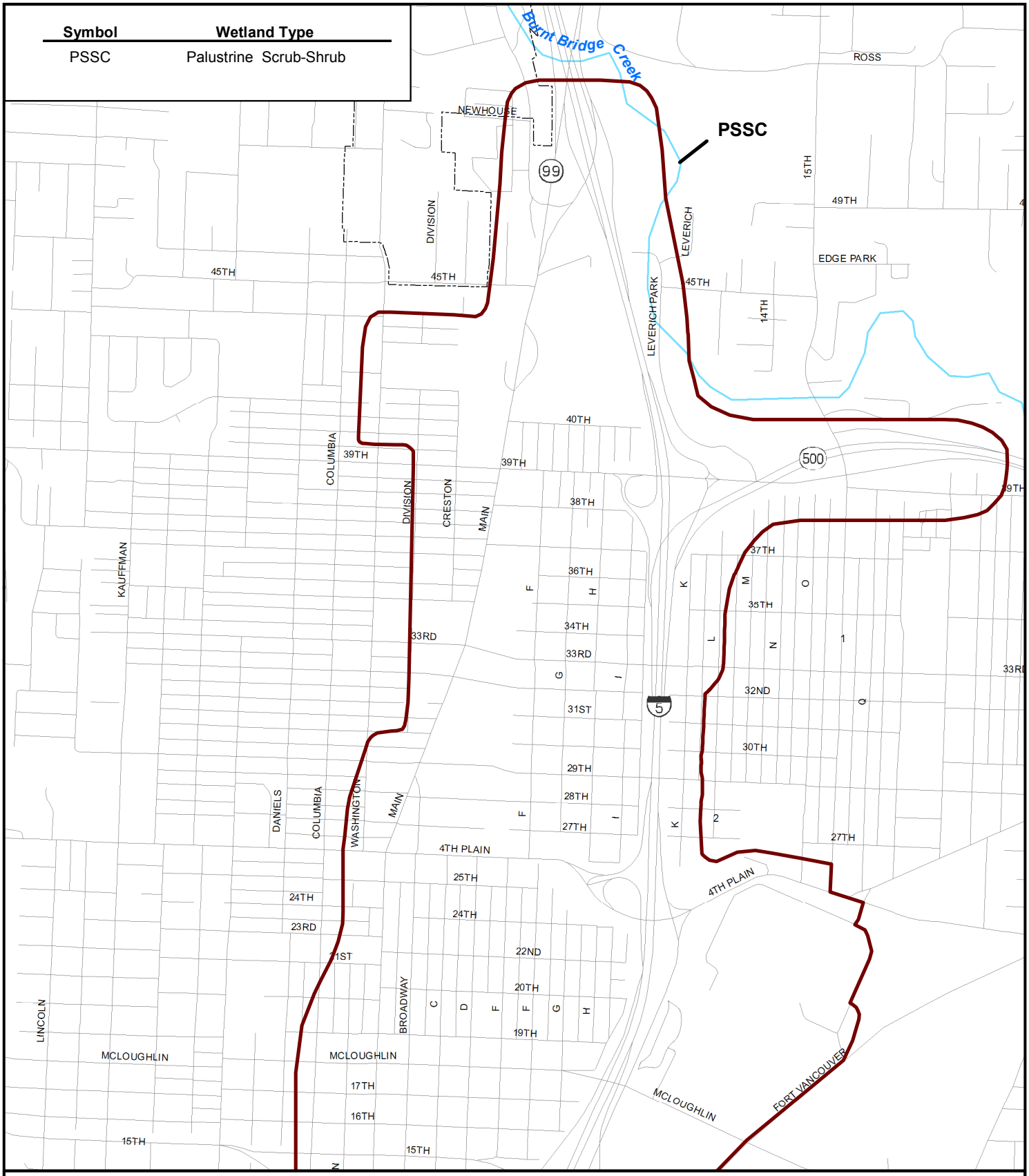


Exhibit 4-5: National Wetland Inventory Areas
Segment B

Columbia River CROSSING

Source: Locally Identified Wetlands = Clark Co. and Metro; Project Delineated Wetlands = Columbia River Crossing (Parametrix)

Analysis by J. Koloszar; Analysis Date: 8-7-07; Plot Date: 8-7-07; File Name: 72_TF_OtherWaters_PrimaryAPI.mxd

4.3.2 Mapped Wetlands

Available NWI data indicate five palustrine wetlands and one riverine wetland within Segment A (Exhibit 4-4). Vanport Wetland, located south of N Marine Drive and west of I-5, is mapped as a palustrine emergent, seasonally flooded (PEMC) wetland. Three small wetlands within East Delta Park are mapped as palustrine unconsolidated bottom, permanently flooded, excavated (PUBHx) wetlands. A palustrine scrub-shrub, seasonally flooded PSSC-PEMC-PUBHx wetland complex is mapped primarily east of I-5 along N Whitaker Road between N Victory Boulevard and N Schmeer Road. This wetland extends west under I-5, just north of N Schmeer Road. The NWI maps the Columbia River (including the North Portland Harbor) as a riverine tidal, unconsolidated bottom, permanent-tidal (R1UBV) wetland.

There are no NWI wetlands present within Segment A in Washington. The Clark County Wetland Inventory maps the Columbia River as a wetland area.

4.3.3 Identified Wetlands and Waters of the State and U.S.

There are seven wetland systems, a potentially jurisdictional ditch, and one regulated water of the State and U.S. within Segment A. The water of the State and U.S. is the Columbia River (including the North Portland Harbor), which flows from east to west through the project area. It is the primary hydrologic feature of the project. For more detailed discussion of this water of the State and U.S., refer to the Ecosystems and Water Quality Technical Reports.

4.3.3.1 Waters of the State and U.S.

A potentially jurisdictional ditch is located adjacent to Wetland System L/M. The ditch enters the Wetland System from the north and leaves the Wetland System to the south. The ditch is located at the toe of slope from the existing highway roadway prism. It receives stormwater from the prism slope and from the Trimet tracks.

The Columbia River (including the North Portland Harbor), flows from east to west through the project area. It is the primary hydrologic feature of the project and is considered a navigable water. For more detailed discussion of this water of the State and U.S., refer to the Ecosystems and Water Quality Technical Reports.

4.3.3.2 Wetlands

Wetland areas are identified alphabetically, in the order in which they were identified in the field or using off-site data. As property access permission was not obtained sequentially, wetland areas are not named sequentially. Exhibit 4-6 shows the locations of these features.

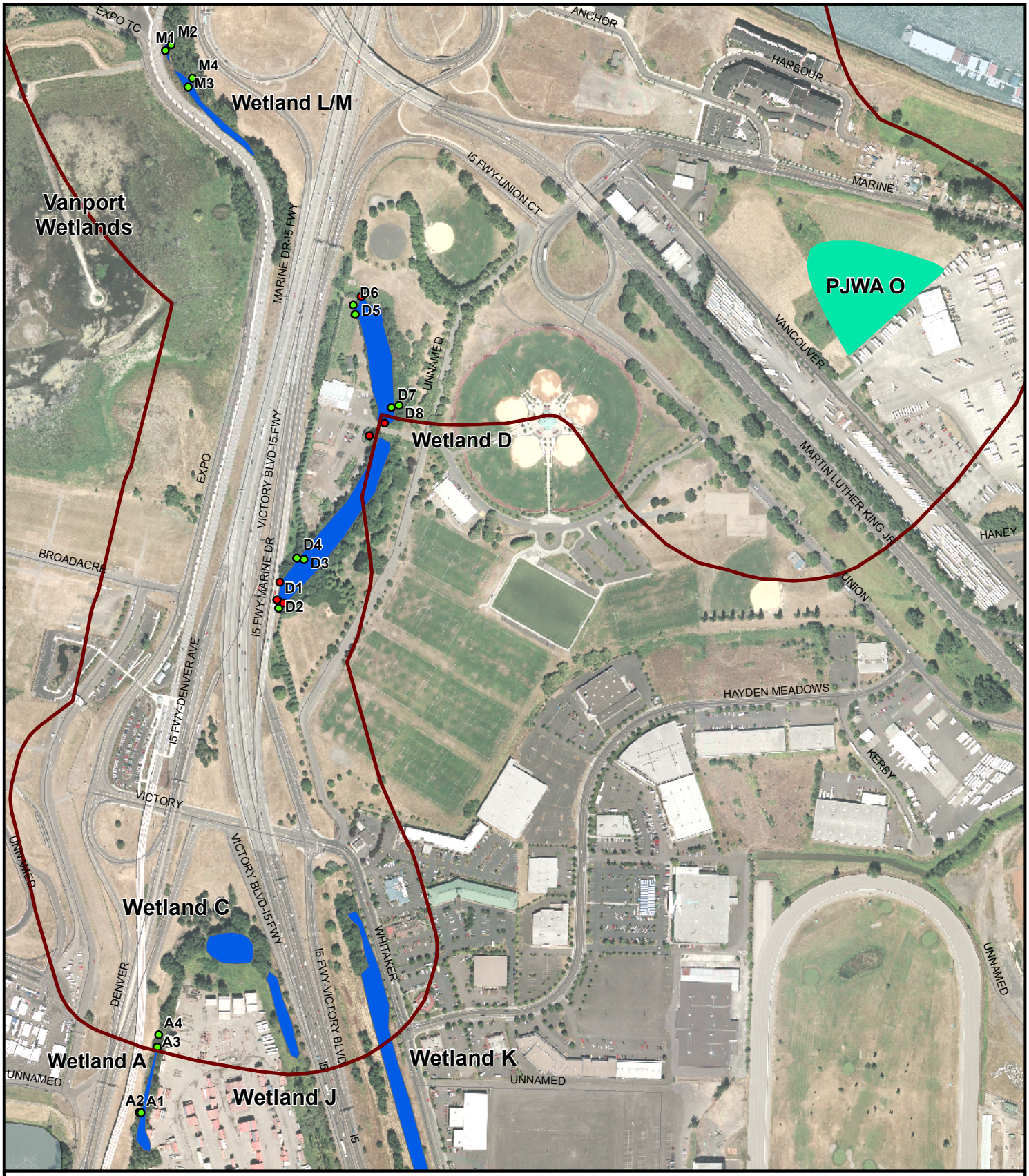


Exhibit 4-6: Field Identified Wetlands
Segment A

Columbia River CROSSING

Source: Locally Identified Wetlands = Clark Co. and Metro; Project Delineated Wetlands = Columbia River Crossing (Parametrix)

Analysis by J. Koloszar; Analysis Date: 8/7/07; Plot Date: 9/26/07; File Name: Exhibit4_6_4_8_TF072.mxd

4.3.3.2.1 Oregon, West of I-5

Wetland System L/M is a set of two palustrine, forested, seasonally flooded (PFOC) wetlands approximately 0.339 acres in size (Exhibit 4-6). The HGM classification is Flats. Wetland System L/M is located southwest of the southbound I-5 entrance ramp at Marine Drive and northeast of the TriMet light rail tracks at the Expo Center. The NWI does not map a wetland in the vicinity of wetland system L/M. The wetland appears to be part of a stormwater system and has two stormwater culverts for overflow from the wetland, one at the northwestern end and one at the southern end of the wetland system. Both culverts appear to drain to the Vanport Wetlands, west of the wetland area. A potentially jurisdictional stormwater ditch enters the Wetland System from the north and leaves the Wetland System to the south. See Section 4.3.3.1 Waters of the State and U.S. for further details. The boundary of wetland system L/M was determined by topography and a change in vegetation from wetland to upland species.

Wetland System L/M is dominated by *Salix lasiandra* (FACW+), *Populus balsamifera* (FAC), *Rubus discolor* (FACU), and *Phalaris arundinacea* (FACW). Indicators of wetland hydrology present at the time of survey include watermarks, water-stained leaves, and surface organic pan. Soils are sandy (no color assessment), with redox concentrations and an organic pan.

The upland areas around wetland system L/M are dominated by *Populus balsamifera* (FAC) and *Rubus discolor* (FACU). No indicators of wetland hydrology were present at the time of survey. Soils are sandy, without redox concentrations or an organic pan.

Wetland System L/M received moderate to low HGM ratings for all functions evaluated. As shown in Exhibit 4-7, the highest rated functions for Wetland System L/M are water storage and delay and primary production.

Exhibit 4-7. Oregon HGM and Washington Rating System Results for Wetlands in Oregon

Wetland	A	C	D	J	K	L/M	Vanport	O[a]
Wetland Function	**Oregon HGM**							
Water Storage & Delay	0.45	0.5	0.6	0.5	0.5	0.5	0.75	n/a
Sediment Stabilization & Phosphorus Retention	0.36	0.4	0.38	0.4	0.4	0.28	0.56	n/a
Nitrogen Removal	0.34	0.27	0.37	0.27	0.3	0.28	0.41	n/a
Thermoregulation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Primary Production	0.42	0.36	0.44	0.36	0.42	0.36	0.44	n/a
Resident Fish Habitat Support	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Anadromous Fish Habitat Support	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invertebrate Habitat Support	0.31	0.27	0.37	0.27	0.33	0.27	0.4	n/a
Amphibian & Turtle Habitat	0.27	0.25	0.38	0.25	0.3	0.32	0.39	n/a

Wetland	A	C	D	J	K	L/M	Vanport	O[a]
Breeding Waterbird Support	0.19	0.19	0.28	0.19	0.25	0.18	0.57	n/a
Wintering & Migrating Waterbird Support	0.24	0.26	0.36	0.26	0.32	0.25	0.55	n/a
Songbird Habitat Support	0.25	0.22	0.45	0.22	0.23	0.25	0.57	n/a
Support of Characteristic Vegetation	0.24	0.25	0.42	0.21	0.5	0.5	0.55	n/a
Washington Rating System								
Water Quality	14	14	10	14	14	14	26	n/a
Hydrological	16	10	16	10	10	16	24	n/a
Habitat	9	4	15	6	10	8	22	n/a

[a] Functional assessment of potential wetland area O has not been performed due to recent addition of this area into the project area and missing right of entry permission.

Vanport Wetland is located on the west side of I-5, west and south of N Expo Road (Exhibit 4-4). This wetland is a palustrine forested/scrub-shrub/emergent system managed as a mitigation site by the Port of Portland. Vanport Wetland is mapped by the NWI as a palustrine emergent, seasonally flooded (PEMC) wetland. The wetland was not delineated by project staff as the property owner has current wetland data for the site and impacts to the site will be avoided.

Vanport Wetlands received mostly moderate and one high HGM ratings for all functions evaluated. As shown in Exhibit 4-7, the highest rated functions for Vanport Wetlands are water storage and delay, breeding waterbird support, and songbird habitat support.

Wetland A is a palustrine forested, seasonal/semipermanently flooded (PFOC/F) wetland and occupies approximately 0.32 acre within the project area (Exhibit 4-6). The HGM classification is Depressional closed permanent (DCP). It is located in the southwest end of the Oregon project area. It is immediately east of N Denver Avenue and the Interstate light-rail line, north of N Schmeer Road, and west of a shipping container yard. The NWI does not map a wetland in the vicinity of Wetland A. Wetland A is a linear feature, paralleling N Denver Avenue. The wetland experiences seasonal flooding in the northern portion of the wetland and semipermanent flooding in the southern portion. The northern and western edges of the wetland were determined through topography and a shift from wetland plant species to upland vegetation. The eastern edge of the wetland was determined through topography and vegetation in some areas; in other areas the pavement associated with the container yard defined the boundary. The southern edge of the wetland was determined through aerial photograph interpretation as it could not be accessed due to lack of right of entry permission. As this property is not directly impacted by any of the build alternatives, more precise boundary mapping is not necessary for impacts analysis.

Wetland A is dominated by *Salix lasiandra* (FACW+), *Populus balsamifera* (FAC), *Salix* sp. (generally FAC or wetter), *Phalaris arundinacea* (FACW), *Equisetum arvense* (FAC), and *Rubus discolor* (FACU). Wetland hydrology is indicated by free water and saturation in the upper 12 inches of soil, watermarks, sediment deposits, and water-

stained leaves. Soils exhibit low chroma colors (10 YR 3/2 and 10 YR 3/1) with redox concentrations.

The wetland occurs at the base of the N Denver Avenue roadway prism. It is constrained by the roadway prism slope to the west and a shipping yard to the east. There is no apparent outlet from the wetland; however, the southernmost edge of the wetland could not be viewed due to access restrictions. Due to the presence of stagnant surface water at the time of survey, it is unlikely that a permanent outlet is present.

The upland areas adjacent to Wetland A are characterized by the presence of *Salix lasiandra* (FACW+), *Populus balsamifera* (FAC), *Rubus discolor* (FACU), and *Phalaris arundinacea* (FACW). No hydrologic indicators were observed at the time of survey. Soils in upland plots have a chroma of 10 YR 3/2 without redox concentrations.

Wetland A received moderate to low HGM ratings for all functions evaluated. As shown in Exhibit 4-7, the highest rated functions for Wetland A were water storage and delay and primary production.

Wetland C (David Evans & Associates [DEA] Wetland 1) is a palustrine, forested wetland and occupies approximately 0.1 acre within the project area. It is located in Oregon, west of I-5, and in close proximity to the southbound highway entrance ramp at Victory Boulevard. The boundary of Wetland C was determined by a shift from the presence of wetland hydrological indicators to the absence of indicators and a change in vegetation from wetland to upland species (DEA 2006).

Wetland C is dominated by *Populus balsamifera* (FAC), *Rubus discolor* (FACU), *Equisetum arvense* (FAC), and *Phalaris arundinacea* (FACW). Indicators of wetland hydrology include sediment deposits, cracked soils, and drainage patterns. Soils exhibit low chroma colors (10YR 3/1 and 10YR 4/1) with redox concentrations (DEA 2006).

The upland areas adjacent to Wetland C are dominated by *Populus balsamifera* (FAC), *Populus nigra* (NOL), *Rubus discolor* (FACU), and *Festuca arundinacea* (FAC-). There are no indicators of wetland hydrology in upland areas. Soils exhibit low chroma colors (10YR 3/1 and 10YR 4/1) with redox concentrations (DEA 2006).

Wetland C received moderate to low HGM ratings for all functions evaluated. As shown in Exhibit 4-7, the highest rated functions for Wetland C are water storage and delay and sediment stabilization and phosphorous retention.

Wetland J (DEA Wetland 2) is a palustrine emergent wetland and occupies approximately 0.1 acre within the project area. It is a linear wetland along the base of the I-5 roadway prism. It is located along the west side of I-5, south of Victory Boulevard. The boundary of Wetland J was determined by topography (toe of slope), a shift from the presence of wetland hydrological indicators to the absence of indicators, and a change in vegetation from wetland to upland species (DEA 2006).

Wetland J is dominated by *Phalaris arundinacea* (FACW). *Juncus effusus* (FACW) is a subdominant species. Wetland hydrology indicators include present saturated soils and drainage patterns. Soils are gleyed (Gley 1 3/10Y) clay with many redox concentrations (DEA 2006).

The upland area around Wetland J is dominated by *Rubus discolor* (FACU), *Cytisus scoparius* (UPL), *Rubus ursinus* (FACU), and *Phalaris arundinacea* (FACW). No indicators of wetland hydrology were present in upland areas at the time of survey. Soils exhibit 10 YR 4/2 chroma with redox concentrations (DEA 2006).

Wetland J received moderate to low HGM ratings for all functions evaluated. As shown in Exhibit 4-7, the highest rated functions for Wetland J are water storage and delay and sediment stabilization and phosphorous retention.

4.3.3.2.2 Oregon, East of I-5

Wetland D is a palustrine, forested/scrub-shrub/emergent, permanently flooded, excavated (PFO/SS/EMHx) wetland and is approximately 2.668 acre (Exhibit 4-6). It is located in the northeast corner of the Oregon API within Delta Park (City of Portland). It consists of two small, oblong ponds connected by a culvert under a City of Portland Parks and Recreation access road. The wetland receives stormwater from a culvert on the north end and from overland flow. Wetland D drains to Schmeer Slough through a storm drain pipe at the south end of the wetland. The HGM classification is depressional. The NWI maps three palustrine, unconsolidated bottom, permanently flooded, excavated (PUBHx) wetlands in the vicinity of Wetland D. The northernmost of the NWI mapped wetlands is not present. The area is without any wetland indicators. The boundary of Wetland D was determined by topography and a change in vegetation from wetland to upland species.

