reference data sources

The following sources were used as the main reference data for determining the presence and/or location of vegetation patches:

Source:	**City of Portland Aerial Photos**
Created By:	Varies; refer to metadata
Data Format:	Geo-referenced TIFF images
Date of Acquisition:	2007 aerials – July 12 - August 28, 2007
	2006 aerials – June 23-27, 2006
	2005 aerials – July 3 & 4, 2005
	2004 aerials – July 21, 22, 24, 2004
	2003 aerials – July 18 & 19, 2003
	2002 aerials - August 2002
Description:	Natural color ortho-rectified digital imagery. All photography has been rectified to adjust for curvature of the earth. Photo resolution for all years is 6".
Notes:	Data is viewable for specific properties via www.portlandmaps.com
Metadata Reference:	http://geode.metro-region.org/metadata/index.cfm?startpage=main.cfm?db_type=rlis (listed by aerial year)

Source:	**City of Portland LiDAR data**
Created By:	Varies; refer to metadata
Data Format:	Geo-referenced ERDAS Imagine images
Date of Acquisition:	West Hills/Columbia Slough – March, 2005
	All other areas – March/April, 2007
Description:	A 3-foot rasterized digital elevation model (DEM) and digital surface model (DSM) of all Portland area LiDAR point returns collected and processed to date.
Notes:	Average vertical accuracy +/- 6"
Metadata Reference:	none currently available

Source:	**2002 Multispectral Image Classification**
Created By:	City of Portland Bureau of Environmental Services/Bureau of Planning & Sustainability
Data Format:	ERDAS Imagine 8.7 images
Date of Acquisition:	June 1st to June 20th, 2002

Description:	Classified 4-band 1.1-meter multispectral image data for the Portland metropolitan area. Classes are vegetation, bare soil, impervious surfaces, and water. Refer to the metadata link below for a complete description of the methodology.
Notes:	Overall classification accuracy – 89.3% (Kappa 0.8443).
Online Metadata:	\\cgisfile\data\Images\Multi-Spectral\June_2002\Classified_Images\June_2002_Classification_METADATA.htm (metadata available to City of Portland employees only. Can be made available to outside parties upon request.)

Source:	**Parks Vegetation Assessment**
Created By:	City of Portland Bureau of Parks and Recreation
Data Format:	ESRI Shapefile
Date of Acquisition:	May 2003 through October 2004
Description:	Vegetation patches as digitized by Parks natural area assessment team using 2002 and 2003 aerial photographs. Patches were visited in the field by Parks technicians, data about the patch was collected and recorded, and patch geometry and classes were changed as necessary based on the field data.
Notes:	Please contact the City of Portland, Bureau of Parks and Recreation for more information about the natural area assessment.
Online Metadata:	None available.

Source:	**River Habitat Maps**
Created By:	City of Portland Bureau of Planning & Sustainability (original mapping done on contract with Adolfson and Associates, Inc.)
Data Format:	ESRI Shapefile
Date of Acquisition:	November 1999 through April 2000
Description:	Wildlife habitat areas along the Willamette and Columbia rivers. Habitat areas were defined as plant species and plant communities that support avian, mammalian, reptilian and amphibian species that use the riparian area. The boundaries of the habitat area were mapped using 1998 and 1999 aerial photos and field visits.
Notes:	Modified by City of Portland, Bureau of Planning & Sustainability using 2000 and 2001 aerial photos to refine the habitat boundaries and incorporate vegetation changes since the original date of acquisition.
Online Metadata:	None available.

Source:	**Metro 2000/2002 Vegetation**

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Created By: Metro
Data Format: ESRI Shapefile
Date of Acquisition: July 2000
Description: This is a simple vegetation land-cover layer collected via interpretation of Metro's 2000 digital orthophotographs. Polygons were digitized around forest, woody non-forest vegetation, open space, and developed gaps. Forest land-cover types were delineated for the entire area within the Metro Service District and all sections within one mile beyond the District boundary. Woody non-forest vegetation and open space was delineated only within 300 feet of a mapped stream within the Metro Service District and all sections within one mile beyond the District boundary. Updated with 2002 aerial photos.

Notes: Minimum patch mapping size used by Metro was 1 acre.