Wetland D is dominated by *Fraxinus latifolia* (FACW), *Populus balsamifera* (FAC), *Salix babylonica* (FAC+), *Salix hookeriana* (FACW-), *Salix sitchensis* (FACW), *Carex obnupta* (OBL), *Bidens cernua* (FACW+), and *Phalaris arundinacea* (FACW). Wetland hydrology is demonstrated by free water and saturation in the upper 12 inches of soil, watermarks, and drift lines. The soils exhibit low chroma colors (10YR 2/1 and 10YR 3/1) with redox concentrations.

The upland areas adjacent to Wetland D are characterized by *Alnus rubra* (FAC), *Fraxinus latifolia* (FACW), *Populus balsamifera* (FAC), *Prunus virginiana* (FACU), *Acer circinatum* (FAC-), *Rubus discolor* (FACU), *Symphoricarpos albus* (FACU), and *Phalaris arundinacea* (FACW). No indicators of wetland hydrology were present at the time of survey. Soils exhibit 10 YR 2/2 and 10YR 3/2 chroma without redox concentrations.

Wetland D received moderate and one low HGM ratings for all functions evaluated. As shown in Exhibit 4-7, the highest rated functions for Wetland D are water storage and delay and songbird habitat support.

Wetland K (DEA Wetland 3 – Schmeer Slough) is a deep excavated ditch with water levels managed by the Multnomah County Drainage District. It occupies approximately 2.5 acres within the project area. Wetland K is located east of I-5 with a portion wrapping

under the highway overpass at Schmeer Road. The boundary of Wetland K was determined by topography (toe of slope), a shift from the presence of wetland hydrological indicators to the absence of indicators, and a change in vegetation from wetland to upland species (DEA 2006).

Wetland K is dominated by *Populus balsamifera* (FAC), *Salix lasiandra* (FACW+), *Rubus ursinus* (FACU), *Bromus carinatus* (NOL), *Elymus glaucus* (FACU), *Phalaris arundinacea* (FACW), *Hordeum brachyantherum* (FACW-), and *Equisetum arvense* (FAC), with plantings of *Fraxinus latifolia* (FACW) and *Ribes* sp. (assumed FAC) contributing to the understory. The water level within Schmeer Slough is controlled between 2.0 and 2.5 feet (NGVD). Indicators of wetland hydrology in higher elevation portions of Wetland K include drainage patterns and sediment deposits. Wetland indicators in lower elevations, near the ordinary high water mark of Schmeer Slough include soil saturation at the surface, watermarks, drift lines, and sediment deposits. Soils exhibit low chroma colors (10YR 5/1 and 10YR 4/1) with redox concentrations (DEA 2006).

The upland areas around Wetland K are dominated by *Populus balsamifera* (FAC), *Sambucus racemosa* (FACU), *Rubus discolor* (FACU), *Equisetum arvense* (FAC), *Bromus carinatus* (NOL), *Elymus glaucus* (FACU), and *Phalaris arundinacea* (FACW). No indicators of wetland hydrology were present in upland areas at the time of survey. Soils exhibit 10 YR 3/2 chroma with redox concentrations (DEA 2006).

Wetland K received moderate to low HGM ratings for all functions evaluated. As shown in Exhibit 4-7, the highest rated functions for Wetland K are water storage and delay and sediment stabilization and phosphorous retention.

Potential Wetland O: Due to recent changes in project alignment, an unsurveyed area is present between N Marine Drive and N Vancouver Way, immediately east of the intersection. The NWI does not show wetlands in this area. Soils mapped by NRCS are Rafton silt loam, protected (40), a hydric soil.

4.3.3.2.3 Washington

There are no wetlands in the Washington portion of Segment A.

4.4 Segment B Mill Plain District to North Vancouver

4.4.1 Mapped Soils

Soils mapped within Segment B (Exhibit 4-3) include Hillsboro loam, 0 to 3 percent slopes (HIA), Lauren gravelly loam, 0 to 8 percent slopes (LgB), Lauren gravelly loam, 8 to 20 percent slopes (LgD), Wind River sandy loam, 0 to 8 percent slopes (WnB), Wind River sandy loam, 8 to 20 percent slopes (WnD), Wind River sandy loam, 30 to 65 percent slopes (WnG); Wind River gravelly loam, 0 to 8 percent slopes (WrB); and Wind River gravelly loam, 12 to 50 percent slopes (WrF).

There are no hydric soils mapped within Segment B.

4.4.2 Mapped Wetlands

The NWI maps one wetland feature within Segment B (Exhibit 4-5). Burnt Bridge Creek, a perennial stream, was mapped as a PSSC wetland.

The Clark County Wetland Inventory mapped wetlands in the northeastern portion Segment B. Several linear wetland features are mapped within the I-5 right-of-way in the vicinity of the I-5 – Highway 99 interchange. Wetlands are mapped intermittently along Burnt Bridge Creek. Two additional wetlands are mapped southeast of the I-5 – SR 500 interchange. These features are shown in Exhibit 4-8.

4.4.3 Identified Wetlands and Waters of the State and U.S.

There are three delineated wetland systems, one mitigation site, one stormwater treatment pond system, two potentially regulated waters of the State and U.S., and one water of the State and U.S. within Segment B.

4.4.3.1 Waters of the State and U.S.

Burnt Bridge Creek flows from southeast to northwest through the project area, passing under I-5 through a culvert. For further discussion of this water of the State and U.S., refer to the Ecosystems and Water Quality Technical Reports.

Potentially Jurisdictional Water Area (PHWA) G is located between SR 500 and the eastbound SR 500 entrance ramp from P Street (Exhibit 4-8). The area is a drainage ditch with a stormwater drain at the western end. Runoff from the ditch is conveyed to a stormwater detention basin north of SR 500 before being discharged into Burnt Bridge Creek. Additional coordination with WSDOT is necessary to determine the precise locations of the detention basin and the connection with Burnt Bridge Creek. Vegetation within the ditch includes *Populus deltoides* (FAC), *Alopecurus pratensis* (FACW), *Agropyron repens* (FAC-), *Phalaris arundinacea* (FACW), and unidentified (mowed) grass. The ditch contains sediment deposits and water-stained leaves. Soils exhibit 10YR 3/2 color without redox concentrations, which does not satisfy the wetland soil criteria. However, this area may be considered jurisdictional water by COE and/or Ecology. Further coordination with these agencies is required.

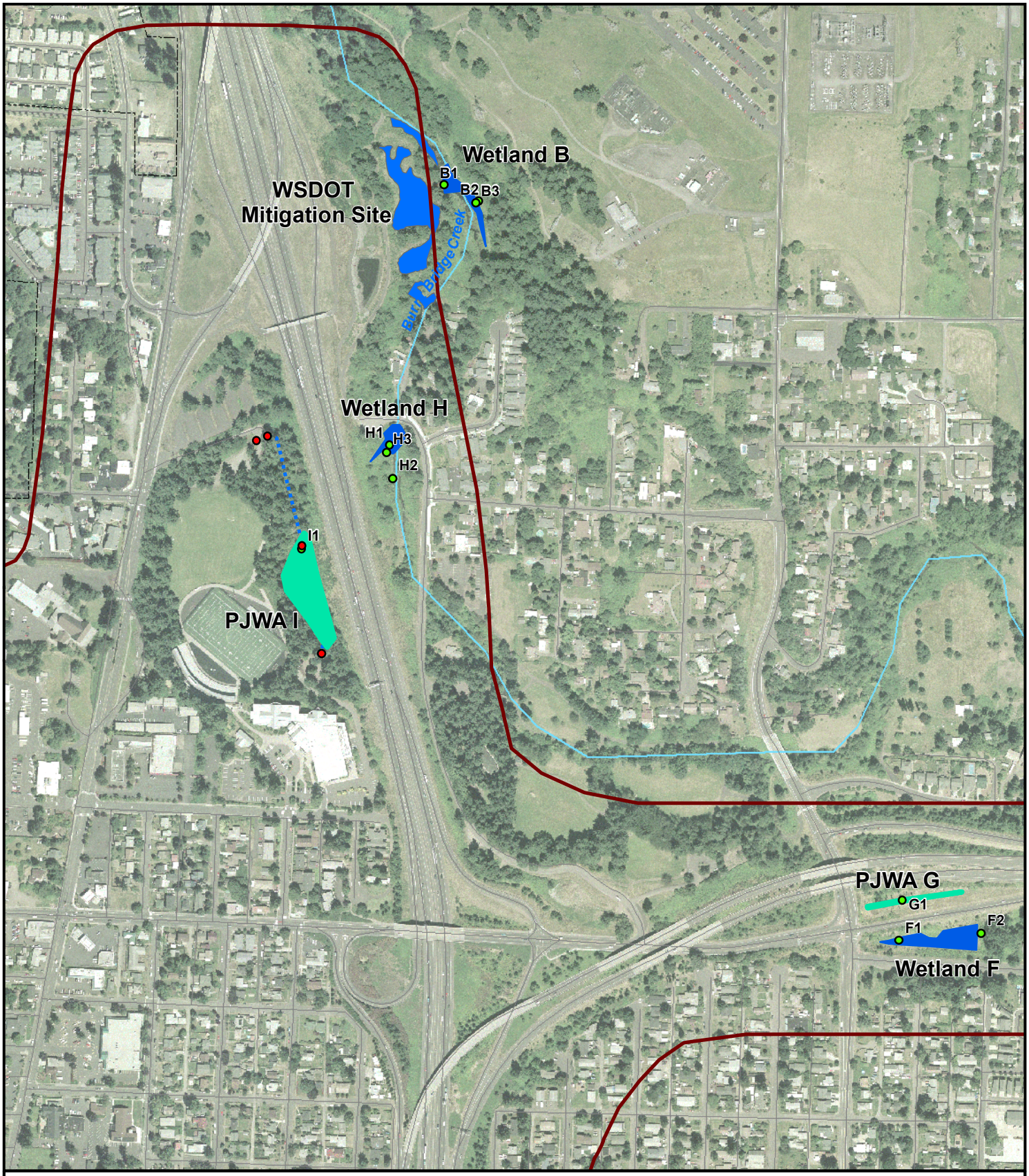


Exhibit 4-8: Field Identified Wetlands
Segment B

Columbia River CROSSING

Source: Locally Identified Wetlands = Clark Co. and Metro; Project Delineated Wetlands = Columbia River Crossing (Parametrix)

Analysis by J. Koloszar; Analysis Date: 8/7/07; Plot Date: 9/26/07; File Name: Exhibit4_6_4_8_TF072.mxd

Potentially Jurisdictional Water Area I is located in the Kiggins Bowl area immediately west of I-5, north of 39th Street, on Vancouver School District property (Exhibit 4-8). PJWA I appears to be part of an existing drainage system. A stormwater conveyance system on Main Street discharges into a ditch traveling from the intersection of Main Street and 45th Street east towards PJWA I along an access road to Kiggins Bowl. The ditch discharges through a culvert to a steep slope on the northwest side of PJWA I. There is no defined channel east of the culvert discharge area. PJWA I also likely receives stormwater from the surrounding area, including I-5 and the school grounds. There is an additional discharge culvert on the southwest side of PJWA I. It is unclear where this culvert initiates. It discharges to the northeast, towards PJWA I. Riprap is present immediately below the culvert discharge area; however there is no defined channel east of the riprap.

PJWA I is at the convergence of two steep topographic grades; one associated with the I-5 roadway prism and the other with a natural grade starting at the edge of the school grounds. The resulting low area runs in a parallel direction to I-5. The surveyed sample point is in the lowest topographic point in the area, near a culvert passing under I-5 and presumably draining into Wetland H. There is no defined drainage channel in the area; however, the valley bottom forms a diffuse linear depression. The area is dominated by *Populus balsamifera* (FAC), *Salix* sp. (generally FAC or wetter), and *Phalaris arundinacea* (FACW). Soils are sandy, with a color of 10YR 3/3 and no redox concentrations or other indicators of hydric conditions. There were no indicators of wetland hydrology present at the time of survey. However, this area may be considered jurisdictional by COE and/or Ecology. Further coordination with these agencies is required.

Stormwater detention ponds within the WSDOT right-of-way, located immediately east of I-5 at the Main Street/NE Highway 99 – I-5 interchange, have not been investigated. Information provided by WSDOT indicates that these stormwater ponds are designed to infiltrate. They contain surface water and/or discharge to the WSDOT mitigation site (described in Section 4.4.3.2 Wetlands) several times a year. The ponds receive 100 percent of the run-off from 39th Street to 78th Street along I-5.

4.4.3.2 Wetlands

Wetland B is located east of Burnt Bridge Creek in the northeast portion of the project area in Washington. It is a palustrine, scrub-shrub/emergent, seasonally flooded (PSS/EMC) wetland approximately 0.33 acre (Exhibit 4-8). The HGM classification is riverine impounding (RI). It is located between the Burnt Bridge Creek channel and an unpaved access road. The wetland experiences seasonal flooding associated with high flows in Burnt Bridge Creek and a high ground water table. The NWI does not map a wetland in the vicinity of Wetland B. The boundary of Wetland B was determined by topography and a change in vegetation from wetland to upland species.

Wetland B is dominated by *Physocarpus capitatus* (FACW-), *Rubus discolor* (FACU), *Cornus stolonifera* (FACW), *Phalaris arundinacea* (FACW), *Impatiens noli-tangere* (FACW), *Veronica americana* (OBL), and *Epilobium ciliatum* (FACW-). Wetland

hydrology is demonstrated by drift lines, watermarks, and water-stained leaves. The soils exhibit low chroma colors (10 YR 2/1) with redox concentrations.

The upland areas adjacent to Wetland B are characterized by *Rubus discolor* (FACU), *Physocarpus capitatus* (FACW-), *Cornus stolonifera* (FACW), and *Phalaris arundinacea* (FACW). No indicators of wetland hydrology were present at the time of survey. Soils exhibit high chroma colors (10YR 3/3) without redox concentrations.

As shown in Exhibit 4-9, Wetland B received a water quality rating of 16, a hydrological rating of 18, and a habitat rating of 15. The total rating for Wetland B is 49, making it a Category III wetland.

The **WSDOT mitigation site**, located east of I-5 and stormwater detention ponds and described in Section 4.4.4, consists of three wetland areas totaling approximately 1.5 acres (Exhibit 4-8). It is a palustrine, scrub-shrub/emergent, seasonally flooded (PSS/EMC) wetland, constructed on both sides of Burnt Bridge Creek. It was designed to receive stormwater input from the stormwater detention ponds described below. The mitigation site receives stormwater from the detention ponds several times a year. Water from the mitigation site is released to Burnt Bridge Creek. The NWI does not map a wetland in the vicinity of the mitigation site.

The mitigation site is still within its permit period and WSDOT provided recent wetland monitoring data for use in this technical report. As the site is still within the establishment phase, this information is not considered final. The wetland areas are dominated by *Phalaris arundinacea* (FACW), *Alopecurus pratensis* (FACW), and planted shrubs including *Cornus stolonifera* (FACW), *Ribes sanguineum* (NOL), *Rubus spectabilis* (FAC+), and *Symphoricarpos albus* (FACU). Signs of wetland hydrology include saturation in the upper 12 inches and drainage patterns in wetlands. Soils exhibited low-chroma colors with redox concentrations and concretions.

As shown in Exhibit 4-9, assessment of the WSDOT mitigation site performed by WSDOT staff resulted in a water quality rating of 14, a hydrological rating of 16, and a habitat rating of 22. The total rating for the WSDOT mitigation site is 52, making it a Category II wetland.

Wetland H is a palustrine emergent, temporarily flooded (PEMA) wetland and is approximately 0.122 acre in size (Exhibit 4-8). The HGM classification is Riverine impounding (RI). Wetland H is located northwest of Leverich Park, on the west side of Burnt Bridge Creek, east of I-5. The NWI does not map a wetland in the vicinity of Wetland H. The boundary of Wetland H was determined by a shift from the presence of wetland hydrological indicators to the absence of indicators. The wetland receives water from a stormwater culvert passing under I-5 and from the adjacent Burnt Bridge Creek.

Wetland H is dominated by *Phalaris arundinacea* (FACW), *Polygonum hydropiper* (OBL), and *Polygonum persicaria* (FACW). Indicators of wetland hydrology present at the time of survey include saturation in the upper 12 inches of soil, watermarks, and drainage patterns. Soils exhibit low chroma colors (10YR 3/2) with redox concentrations.

The adjacent upland areas are dominated by *Cornus stolonifera* (FACW), *Corylus cornuta* (FACU), *Rubus discolor* (FACU), and *Phalaris arundinacea* (FACW). No indicators of wetland hydrology were present at the time of survey. Soils exhibited 10 YR 3/2 chroma with redox concentrations.

As shown in Exhibit 4-9, Wetland H received a water quality rating of 16, a hydrological rating of 18, and a habitat rating of 10. The total rating for Wetland H is 44, making it a Category III wetland.

Wetland F is a small palustrine, emergent, seasonally flooded (PEMC) wetland approximately 0.437 acres in size. The wetland is located between the SR 500 eastbound on-ramp and 39th Street (Exhibit 4-8). The western end of the wetland has a stormwater outlet. The HGM classification is depressional. The NWI does not map a wetland in the vicinity of Wetland F. The boundary of Wetland F was determined by topography and a change in vegetation from wetland to upland species.

Wetland F is dominated by *Juncus effusus* (FACW) and *Phalaris arundinacea* (FACW). Indicators of wetland hydrology present at the time of survey include drainage patterns and water-stained leaves. Soils exhibit low chroma colors (10YR 2/1 and 10YR 3/1) with redox concentrations.

The adjacent upland areas are dominated by *Prunus virginiana* (FACU), *Malus pumila* (NOL), and *Rubus discolor* (FACU). Water-stained leaves are present within the sample area; however, two or more secondary hydrology indicators are required to satisfy the wetland hydrology criteria. Soils exhibit high chroma color (10YR 3/3) with redox concentrations.

As shown in Exhibit 4-9, Wetland F received a water quality rating of 16, a hydrological rating of 14, and a habitat rating of 3. The total rating for Wetland F is 33, making it a Category III wetland.

Exhibit 4-9. Oregon HGM and Washington Rating System Results for Wetlands in Washington

	Wetland B	Wetland F	PJWA G [a]	Wetland H	PJWA I [a]	WSDOT Mitigation Site
Wetland Functions			**Oregon HGM**			
Water Storage & Delay	0.4	0.35	0.35	0.4	0.40	0.45
Sediment Stabilization & Phosphorus Retention	0.5	0.36	0.29	0.42	0.40	0.41
Nitrogen Removal	0.33	0.14	0.14	0.27	0.23	0.26
Thermoregulation	n/a	n/a	n/a	n/a	n/a	n/a
Primary Production	0.6	0.28	0.22	0.46	0.42	0.44
Resident Fish Habitat Support	n/a	n/a	n/a	n/a	n/a	n/a
Anadromous Fish Habitat Support	n/a	n/a	n/a	n/a	n/a	n/a
Invertebrate Habitat Support	0.4	0.11	0.11	0.3	0.24	0.29
Amphibian & Turtle Habitat	0.41	0.19	0.14	0.26	0.28	0.34
Breeding Waterbird Support	0.41	0.16	0.13	0.25	0.19	0.41
Wintering & Migrating Waterbird Support	0.41	0.15	0.17	0.29	0.24	0.39
Songbird Habitat Support	0.53	0.17	0.10	0.32	0.28	0.48
Support of Characteristic Vegetation	0.46	0.15	0.12	0.26	0.30	0.44
			Washington Rating System			
Water Quality	16	16	8	16	8	14
Hydrological	18	14	8	18	4	16
Habitat	15	3	3	10	14	22

[a] HGM and Rating assessments for PJWA-G and PJWA I are preliminary estimates. Additional coordination and field assessment of these areas is necessary.

4.5 Maintenance Base Stations

4.5.1 Mapped Soils

4.5.1.1 Ruby Junction Maintenance Base

Soils mapped within the vicinity of the Ruby Junction Maintenance Base (Exhibit 4-10) include Multnomah silt loam, 0 to 3 percent slopes (29A), Multnomah silt loam, 8 to 15 percent slopes (29C), Multnomah silt loam, 15 to 30 percent slopes (29D), Multnomah-Urban land complex, 0 to 3 percent slopes (30A), Pits (PT), and Wapato silt loam (55). Wapato silt loam is a hydric soil.