Online Metadata: http://geode.metro-region.org/metadata/display.cfm?Meta_layer_id=1997&Db_type=rlis

project contacts

For more information about the City of Portland vegetation mapping project, please contact the following Bureau of Planning & Sustainability staff:

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Elliot Scott
Community Service Aide

references

Grossman, D.H., D. Faber-Langendoen, A. S. Weakley, M. Anderson, P. Bourgeron, R. Crawford, K. Goodin, S. Landaal, K. Metzler, K. Patterson, M. Pyne, M. Reid, and L. Sneddon, 1998. *The National Vegetation Classification System: Development, Status, and Applications*. The Nature Conservancy, Arlington, Virginia, 139 p. (available online at http://www.natureserve.org/library/vol1.pdf)

appendix 1 | image supplement

This image supplement features aerial photographs of correctly mapped patches of each of the NVCS classes and subgroups used in the vegetation mapping project. It is intended a visual reference to complement the textual description of the vegetation mapping methodology contained in this document.

The primary goals of this supplement are:

› to help foster consistency and accuracy in future additions or modifications to the vegetation GIS data;

› to better illustrate the range of different types of vegetation that fall within each NVCS class and subgroup.

Each map shows a vegetation patch (outlined in yellow) and any surface streams present in the patch (in blue). A brief description of each map describes what the patch represents (NVCS class and subgroup) and why.

Figure 1. Cultivated Herbaceous Vegetation Patches

A

B

C

D

A. These patches are marked cultivated herbaceous due to proximity to roads and human activity.
B. The herbaceous patches in this cemetery are divided by paved roads and paths.
C. A backyard patch of herbaceous vegetation follows the edge of bordering woodland patches.
D. Geometric planting patterns are an indication of a cultivated vegetation patch.

Figure 2. Semi-Natural/Natural Herbaceous Vegetation Patches

A. This herbaceous patch is semi-natural/natural because it is unmaintained and near the river.
B. An unused lot allowed to grow with vegetation is marked semi-natural/natural.
C. This cleared area in the middle of a forest patch is semi-natural/natural herbaceous.
D. This herbaceous patch near new development remains undisturbed and contains a small pond.

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Figure 3. Cultivated Shrubland Vegetation Patches

A. Rose beds in Washington Park constitute a cultivated shrubland patch.
B. Small trees in this vegetation patch may eventually meet cultivated woodland status.
C. Connected backyards over ½ acre form a cultivated vegetation patch.
D. This cultivated shrubland patch consists of highly manicured low hedges.

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Figure 4. Semi-Natural/Natural Shrubland Vegetation Patches

A. This semi-natural/natural shrubland contrasts with nearby forest and herbaceous patches.
B. These shrubland patches are distinct from the surrounding herbaceous in this wetland area.
C. A stream runs along the center of this semi-natural/natural shrubland patch in Kenton.
D. A patch of cultivated shrubland lies adjacent to the south of this semi-natural/natural patch.

Figure 5. Cultivated Woodland Vegetation Patches

A

B

C

D

A. These cultivated woodland patches are composed of tree canopy that overhangs the street.
B. Vegetation in this golf course shows the distance woodland patches should connect or break.
C. Two cultivated woodland patches split from a forest patch as they reach into a residential area.
D. Tree canopies overlap in this residential area to form a cultivated woodland patch.

Figure 6. Semi-Natural/Natural Woodland Vegetation Patches

A

B

C

D

A. Semi-natural and natural woodland patches often border cultivated vegetation.
B. Many woodland patches are found along the borders of denser natural forest patches.
C. This natural woodland area lies between natural shrubland and forest patches.
D. This woodland patch borders cultivated herbaceous, but its interior is not maintained.

Figure 7. Semi-Natural/Natural Forest Vegetation Patches

A

B

C

D

A. *Forest patches can be extensive and border many land use and vegetation patterns.*
B. *Forest patches should be broken and not connect across areas of lower vegetation.*
C. *Highways split forest patches when the tree canopy does not touch over the roadway.*
D. *Forest patches can be large enough to encircle smaller areas that lack vegetation.*

Natural Resource Inventory Update
wetland data refinement project | February 2010

City of Portland Bureau of
Planning and Sustainability
Sam Adams, Mayor | Susan Anderson, Director

Natural Resource Inventory Update
wetland data refinement project

Wetland Data Refinement Project
City of Portland Bureau of Planning and Sustainability
February 2010

project description

Overview

The Wetland Data Refinement Project is part of the City of Portland's Natural Resource Inventory Update Project. The Bureau of Planning (now Bureau of Planning and Sustainability) produced a number of natural resource inventories for different areas in the city between 1987 and 2002. The different inventories contain maps and descriptive information about resources including rivers, streams, wetlands, groundwater, forests and vegetation and wildlife. These inventories provided the technical basis for a series of resource protection plans and programs, including the Environmental and Greenway overlay zones. The inventories and associated overlay zones were developed to meet the requirements of Statewide Land Use Planning Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces. They also supported Statewide Planning Goal 6: Air and Water Quality, Goal 7: Areas Subject to Natural Hazards, and Goal 15: Willamette Greenway. In addition, they have helped the City meet the requirements of Titles 3 and 13 of Metro's Urban Growth Management Functional Plan, and the federal Clean Water Act.