4.5.1.2 Vancouver Maintenance Base

Soils mapped within the vicinity of the Vancouver Maintenance Base (Exhibit 4-11) include Lauren gravelly loam, 0 to 8 percent slopes (LgB) and Tisch silt loam, 0 to 3 percent slopes (ThA). Tisch silt loam, 0 to 3 percent slopes is a hydric soil.

4.5.2 Mapped Wetlands and Other Waters

4.5.2.1 Ruby Junction Maintenance Base

The NWI (USFWS 1988a) mapped several palustrine, unconsolidated bottom, permanently flooded, excavated (PUBHx) wetlands; two palustrine unconsolidated shore, seasonally flooded, excavated (PUSCx) wetlands; and one palustrine emergent, seasonally flooded, excavated (PEMCx) wetland west and southwest of the Ruby Junction area (Exhibit 4-12).

The NWI and USGS mapped Fairview Creek in the Vicinity of the Ruby Junction Maintenance Base. The Creek flows generally from southwest to northwest, passing south of the Ruby Junction Maintenance Base. It connects to the Columbia River through Osburn Creek and the Columbia Slough.

4.5.2.2 Vancouver Maintenance Base

The NWI (USFWS 1988b) did not map any wetlands northeast of the intersection of NE 65th Avenue and NE 18th Street in Vancouver. There are no other waters of the state mapped in this area (Exhibit 4-13). The NWI did map several wetlands south of 18th Street along the Burnt Bridge Creek Riparian zone.

4.5.3 Wetland and Other Waters Identified

4.5.3.1 Ruby Junction Maintenance Base

Hydric soils are mapped under a portion of the maintenance base. Air photo examination confirmed the presence of several permanent wetland features west and southwest of the Ruby Junction Maintenance Base and of Fairview Creek. The wetlands appear to be excavated quarries. Fairview Creek was also identified on the air photo and appears to be highly constrained by the surrounding urban landscape. The wetland and creek are both outside the area potentially impacted by Maintenance Base expansion.

4.5.3.2 Vancouver Maintenance Base

Hydric soils are mapped under a portion of the maintenance base. Upon examination of air photographs of the Vancouver Maintenance Base area, no potential wetlands or other waters were identified within the area potentially impacted by facility expansion.

5. Long-Term Effects

5.1 Introduction

This chapter describes the long-term impacts that would be expected from the I-5 CRC alternatives and options. It first describes impacts from the No-Build Alternative and four full build alternatives. These are the five representative alternatives that include specific highway, transit, bicycle, pedestrian and other elements. This discussion focuses on how these alternatives would affect corridor and regional impacts. The chapter then focuses on impacts that would occur with various design options at the segment level, for example, comparing the impacts of each alignment option in each segment. Finally, it provides a more comparative and synthesized summary of the impacts associated with the system-level choices. This three-part approach provides a comprehensive description and comparison of (1) the combination of system-level and segment-level choices expressed as five specific alternatives (2) discrete system-level choices, and (3) discrete segment-level choices.

5.2 Impacts from Full Alternatives

This section describes the impacts from the No-Build Alternative and four full build alternatives. These are combinations of highway, river crossing, transit and pedestrian/bicycle alternatives and options covering all of the CRC segments. They represent the range of system-level choices that most affect overall performance, impacts and costs. The full alternatives are most useful for understanding the regional impacts, performance and total costs associated with the CRC project. Both long-term direct impacts and indirect impacts are discussed in this section.

Long-term direct impacts occur when the selected alternative results in removal or fill within jurisdictional wetlands, regulated wetland buffers, or other waters of the State or U.S. These impacts are quantifiable and are discussed in units of area and volume where that information is available. In addition, long-term direct impacts to wetlands are discussed in terms of their specific wetland functions and values (DSL) and ratings (Ecology).

Indirect impacts to wetlands and other waters of the State and U.S. would potentially occur:

- Where the selected alternative comes within the buffer area of existing wetlands (usually between 25 to 300 feet), disturbing natural resources and vegetation cover;
- Where there is decrease in vegetation cover, an increase in impervious surfaces (without associated stormwater treatment), or traffic volume associated with the alternatives in the immediate vicinity of existing wetlands;

- Where improved public access to wetland areas resulting from the alignment may disrupt wildlife activity and other functions performed by existing wetlands; and
- Where permanent bridge piers alter flow patterns and wildlife activity.

A vegetated area immediately surrounding a wetland provides a buffer from detrimental land uses when present within the wetland's drainage zone. Vegetated buffers can provide water quality, hydrological, and wildlife habitat benefits. Adequate wetland buffer zones are highly dependent upon local topography and other landscape features. Depending on the regulatory agency, land use intensity, and quality of the wetland, minimum required wetland buffer zones generally range from 25 to 300 feet. In Portland, approved developments within a City of Portland's environmental conservation zone must be at least 50 from any wetland boundary. In Washington, Clark County and the City of Vancouver regulate the area around jurisdictional wetlands according to the rating of the wetland and land use intensity. See Section 10 for further details on wetland buffers.

Increased impervious surfaces associated with new or improved roadways, infrastructure, and other developments could occur with any of the alternatives. In most cases, stormwater treatment would be required and provided. However, stormwater runoff or other contaminants could reach wetlands if the increased impervious surface area is in close proximity to the wetland area. In addition, increased traffic volumes or changes in traffic patterns are likely to occur with any of the alternatives as a result of construction activities, Alternative designs, or population growth. Increases in traffic volume or trip time in the vicinity of wetlands could result in increased contaminant load in stormwater runoff. Further details on traffic are not yet available.

Increased public access to wetland areas resulting from the build alternatives may disrupt wildlife activity and other functions performed by existing wetlands. Transit stations, park and rides, and other developments in the vicinity of wetlands may result in more frequent visits by humans. Increased public access may result in disruptions to normal wildlife activity, greater volumes of trash within and around wetland areas, and damage to vegetation and substrates.

Permanent bridge piers within the Columbia River may alter flow patterns and wildlife activity within this regulated resource. For greater discussion of these indirect impacts, refer to the Water Quality and Ecosystems Technical Reports.

Anticipated impacts to jurisdictional and potentially jurisdictional wetlands and other waters are mapped in Exhibits 5-1 and 5-2 and listed in Exhibits 5-3 and 5-4.

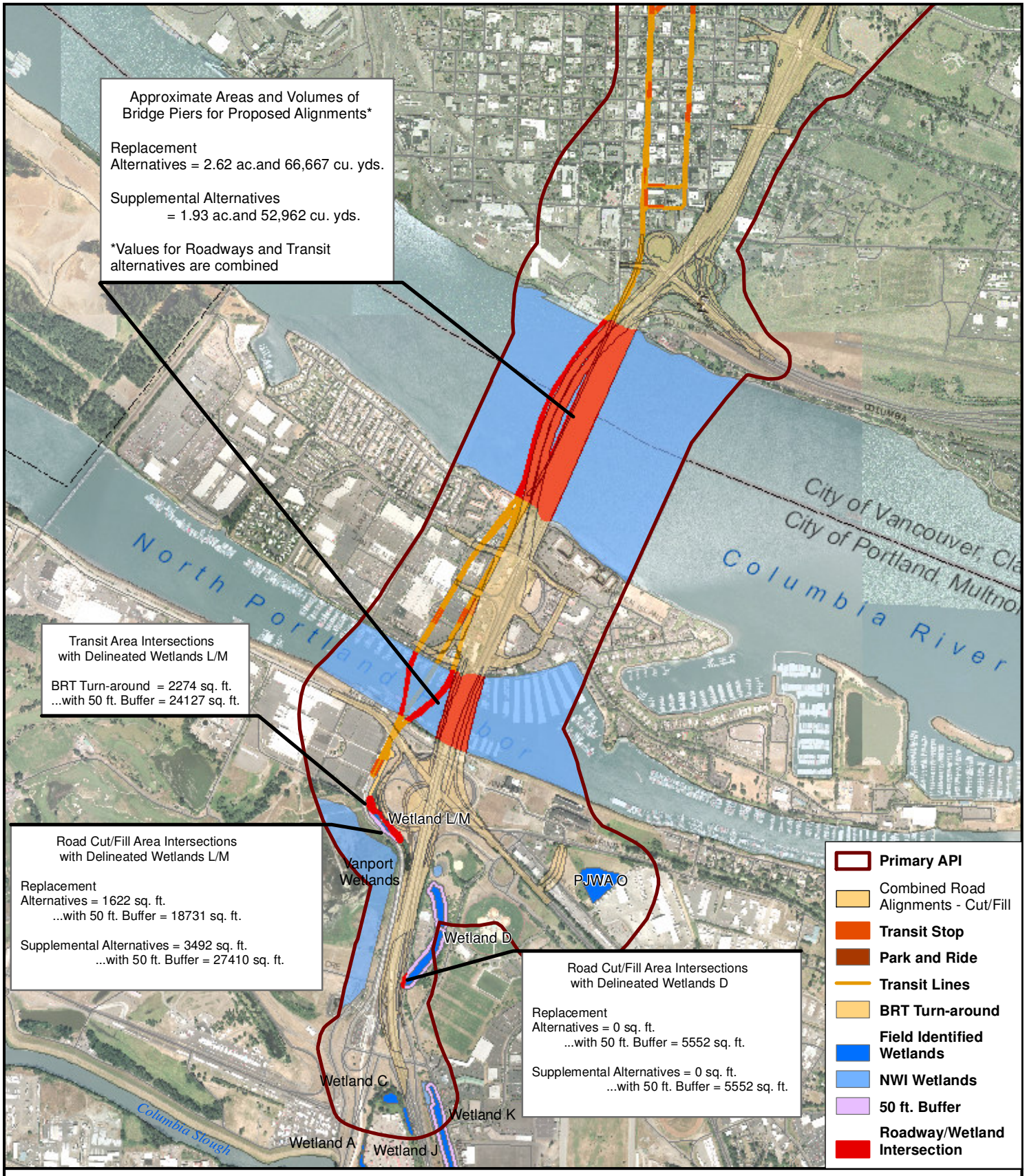


Exhibit 5-1: Project Intersections with Regulated Wetlands and Other Waters of the States and U. S.
Segment A

Columbia River CROSSING

Source: NWI Wetlands = Clark Co. and Metro; Field Identified Wetlands = Columbia River Crossing (Parametrix)

Analysis by J. Koloszar; Analysis Date: 8/7/07; Plot Date: 9/26/07; File Name: Exhibit5_1_TF072.mxd

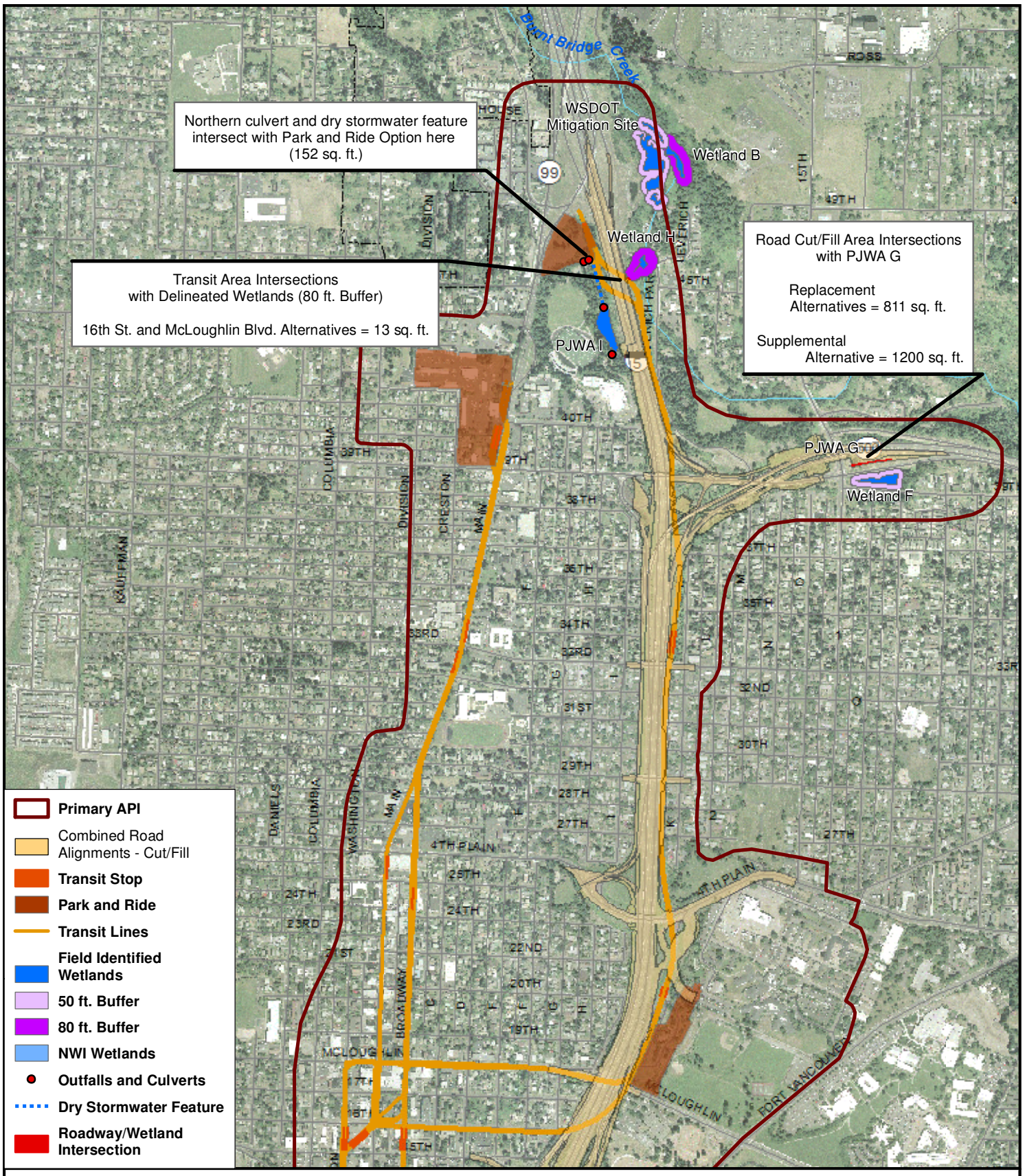


Exhibit 5-2: Project Intersections with Regulated Wetlands and Other Waters of the States and U. S.
Segment B

Columbia River CROSSING

Source: NWI Wetlands = Clark Co. and Metro; Field Identified Wetlands = Columbia River Crossing (Parametrix)

Analysis by J. Koloszar; Analysis Date: 8/21/07; Plot Date: 9/26/07; File Name: Exhibit5_2_TF072.mxd

Exhibit 5-3. Long-Term Direct Impacts to Wetlands and Other Waters from Full Alternatives

Wetland/Water Name	No-Build Alternative 1 (acres)	Alternative 2 (acres)	Alternative 3 (acres)	Alternative 4 (acres)	Alternative 5 (acres)
Wetland D Buffer	0.00	0.13	0.13	0.13	0.13
Wetland System L/M	0.00	0.089	0.037	0.13	0.080
Wetland System L/M Buffer	0.00	0.98	0.43	1.18	0.63
Wetland H Buffer	0.00	0.00030	0.00030	0.00	0.00
Total Impact to Wetlands and Wetland Buffers	**0.00**	**1.2**	**0.60**	**1.4**	**0.84**
PJWA G	0.00	0.019	0.019	0.028	0.028
PJWA I	0.00	Impact to stormwater feature that drains to PJWA I not quantified	Impact to stormwater feature that drains to PJWA I not quantified	Impact to stormwater feature that drains to PJWA I not quantified	Impact to stormwater feature that drains to PJWA I not quantified
Columbia River/ North Portland Harbor (fill)	0.00	2.62	2.62	1.93[a]	1.93[a]
Columbia River/ North Portland Harbor (removal)	0.00	0.75	0.75	0.25	0.25

[a] Impacts from Alternatives 4 and 5 do not include the area impacted by the existing bridge piers

Exhibit 5-4. Long-Term Indirect Impacts to Wetlands and Other Waters from Full Alternatives

	No-Build (Alt 1)	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wetland A					
No anticipated impacts	X				
Disruption of wildlife activity		Potential in general project area	Potential in general project area	Potential in general project area	Potential in general project area
Wetland B					
No anticipated impacts	X	X	X	X	X
Wetland C					
Disruption of wildlife activity	No additional impacts	Potential in general project area	Potential in general project area	Potential in general project area	Potential in general project area
Stormwater treatment	Continued and increasing discharge of untreated stormwater	Potential improvement	Potential improvement	Potential improvement	Potential improvement
Water quality	No additional impacts	BRT may increase likelihood of impacts	Potential improvement	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality. BRT may increase likelihood of impacts	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.
Wetland D					
Stormwater treatment	Continued and increasing discharge of untreated stormwater	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts
Disruption of wildlife activity	No additional impacts	Likely	Likely	Likely	Likely
Water quality	No additional impacts	BRT may increase likelihood of impacts	Potential improvement	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality. BRT may increase likelihood of impacts	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.
Wetland F					
No anticipated impacts	X				
Disruption of wildlife activity	No additional impacts	Potential in general project area	Potential in general project area	Potential in general project area	Potential in general project area

	No-Build (Alt 1)	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wetland H					
Stormwater treatment	Continued and increasing discharge of untreated stormwater	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts
Disruption of wildlife activity	No additional impacts	Likely	Likely	Likely	Likely
Water quality	No additional impacts	BRT may increase likelihood of impacts	Potential improvement	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality. BRT may increase likelihood of impacts	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.
Wetland J					
Stormwater treatment	Continued and increasing discharge of untreated stormwater	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts
Disruption of wildlife activity	No additional impacts	Potential in general project area	Potential in general project area	Potential in general project area	Potential in general project area
Water quality	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	BRT may increase likelihood of impacts	Potential improvement	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality. BRT may increase likelihood of impacts	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.
Wetland K					
Stormwater treatment	Continued and increasing discharge of untreated stormwater	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts
Disruption of wildlife activity	No additional impacts	Potential in general project area	Potential in general project area	Potential in general project area	Potential in general project area
Water quality	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	BRT may increase likelihood of impacts	Potential improvement	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality. BRT may increase likelihood of impacts	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.

	No-Build (Alt 1)	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wetland L/M					
Stormwater treatment	Continued and increasing discharge of untreated stormwater	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts
Disruption of wildlife activity	No additional impacts	Likely	Likely larger because more permanent direct impacts	Likely	Likely larger because more permanent direct impacts
Water quality	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	BRT may increase likelihood of impacts	Potential improvement	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality. BRT may increase likelihood of impacts	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.
PJWA O					
No anticipated impacts	X				
Disruption of wildlife activity	No additional impacts	Potential in general project area	Potential in general project area	Potential in general project area	Potential in general project area
Stormwater treatment	No additional impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts
Water quality	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	BRT may increase likelihood of impacts	Potential improvement	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality. BRT may increase likelihood of impacts	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.
Waters of the State and U.S.					
Columbia River					
Bridge failure	Potential				
Disruption of wildlife activity	No additional impacts	Potential	Potential	Potential	Potential
Stormwater treatment	Continued discharge of untreated stormwater	Improvement	Improvement	Improvement	Improvement
Water quality	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	BRT may increase likelihood of impacts	Potential improvement	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality. BRT may increase likelihood of impacts	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.

	No-Build (Alt 1)	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Burnt Bridge Creek	Continued and increasing discharge of untreated stormwater. Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	Potential improvement. Footprint of I-5 transit alignment closer than Vancouver alignment, may result in more water quality impacts	Potential improvement. Footprint of I-5 transit alignment closer than Vancouver alignment, may result in more water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts. Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	Potential improvement, but nearby footprint may result in water quality impacts. Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.
PJWA G (stormwater feature)	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts. Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	Potential improvement, but nearby footprint may result in water quality impacts. Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.
PJWA I (stormwater feature)	Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts	Potential improvement, but nearby footprint may result in water quality impacts. Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.	Potential improvement, but nearby footprint may result in water quality impacts. Less traffic improvement than Alts 2 & 3, potentially greater impacts to water quality.