Several years ago the City began the Natural Resource Inventory Update Project. The City modeled its approach on Metro's inventory of regionally significant riparian corridors and wildlife habitat. As part of this project, the Bureau of Planning and Sustainability (BPS) has updated the geographic information system (GIS) mapping data for streams, flood areas, vegetation and wildlife habitat in the City of Portland and in unincorporated parts of Multnomah County, where land use reviews and development permits are administered by the City.

The Wetland Data Refinement Project is a strategic update of the City's wetland inventory data. This update is required by the Oregon Department of Land Conservation and Development (DLCD) as part of the City's approved periodic review work plan (2009). Using available information from the Oregon Department of State Lands (DSL) and the City's land use review records, permits and other mapping data, the wetland GIS data have been refined to improve accuracy and better reflect current conditions. This updated wetland inventory information will support multiple City planning efforts including the Portland Plan and area-specific projects such as the Airport Futures Project and the River Plan. This information could also be used to support City and community restoration efforts and to educate the public about wetland functions.

Why are wetlands important?

The updated draft City of Portland natural resource inventory includes approximately 2,455 areas of wetlands located within the city limits and the urbanizing areas of unincorporated Multnomah County. Wetlands exist in all of Portland's watersheds, although a majority of these wetlands are found in the Columbia Slough Watershed.

Watershed	Columbia Slough	Fanno Creek	Johnson Creek	Tryon Creek	Willamette River	Other Watersheds*
Approximate Acres of Wetlands	2011	8	71	1	298	66

*Other watersheds include: Columbia River, Multnomah Channel and Tualatin River
(From Natural Resource Inventory Analysis: Watershed Statistics, City of Portland Bureau of Planning and Sustainability, 10/7/09)

Wetlands serve important functions including intercepting and storing surface runoff and groundwater and containing floodwaters. By moderating stream flows, wetlands can reduce bank erosion. They also store and filter sediments, cycle nutrients, decompose organic waste and prevent heavy metals from entering streams. Evaporation from wetlands contributes to localized humidity levels and air and soil temperature moderation. Forested wetlands contribute large wood to nearby streams offering habitat for wildlife. Wetlands can provide food, water, refuge from summer heat, shelter from winter cold, and cover for a variety of wildlife including mammals, amphibians, birds and aquatic species, such as rearing areas for juvenile salmon.

The City has established policies that recognize the importance of wetlands in its Comprehensive Plan and in the Portland Watershed Management Plan. The City has also applied overlay zones to protect wetlands. As a result, approximately 95% of the mapped wetlands in Portland are within environmental, greenway or other resource overlay zones. Metro has also recognized the role and functions of wetlands, and has established regional policies and requirements for cities and counties to protect and enhance wetlands through the adoption of Title 3: Water Quality, Flood Management and Fish and Wildlife Conservation and Title 13: Nature in Neighborhoods, of the Urban Growth Management Functional Plan

Project Purpose and Approach

The main goal of this project is to improve the accuracy of the City's wetland data in a relatively short period of time using readily available documentation and other resources.

On September 30, 2009, the DLCD approved a periodic review work plan for the City. The work plan includes a task to update the City's wetland inventory data using existing information sources. This project initiated the first steps of a Local Wetland Inventory process and was determined to be an efficient approach to update the data without delaying the periodic review work plan as a whole[1]. It is understood that the project scope is limited and additional steps will be needed to produce a comprehensive update.

The City of Portland's existing wetland inventory data is based primarily on information from the 1982 National Wetlands Inventory (NWI). The NWI was derived from high-altitude aerial photography flown at a scale of 1:24,000. The boundaries of those wetlands were sometimes inaccurate, and since the minimum mapping resolution was 2 acres, smaller wetlands were generally not included. Seasonal wetlands may also not have been mapped since photographs were taken primarily in the summer months[2]. In addition to the NWI, the City's existing GIS wetland data reflect ad hoc updates based on local City of Portland natural resource inventories and DSL permits. Before this project some DSL permit data and wetland-related documentation from City land use reviews, permits, and other surveys or delineations had not been incorporated into the inventory. This is primarily because the City had not yet established a systematic approach to regularly update its GIS wetland data with new information.