5.2.1 No-Build Alternative

The No-Build Alternative would avoid the direct impacts to wetlands or other waters of the State and U.S. associated with the build alternatives. However, other projects and development occurring through 2030 would undoubtedly result in their own direct impacts to wetlands and water bodies. Not building the CRC alternatives would mean the proposed river crossing, highway, and transit improvements would not occur and could result in unique direct and indirect impacts including:

- Much greater risk that the existing bridge structures would fail in a major seismic event. Bridge collapse, and emergency actions associated with it, would have adverse impacts on waters of the States and U.S.
- Continued discharge of untreated storm water runoff from the highway and bridge into surface waters.
- Lower quality transit service and lower transit ridership would continue a rise in vehicular traffic that could likely result in degraded water quality.

5.2.2 Alternatives 2 and 3 (Replacement Crossings)

No differences in direct wetland impacts are anticipated among the tolling options associated with the replacement crossings. BRT is more likely to indirectly impact water quality than LRT. Additional analysis is necessary to quantify water quality impacts.

As shown in Exhibit 5-3, long-term direct impacts to wetlands resulting from the replacement crossing with LRT would include approximately 5,552 square feet (0.127 acre) to the Wetland D buffer, 1,622 square feet (0.037 acre) to Wetland System L/M, 18,731 square feet (0.430 acre) to the Wetland System L/M buffer, and 13 square feet (0.0003 acre) to the Wetland H buffer. Long-term direct impacts from the replacement crossing with BRT would include approximately 5,552 square feet (0.127 acre) to the Wetland D buffer, 3,896 square feet (0.089 acre) to Wetland System L/M, 42,858 square feet (0.984 acre) to the Wetland System L/M buffer, and the same impacts as for the LRT project element for the Wetland H buffer. In addition, total impacts to wetlands and wetland buffers would be higher with the Marine Drive interchange southern realignment option due to impacts to Vanport Wetlands, which is discussed further in Section 5.3.1.

The cut/fill line of all of the replacement crossings would impact the wetland or buffers of Wetland D, Wetland H, and Wetland System L/M. This would likely result in indirect impacts such as decreased water quality (due to lost vegetation cover) and disrupted habitat function to the wetland area, as shown in Exhibit 5-4. However, improvements to stormwater treatment associated with new construction may lead to improved water quality. For BRT, there is an increased risk of contamination associated with buses as opposed to light-rail. Additional indirect impacts to other wetlands in the project vicinity are possible and are listed in Exhibit 5-4 and described throughout this section.

Permanent bridge piers in the Columbia River (including the North Portland Harbor) for a replacement bridge would cover an area of 114,000 square feet (2.62 acres) and displace a volume of 66,667 cubic yards.

The permanent cut/fill line of the replacement crossing would temporarily impact approximately 300 square feet (0.007 acre) of a potentially jurisdictional ditch associated with Wetland System L/M. Both the highway footprint and the transit alignments intersect this feature.

The permanent cut/fill line of the replacement crossing would impact approximately 811 square feet (0.019 acre) of potentially jurisdictional water area (PJWA) G.

The permanent cut/fill line of the Kiggins Bowl Park and Ride may impact approximately 152 square feet of the stormwater feature that drains to PJWA I. The Kiggins Bowl terminus option would impact a small portion of this stormwater feature, while the other terminus options would not. Additional coordination with the COE and Ecology is necessary to determine if these areas are considered jurisdictional. If the area is considered jurisdictional by one or both agencies, additional fieldwork delineating the extent of these areas will be necessary.

Permanent bridge piers in the Columbia River (including the North Portland Harbor) for a replacement bridge may result in indirect impacts to flow patterns and wildlife activity. For further discussion refer to the Water Quality and Ecosystems Technical Reports.

A replacement crossing would provide more congestion relief than the supplemental crossing or No-Build Alternative. It the least likely to result in degraded water quality associated with vehicular traffic.

5.2.3 Alternatives 4 and 5 (Supplemental Crossings)

No differences in direct wetland impacts are anticipated among the tolling options associated with the supplemental crossing. BRT is more likely to indirectly impact water quality than LRT. Additional analysis is necessary to quantify water quality impacts. This section applies to the supplemental crossing with LRT and I-5 Standard Toll, and with BRT and I-5 Higher Toll options.

As shown in Exhibit 5-3, long-term direct impacts to wetlands resulting from the supplemental crossing with LRT would include approximately 5,552 square feet (0.13 acre) to the Wetland D buffer, 3,492 square feet (0.080 acre) to Wetland System L/M, and 27,410 square feet (0.63 acre) to the Wetland System L/M buffer. Long-term direct impacts to wetlands resulting from the supplemental crossing with BRT would include approximately 5,552 square feet (0.13 acre) to the Wetland D buffer, 5,766 square feet (0.13 acre) to Wetland System L/M, and 51,537 square feet (1.18 acres) to the Wetland System L/M buffer. In addition, total impacts to wetlands and wetland buffers would be higher with the Marine Drive interchange southern realignment option due to impacts to Vanport Wetlands, which is discussed further in Section 5.3.1.

The cut/fill line of the supplemental crossing would impact the wetland or buffers of Wetland D and Wetland System L/M, which will likely result in indirect impacts such as decreased water quality (due to lost vegetation cover) and disrupted habitat function to the wetland area. However, improvements to stormwater treatment associated with new construction may lead to improved water quality. For BRT, there is an increased risk of contamination associated with buses as opposed to light rail. Additional indirect impacts

to other wetlands in the project vicinity are possible and are listed in Exhibit 5-4 and described throughout this section.

Permanent bridge piers in the Columbia River (including the North Portland Harbor) for a supplemental bridge would cover an area of 84,000 square feet (1.93 acres) and displace a volume of 52,962 cubic yards, in addition to the existing bridge that covers an area of approximately 1 acre and displaces approximately 48,400 cubic yards.

The permanent cut/fill line of the replacement crossing would temporarily impact approximately 300 square feet (0.007 acre) of a potentially jurisdictional ditch associated with Wetland System L/M. Both the highway footprint and the transit alignments intersect this feature. The permanent cut/fill line of the supplemental crossing would impact approximately 1,200 square feet (0.028 acre) of PJWA G.

The permanent cut/fill line of the Kiggins Bowl terminus option may impact approximately 152 square feet (0.003 acre) of the stormwater feature that drains to PJWA I. The Kiggins Bowl terminus option would impact a small portion of this stormwater feature, while the other terminus options would not. Additional coordination with the COE and Ecology is necessary to determine if these areas are considered jurisdictional. If the area is considered jurisdictional by one or both agencies, additional fieldwork delineating the extent of these areas will be necessary.

A supplemental crossing would provide more congestion relief than the No-Build Alternative but less congestion relief than the replacement crossing. It is more likely to result in degraded water quality associated with vehicular traffic than a replacement crossing but less likely than the No-Build Alternative.

5.3 Impacts from Segment-Level Options

This section describes and compares the impacts associated with specific highway alignment and interchange options and specific transit alignments and options. Options are organized by segment as shown in the segment boundary map, Exhibit 5-6.

Impacts from highway options are described separately from impacts from transit options. The purpose of this organization is to present the information according to the choices to be made. Where the traffic and transit choices would have a substantial effect on each other, this is considered and described.

5.3.1 Segment A: Delta Park to Mill Plain District - Highway Alternatives

Exhibit 5-5 presents a summary of impacts from highway alternatives in Segment A.

Exhibit 5-5. Segment A Impacts to Wetlands and Other Waters from Highway Alternatives

Wetland/Water Name	No-Build (acres)	Replacement Crossing (acres)	Supplemental Crossing (acres)
Wetland D Buffer	0	0.13	0.13
Wetland System L/M	0	0.04	0.08
Wetland System L/M Buffer	0	0.43	0.63
Columbia River	0	2.62[a]	1.93[b]

[a] Values for highway and transit bridges have not been separated at this time.
[b] Value does not include area impacted by the existing bridge piers. The existing bridge piers occupy approximately one acre.

5.3.1.1 No-Build

The No-Build Alternative would avoid the direct impacts to wetlands and waters associated with the build alternatives. However, the No-Build Alternative would have potentially unique adverse effects on wetlands and waters in Segment A, including increased risk of bridge failure and continued discharge of untreated stormwater runoff, as described in Section 5.2.1.

5.3.1.2 Replacement Crossing

Long-term direct impacts to wetlands from highway elements of the replacement crossing would include 0.13 acre to the Wetland D buffer, 0.04 acre to Wetland System L/M, and 0.43 acre to the Wetland System L/M.

The cut/fill line would impact the wetland or buffer of Wetland D and Wetland System L/M for the replacement crossing, resulting in indirect impacts to the wetland area, as described previously in Section 5.2.

Permanent highway and transit bridge piers in the Columbia River (including the North Portland Harbor) would result in 2.62 acres of long-term direct impacts to the river for the replacement crossing.

In addition, a Marine Drive southern realignment option, south of the Expo Center would impact the E-zone associated with Vanport Wetland, which is a mitigation site owned and maintained by the Port of Portland. Construction impacts within the wetland would be about 0.48 acres. Two piers would be placed in the wetland, both approximately 10 ft in diameter, causing a direct impact of 0.003 acre. Mitigation for this impact could require three times the standard DSL ratios because of impacts to a mitigation site. Long-term effects on vegetation (mature cottonwood forest) below the alignment at Vanport and Wetland System L/M cannot be quantified due to the preliminary design of this option. The diagonal realignment would not impact Vanport, and would impact approximately the same area of Wetland System L/M as the standard Marine Drive alignment.

5.3.1.3 Supplemental Crossing

Long-term direct impacts to wetlands from highway elements would include 0.13 acre to the Wetland D buffer, 0.08 acre to Wetland System L/M, and 0.63 acre to the Wetland System L/M buffer for a supplemental crossing.

The cut/fill line of a supplemental crossing would impact the wetland or buffers of Wetland D and Wetland System L/M, resulting in indirect impacts to the wetland area. See Section 5.2 for further details.

Permanent highway and transit bridge piers in the Columbia River (including the North Portland Harbor) for the supplemental crossing would result in 1.93 acres of impact to the river.

Impacts associated with the Marine Drive southern and diagonal realignment options would be the same as those discussed with a Replacement Crossing.

5.3.2 Segment B: Mill Plain District to North Vancouver - Highway Alternatives

Exhibit 5-6 presents a summary of impacts from highway alternatives in Segment B.

Exhibit 5-6. Segment B Impacts to Wetlands and Other Waters from Highway Alternatives

Wetland/Water Name	No-Build (acres)	Replacement Crossing (acres)	Supplemental Crossing (acres)
PJWA G	0	0.02	0.03

5.3.2.1 No-Build

The No-Build Alternative would avoid the direct impacts to wetlands and waters associated with the build alternatives. However, the No-Build Alternative would have potentially unique adverse effects on wetlands and waters in Segment B, including continued discharge of untreated storm water runoff, as described in Section 5.2.1.

5.3.2.2 All Build Highway Alternatives in Segment B

The permanent cut/fill line of a replacement crossing would impact approximately 811 square feet (0.02 acre) of PJWA G. The permanent cut/fill line of a supplemental crossing would impact approximately 1,200 square feet (0.03 acre) of PJWA G.

There are no additional long-term direct impacts to wetlands or jurisdictional waters associated with any of the highway improvements in Segment B.

Indirect impacts through storm water runoff to wetlands and other waters of the State and U.S. are not anticipated in Segment B as stormwater treatment is anticipated for all new impervious surface area.

5.3.3 Segment A1: Delta Park to South Vancouver - Transit Alternatives

Exhibit 5-7 provides a summary of impacts from transit alternatives

Exhibit 5-7. Segment A1 Impacts to Wetlands and Other Waters from Transit Alternatives

Wetland/Water Name	No-Build (acres)	LRT (acres)	BRT (acres)
Wetland System L/M	0	0	0.05
Wetland System L/M Buffer	0	0	0.55
Columbia River	0	2.62[a]	1.93[b]

[a] Values for highway and transit bridges have not been separated at this time.
[b] Value does not include area impacted by the existing bridge piers. The existing bridge piers occupy approximately one acre.

5.3.3.1 No-Build

The No-Build Alternative would avoid the direct impacts to wetlands and waters associated with the build alternatives and would not likely have any added direct or indirect impacts in Segment A1.

5.3.3.2 Hayden Island Alignments

This discussion covers both the alignment option adjacent to I-5 as well as the alignment offset from it.

There are no long-term direct impacts to wetlands associated with LRT Hayden Island alignments. Long-term direct impacts to other waters of the State and U.S. have been discussed under Section 5.2. There are no indirect impacts to wetlands associated with the LRT Hayden Island alignments.

Impacts to wetlands and other waters of the State and U.S. for BRT alignments on Hayden Island would be similar to those for LRT. The critical exception is that BRT bus bays and bus turn-around facility would be constructed just east of the existing Expo MAX station. This would result in 0.05 acres of long-term direct impacts to Wetland System L/M and 0.55 acres of long-term direct impacts to its buffer. Indirect impacts such as decreased water quality and disrupted habitat function within the wetland area may occur. See Section 5.2 for further details.

5.3.4 Segment A2: South Vancouver to Mill Plain District - Transit Alternatives

For all transit alternatives within Segment A2, there are no long-term direct, temporary direct, or indirect impacts to wetlands or other waters of the State or U.S.

5.3.5 Segment B: Mill Plain District to North Vancouver - Transit Alternatives

Exhibit 5-8 presents a summary of impacts related to transit alternatives in Segment B.

Exhibit 5-8. Segment B Impacts to Wetlands and Other Waters from Transit Alternatives

Wetland/Water	No-Build (acres)	Vancouver Alignment (acres)	North I-5 Alignment (acres)
Wetland H buffer	0	0	0.0003
PJWA I	0	Direct impact to approximately 0.003 acre of stormwater feature that drains to PJWA I	Direct impact to approximately 0.003 acre of stormwater feature that drains to PJWA I

5.3.5.1 No-Build

There are no long-term direct, temporary direct, or indirect impacts to wetlands or other waters of the State or U.S. associated with the No-Build Alternative in Segment B.

5.3.5.2 Vancouver Transit Alignments and Options

The permanent cut/fill line of the Kiggins Bowl Park and Ride may impact approximately 152 square feet (0.003 acre) of the stormwater feature that drains to PJWA I. Additional coordination with the COE and Ecology is necessary to determine if these areas are considered jurisdictional. If the area is considered jurisdictional by one or both agencies, additional fieldwork delineating the extent of these areas will be necessary.

There are no additional long-term direct or temporary direct impacts to wetlands or other waters of the State or U.S. associated with the Vancouver transit alignments and options.

Indirect impacts such as decreased water quality and disrupted habitat function within wetland areas may occur. See Section 5.2 for further details.

5.3.5.3 North I-5 Transit Alignments and Options

The permanent cut/fill line of the North I-5 transit alignments would impact approximately 13 square feet (0.0003 acre) of the Wetland H buffer. Indirect impacts such as decreased water quality and disrupted habitat function within the wetland area may occur.

The permanent cut/fill line of the Kiggins Bowl Park and Ride may impact approximately 152 square feet (0.003 acre) of the stormwater feature that drains to PJWA I. Additional coordination with the COE and Ecology is necessary to determine if these areas are considered jurisdictional. If the area is considered jurisdictional by one or both agencies, additional fieldwork delineating the extent of these areas will be necessary.

Indirect impacts such as decreased water quality and disrupted habitat function to the Burnt Bridge Creek area may occur because the transit footprint along I-5 comes in closer proximity to the Burnt Bridge Creek riparian area. Stormwater treatment will be provided and may be an improvement to existing stormwater quality.

All other impacts to wetlands and other waters of the State and U.S. would be the same as those discussed for the Vancouver alignments and options.

5.4 Impacts from Other Project Elements

5.4.1 Minimum Operable Segments

The Mill Plain and Clark College terminus options, or Minimum Operable Segments (MOS), would avoid potential long-term direct impacts to the Wetland H buffer. The potential impact to the stormwater feature that drains to PJWA I from permanent cut/fill line for the Kiggins Bowl Park and Ride would still occur with the MOS. In addition, the MOS, providing less-extensive transit service and ridership, could have greater indirect effects associated with higher congestion and increased automobile use.

5.4.2 Transit Maintenance Base Options

No wetlands or waters are present within the bases' boundaries. No long-term direct, temporary direct, or indirect impacts to wetlands or other waters of the U.S. are anticipated from expanded maintenance bases in Gresham or Vancouver.

5.5 Impacts from System-Level Choices

5.5.1 River Crossing Type and Capacity: How does the supplemental crossing compare to the replacement crossing?

For wetlands, the supplemental crossing would have a slightly greater impact at Wetland System L/M (0.080 acres compared to 0.037 acres for the replacement crossing) and the Wetland System L/M buffer (0.63 compared to 0.43 for the replacement crossing). Both the supplemental and replacement crossings would impact 0.13 acres at the Wetland D buffer.

For other waters of the State and U.S., the number of bridge piers within the Columbia River will differ between river crossing types, resulting in 2.62 acres and 66,667 cubic yards of impact from the replacement crossing and 1.93 acres and 52,962 cubic yards of impact from the supplemental crossing. The existing crossing covers approximately 1 acre and displaces approximately 48,400 cubic yards.

Indirect impacts such as decreased water quality and disrupted habitat function within wetlands and other water of the State and U.S. may occur. See Section 5.2 for further details.

5.5.2 Transit Mode: How does BRT compare to LRT?

The BRT bus bays and bus turn-around facility that would be constructed just east of the existing Expo MAX station would result in 0.05 acres of long-term direct impacts to wetlands (Wetland System L/M) and 0.55 acres of long-term direct impacts to wetland buffers (Wetland System L/M buffer), whereas LRT would not directly impact these wetlands.

5.5.3 Balance of Transit vs. Highway Investment: Increased Transit System Operations with Aggressive TDM/TSM Measures, and Efficient Transit System Operations with Standard TDM/TSM Measures

There is no difference between highway investment operations and measures relative to wetlands and other waters of the State and U.S.

5.5.4 Major Transit Alignment: How does the Vancouver alignment compare to the I-5 alignment?

The I-5 alignment would result in long-term direct impacts 0.0003 acres of wetland buffer (Wetland H). The Kiggins Bowl Park and Ride, associated with both the Vancouver and I-5 alignments would impact a portion of the stormwater feature that drains to PJWA I.

The I-5 alignment comes closer to the Burnt Bridge Creek riparian area, possibly resulting in a greater amount of indirect impacts to the water of the State and U.S.

5.5.5 Tolling: How do the tolling options compare (no toll, standard or higher toll on I-5, toll on both I-5 and I-205)?

There is no difference between tolling options relative to wetlands and other waters of the State and U.S. (pending indirect effects analysis).

5.5.6 Transit Project Length: How do the full-length alternatives compare to the shorter length option?

All potential direct impacts to wetlands and other waters would be the same for the full-length alternatives and for the shorter length option except for the impacts to Wetland H. For the shorter length option, impacts to Wetland H would be avoided. In addition, the full-length option with the I-5 transit alignment would come closer to Burnt Bridge Creek, potentially resulting in greater indirect impacts to this water.

6. Temporary Effects

6.1 Introduction

Temporary effects include those related primarily to construction activities.

6.2 Regional and System-wide Impacts

6.2.1 Impacts Common to All Alternatives and Options

Temporary impacts to wetlands and other waters of the State and U.S. may occur where long-term direct impacts are anticipated. Temporary disturbances to wildlife activity, hydrology, and water quality will be avoided as much as possible through the use of best management practices such as silt fences, construction fencing, wildlife exclusionary netting, etc during the construction process.

Temporary direct impacts to the Columbia River would be anticipated due to the in-water work required to deconstruct the existing bridge structures and install new bridge piers and decks. For more details, refer to the Ecosystems and Water Quality Technical Reports.

The potential sites for a bridge assembly/casting yard are unknown at this time. However, they are likely to be adjacent to the Columbia River, Willamette River, or other water body in the region. The existing conditions on the assembly/casting yard could range from a developed and paved port terminal to a currently undeveloped site, and could contain wetlands. The development and operations of the assembly/casting yard would be subject to the same federal and state environmental regulations that apply to other aspects of project construction (depending on which state it is in), as well as any other federal, state or local regulations that may apply to the particular site. Before any site is selected, a thorough, site-specific environmental impact analysis will be conducted. All necessary permits will be secured prior to site development and operations.