Key steps of this project included:

- Developing a wetland mapping protocol
- Reviewing existing DSL permit and City land use permit and other mapping information and conducting field visits
- Updating the City's GIS wetland data
- Producing recommendations for improving and maintaining the data

BPS staff collaborated with Portland's Bureaus of Development Services, Parks and Recreation, and Environmental Services to complete this project. The revised wetland data will be available to all City bureaus for their use and to Metro for regional distribution along with the Regional Land Information System (RLIS) "Natural Resource" GIS data.

The remainder of this report describes the mapping protocol used by staff, project results, and conclusions and recommendations to maintain and improve the BPS GIS wetland data over time.

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[1] The City did not complete a full Local Wetlands Inventory as part of this project.

[2] *Just the Facts…About the National Wetlands Inventory*, Oregon Department of State Lands - Wetlands Program, Revised November 2004

wetland mapping protocol

The first step in this process was to determine which information sources would be appropriate to support the project and then develop protocol for updating the wetland data. It was important that the information be provided by credible "qualified" sources and be adequate to meet City and regional mapping criteria.

Ultimately, the project relied on data generated by the following sources:

- City of Portland land use and permit reviews and wetland delineations
- Department of State Lands permits
- U.S. Army Corps of Engineers permits
- Environmental consultants' maps

National Wetland Inventory GIS data, LiDAR (Light Detection and Ranging) data, and aerial photos were also referenced during the project. LiDAR is a remote sensing system used to collect topographic data. LiDAR maps show land depressions that are common in wetland areas. Aerial photography was used to check for standing water and/or vegetation typical to wetland areas and also to double check if wetlands were removed from a site in conjunction with a DSL removal/fill permit. Based on the clarity of the information, data was either used for immediate mapping updates or to identify the appropriate follow up action according to the following protocol:

Accurate Wetlands - The existing City GIS wetland inventory data was deemed to be accurate when maps from qualified sources were in substantial conformance with this data.

New Wetlands – New wetlands were added to the City inventory data based on the following mapping information:

- A survey or delineation from a qualified source clearly showed the boundaries of the wetland; or

- The wetland was indicated on a topographic map or other map from a qualified source, and was supported by LiDAR data and documented field observations (see additional information about field observations below).

Modified Wetland Boundaries – Wetland boundaries of existing City inventory data were modified based on the following information:

- A survey or delineation from a qualified source clearly showed that the boundaries of the wetland differ from the existing data; or

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City of Portland Bureau of Planning and Sustainability
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- The wetland boundaries were indicated on a topographic map or other map from a qualified source, and were supported by LiDAR data and documented field observations.

Deleted Wetlands – Wetlands were deleted from the City inventory data based on the following information:

- A removal/fill permit from the Department of State Lands and verification with aerial photography; or

- Any other map from a qualified source showed that the wetland did not exist or had been removed, and aerial photography verified this.
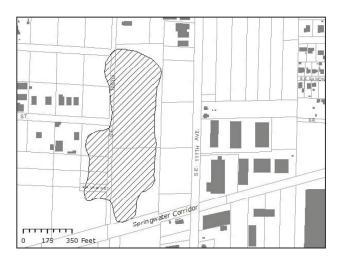
Probable Wetlands – Sometimes wetlands were referenced in a report or permit but could not be mapped or modified for the following reasons:

- The map was not from a qualified source;

- The referenced wetland was from a qualified source but did not include a survey or delineation and could not be confirmed because it was on private property; or

- The proposed new wetlands or modifications to existing wetlands were located on sites that were undergoing land use or permit review by the City of Portland.

These wetlands have been entered in a "probable wetland" database for follow up should the City proceed with further wetland inventory update projects.

Using the above criteria, staff compared maps and images from DSL and City permit records to existing City wetland inventory maps. Clear, well-documented information from qualified sources was used to update the data without further action. In some instances, these maps were either not clearly surveyed or were difficult to read. In these cases, BPS staff and experts from the Bureau of Parks and Recreation or the Bureau of Environmental Services visited the sites to confirm the presence and general location and configuration of wetlands. Field observations were conducted only on publicly owned property. Data sheets (see attached example) were used to record overall site conditions, vegetation, hydrology/drainage, soils and any indication of wildlife. No delineations were conducted. Soil pits were not dug, but National Resource Conservation Service mapping codes were noted on the data form. Sites with soils coded as "hydric" have a greater possibility of containing wetlands. Sites were also digitally photographed.

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Original NWI mapping   New & modified wetland boundaries

Figure 1. Comparison of previously-mapped wetlands and remapped wetlands

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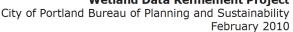February 2010

accomplishments and results

To date, BPS has retrieved and reviewed more than 120 City land use review staff reports, project proposals and approved permits, and over 70 Department of State Lands permits for wetland site plans or other wetland data. Staff analyzed site plans, report text and project descriptions and compared this information with the GIS database, aerial photographs and property history information. This analysis, in conjunction with the above mapping protocol, allowed for modifications to the City's current wetland GIS database.

The project has updated the inventory information for 53 wetlands (as of 2/1/2010), totaling approximately 72 acres. Thirty-seven wetlands have been added to the data (48 acres) and the boundaries of sixteen wetlands have been modified substantially (24 acres). In addition, eleven wetlands were confirmed as accurate since more current documentation closely matched the existing data.

No wetlands were deleted from the database during this project. This may be because since 2000, the City has been updating maps based on information sent from DSL removal/fill permits. In addition, approximately 95% of most mapped wetlands in the City are in environmental resource overlay zones Resources within the overlay zones are subject to specific requirements to prevent impacts from new development.

Finally, 13 sites with "probable" wetland areas were targeted for follow up research. These sites are either on private property and could not be evaluated with a field visit or else are currently under permit or land use review, and so the wetland area could still be modified.

conclusions and recommended next steps

This project yielded an incremental update to the existing 2,455 acres of inventoried wetlands based on information readily available to City staff. It is important that the City now establish a process to continue using this type of information to regularly update the wetland database. Outlined below are recommendations for regularly incorporating new or revised wetland data from other information sources.

Department of State Lands permit information

The permit information provided to date from DSL has been instrumental in helping to keep the City's wetland records up to date. Staff should continue to use this information to add, modify or remove wetlands from the database.

City of Portland land use reviews and permits

When a City-required land use review or development permit addresses wetlands directly, or sites with wetlands, the project should be flagged for further research. Since all permits and land use reviews are assigned a permit tracking number in a program called TRACS, staff in the Bureau of Development Services should develop a consistent method to identify these projects. This may include either ensuring the project description field in TRACS contains the word "wetland," or creating a field in the "permit information" tab in TRACS to note if a wetland is located on the site. BPS staff could run regular reports to retrieve these permits for review. Maps would be reviewed using the mapping protocol described above. For example while some of the maps may be from a qualified source and allow updates to the database immediately, other wetlands may need further research. In many cases, the City of Portland does not require wetlands to be surveyed and/or delineated in order for the site to be developed, enhanced or otherwise modified. These sites could be placed in a follow-up database for future research, should funding become available for additional wetland inventory updates.

In addition, since natural resource information is included on the *Portlandmaps.com* website, current mapping data can be viewed by City staff and by the general public. This information is located in the "Maps" tab of *Portlandmaps.com* and includes a "Map Accuracy" section with a hyper-link to an online correction form. Anyone submitting corrections can describe the resource, its location, and the reason why they think the data is not accurate. This information can be submitted by property owners, surveyors, environmental consultants, or anyone familiar with the wetlands on a site. Mapping could be completed based on the mapping protocol described above. For instance, only data from a "qualified" source could be used to update City maps. Other sites could be placed in the follow-up database for future research. Permit and land use review staff may also be able to use this

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link to alert GIS staff, who could then work with BPS staff to check records for additional mapping information.

Wetland delineations by other City of Portland bureaus

Other City bureaus such as Parks and Recreation and Environmental Services perform wetland delineations for various projects. As they are completed, these delineations should be forwarded to BPS for mapping. BPS GIS staff should work with staff in these bureaus to outline the necessary mapping data and a method for consistent retrieval of this information. These and others bureaus could also use the *Portlandmaps.com* tool described above to notify BPS GIS staff about corrections to the database.

Wetland data from current and future planning projects

The Airport Futures Project, the River Plan, the Portland Plan and other planning projects involve area-specific natural resource inventory updates. Any wetland mapping information generated through these types of projects should continue to be included in the GIS wetland database.