6.3 Segment A: Delta Park to Mill Plain District

Temporary disturbances to wildlife activity, hydrology, and water quality will be avoided as much as possible through the use of best management practices such as silt fences, construction fencing, wildlife exclusionary netting, etc during the construction process.

Wetland System L/M and its buffer and the Wetland D buffer will have direct impacts. Temporary impacts due to construction activity and proximity may occur.

Construction of highway footprint and transit alignments could temporarily impact approximately 300 square feet (0.007 acre) of a potentially jurisdictional stormwater ditch associated with Wetland System L/M.

Temporary impacts to the Columbia River would occur based on the specific in-water construction methods employed. Further details are provided in the Ecosystems Technical Report.

6.4 Segment B: Mill Plain District to North Vancouver

Temporary disturbances to wildlife activity, hydrology, and water quality will be avoided as much as possible through the use of best management practices such as silt fences, construction fencing, wildlife exclusionary netting, etc during the construction process.

PJWA G, a stormwater feature that drains to PJWA I, and the Wetland H buffer will have direct impacts. Temporary impacts due to construction activity and proximity may occur.

Temporary impacts to the Burnt Bridge Creek area may occur based on the specific construction methods employed. Further details are provided in the Ecosystems Technical Report.

7. Mitigation for Long-Term Effects

7.1 Introduction

In accordance with state and federal regulations and Executive Order 11990, the project has avoided and minimized impacts to wetlands to the extent practicable during the design of the highway and transit alignments, and will continue to consider this as the design process moves forward and the project sponsors select a preferred alternative.

Mitigation of impacts to wetlands and other jurisdictional waters could take the form of best management practices (BMPs), conservation measures, avoidance/minimization measures, or creation, restoration, or enhancement of wetlands or waters to offset losses due to the project. Standard construction BMPs and conservation measures would be implemented in the build alternatives to avoid impacts to wetlands and waters from construction activities. Designs will avoid and minimize impacts to existing wetland and water resources. Mitigation to offset losses of wetland areas and functions and values will be explored in detail after the locally preferred alternative has been identified. Mitigation opportunities in existing or newly acquired rights-of-way will be explored. Mitigation may occur within the same watershed but not necessarily in close proximity to existing wetland resources given the constrained urban area typical of the API.

7.2 Mitigation Common to All Build Alternatives

The build alternatives would impact between about 1.9 and 3.1 acres of waterways, about 0.06 to 0.16 acres of existing wetlands, and 0.56 to 1.31 acres of buffer areas. The southern realignment option for Marine Drive would impact an additional 0.48 acre of wetland and 1.58 acres of E-zone at the Vanport Wetland. Mitigation for these direct impacts is regulated by federal, state, and local jurisdictions, and would typically require restoring or enhancing degraded wetland areas or establishing new wetlands nearby to compensate for functions lost or degraded by those impacts. Because Vanport is already a wetland mitigation site, it could require a 9:1 mitigation ratio for any impacts to it.

Potential compensatory mitigation sites would be identified after the selection of a locally preferred alternative. Likely mitigation sites depend on the area needed for mitigation, current and future ownership of potential mitigation sites, and site characteristics. Preference would be given to sites near the potential impacts, for example, between the Columbia Slough and Marine Drive and near Burnt Bridge Creek. Mitigation sites would be selected based on soil types and topographic position that would increase the likelihood of successful restoration or establishment of wetland conditions. Options for off-site mitigation could also be considered.

Mitigation needs for Oregon wetlands could range from 0.06 to 0.48 acres (not including potential Vanport impact mitigation from the Marine Drive southern realignment option) depending on the type of mitigation (restoration, creation, and/or enhancement) and the amount of affected wetlands associated with the selected alternative. Mitigation for Oregon wetland buffers would require a replacement of lost functions and would likely be between 0.56 acre and 1.31 acres depending on the amount of affected buffer.

Mitigation needs for Washington wetlands could range from 0.02 to 0.24 acre depending on the type of mitigation and the amount of affected wetlands associated with the selected alternative, assuming that impacts occur only to Category 3 or Category 4 wetlands. Mitigation for Washington wetland buffers would require the replacement of lost functions and values and would likely be less than 0.01 acre, depending on the amount of affected buffer, and pending jurisdictional determinations.

8. Mitigation for Temporary Effects

8.1 Introduction

Mitigation for temporary effects includes the use of erosion and sediment control procedures and avoidance of jurisdictional resources. Where vegetation is cleared for construction activity, it will be replaced in accordance with local regulatory guidance. Temporary impacts to the Columbia River would be anticipated due to the in-water work required to deconstruct the existing bridges and install new bridge piers and decks. For more details, refer to the Ecosystems and Water Quality Technical Reports.

8.2 Mitigation Common to All Build Alternatives

Construction activities will implement appropriate sediment and erosion control activities under all alternatives. Measures to avoid jurisdictional and potentially jurisdictional resources will be implemented under all build alternatives. Mitigation for impacts to the Columbia River is discussed more fully in the Ecosystems Technical Report.

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9. Permits and Approvals

9.1 Federal

Clean Water Act (CWA). 1977. 33 USC 1251-1376, as amended.

Impacts to jurisdictional wetlands or other jurisdictional waters will require a Section 404 CWA permit and a Section 401 certification under the Clean Water Act.

Background: The CWA requires States to set water quality standards for all contaminants in surface waters based on the "beneficial" or "designated" uses for the water body, and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit is obtained under its provisions. It also recognizes the need to address the problems posed by nonpoint source pollution. Some of the permitting processes that fall within the purview of the CWA include National Pollutant Discharge Elimination System (NPDES) permits, Section 404 permits, and Section 401 Water Quality Certifications.

If there are any impacts to jurisdictional wetlands or other waters of the U.S. (which may include ditches), then a Section 404 Clean Water Act permit from the U.S. Army Corps of Engineers COE would likely be required. Section 401 of the CWA requires an applicant for a federal license or permit, who conducts an activity that may result in a discharge to waters of the state or U.S., to obtain a certification that the activity complies with water quality requirements and standards. Dredging, filling, and other activities that alter a waterway require a Section 404 permit and Section 401 certification. Applicants must submit a Section 404 application form to the appropriate state agency and COE, who forward the application to the certifying state agency. The state agency then certifies that the project meets state water quality standards and does not endanger waters of the State, U.S., or wetlands. Certifications are issued by Oregon Department of Environmental Quality (DEQ) in the state of Oregon (Oregon Revised Statutes [ORS] 468, Oregon Administrative Rules [OAR] 340-041-001 to 340-041-0350) and by the Washington State Department of Ecology (Ecology) in the state of Washington (Revised Code of Washington [RCW] 90.48, as amended, Washington Administrative Code [WAC] 173-201A and 173-201A-070).

Rivers and Harbors Act. 1899. 33 USC 403, as amended.

Under the River and Harbors Act, the project will have to submit final plans for congressional and COE approval.

Background: Under the Rivers and Harbors Act, the COE is authorized to regulate the construction of any structure or work within navigable waters. The act prohibits the construction of any bridge over or in navigable waters of the U.S. without congressional approval and the consent of the Secretary of Transportation.

Fish and Wildlife Coordination Act. 1934. 16 USC 661-667e, as amended.

Consultation with the U.S. Fish and Wildlife Service (USFWS), Oregon Department of Fish and Wildlife (ODFW), and Washington Department of Fish and Wildlife (WDFW) will be required if the project impounds, diverts, channelizes, or otherwise controls or modifies the waters of any stream or other body of water. The agencies may place constraints upon project alternatives to prevent damage or loss to wetlands within the primary API. Currently, it is not anticipated that project activities will have to be permitted under the Fish and Wildlife Coordination Act.

Background: The Fish and Wildlife Coordination Act requires consultation with the USFWS and the appropriate state wildlife agency when a project will impound, divert, channelize, or otherwise control or modify the waters of any stream or other body of water. Such actions would also require compliance with Section 404 of the CWA. Consideration must be given to preventing damage or loss to wildlife and to mitigating any effects caused by a federal project. The environmental assessment must include an evaluation of how the actions may affect fish and wildlife resources, and must identify measures to reduce impacts to fish and wildlife.

Endangered Species Act. 1973. 16 USC 1531-1544, as amended.

If the project may affect listed species and/or designated critical habitat, a Section 7 consultation will be required. An incidental take permit may be required as part of a Section 7 consultation. If a Section 7 consultation is required, a biological assessment will need to be written and submitted to USFWS or the National Marine Fisheries Service (NMFS).

Background: The federal Endangered Species Act (ESA) prohibits the take of any listed species. Take is defined in the law to include harass and harm. Harm is further defined to include any act which actually kills or injures listed species, including acts that may modify or degrade habitat in a way that significantly impairs essential behavioral patterns of the species. Under Section 7 of the ESA, any federal agency that authorizes, funds, or carries out an action is required to that the action is not likely to jeopardize the continued existence of listed species or ensure result in the destruction or adverse modification of designated critical habitat.

If there is a potential for the project to impact a listed species or its critical habitat, then a biological assessment is required. If listed species are found within the CRC project area, an informal or formal consultation with NMFS and USFWS under Section 7 of the ESA may be required. Informal consultations occur for projects that would not likely adversely affect listed species, whereas formal consultations occur for projects that would likely adversely affect listed species.

9.2 State

9.2.1 Oregon

Oregon Revised Statutes. 1989. "Oregon's Removal-Fill Law Definitions." ORS 196.800-196.990 and ORS 196.600-196.692. OAR 141-085-0005 to 141-089-0615. "Issuance and Enforcement of Removal-Fill Authorizations." Salem, OR.

Impacts to jurisdictional wetlands and waters will require a joint permit from COE and DSL.

Background: If there are any impacts to jurisdictional wetlands or other waters of the state (which may include ditches), then a Removal-Fill permit from the DSL would likely be required. This regulation is often associated with Section 404 of the CWA, and Section 10 of the Rivers and Harbors Act, under the jurisdiction of the COE. In most cases, the preparation of a joint permit application for impacts to wetlands and jurisdictional waters and a wetland delineation and conceptual mitigation plan are required. A wetland delineation is required if wetlands are in the project area (API). Compensatory mitigation (e.g., for wetland or riverine habitats) is required for any unavoidable impact to wetlands or waterways.

Oregon Administrative Rules. Water Quality Standards. ORS 468, OAR 340-041-001 to 340-041-0350. Salem, OR.

In Oregon, DEQ issues and enforces NPDES permits and authorizes Section 401 water quality certifications. Impacts to jurisdictional wetlands or other waters will require a Section 404 CWA permit and a Section 401 certification.

Background: A joint 404 permit application is submitted to the DSL and COE (Portland Regional Office), who forward it to DEQ. DEQ reviews the project for 401 water quality certification. Frequently, applicants will be required to incorporate protective measures into their construction and operational plans, such as bank stabilization, treatment of stormwater runoff, spill protection, and fish and wildlife protection. The DEQ certification process requires a Land Use Compatibility Statement, signed by the local government land use authority, to ensure that permits affecting land use are compatible with local government comprehensive plans.

Oregon Administrative Rules. 1973. "Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces." OAR 660-15-0000 (5). Salem, OR.

Permitting may be required through local government Goal 5 ordinances.

Background: To protect natural resources and conserve scenic and historic areas and open spaces, local governments throughout Oregon have adopted programs that will protect natural resources and conserve scenic, historic, and open space resources under Goal 5. Goal 5 parameters related to jurisdictional wetlands and waters within the CRC project area include the following:

- Fish and wildlife areas and habitats should be protected and managed in accordance with ODFW's fish and wildlife management plans.
- Stream flow and water levels should be protected and managed at a level adequate for fish, wildlife, pollution abatement, recreation, aesthetics, and agriculture.
- Significant natural areas that are historically, ecologically or scientifically unique, outstanding or important, including those identified by the State Natural Area Preserves Advisory Committee, should be inventoried and evaluated.
- Plans should provide for the preservation of natural areas consistent with an inventory of scientific, educational, ecological, and recreational needs for significant natural areas.

9.2.2 Washington

Revised Code of Washington. "State Environmental Protection Act" (SEPA). 1971. RCW 43.21C, WAC 197-11, and WAC 468-12. Olympia, WA.

An environmental impact statement (EIS) must be prepared when the lead agency determines that a proposed action is likely to have significant adverse environmental impacts. Approval of this EIS by state and local agencies will be required.

Background: SEPA requires all governmental agencies to consider the environmental impacts of a proposed action before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. RCW and WAC allow adoption of an EIS prepared in compliance with NEPA to fulfill SEPA obligations.

Revised Code of Washington. 1971. "Shoreline Management Act of 1971." RCW 90.58. Olympia, WA.

A permit will be required from the City of Vancouver for project activities occurring along the shoreline of the Columbia River or Burnt Bridge Creek. A permit will be required from Clark County for activities occurring along Salmon Creek. Ecology may require approval.

Background: The goal of Washington's Shoreline Management Act (SMA) is "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines." The act establishes a broad policy of shoreline protection, which includes fish and wildlife habitat. The SMA uses a combination of policies, comprehensive planning, and zoning to create a special zoning code overlay for shorelines. Under the SMA, each city and county is required to adopt a shoreline master program that is based on state guidelines and may be tailored to the specific geographic, economic and environmental needs of the community. Master programs provide policies and regulations addressing shoreline use and protection as well as a permit system for administering the program.

Revised Code of Washington. 1949. State Water Pollutant Control Act. RCW 90.48, as amended, WAC 173-201A and 173-201A-070. Olympia, WA.

A permit will be required if jurisdictional wetlands and waters are negatively impacted by the project under the Washington State Water Pollution Control Act.

Background: This act gives Ecology "jurisdiction to control and prevent the pollution of streams, lakes, rivers, ponds, inland waters, salt waters, water courses, and other surface and underground waters of the state of Washington." Amendments to state water quality standards in 1997 included wetlands in the definition of surface waters. The act's definition of pollution includes impacts that typically degrade wetland function, including placing fill and discharging stormwater runoff.

The implementing standards for the act include surface water quality standards (WAC 173-201A) and an antidegradation policy (WAC 173-201A-070). The regulations allow for short-term impacts to waters of the state as long as the degradation does not "interfere(s) with or become injurious to existing water uses or causes long-term harm to the environment." Ecology can permit alterations of wetlands, including filling, only if the net result does not result in long-term harm to the environment. With adequate mitigation that effectively offsets the impacts, Ecology can permit projects that would otherwise not comply with the regulations.

Washington Administrative Code. 2005. "National Pollutant Discharge Elimination System Permit Program (Department of Ecology)." WAC 173-220. Olympia, WA.

Impacts to jurisdictional wetlands or other waters will require a Section 404 CWA permit and a Section 401 certification.

Background: This code establishes a state individual permit program, applicable to the discharge of pollutants and other wastes and materials to the surface waters of the state, and operating under state laws as part of the NPDES created by the CWA. In the state of Washington, Ecology issues and enforces NPDES permits and authorizes Section 401 water quality certifications.

In Washington, a Joint Aquatic Resource Permits Application (JARPA) is submitted to both the COE and Ecology. Ecology reviews the permit application for 401 water quality certification.

Revised Code of Washington. 1949. "Hydraulic Code." RCW 77.55.100 and WAC 220-110. Olympia, WA.

An Hydraulic Permit Approval (HPA) process will be required for work occurring within streams.

Background: The state legislature has given WDFW the responsibility of preserving, protecting, and perpetuating all fish and shellfish resources of the state. To assist in achieving that goal, the state legislature passed a law in 1949, now known as the "Hydraulic Code." The purpose of the law is to ensure that damage or loss of fish and shellfish habitat does not result in direct loss of fish and shellfish production. The

enactment of the Hydraulic Code by the state legislature was recognition that virtually any construction within the high water area of the waters of the state has the potential to cause habitat damage. It was also an expression of a state policy to preclude that potential from occurring. The law's purpose is to ensure that required construction activities are performed in a manner to prevent damage to the state's fish, shellfish, and their habitat. By applying for and following the provisions of the HPA process from WDFW, most construction activities around water can be allowed with little or no adverse impact on fish or shellfish.

Revised Code of Washington. 1990. "Growth Management Act." RCW 36.70A. Olympia, WA.

Background: Each county and city must adopt development regulations protecting critical areas that are required to be designated under the Growth Management Act (GMA). Counties and cities are required to periodically review and update their critical area ordinances (CAOs). The GMA defines critical areas that must be designated and protected as wetlands, critical habitat, geologic hazard areas, flood hazard areas, and critical aquifer recharge areas. The focus of the GMA is to avoid unplanned growth and conserve natural resources, while allowing for economic development. Under the GMA, counties, cities, and towns must classify, designate, and regulate critical areas through their CAOs. Any of the five types of critical areas listed above may serve as fish, wildlife, or sensitive plant habitat.

All regulated habitat and critical areas should be identified during the project development phase. Some local jurisdictions may have fish and wildlife habitat regulation inventory maps. These maps identify what types of habitat the jurisdiction is regulated, indicate where all of the inventoried habitat areas are, and identify the regulations that apply to the management and development of these areas. If available, these maps should be reviewed to help identify critical areas. Local planning departments should be contacted to determine requirements that could affect a project.

9.3 Local

9.3.1 Portland

Metro. Nature in Neighborhoods. 2005. Ordinance No. 05-1077C. Portland, OR.

No permitting will be required through Metro, but implementation of Nature in Neighborhoods by the City of Portland may require permitting (see CPC 1994, below).

Background: The Nature in Neighborhoods ordinance is designed to help local communities meet the requirements of Statewide Planning Goal 5: Open Spaces, Scenic and Historic Areas, and Natural Resources. This ordinance amends Metro's Regional Framework Plan and is implemented by cities and counties. It relies on voluntary, incentive-based approaches for development in upland areas, and includes new regulations on future urban areas. The ordinance conserves and protects fish and wildlife habitat, but does not prohibit development. It uses regulation to protect the region's highest value streamside habitat, called habitat conservation areas, while also

encouraging protection of other valuable habitat through a combination of incentives and voluntary efforts.

City of Portland Code (CPC). 1994. "Environmental Zones." CPC 33.430, as amended, Portland, OR. CPC. 2002. "Streams, Springs, and Seeps." CPC 33.640. Portland, OR.

Permits are required for development or disturbance within environmental zones.

Background: Environmental Zones Code provides for fish habitat protection through the designation of environmental protection zones and environmental conservation zones. An environmental protection zone provides the highest level of protection to the most important resources and functional values. Development is approved in an environmental protection zone only in rare and unusual circumstances. An environmental conservation zone conserves important resources and functional values in areas where these can be protected while allowing environmentally sensitive urban development.

In these zones, development and disturbances must be at least 50 feet from the boundary of any wetland. Development within these zones requires a permit application and additional information. Natural resource management plans (NRMPs) may be developed and approved, and may contain regulations that supersede or supplement the environmental zone regulations. Whenever natural resource management plan provisions conflict with other environmental zone provisions, the natural resource management plan provisions take precedence. NRMPs within the CRC project's primary API include the East Columbia Neighborhood NRMP and Peninsula Drainage District No. 1 NRMP.

These regulations apply to building permit and development permit applications for activities within the resource area of an environmental conservation zone. Activities within an environmental conservation zone are subject to the Development Standards of Section 33.430.110-190. These regulations do not apply to building or development permit applications for development that has been approved through environmental review.

Fish habitat is also protected in the "Streams, Springs, and Seep" code. This code is applicable when there are land division actions. The standards in this chapter ensure that important streams, seeps, and springs that are not already protected by the environmental overlay zones are maintained in their natural state.

9.3.2 Vancouver

Vancouver Municipal Code (VMC). 2005. "Critical Areas Protection Ordinance." VMC 20.740. Vancouver, WA.

VMC. 2005 "Wetlands." VMC 20.740.140. Vancouver, WA.

A Critical Areas Report and Permit will be required for project activities occurring on properties containing wetlands or their buffers.

Background: The City of Vancouver's regulations that affect wetlands and their buffers are found in the Critical Areas Protection Ordinance. Adopted on February 28, 2005, the ordinance combines separate permitting processes for critical areas (wetlands, frequently flooded areas, geologic hazard areas, and fish and wildlife habitat conservation areas) into a single integrated process. VMC 20.740, Critical Areas Protection, implements the goals and policies of the Vancouver Comprehensive Plan, 2003-2023, under the GMA and other related state and federal laws. Regulations related to wetlands and their buffers and ordinance compliance in Chapter 20.740 are described below.

The Wetlands code outlines the City's regulations related to wetlands and their buffers, and it describes which areas in the City of Vancouver are designated as wetlands. Designations include, but are not limited to, swamps, marshes, bogs, and similar areas and buffers (required buffer widths vary from 300 to 50 feet for wetlands surrounded by high intensity land use).

Applicants must provide a Critical Areas Report with their permit applications. A Critical Areas Report for a riparian management area or riparian buffer must include an evaluation of habitat functions using the Clark County Habitat Conservation Ordinance Riparian Habitat Field Rating Form or another habitat evaluation tool approved by the WDFW. In addition, there are several performance standards that apply to habitat conservation areas, riparian management areas, and riparian buffers.

Vancouver Municipal Code. 2005. "Shoreline Management Area." VMC 20.760. Vancouver, WA.

Both a Substantial Development Permit and a Critical Areas Permit will be required for project activities on properties containing a wetland or buffer in a shoreline area.

Background: The purpose of the Shoreline Management Area code is to implement the policies and procedures set forth by the Shoreline Management Act of 1971 (SMA), as amended, and all applicable provisions contained in the Washington Administrative Code. The Shoreline Management Master Program (Ord. M-3231, as amended) is used to regulate uses within the Shoreline Management Area.

Vancouver Municipal Code. 2004. "SEPA Regulations." VMC 20.790.

An environmental impact statement must be prepared when the lead agency determines that a proposal is likely to have significant adverse environmental impacts. Approval of the EIS by state and local agencies will be required.

Background: This is the adoption of Washington's SEPA law by the City of Vancouver. RCW and WAC allow adoption of an EIS prepared in compliance with NEPA to fulfill the SEPA obligations.

Clark County Code. Title 40.4. 2005. "Critical Areas and Shorelines." Vancouver, WA.

A permit may be required if a project activity occurs in wetlands protected by the Clark County Code.

Background: Clark County has designated critical areas in accordance with GMA. The County updated its critical areas in 2005. Regulated activities in the Wetland Protection chapter (40.450) include the removal, excavation, grading, dredging, dumping, discharging, or filling of any material in excess of fifty (50) cubic yards or impacting more than one (1) acre of wetland or buffer, the construction of a structure, and the destruction or alteration of wetlands vegetation through clearing, harvesting, intentional burning, or planting of vegetation that would alter the character of a wetland or buffer.

City of Vancouver. Comprehensive Plan. 2004. Environmental Policies.

No permitting of project activities will be required under the City of Vancouver Comprehensive Plan.

Background: Vancouver's Comprehensive Plan includes the following provisions:

- Environmental protection (EN-1): Protect, sustain, and provide for healthy and diverse ecosystems.
- Habitat (EN-5): Protect riparian areas, wetlands, and other fish and wildlife habitat. Link fish and wildlife habitat areas to form contiguous networks. Support sustainable fish and wildlife populations.
- Trees and other vegetation (EN-8): Conserve and restore tree and plant cover, particularly native species, throughout Vancouver. Promote planting using native vegetation.

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10. References

Adamus, P.R. 2001. Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles. Oregon Department of State Lands. Salem, OR.

Clark County Public Works, Clean Water Program. 2004. Clark County Stream Health: A Comprehensive Overview of the Condition of Clark County's Streams, Rivers, and Lakes.

Clark GIS Digital Data. 2007. Clark County Wetland Inventory. Clark County Assessor's Office, County Washington. 2-10-07.

U.S. Army Corps of Engineers (COE). 1989. Columbia River and Tributaries Review Study: Project Data and Operating Limits, North Pacific Division, CRT 69. Available online at: http://www.nwd-wc.usace.army.mil/TMT/basin.html.

COE (U.S. Army Corps of Engineers). 1987. Environmental Laboratory Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, MS.

Cowardin L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U. S. Department of the Interior, Fish and Wildlife Service, Washington, DC.

David Evans and Associates. 2006. Draft Wetland Delineation Report, I-5: Victory to Lombard (ODOT Key #12076). Prepared for the Oregon Department of Transportation, August 2006.

Hitchcock, C. L., and Cronquist, A. 1973. Flora of the Pacific Northwest, University of Washington Press, Seattle, Wash.

Hruby, T. 2004. Washington State Wetland Rating System for Western Washington – Revised. Washington State Department of Ecology Publication # 04-06-025.

Metro. Nature in Neighborhoods, Ordinance No. 05-1077. Available at: http://www.metro-region.org/article.cfm?ArticleID=13806.

Munsell Color. 1975. Munsell Soil Color Charts, Kollmorgen Corporation, Baltimore, Md.

Oregon Climate Service (OCS). 2007. Precipitation Data for Portland, Oregon. Available online: http://www.ocs.oregonstate.edu/index.html

Reed, P.B., Jr. 1988. "National list of plant species that occur in wetlands: Northwest (Region 9)". U.S. Fish and Wildlife Service, Biological Report 88(26.9).

Reed, P.B., Jr. 1993. "1993 Supplement to list of plant species that occur in wetlands: Northwest (Region 9)". U.S. Fish and Wildlife Service, Supplement to Biological Report 88(26.9).

U.S. Department of Agriculture (USDA). 1972. Soil Survey of Clark County, Washington. Soil Conservation Service.

U.S. Fish and Wildlife Service (USFWS). 1989. National Wetlands Inventory, Vancouver, Washington – Oregon, USFWS Office of Biological Services.

U.S. Geological Service (USGS). 1988a. Camas, Washington - Oregon, 15 minute Quadrangle.

U.S. Geological Service (USGS). 1988b. Orchards, Washington, 15 minute Quadrangle.

U.S. Geological Service (USGS). 1989. Portland, Oregon - Washington, 15 minute Quadrangle.

U.S. Geological Service (USGS). 1989. Vancouver, Washington – Oregon, 15 minute Quadrangle.

USFWS (U.S. Fish and Wildlife Service). 1988 (and 1993 supplement). List of Plants that Occur in Wetlands. Region 9.

Washington State Department of Ecology (DOE). 1997. Washington State Wetlands Identification and Delineation Manual. Publication Number 96-94.

APPENDIX A

Plant Species Synonymy

List of Plant Species that Occur in Wetlands (Region 9)	**USDA Plants Database Synonymy**	
Agropyron repens (FAC-)	*Elymus repens*	
Alopecurus pratensis (FACW)	None	
Bidens cernua (FACW+)	None	
Bromus carinatus (NOL)	None	
Carex obnupta (OBL)	None	
Cornus stolonifera (FACW)	*Cornus sericea* ssp. *sericea*	
Elymus glaucus (FACU)	None	
Epilobium ciliatum (FACW-)	None	
Equisetum arvense (FAC)	None	
Fraxinus latifolia (FACW)	None	
Hordeum brachyantherum (FACW-)	None	
Impatiens noli-tangere (FACW)	None	
Juncus effusus (FACW)	None	
Phalaris arundinacea (FACW)	None	
Physocarpus capitatus (FACW-)	None	
Polygonum hydropiper (OBL)	None	
Polygonum persicaria (FACW)	None	
Populus balsamifera (FAC)	None	
Populus deltoides (FAC)	None	
Ribes sanguineum (NOL)	None	
Ribes sp. (assumed FAC)	None	
Rubus discolor (FACU)	*Rubus armeniacus*	
Rubus spectabilis (FAC+)	None	
Rubus ursinus (FACU)	None	
Salix babylonica (FAC+)	*Salix* x *sepulcralis*	
Salix hookeriana (FACW-)	None	
Salix lasiandra (FACW+)	*Salix lucida* ssp. *lasiandra*	
Salix sitchensis (FACW)	None	
Salix sp. (generally FAC or wetter)	None	
Symphoricarpos albus (FACU)	None	
Veronica americana (OBL)	None	

APPENDIX B

Wetland Data Sheets

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 07/20/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forested Plot # A-1
Plot location: West of I-5 and immediately east of Denver Ave, north of Schmeer Rd.
Recent Weather: 0.45 inches of precipitation in previous 2 weeks
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Salix lasiandra	FACW+	50	42
2. Populus balsamifera	FAC	40	33
3. Salix sp.	FAC	30	25

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	80	80
2. Equisetum arvense	FAC	20	20
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes Drainage Class: Poorly drained, mesic fluvaquentic endoaquolls: very poorly drained, mesic fluvaquentic endoaquepts

On Hydric Soils List? Y ☒ N ☐ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-4 inches	10YR 3/2	7.5 YR 3/4, few, med, dstnct	N/A	Silt Loam
4-18 inches	10YR 3/1	7.5YR 3/4, com, med, dstnct	N/A	Silt Loam

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion. Many fine roots are present in the soil profile.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: 1 inch Depth to free water: 5 inches

Primary Hydrology Indicators:
- ☐ Inundated
- ☒ Saturated in upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Saturation in the upper 12 inches, water marks, and sediment deposits satisfy the wetland hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 07/20/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forested Plot # A-2
Plot location: West of I-5 and immediately east of Denver Ave, north of Schmeer Rd.
Recent Weather: 0.45 inches of precipitation in previous 2 weeks
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Salix lasiandra	FACW+	30	50
2. Populus balsamifera	FAC	30	50
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	60	100
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Equisetum arvernse	FAC	40	67
2. Phalaris arundinacea	FACW	20	33
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 80%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes Drainage Class: Poorly drained, mesic fluvaquentic endoaquolls: very poorly drained, mesic fluvaquentic endoaquepts

On Hydric Soils List? Y ☒ N ☐ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-4 inches	10YR 3/2	none	N/A	Silt Loam
4-18 inches	10YR 3/2	none	N/A	gravelly Silt Loam

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area. Soils have a fine granular structure with some gravel in the upper 4 inches.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey..

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: Only one of the three wetland criteria were satisfied, indicating the sample area is not within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 07/20/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forested Plot # A-3
Plot location: West of I-5 and immediately east of Denver Ave, north of Schmeer Rd.
Recent Weather: 0.45 inches of precipitation in previous 2 weeks
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status/	Raw % Cover/	Rel % Cover
1. Salix lasiandra	FACW+	50	55
2. Populus balsamifera	FAC	40	45
3.			

Sapling/Shrub Stratum

	Status/	Raw % Cover/	Rel % Cover
1. Rubus discolor	FACU	20	100
2.			
3.			
4.			
5.			

Herb Stratum

	Status/	Raw % Cover/	Rel % Cover
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 67%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes Drainage Class: Poorly drained, mesic fluvaquentic endoaquolls: very poorly drained, mesic fluvaquentic endoaquepts

On Hydric Soils List? Y ☒ N ☐ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-4 inches	10YR 3/3	none	N/A	Silt Loam
4-18 inches	10YR 3/2	7.5YR 3/4, com, sm, dstnct	N/A	Silt Loam

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Redox features in the upper 10 inches satisfies the hydric soils criterion. Fine granular structure.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☒ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Water marks, sediment deposits, and water-stained leaves satisfy the wetland hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 07/20/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forested Plot # A-4
Plot location: West of I-5 and immediately east of Denver Ave, north of Schmeer Rd.
Recent Weather: 0.45 inches of precipitation in previous 2 weeks
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status/ Raw % Cover/ Rel % Cover
1.	
2.	
3.	

Sapling/Shrub Stratum

	Status/ Raw % Cover/ Rel % Cover
1. Rubus discolor	FACU 100 100
2.	
3.	
4.	
5.	

Herb Stratum

	Status/ Raw % Cover/ Rel % Cover
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 0%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☐ NO ☒ Comments: Less than 50% of the vegetation within the sample area is FAC or wetter, which does not satisfy the hyrophytic vegetation criterion

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes Drainage Class: Poorly drained, mesic fluvaquentic endoaquolls: very poorly drained, mesic fluvaquentic endoaquepts

On Hydric Soils List? Y ☒ N ☐ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-4 inches	10YR 3/2	none	N/A	Silt Loam
4-18 inches	10YR 3/2	none	N/A	gravelly silt loam

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area. Soils have a fine granular structure with some gravel in the upper 4 inches.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey..

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: None of the three wetland criteria were satisfied, indicating the sample area is not within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark, WA City: Vancouver Date: 08/01/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Herbaceous Plot # B-1
Plot location: East of Burnt Bridge Creek
Recent Weather: 0.2 inches of precipitation in the previous two weeks
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

Status/ Raw % Cover/ Rel % Cover

1. _____
2. _____
3. _____

Sapling/Shrub Stratum

Status/ Raw % Cover/ Rel % Cover

1. _____
2. _____
3. _____
4. _____
5. _____

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	30	25
2. Impatiens noli-tangere	FACW	30	25
3. Veronica americana	OBL	20	17
4. Epilobium ciliatum	FACW-	20	17
5. Polygonum persicaria	FACW	15	13
6. Lythrum salicaria	FACW+	5	3
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____

Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Wind River sandy loam, 30 to 65 percent slopes (WnG) Drainage Class: Well drained. Mesic Ultic Haploxerolls

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-12 inches	10YR 2/1	10YR 3/4 & 5YR 4/6, distnct	N/A	Silt Loam
12-18 inches	10YR 2/1	5YR 4/6, few, large, dstnct	N/A	Silt Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion. 0-12 inches fine granular structure; 12-18 inches medium blocky structure

HYDROLOGY

Recorded Data

☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data

Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☒ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Drift lines and water-stained leaves satisfy the wetland hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark, WA City: Vancouver Date: 08/01/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Scrub-shrub Plot # B-2
Plot location: East of Burnt Bridge Creek
Recent Weather: 0.2 inches of precipitation in the previous two weeks
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	30	42
2. Physocarpus capitatus	FACW-	20	29
3. Cornus stolonifera	FACW	20	29
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	40	80
2. Urtica dioica	FAC+	10	20
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 80%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the dominant vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Wind River sandy loam, 30 to 65 percent slopes (WnG) Drainage Class: Well drained. Mesic Ultic Haploxerolls

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-14 inches	10YR 3/3	none	N/A	SL

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area. Soils have a fine granular structure.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey..

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: Only one of the wetland criteria were met, indicating the sample area is not within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark, WA City: Vancouver Date: 08/01/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Scrub-shrub Plot # B-3
Plot location: East of Burnt Bridge Creek
Recent Weather: 0.2 inches of precipitation in the previous two weeks
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Physocarpus capitatus	FACW-	20	33
2. Rubus discolor	FACU	20	33
3. Cornus stolonifera	FACW	20	33
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	40	44
2. Impatiens noli-tangere	FACW	40	44
3. Mimulus guttatus	OBL	10	12
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 80%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Wind River sandy loam, 30 to 65 percent slopes (WnG) Drainage Class: Well drained. Mesic Ultic Haploxerolls

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-4 inches	10YR 2/1	10YR 3/4, few, med, fnt	N/A	Silt Loam
4-18 inches	10YR 2/1	7.5YR 4/6, mny, med, dstnct	N/A	Sild Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion. 0-4 inches fine granular structure with many fine roots; 4-18 inches medium blocky structure.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☒ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Water marks and water-stained leaves satisfy the wetland hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 08/28/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Herbaceous Plot # D-1
Plot location: Southwestern end of southern pond near I-5
Recent Weather: Dry, 90's
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum
Status/ Raw % Cover/ Rel % Cover
1. _____
2. _____
3. _____

Herb Stratum
Status/ Raw % Cover/ Rel % Cover
1. Phalaris arundinacea FACW 60 100
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Sapling/Shrub Stratum
Status/ Raw % Cover/ Rel % Cover
1. _____
2. _____
3. _____
4. _____
5. _____

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophitic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0-3 percent slopes (47A) OR Water (W) Drainage Class: deep, poorly drained soils, mesic Fluvaquentic Endoaquolls (Sauvie); very deep, very poorly drained, mesic Fluvaquentic Endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-4 inches	10YR 2/1	10YR 3/6 – common, faint, small	N/A	Silt loam, fine granular
4-18 inches	10YR 3/1	10YR 3/6 – common, distinct, medium	N/A	Silt loam, medium block

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: 6 inches Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☒ Saturated in upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Saturation in the upper 12 inches, water marks, and drift lines satisfy the hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 08/28/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forest Plot # D-2
Plot location: Southwestern edge of southern pond near I-5
Recent Weather: Dry, 90's
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Populus balsamifera	FAC	80	100
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	20	40
2. Symphoricarpos albus	FACU	20	40
3. Rosa pisocarpa	FAC	10	20
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	23	100
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 60%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0-3 percent slopes (47A) OR Water (W) Drainage Class: deep, poorly drained soils, mesic Fluvaquentic Endoaquolls (Sauvie); very deep, very poorly drained, mesic Fluvaquentic Endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-18 inches	10YR 2/2	none	N/A	Silt loam, small granular

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey.

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: Only one of the three wetland criteria were satisfied, indicating the sample area is not within a wetland. The plot is located upslope from the wetland – approximately 4 feet higher than the wetland – near ODOT right-of-way.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 08/28/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Shrub Plot # D-3
Plot location: Western end of southern pond near I-5
Recent Weather: Dry, 90's
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status/ Raw % Cover/ Rel % Cover
1.	
2.	
3.	

Sapling/Shrub Stratum

	Status/ Raw % Cover/ Rel % Cover
1. Salix hookerana	FACW- 50 100
2.	
3.	
4.	
5.	

Herb Stratum

	Status/ Raw % Cover/ Rel % Cover
1. Phalaris arundinacea	FACW 60 67
2. Bidens cernua	FACW+ 30 33
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0-3 percent slopes (47A) OR Water (W) Drainage Class: deep, poorly drained soils, mesic Fluvaquentic Endoaquolls (Sauvie); very deep, very poorly drained, mesic Fluvaquentic Endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-3 inches	10YR 3/1	2.5YR 3/6 – many, distinct, large	N/A	Silty clay loam, medium block
3-18 inches	10YR 2/1	10YR 3/6 – few, faint, small	N/A	Silty clay loam, medium block

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: surface Depth to free water: 5 inches

Primary Hydrology Indicators:

- ☐ Inundated
- ☒ Saturated in upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Saturation in the upper 12 inches and drift lines satisfy the hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 08/28/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forest Plot # D-4
Plot location: Western edge of southern pond near I-5
Recent Weather: Dry, 90's
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Populus balsamifera	FAC	80	100
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	30	43
2. Symphoricarpos albus	FACU	40	57
3.			
4.			
5.			

Herb Stratum

Status/ Raw % Cover/ Rel % Cover

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 33%
Other Hydrophytic Vegetation Indicators: _____

Criteria Met? YES ☐ NO ☒ Comments: Less than 50% of the vegetation within the sample area is FAC or wetter, which does not satisfy the hyrophyitic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0-3 percent slopes (47A) OR Water (W) Drainage Class: deep, poorly drained soils, mesic Fluvaquentic Endoaquolls (Sauvie); very deep, very poorly drained, mesic Fluvaquentic Endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-4 inches	10YR 3/2	none	N/A	Silt loam, small granular
4+	hardpan/fill	-	-	-

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey.

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: None of the wetland criteria were satisfied, indicating the sample area is not within a wetland. The plot is located upslope from the wetland – approximately 5 feet higher than the wetland – just east of Parks facility parking lot.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 08/28/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forest Plot # D-5
Plot location: Northwestern end of northern pond near I-5
Recent Weather: Dry, 90's
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Salix babylonica	FAC+	100	100
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0-3 percent slopes (47A) OR Water (W) Drainage Class: deep, poorly drained soils, mesic Fluvaquentic Endoaquolls (Sauvie); very deep, very poorly drained, mesic Fluvaquentic Endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-4 inches	10YR 2/1	none	N/A	Silty clay loam fine, many fine roots
4-8 inches	sandy	none	N/A	sand, w/ sparse organic streaking
18 inches	10YR 2/1	2.5 YR 3/6 many, distinct, large	N/A	Silty clay loam fine, several large roots

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☒ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors, redox features, and organic streaking in sandy soils satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Saturation in the upper 12 inches and drift lines satisfy the hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 08/28/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forest Plot # D-6
Plot location: Northwestern end of northern pond near I-5
Recent Weather: Dry, 90's
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Prunus virginiana	FACU	60	67
2. Fraxinus latifolia	FACW	30	33
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	20	100
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1.Convolvulus arvensis	NOL	20	100
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 25%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☐ NO ☒ Comments: Less than 50% of the vegetation within the sample area is FAC or wetter, which does not satisfy the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0-3 percent slopes (47A) OR Water (W) Drainage Class: deep, poorly drained soils, mesic Fluvaquentic Endoaquolls (Sauvie); very deep, very poorly drained, mesic Fluvaquentic Endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-12 inches	10YR 3/2	none	N/A	Silt loam, small granular
12+	hardpan	-	-	-

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey.