Other recommendations for identifying modified and new wetlands

Many wetlands in the City have not been subject to permit or land use review, so their boundaries have not been recently mapped, or may never have been mapped. Some wetlands may have been filled without a DSL permit. At this point, the City has not allocated resources to perform a full Local Wetland Inventory to identify and map or remap these sites. Staff may be able to identify additional probable wetlands by using soil information in conjunction with LiDAR data to search for land depressions that may contain wetlands. The City could also develop an outreach strategy to educate the public about the *Portlandmaps.com* correction tool described above, or provide a hotline to encourage residents to voluntarily submit information about potential new or modified wetlands on their property or in their neighborhood. With landowners' permission, staff could visit sites to determine if the site should be logged into the "probable wetlands" database.

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FIELD DATA FORM
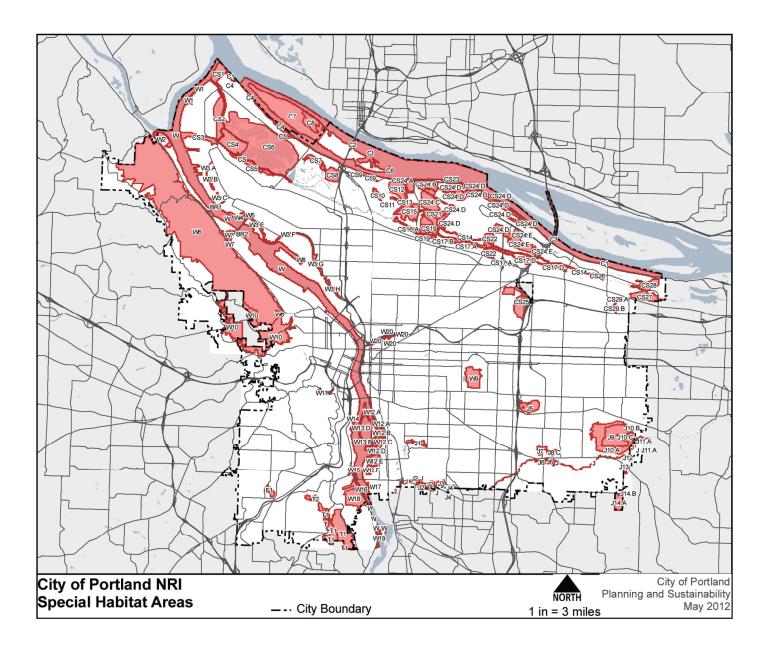## WETLAND INDICATOR IDENTIFICATION

Site Address/location	N. PORTLAND RD between Marine + Columbia (N of Slough)	Date:	11/20/09
Property Owner:	METRO	Weather	Clouds/rain
Tax ID Number	R314582	Date of recent measurable precipitation	11/20/09

Describe Overall Site Conditions:

PFO - Pulustean Forested
Metro Mitigation site for fill in St Johns

Topography?

Sloped down

Investigators:

Susan van Staveren - BPS
Emily Roth - PARKS

VEGETATION

Remarks: Forest ___✓___ Woodland ___✓___ Shrubs _____ Herbaceous _____

(Structure, canopy, understory, contiguousness, fragmentation, wetland species, etc.)

(cottonwood (Populus), alder (alnus) rose understory, elderberry)(spiraea douglasii), (sambucus) Cattails (Typha lahfolia)
planting complements Smith Lake   Sedges + rushes (Cyperaceae)

HYDROLOGY/DRAINAGE

Remarks: (Standing/flowing water, open channels; pipes/culverts, bank erosion, ripple marks, water quality, etc.)

Central depressed area. Per Emily this site ponds during rain events in the winter months.

SOILS

Remarks: (Color, texture, etc.) NRCS Mapping Code: __47A__

Pits dug? Y (N)

Saturated

WILDLIFE

Remarks: (Wildlife presence, tracks, scat, calls, song, evidence of grazing, burrowing, nesting, browsing, wetland associations, etc.)

Noted nest in tree. Songbirds.

GENERAL NOTES AND OBSERVATIONS

Remarks: (Summarize observations and conclusions relating to presence/absence and type(s) of wetlands), apparent size of wetlands, etc.)

Emily, who previously worked for Metro, knows that this site was a filled wetland that was re-excavated and replanted as a wetland.
Wetland area is centered in lower elevation on site.