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: None of the wetland criteria were satisfied, indicating the sample area is not within a wetland. The plot is located upslope from the wetland – approximately 3 feet higher than the wetland – within unmaintained vegetated area.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 08/28/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forest Plot # D-7
Plot location: Southeastern end of northern pond.
Recent Weather: Dry, 90's
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Populus balsamifera	FAC	60	75
2. Fraxinus latifolia	FACW	20	25
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1.Salix sitchensis	FACW	30	60
2. Rubus discolor	FACU	10	20
3. Crataegus douglasii	FAC	10	20
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1.Carex obnupta	OBL	40	100
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 83%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0-3 percent slopes (47A) OR Water (W) Drainage Class: deep, poorly drained soils, mesic Fluvaquentic Endoaquolls (Sauvie); very deep, very poorly drained, mesic Fluvaquentic Endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-12 inches	10YR 2/1	2.5 YR 3/6 many, distinct, medium	N/A	Silty clay loam, medium block
12- 18 inches	10YR 3/1	10YR 3/6 many medium visible	N/A	Silty clay loam, medium block

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: 8 inches Depth to free water: 16 inches

Primary Hydrology Indicators:

- ☐ Inundated
- ☒ Saturated in upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Saturation in the upper 12 inches and drift lines satisfy the hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 08/28/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Forest Plot # D-8
Plot location: Southeastern end of northern pond
Recent Weather: Dry, 90's
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Prunus virginiana	FACU	40	57
2. Alnus rubra	FAC	30	43
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Acer circinatum	FAC-	20	50
2. Rubus discolor	FACU	10	25
3. Symphoricarpos albus	FAC	10	25
4.			
5.			

Herb Stratum

Status/ Raw % Cover/ Rel % Cover

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 40%
Other Hydrophytic Vegetation Indicators: _____

Criteria Met? YES ☐ NO ☒ Comments: Less than 50% of the vegetation within the sample area is FAC or wetter, which does not satisfy the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0-3 percent slopes (47A) OR Water (W) Drainage Class: deep, poorly drained soils, mesic Fluvaquentic Endoaquolls (Sauvie); very deep, very poorly drained, mesic Fluvaquentic Endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-12 inches	10YR 3/2	none	N/A	Silt loam, small granular
12+	hardpan	-	-	-

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey.

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: None of the wetland criteria were satisfied, indicating the sample area is not within a wetland. The plot is located at the top of a 2:1 slope from the wetland – approximately 15 feet higher than the wetland. The upland plot in this area was not closer to the wetland boundary due to unsafe access on the steep slope.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark, WA City: Vancouver Date: 09/22/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly & Cyrus Bullock
Plant Community: Herbaceous Plot # E-1
Plot location: Sample plot in Burnt Bridge Creek riparian area. West of I-5, south of railroad tracks.
Recent Weather: 0.86 inches during previous 2 weeks.
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

Status/ Raw % Cover/ Rel % Cover

1. _____
2. _____
3. _____

Sapling/Shrub Stratum

Status/ Raw % Cover/ Rel % Cover

1. _____
2. _____
3. _____
4. _____
5. _____

Herb Stratum

Status/ Raw % Cover/ Rel % Cover

1. Phalaris arundinacea FACW 100 100
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____

Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion

SOILS

Map Unit Name: Wind River sandy loam, 8 to 20 percent slopes Drainage Class: Well-drained. Mesic Ultic Haploxerolls.

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-18 inches	10YR 3/2	none	N/A	sandy Silt Loam

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area.

HYDROLOGY

Recorded Data

☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data

Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No indicators of wetland hydrology were present within the sample area.

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: Only one of the three wetland criteria were satisfied, indicating the sample area is not within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark, WA City: Vancouver Date: 09/22/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly and Cyrus Bullock
Plant Community: Herbaceous Plot # F-1
Plot location: South of SR 500, between 39th St and SR-500 entrance ramp, east of P St.
Recent Weather: 0.86 inches during previous 2 weeks.
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	5	N/A
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Juncus effusus	FACW	60	60
2. Phalaris arundinacea	FACW	40	40
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion. Rubus discolor was not included in the dominance calculation due to its relative rarity within the sample area.

SOILS

Map Unit Name: Wind River gravelly loam, 12 to 50 percent slopes (WrF) Drainage Class: Well drained. Mesic Ultic Haploxerolls

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-4 inches	10YR 2/1	none	N/A	sandy Silt Loam
4-12 inches	10YR 3/1	5YR 4/6, com, dstnct, sm	N/A	sandy Silt Loam

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion. Many fine roots in upper 4 inches. Soil has fine granular structure.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☒ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Drainage patterns and water-stained leaves satisy the wetland hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark, WA City: Vancouver Date: 09/22/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly and Cyrus Bullock
Plant Community: Scrub-shrub Plot # F-2
Plot location: South of SR 500, between 39th St and SR-500 entrance ramp, east of P St.
Recent Weather: 0.86 inches during previous 2 weeks.
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Prunus virginiana	FACU	30	50
2. Malus pumila.	NOL	20	33
3. Acer macrophyllum	FACU	10	18

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	80	89
2. Corylus cornuta	FACU	10	11
3.			
4.			
5.			

Herb Stratum

Status/ Raw % Cover/ Rel % Cover

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 0%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☐ NO ☒ Comments: Less than 50% of the vegetation within the sample area is FAC or wetter, which deos not satisfy the hyrophytic vegetation criterion

SOILS

Map Unit Name: Wind River gravelly loam, 12 to 50 percent slopes (WrF) Drainage Class: Well drained. Mesic Ultic Haploxerolls

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-10 inches	10YR 3/3	7.5 YR 4/6, many, dstnct, sm	N/A	sandy Clay Loam
10+	gravel	none	N/A	gravel

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: Redox features in the upper 10 inches without low chroma colors does not satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: _____

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: None of the three wetland criteria were satisfied, indicating the sample area is not within a wetland..

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark, WA City: Vancouver Date: 09/22/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly and Cyrus Bullock
Plant Community: Herbaceous Plot # G-1
Plot location: South of SR 500, between the highway and the eastbound entrance ramp from P St.
Recent Weather: 0.86 inches during previous 2 weeks.
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Populus deltoides	FAC	20	100
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Alopecurus pratensis	FACW	40	40
2. Phalaris arundinacea	FACW	20	20
3. Agropyron repens	FAC-	20	20
4. Unidentified grasses	unkno	20	20
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 75%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Wind River sandy loam, 0 to 8 percent slopes Drainage Class: Well drained. Mesic Ultic Haploxerolls

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-4 inches	10YR 3/2	none	N/A	sandy Silt Loam
4-18 inches	n/a	none	N/A	sndy gravl

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No indicators of wetland hydrology were present within the sample area.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☐ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☒ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Sediment deposits and water-stained leaves satisfy wetland hydrology criterion.

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: Only two of the three wetland criteria were satisfied, indicating the sample plot is not within a wetland. The area is a drainage ditch within WA DOT right of way. At the lowest point (western end of ditch) there is a stormwater drain.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark City: Vancouver Date: 08/30/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Herbaceous Plot # H-1
Plot location: East of I-5, west of Burnt Bridge Creek, near Leverich Park. Center of wetland area near impounding water from Burnt Bridge Creek/Stormwater outfall
Recent Weather: 0.12 inches of recent rain (8/29 and 8/30)
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status/ Raw % Cover/ Rel % Cover
1.	
2.	
3.	

Sapling/Shrub Stratum

	Status/ Raw % Cover/ Rel % Cover
1. Rubus discolor	FACU 5 N/A
2.	
3.	
4.	
5.	

Herb Stratum

	Status/ Raw % Cover/ Rel % Cover
1. Phalaris arundinacea	FACW 60 49
2. Polygonum hydropiper	OBL 30 25
3. Polygonum persicaria	FACW 20 17
4. Dipsacus sylvestris	FAC 5 4
5. Impatiens noli-tangere	FACW 5 4
6. Cirsium vulgare	FACU 1 1
7.	
8.	
9.	
10.	
11.	
12.	

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion. Rubus discolor was not included in the dominance calculation due to its relative rarity in the sample area.

SOILS

Map Unit Name: Wind River sandy loam, 30 to 65 percent slopes (WnG) Drainage Class: well drained. mesic Ultic Haploxerolls.

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-2 inches	sand	n/a	N/A	sand
2-18 inches	10YR 3/2	5YR 4/6 – common, medium, visible	N/A	Silty clay loam, small block

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: 11 inches Depth to free water: 13 inches

Primary Hydrology Indicators:

- ☐ Inundated
- ☒ Saturated in upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Saturation in the upper 12 inches, water marks, and drainage patterns satisfy the hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark City: Vancouver Date: 08/30/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Shrub Plot # H-2
Plot location: East of I-5, west of Burnt Bridge Creek, near Leverich Park. Southern edge of wetland area
Recent Weather: 0.12 inches of recent rain (8/29 and 8/30)
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	15	100
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	95	85
2. Urtica dioica	FAC+	15	14
3. Cirsium arvense	FACU	1	1
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 50%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☐ NO ☒ Comments: Less than 50% of the vegetation within the sample area is FAC or wetter, which does not satisfy the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Wind River sandy loam, 30 to 65 percent slopes (WnG) Drainage Class: well drained. mesic Ultic Haploxerolls.

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-18 inches	10YR 3/2	7.5YR 4/6 – common, small, visible	N/A	Silty clay loam, small block

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey.

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: Only one of the three of the wetland criteria were met, indicating the sample area is not within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark City: Vancouver Date: 08/30/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Shrub Plot # H-3
Plot location: East of I-5, west of Burnt Bridge Creek, near Leverich Park. Western edge of wetland area
Recent Weather: 0.12 inches of recent rain (8/29 and 8/30)
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	40	31
2. Cornus stolonifera	FACW	60	46
3. Corylus cornuta	FACU	30	23
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	40	89
2. Urtica dioica	FAC+	5	11
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 50%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☐ NO ☒ Comments: Only 50% of the vegetation within the sample area is FAC or wetter, which does not satisfy the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Wind River sandy loam, 30 to 65 percent slopes (WnG) Drainage Class: well drained. mesic Ultic Haploxerolls.

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-18 inches	10YR 3/2	7.5YR 4/6 – common, small, visible	N/A	Silty clay loam, small block

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma soil colors and redox features satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: none Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey.

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: Only one of the three of the wetland criteria were met, indicating the sample area is not within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Clark City: Vancouver Date: 08/30/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly
Plant Community: Scrub-shrub Plot # I-1
Plot location: West of I-5, east of Main St., north of 39th. Plot taken at lowest topographic point in the area, near a stormwater culvert.
Recent Weather: 0.12 inches of recent rain (8/29 and 8/30)
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Populus balsamifera	FAC	70	100
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Salix sp.	FACW	40	89
2. Rubus discolor	FACU	5	11
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	50	91
2. Urtica dioica	FAC+	5	9
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 100%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Wind River sandy loam, 30 to 65 percent slopes (WnG) Drainage Class: Well drained. Mesic Ultic Haploxerolls.

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☐ N ☒

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-10 inches	10YR 3/3	none	N/A	sandy loam
10-18 inches	n/a	none	N/A	sand

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No indicators of wetland hydrology were present within the sample area

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: Only one of the three wetland criteria were satisfied, indicating the sample area is not within a wetland. The sample plot occurs near a culvert passing under I-5. The area is at the base of steep slopes from the east (I-5 roadway prism) and west (school property).

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 09/26/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly and Cyrus Bullock
Plant Community: Forsted Plot # L-1
Plot location: East of the Marine Dr. southbound entrance ramp onto I-5, west of trimet, south of Marine Dr.
Recent Weather: 0.83 inches during previous 2 weeks.
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Salix lasiandra	FACW+	40	67
2. Populus balsamifera	FAC	20	33
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	20	100
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	20	100
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 75%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes Drainage Class: Poorly drained, mesic fluvaquentic endoaquolls: very poorly drained, mesic fluvaquentic endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-1 inches	organic	none	N/A	organic
1-18 inches	sand	10YR 4/6, com, dstnct, sm	N/A	sandy

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☒ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Redox features and organic pan (in sandy soils) satisfies the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☒ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☒ Other: organic material oxidation at surface.

Criteria Met? YES ☒ NO ☐ Comments: Water marks, water-stained leaves, and surface oxidation satisfy the wetland hydrology criterion.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 09/26/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly and Cyrus Bullock
Plant Community: Forsted Plot # L-2
Plot location: East of the Marine Dr. southbound entrance ramp onto I-5, west of trimet, south of Marine Dr.
Recent Weather: 0.83 inches during previous 2 weeks.
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Populus balsamifera	FAC	80	100
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	40	100
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 50%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☐ NO ☒ Comments: 50% of the vegetation within the sample area is FAC or wetter, which does not satisfy the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes Drainage Class: Poorly drained, mesic fluvaquentic endoaquolls: very poorly drained, mesic fluvaquentic endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-18 inches	sand	none	N/A	sand

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: None of the three wetland criteria were satisfied, indicating the sample area is not within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 09/26/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly and Cyrus Bullock
Plant Community: Forsted Plot # M-1
Plot location: East of the Marine Dr. southbound entrance ramp onto I-5, west of trimet, south of Marine Dr.
Recent Weather: 0.83 inches during previous 2 weeks.
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status	Raw % Cover	Rel % Cover
1. Populus balsamifera	FAC	30	100
2.			
3.			

Sapling/Shrub Stratum

	Status	Raw % Cover	Rel % Cover
1. Rubus discolor	FACU	15	100
2.			
3.			
4.			
5.			

Herb Stratum

	Status	Raw % Cover	Rel % Cover
1. Phalaris arundinacea	FACW	80	73
2. Polygonum amphibium	OBL	15	13
3. Juncus effusus	FACW	10	9
4. Solanum dulcamara	FAC+	5	5
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 67%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☒ NO ☐ Comments: Greater than 50% of the vegetation within the sample area is FAC or wetter, which satisfies the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes Drainage Class: Poorly drained, mesic fluvaquentic endoaquolls: very poorly drained, mesic fluvaquentic endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
0-6 inches	10YR 3/2	10YR 4/6, few, dstnct, sm	N/A	clay loam
6-18 inches	10YR 4/1	10YR 4/6, com, dstnct, med	N/A	clay

Hydric Soil Indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☒ Gleyed or low chroma colors
- ☒ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☒ NO ☐ Comments: Low chroma colors and redox features satisfy the hydric soils criterion.

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):
- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☒ NO ☐ Comments: Water marks and sediment deposits satisfy the wetland hydrology criterion. A culvert discharges into the wetland area.

DETERMINATION

WETLAND? YES ☒ NO ☐ Comments: All three of the wetland criteria were met, indicating the sample area is within a wetland.

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: Multnomah City: Portland Date: 09/26/06 File # _____
Project/Contact: CRC Det. by: Tina Farrelly and Cyrus Bullock
Plant Community: Forsted Plot # M-2
Plot location: East of the Marine Dr. southbound entrance ramp onto I-5, west of trimet, south of Marine Dr.
Recent Weather: 0.83 inches during previous 2 weeks.
Do normal environ. conditions exist? Y ☒ N ☐ If No, explain: _____
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain: N/A

VEGETATION

Tree Stratum

	Status/ Raw % Cover/ Rel % Cover
1. Populus balsamifera	FAC 70 100
2.	
3.	

Sapling/Shrub Stratum

	Status/ Raw % Cover/ Rel % Cover
1. Rubus discolor	FACU 60 100
2.	
3.	
4.	
5.	

Herb Stratum

Status/ Raw % Cover/ Rel % Cover

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 50%
Other Hydrophytic Vegetation Indicators: _____
Criteria Met? YES ☐ NO ☒ Comments: 50% of the vegetation within the sample area is FAC or wetter, which does not satisfy the hyrophytic vegetation criterion.

SOILS

Map Unit Name: Sauvie-Rafton-Urban land complex, 0 to 3 percent slopes Drainage Class: Poorly drained, mesic fluvaquentic endoaquolls: very poorly drained, mesic fluvaquentic endoaquepts

On Hydric Soils List? Y ☐ N ☒ Has hydric inclusions? Y ☒ N ☐

Depth Range of Horizon	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture
		* abund./size/contrast/color/location (matrix or pores/peds)		
0-18 inches	sand	none	N/A	sand

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Reducing Conditions (tests positive)
- ☐ Gleyed or low chroma colors
- ☐ Redox features within 10" (e.g., concentrations)
- ☐ Concretions/Nodules (w/in 3"; > 2mm)
- ☐ High organic content in surface (in Sandy Soils)
- ☐ Organic streaking (in Sandy Soils)
- ☐ Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ☐ NO ☒ Comments: No hydric soil indicators were present within the sample area

HYDROLOGY

Recorded Data
☐ Recorded Data Available ☒ Aerial Photos ☐ Stream gauge ☐ Other ☐ No Recorded Data Available

Field Data
Depth of inundation: 0 Depth to Saturation: none Depth to free water: none

Primary Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- ☐ Oxidized Root Channels (upper 12")
- ☐ Water-stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other: _____

Criteria Met? YES ☐ NO ☒ Comments: No primary or secondary indicators of wetland hydrology were present at the time of survey

DETERMINATION

WETLAND? YES ☐ NO ☒ Comments: None of the three wetland criteria were satisfied, indicating the sample area is not within a wetland.