BASED ON OBSERVATIONS, IS THERE PROBABLE WETLANDS ON SITE?   Y ✓   N ___   UNCLEAR ___

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APPENDIX 7

SPECIAL HABITAT AREAS

City of Portland NRI
Special Habitat Areas

— ·· City Boundary

NORTH
1 in = 3 miles

City of Portland
Planning and Sustainability
May 2012

Special Habitat Areas

Updated May 30, 2012

Attributes

Watershed	Site ID	Site Name	P	W	O	B	I	D	M	C	S	E	G	U
Columbia River	C1	Columbia River Mainstem							✔	✔	✔			
Columbia River	C2	Interstate Bridge (I-5)									✔			✔
Columbia River	C3	Interstate 205 Bridge (I-205)									✔			✔
Columbia River	C4	South Bank Oregon Slough				✔			✔	✔				
Columbia River	C5	T6 Vacant Industrial Land							✔	✔			✔	
Columbia River	C6	East Hayden Island				✔	✔		✔					
Columbia River	C7	West Hayden Island Mosaic		✔		✔	✔		✔	✔	✔			
Columbia River	C8	Dredge Deposit Management Area						✔	✔	✔	✔		✔	
Columbia Slough	CS	Lower Columbia Slough		✔		✔			✔	✔	✔			✔
Columbia Slough	CS1	Kelley Point Park				✔			✔	✔				
Columbia Slough	CS10	Brandwein Wetlands		✔		✔			✔					
Columbia Slough	CS11	Blue Heron Meadows Wetland	✔	✔		✔			✔					
Columbia Slough	CS12	Columbia Edgewater Golf Course				✔								
Columbia Slough	CS13	Peninsula Drainage Canal							✔	✔	✔			
Columbia Slough	CS14	Middle Columbia Slough				✔			✔					
Columbia Slough	CS15	Riverside Golf Course				✔								
Columbia Slough	CS16.A	South Arm Complex - Buffalo Slough West				✔			✔	✔				✔
Columbia Slough	CS16.B	South Arm Complex - Buffalo Slough East				✔			✔	✔				✔
Columbia Slough	CS17.A	South Arm Complex - Whitaker Slough				✔			✔	✔				✔
Columbia Slough	CS17.B	South Arm Complex - Whitaker Ponds		✔		✔			✔		✔			✔
Columbia Slough	CS17.D	South Arm Complex - Johnson Lake				✔			✔	✔				✔
Columbia Slough	CS17.D	South Arm Complex - Little Four Corners / Prison Pond		✔		✔			✔	✔	✔			
Columbia Slough	CS18	Subaru Wetlands		✔		✔								
Columbia Slough	CS19	Broadmoor Golf Course				✔								
Columbia Slough	CS2	Ramsey Wetland Complex		✔		✔			✔	✔	✔			
Columbia Slough	CS20	Buffalo Street Mitigation Site							✔	✔	✔			
Columbia Slough	CS20.A	Wilkes Creek Headwaters Property (North of NE Fremont St)												✔
Columbia Slough	CS20.B	Wilkes Creek Headwaters Property (South of NE Fremont St)												✔
Columbia Slough	CS21	Elrod Slough Complex		✔						✔				