APPENDIX C

Oregon HGM and Washington Rating

Water Storage and Delay

Highest Functioning	**WL-F** SR 500	**WL-B** BPA	**Mit-WADOT**	**SW detention ponds**	**WL-H** City of Vancouver	**WL-L/M** Marine Dr. South-Trimet	**WL-D** Delta Park	**Vanport**	**WL-A** Trimet west triangle	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**WL-C** DEA 1 - north triangle	**WL-J** DEA 2 - east triangel	**WL-K** DEA 3 - schmeer slough	**Minimal Functioning**
___ The proportion of the site that is inundated only seasonally is large. The seasonallyinundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	0.2	0.3	0.4	n/a	0.3	0.5	0.6	0.9	0.4	0.4	0.3	0.5	0.5	0.5	___ None of the site is inundated only seasonally. The site is always comprised only of permanent water or a high water table without surface water.
___ Most of the surface water in the seasonallyinundated zone remains for a few days after each rain event, but not less or more.	0.5	0.5	0.5	n/a	0.5	0.5	0.6	0.6	0.5	0.3	0.5	0.5	0.5	0.5	___ Water added from rain events empties quickly from all of the site, via outlets or percolation. This often is evidenced by: ___ lack of flood marks on trees and shrubs ___ scarcity of wetland plants (few FAC or wetter) ___ little or no mottling of soils throughout the seasonally-inundated zone. ___ site is located on slope ___ site is flat (few or no puddles, etc.) ___ presence of outlet channels
Function Capacity Score:	**0.35**	**0.4**	**0.45**	**n/a**	**0.4**	**0.5**	**0.6**	**0.75**	**0.45**	**0.35**	**0.4**	**0.5**	**0.5**	**0.5**	

Function Capacity (Judgmental Assessment of):

Sediment Stabilization and Phosphorus Retention

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	0.35	0.4	0.45	n/a	0.4	0.5	0.6	0.75	0.45	0.35	0.4	0.5	0.5	0.5	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
___ Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	0.1	0.2	0.1	n/a	0.1	0.1	0.2	0.6	0.1			0.1	0.1	0.1	___ Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
___ Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	0.8	0.8	0.6	n/a	0.8	0.4	0.6	0.5	0.6	0.6	0.8	0.8	0.8	0.8	___ All or nearly all of the substrate in the seasonal zone is unvegetated.
___ Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	0.2	0.4	0.6	n/a	0.4	0.2	0.4	0.6	0.4	0.2	0.2	0.4	0.4	0.4	___ Shallow pools are absent at all times of the year
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	0.1	0.6	0.1	n/a	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	0.6	0.6	0.6		0.6	0.4	0.4	0.8	0.5	0.2	0.4	0.5	0.5	0.5	___ The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)
Function Capacity Score:	**0.358333333**	**0.5**	**0.408333333**	**n/a**	**0.416666667**	**0.283333333**	**0.383333333**	**0.558333333**	**0.358333333**	**0.29**	**0.4**	**0.4**	**0.4**	**0.4**	

Function Capacity (Judgmental Assessment of):
Nitrogen Removal

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
Note: Proceed with assessing this function only if mottling and/or other features that indicate oxygen deficits in soils/ sediments are found in at least part of the site.															
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	0.35	0.4	0.45	n/a	0.4	0.5	0.6	0.75	0.45	0.35	0.4	0.5	0.5	0.5	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
___ Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	0.1	0.4	0.3	n/a	0.4	0.3	0.5	0.6	0.5	0.1	0.2	0.3	0.3	0.3	___ No surface water or saturation remains year-round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g., channel or pond, and does not remain for long.
___ Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees.	0.1	0.2	0.1	n/a	0.2	0.6	0.6	0.4	0.6	0.1	0.4	0.3	0.3	0.5	___ Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large diameter trees
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	0.1	0.6	0.1	n/a	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	0.2	0.4	0.6	n/a	0.4	0.2	0.4	0.6	0.4	0.2	0.2	0.4	0.4	0.4	___ Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
___ Site is burned annually or biennially	0	0	0		0	0	0	0	0	0	0	0	0	0	___ Site has not been burned in recent years
Function Capacity Score:	**0.141666667**	**0.333333333**	**0.258333333**	**n/a**	**0.266666667**	**0.283333333**	**0.366666667**	**0.408333333**	**0.341666667**	**0.141666667**	**0.233333333**	**0.266666667**	**0.266666667**	**0.3**	

Function Capacity (Judgmental Assessment of):

Primary Production

Highest Functioning	SR 500	BPA	Mit-WADOT	SW detention ponds	City of Vancouver	Marine Dr. South-Trimet	Delta Park	Vanport	Trimet west triangle	PJWA-G SR 500	PJWA-I Kiggins Bowl	DEA 1 - north triangle	DEA 2 - east triangel	DEA 3 - schmeer slough	Minimal Functioning
___ All of the site has vascular plants and/or water with algae.	0.8	0.8	0.8		0.8	0.6	0.6	0.6	0.8	0.6	0.8	0.8	0.8	0.8	___ Much of the site is devoid of vascular plants and/or algae.
___ A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	0.2	0.4	0.3		0.4	0.5	0.8	0.4	0.5	0.2	0.6	0.4	0.4	0.6	___ Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
___ Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	0.1	0.4	0.3	n/a	0.4	0.3	0.5	0.6	0.5	0.1	0.2	0.3	0.3	0.3	___ The site is entirely dry during much of the year.
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	0.1	0.6	0.1	n/a	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
___ The site's contributing watershed contains no cropland, paved surface, buildings, or lawns – especially in the parts closest to the site.	0.2	0.8	0.7		0.5	0.3	0.2	0.5	0.2	0.1	0.3	0.2	0.2	0.3	___ The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.
Function Capacity Score:	**0.28**	**0.6**	**0.44**	**0**	**0.46**	**0.36**	**0.44**	**0.44**	**0.42**	**0.22**	**0.42**	**0.36**	**0.36**	**0.42**	

Function Capacity (Judgmental Assessment of):
Thermoregulation

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
Note: This function should be assessed only for riverine sites at which part of the site is permanently inundated and connected by surface water during summer to other water bodies.															
___ Entire water surface in summer is shaded by a closed tree canopy or by topography.	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
___ Almost the entire site consists of water deeper than 6 ft.	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Very little of the site contains permanent water, and it never is deeper than a few inches.
Function Capacity Score:	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	

Function Capacity (Judgmental Assessment of):
Resident Fish Habitat Support

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
Note: This function may be assessed only if part of the site is permanently inundated and the subclass is Riverine Impounding.															
___ Permanent water is extensive, and the site is connected only briefly with associated channels	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Permanent water is very limited
___ Non-native fish species are absent	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Non-native species dominate the resident fish component, although some natives are present
___ Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
___ Water quality (especially dissolved oxygen) is excellent	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
Function Capacity Score:															

Function Capacity (Judgmental Assessment of):
Anadromous Fish Habitat Support

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
Note: Proceed with assessing this function only if part of the site is accessible to anadromous fish during seasonal inundation															
___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Floodwaters enter most of the site entirely through a narrow channel, ditch, or pipe
___ Floodwaters remain in the site for more than a few days	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ No surface water remains in the site for more than a few days
___Non-native fish species are generally absent	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Non-native fish species predominate
___Substrates suitable for spawning or feeding are extensively present	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Substrates suitable for spawning or feeding are scarce or absent
___Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
___Water quality (especially dissolved oxygen) is excellent	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___Summertime temperature maxima do not exceed preferred range of anadromous fish	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	___Summertime temperature maxima exceed limits lethal to anadromous fish
Function Capacity Score:															

Function Capacity (Judgmental Assessment of):

Invertebrate Habitat Support

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
___ Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	0.1	0.4	0.3	n/a	0.4	0.3	0.5	0.6	0.5	0.1	0.2	0.3	0.3	0.3	___ Surface water is present only briefly (RI sites) or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
___Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	0.1	0.2	0.1	0	0.2	0.4	0.6	0.4	0.5	0.1	0.2	0.4	0.4	0.5	___Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
___Plant forms and species are highly diverse	0.1	0.4	0.3		0.4	0.5	0.6	0.6	0.4	0.1	0.5	0.3	0.3	0.5	___Only one plant form is present, and plant species richness is very low
___Water quality (especially dissolved oxygen) is excellent	0.1	0.4	0.2	0	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.2	0.2	0.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Vegetation is well-interspersed with pools	0.2	0.4	0.6	n/a	0.4	0.2	0.4	0.6	0.4	0.2	0.2	0.4	0.4	0.4	___ Vegetation and pools (if any) are in 2 separate areas or zones
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	0.1	0.6	0.1	n/a	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	0.1	0.4	0.4		0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	___ Surrounding landscape contains no wetlands or ponds
Function Capacity Score:	**0.114285714**	**0.4**	**0.285714286**	**0**	**0.3**	**0.271428571**	**0.371428571**	**0.4**	**0.314285714**	**0.114285714**	**0.242857143**	**0.271428571**	**0.271428571**	**0.328571429**	

* Areas likely to retain water well into the growing season may have many of these characteristics:
___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone.
___ site is located in flatland terrain (not on slopes)
___ site is large relative to its contributing watershed (>4% of total area)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Function Capacity (Judgmental Assessment of):

Amphibian & Turtle Habitat

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
___ Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs[1] is extensive, and recedes very gradually during the months of January – May[2] (i..e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches). OR: ___ Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs[1]	0.2	0.3	0.3		0.3	0.2	0.6	0.6	0.2	0.1	0.2	0.2	0.2	0.2	___ Site never contains surface water OR ___ Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly-submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
___ Bullfrogs and other non-native predators are absent	0.8	0.4	0.8		0.4	0.8	0.2	0.2	0.4	0.4	0.4	0.6	0.6	0.6	___ Bullfrogs and other non-native predators are abundant
___ If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)	0.2	0.6	0.6		0.4	0.6	0.6	0.6	0.6	0.2	0.3	0.4	0.4	0.4	___ If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
___ There is extensive and varied woody debris in the seasonal zone	0.1	0.2	0.1		0.2	0.3	0.6	0.3	0.3	0.1	0.4	0.2	0.2	0.3	___ There is no woody debris in the seasonal zone
___ Either vegetation and pools are well-interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end.[3] Microtopography is quite varied.	0.2	0.4	0.3	0	0.4	0.5	0.8	0.4	0.5	0.2	0.6	0.4	0.4	0.6	___ Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
___ Suitable basking sites for turtles and calling sites for frogs are present	0.1	0.2	0.1		0.2	0.2	0.4	0.4	0.2	0.1	0.2	0.2	0.2	0.2	___ There are no basking sites for turtles or calling sites for frogs
___ Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	0.1	0.6	0.5		0.4	0.5	0.5	0.8	0.3	0.1	0.6	0.3	0.3	0.4	___ Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
___ Shorelines are gently sloping	0.2	0.3	0.3		0.2	0.2	0.3	0.6	0.3	0.1	0.1	0.3	0.3	0.3	___ Shorelines, if present, are mostly steep
___Busy roads are distant from the site	0.1	0.8	0.6		0.1	0.1	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	___ Busy roads adjoin the site
___ Many other wetlands (excluding flowing water) are present nearby	0.1	0.4	0.4	0	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	___ There are no other wetlands (excluding flowing water) nearby
___ Water quality is excellent	0.1	0.4	0.2	0	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.2	0.2	0.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Function Capacity (Judgmental Assessment of):

Amphibian & Turtle Habitat (continued)

Highest Functioning	SR 500	BPA	Mit-WADOT	SW detention ponds	City of Vancouver	Marine Dr. South-Trimet	Delta Park	Vanport	Trimet west triangle	PJWA-G SR 500	PJWA-I Kiggins Bowl	DEA 1 - north triangle	DEA 2 - east triangel	DEA 3 - schmeer slough	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	0.1	0.6	0.1	n/a	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
___ Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)	0.1	0.1	0.1		0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	___ Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.
Function Capacity Score:	**0.184615385**	**0.407692308**	**0.338461538**	**0**	**0.261538462**	**0.315384615**	**0.384615385**	**0.392307692**	**0.269230769**	**0.138461538**	**0.284615385**	**0.253846154**	**0.253846154**	**0.3**	

[1] Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except cattail.

[2] Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)

___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone.

___ site is located in flatland terrain (not on slopes)

___ extensive microtopographic variation (many hummocks, puddles, etc.)

___ absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

[3] Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Function Capacity (Judgmental Assessment of):

Breeding Waterbird Support

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
___ The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby AND ___ Water depths are predominantly shallow (2 to 24 inches) in April-August*	0.1	0.2	0.1		0.2	0.2	0.5	0.8	0.2	0.1	0.1	0.1	0.1	0.4	___ Surface water is present for only a few weeks during April-June, OR ___ Nearly all of the water remains deeper than 6 ft during May-September AND ___ No permanent wetlands are located nearby.
___ Most of the shoreline is not steep	0.2	0.3	0.3	0	0.2	0.2	0.3	0.6	0.3	0.1	0.1	0.3	0.3	0.3	___ Most of the shoreline is steep
___ Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.	0.1	0.2	0.1		0.2	0.1	0.2	0.8	0.1	0.1	0.1	0.1	0.1	0.2	___ Larger pools, if present, are bordered by only a narrow band of sparse vegetation
___ About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period	0.2	0.4	0.6	n/a	0.4	0.2	0.4	0.6	0.4	0.2	0.2	0.4	0.4	0.4	___ Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
___ Water levels do not abruptly rise a foot or more during April-June	0.8	0.8	0.6		0.6	0.6	0.6	0.8	0.6	0.5	0.5	0.6	0.6	0.6	___ Water levels are prone to quickly rise at least 1 foot during April-June
___ A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species	0.1	0.3	0.6		0.3	0.1	0.3	0.6	0.1	0.1	0.3	0.2	0.2	0.3	___ Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water	0.1	0.8	0.7		0.4	0.2	0.4	0.8	0.1	0.1	0.4	0.1	0.1	0.2	___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Busy roads are distant from the site	0.1	0.8	0.6	0	0.1	0.1	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	___ Busy roads border the site
___Water quality is excellent	0.1	0.4	0.2	0	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.2	0.2	0.2	___ Water is heavily contaminated with pollutants
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.	0.1	0.6	0.1	n/a	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	0.1	0.4	0.4	0	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	___ Surrounding landscape contains no wetlands or ponds
___ Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.	0	0	0.4		0	0	0	0.8	0	0	0	0	0	0	___ No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-maintained.
___ Part of the site is visited infrequently in April-June by humans on foot	0.1	0.1	0.6		0.1	0.1	0.1	0.6	0.1	0.1	0.1	0.1	0.1	0.1	___ None of the site is visited frequently by humans on foot during April-June
Function Capacity Score:	**0.161538462**	**0.407692308**	**0.407692308**	**0**	**0.246153846**	**0.176923077**	**0.276923077**	**0.569230769**	**0.184615385**	**0.130769231**	**0.192307692**	**0.192307692**	**0.192307692**	**0.246153846**	

* Areas likely to retain water well into the waterbird breeding season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)

___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone.

___ site is located in flatland terrain (not on slopes)

___ extensive microtopographic variation (many hummocks, puddles, etc.)

___ absence of outlet channels, and/or site is managed for water storage.

Function Capacity (Judgmental Assessment of):

Wintering & Migratory Waterbird Support

Highest Functioning	**SR 500**	**BPA**	**Mit-WADOT**	**SW detention ponds**	**City of Vancouver**	**Marine Dr. South-Trimet**	**Delta Park**	**Vanport**	**Trimet west triangle**	**PJWA-G** SR 500	**PJWA-I** Kiggins Bowl	**DEA 1 - north triangle**	**DEA 2 - east triangel**	**DEA 3 - schmeer slough**	**Minimal Functioning**
___ The site contains extensive surface water during all or most of the fall-winter-spring period	0.1	0.2	0.2		0.2	0.2	0.5	0.8	0.2	0.2	0.1	0.2	0.2	0.5	___ The site contains very little surface water during all or most of the fall-winter-spring period
___ Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)	0.1	0.3	0.4		0.3	0.2	0.4	0.6	0.3	0.3	0.2	0.3	0.3	0.2	___ If forested, water depths during the fallwinter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
___ A large portion of the site is inundated only seasonally	0.2	0.3	0.4	n/a	0.3	0.5	0.6	0.9	0.4	0.4	0.3	0.5	0.5	0.5	___ Of the water that is present, nearly all is present year-round.
___ The acreage of various depth categories is about equal during peak annual inundation	0.1	0.2	0.3		0.2	0.3	0.4	0.8	0.3	0.2	0.1	0.2	0.2	0.4	___ A single water depth category predominates.
___ Microtopographic variation (hummocks, puddles, etc.) is extensive	0.2	0.4	0.6	n/a	0.4	0.2	0.4	0.6	0.4	0.2	0.2	0.4	0.4	0.4	___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ None of the site is visited frequently by humans on foot during September-April.	0.4	0.6	0.4		0.4	0.5	0.5	0.4	0.4	0.1	0.4	0.4	0.4	0.4	___Virtually all of the site is visited frequently by humans on foot during April-June
___ A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species	0.1	0.3	0.6	0	0.3	0.1	0.3	0.6	0.1	0.1	0.3	0.2	0.2	0.3	___ Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
___Water quality is excellent	0.1	0.4	0.2	0	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.2	0.2	0.2	___ Water is heavily contaminated with pollutants
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.	0.1	0.6	0.1	n/a	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water	0.1	0.8	0.7	0	0.4	0.2	0.4	0.8	0.1	0.1	0.4	0.1	0.1	0.2	___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime than the assessed site.	0.1	0.4	0.4	0	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	___ Surrounding landscape contains no wetlands, ponds, or hydric soil.
Function Capacity Score:	**0.145454545**	**0.409090909**	**0.390909091**	**0**	**0.290909091**	**0.245454545**	**0.363636364**	**0.554545455**	**0.236363636**	**0.172727273**	**0.236363636**	**0.254545455**	**0.254545455**	**0.318181818**	

Function Capacity (Judgmental Assessment of):

Songbird Habitat Support

Highest Functioning	SR 500	BPA	Mit-WADOT	SW detention ponds	City of Vancouver	Marine Dr. South-Trimet	Delta Park	Vanport	Trimet west triangle	PJWA-G SR 500	PJWA-I Kiggins Bowl	DEA 1 - north triangle	DEA 2 - east triangel	DEA 3 - schmeer slough	Minimal Functioning
___ Some part of the site contains surface water during all (or nearly all) of the year.	0.1	0.4	0.3	n/a	0.4	0.3	0.5	0.6	0.5	0.1	0.2	0.3	0.3	0.3	___ Surface water is never present at any time of the year.
___ The site contains a large acreage of closed-canopy forest, native shrubland, wet prairie, and/or emergent wetland.	0.2	0.3	0.3		0.3	0.2	0.4	0.6	0.2	0.1	0.3	0.2	0.2	0.2	___ Acreage of these is very small.
___ If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) undercanopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.						0.2	0.6		0.2		0.3			0.2	___ If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of nonnative species.
___ If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	0.1	0.3	0.6	0	0.3			0.6		0.1		0.2	0.2		___ If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	0.1	0.8	0.7	0	0.4	0.2	0.4	0.8	0.1	0.1	0.4	0.1	0.1	0.2	___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ None of the site is visited frequently by humans on foot in April-June	0.4	0.6	0.4		0.4	0.5	0.5	0.4	0.4	0.1	0.4	0.4	0.4	0.4	___ All of the site is visited frequently by humans on foot in April-June
___ Busy roads are distant from the site	0.1	0.8	0.6	0	0.1	0.1	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	___ Busy roads adjoin the site.
Function Capacity Score:	**0.166666667**	**0.533333333**	**0.483333333**	**0**	**0.316666667**	**0.25**	**0.45**	**0.566666667**	**0.25**	**0.1**	**0.283333333**	**0.216666667**	**0.216666667**	**0.233333333**	

Function Capacity (Judgmental Assessment of):

Support of Characteristic Vegetation

Highest Functioning	SR 500	BPA	Mit-WADOT	SW detention ponds	City of Vancouver	Marine Dr. South-Trimet	Delta Park	Vanport	Trimet west triangle	PJWA-G SR 500	PJWA-I Kiggins Bowl	DEA 1 - north triangle	DEA 2 - east triangel	DEA 3 - schmeer slough	Minimal Functioning
___Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	0.1	0.2	0.1		0.2	0.4	0.5	0.5	0.4	0.1	0.3	0.1	0.2	0.3	___ Only one plant form (tree, shrub, herb) is present
___ If trees are present, many are very old and large, with abundant evidence of regeneration		0.2	0.1		0.1	0.4	0.4	0.3	0.3		0.4		0.1	0.3	___ If trees are present, all are young
___ If shrubs are present, all of the significantly present shrub species are natives	0.1	0.4	0.4		0.4	0.1	0.4	0.6	0.1		0.4		0.2	0.3	___ If shrubs are present, they are comprised of just one species, and it is non-native
___ If herbs are present, all of the significantly present herb species are natives	0.1	0.1	0.6		0.1	0.1	0.4	0.6	0.1	0.2	0.2	0.1	0.1	0.1	___ If herbs are present, they are comprised of just one species, and it is non-native
___ Microtopographic relief is great (hummocks, puddles, etc.)	0.2	0.4	0.6	n/a	0.4	0.2	0.4	0.6	0.4	0.2	0.2	0.4	0.4	0.4	___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	0.2	0.4	0.4		0.3	0.4	0.6	0.8	0.4	0.1	0.2	0.4	0.4	0.4	___ Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)
___ None of the site is visited frequently by humans on foot in September through April	0.4	0.6	0.4	0	0.4	0.5	0.5	0.4	0.4	0.1	0.4	0.4	0.4	0.4	___ All of the site is visited frequently by humans on foot in September though April
___ Water quality is excellent	0.1	0.4	0.2	0	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.2	0.2	0.2	___ Water is heavily contaminated with pollutants
___ Busy roads are distant from the site	0.1	0.8	0.6	0	0.1	0.1	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	___ Busy roads adjoin the site.
___ Land cover in the contributing watershed is predominantly “natural”	0.1	0.8	0.7	0	0.2	0.2	0.4	0.8	0.1	0.1	0.4	0.1	0.1	0.2	___ Land cover in the contributing watershed largely contains impervious surface, bare ground, lawns, and row crops
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	0.1	0.8	0.7	0	0.4	0.2	0.4	0.8	0.1	0.1	0.4	0.1	0.1	0.2	___ Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops
Function Capacity Score:	**0.15**	**0.463636364**	**0.436363636**	**0**	**0.263636364**	**0.263636364**	**0.418181818**	**0.554545455**	**0.236363636**	**0.122222222**	**0.3**	**0.211111111**	**0.209090909**	**0.263636364**	

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.