Watershed	Site ID	Site Name	P	W	O	B	I	D	M	C	S	E	G	U
Columbia Slough	CS22	Colwood Golf Course Forested Wetland		✔		✔			✔	✔	✔			
Columbia Slough	CS23	Broughton Beach							✔	✔	✔			
Columbia Slough	CS24.A	PDX Upland Grassland Complex - 33rd Field							✔	✔	✔		✔	
Columbia Slough	CS24.B	PDX Upland Grassland Complex - Deicing/Fuel Farm Fields							✔	✔	✔		✔	
Columbia Slough	CS24.C	PDX Upland Grassland Complex - SW Quad							✔	✔	✔		✔	
Columbia Slough	CS24.D	PDX Upland Grassland Complex - Airfield							✔	✔	✔		✔	
Columbia Slough	CS24.E	PDX Upland Grassland Complex - PIC/CS							✔	✔	✔		✔	
Columbia Slough	CS25	Rocky Butte / Grotto		✔					✔	✔				
Columbia Slough	CS26	Cross Levee Habitat Area		✔		✔			✔	✔				
Columbia Slough	CS27	Big Four Corners (south of NE Airport Way)		✔		✔			✔	✔				
Columbia Slough	CS28	Big Four Corners (north of NE Airport Way)		✔		✔				✔				
Columbia Slough	CS3	West Wye/ I-5 Powerline Mitigation Site		✔		✔			✔	✔	✔			
Columbia Slough	CS4	St. Johns Landfill							✔	✔	✔		✔	
Columbia Slough	CS5	Wapato Wetlands		✔		✔								
Columbia Slough	CS6	Smith and Bybee Lakes Management Area		✔		✔			✔	✔	✔			
Columbia Slough	CS7	Heron Lakes Golf Course Wetlands/ Force Lake and Wetlands		✔		✔			✔		✔			
Columbia Slough	CS8	Vanport Wetlands		✔		✔			✔		✔			
Columbia Slough	CS9	Bridgeton Slough		✔		✔					✔			
Fanno Creek	F1	Woods Memorial Park				✔			✔					
Johnson Creek	J	Johnson Creek								✔	✔			
Johnson Creek	J1	Reed College Canyon		✔		✔			✔	✔				
Johnson Creek	J10.A	Powell Butte Nature Park							✔	✔				
Johnson Creek	J10.B	Powell Butte Nature Park							✔	✔				
Johnson Creek	J10.C	Powell Butte Nature Park							✔	✔				
Johnson Creek	J10.D	Powell Butte Nature Park							✔	✔				
Johnson Creek	J11.A	Circle Avenue Wetlands South		✔						✔				
Johnson Creek	J11.B	Circle Avenue Wetlands North		✔						✔				
Johnson Creek	J12	Alsop Wetland		✔					✔	✔	✔			
Johnson Creek	J13	Kelley Creek Refuge				✔				✔	✔			
Johnson Creek	J14.A	Scouter Mt. Uplands West								✔	✔			
Johnson Creek	J14.B	Scouter Mt. Uplands East								✔	✔			
Johnson Creek	J2	Tideman Johnson Park and Riparian Area		✔		✔			✔	✔	✔			

Watershed	Site ID	Site Name	P	W	O	B	I	D	M	C	S	E	G	U
Johnson Creek	J3	Errol Heights Wetland		✔		✔			✔					
Johnson Creek	J4	SE 55th and Harney Wetland		✔					✔	✔				
Johnson Creek	J5	Kelly Butte							✔				✔	
Johnson Creek	J6	Brookside Wetlands		✔					✔	✔				
Johnson Creek	J7	Springwater Wetlands Complex - Beggar's Tick Marsh Wildlife Refuge		✔					✔					
Johnson Creek	J8.A	Springwater Wetlands Complex - North Wetland		✔		✔			✔	✔	✔			
Johnson Creek	J8.B	Springwater Wetlands Complex - Central Wetland		✔					✔	✔				
Johnson Creek	J8.C	Springwater Wetland Complex - Zenger Farm	✔	✔					✔	✔	✔			
Johnson Creek	J9	Powell Butte Grassy Areas							✔				✔	
Tryon Creek	T	Tryon Creek									✔			
Tryon Creek	T1	Tryon Creek State Natural Area							✔	✔	✔			
Tryon Creek	T2	Marshall Property, Jensen Property and Foley Balmer Property								✔				
Willamette River	BR1	St. Johns Bridge Nests									✔			✔
Willamette River	BR2	Railroad Bridge Nests									✔			✔
Willamette River	BR3	Fremont Bridge Nests									✔			✔
Willamette River	BR4	Marquam Bridge Nests									✔			✔
Willamette River	W	Willamette Mainstem ESA Critical Habitat								✔	✔			
Willamette River	W1	NW Willamette River Forested Wetland		✔		✔				✔				
Willamette River	W10	Balch Creek Subwatershed			✔	✔			✔	✔			✔	
Willamette River	W11	Marquam Gulch Oak Stand			✔									
Willamette River	W12.A	Oaks Bottom Complex - Oaks Bottom Bluff			✔					✔				
Willamette River	W12.B	Oaks Bottom Complex - Oaks Bottom River Riparian and Beaches			✔	✔				✔				
Willamette River	W12.C	Oaks Bottom Complex - Oaks Bottom Savanna and Meadow North			✔	✔				✔				
Willamette River	W12.D	Oaks Bottom Complex - Oaks Bottom Bottomland Forest and Wetlands		✔	✔	✔				✔	✔			
Willamette River	W12.E	Oaks Bottom Complex - Oaks Bottom Reservoir and Mudflats		✔	✔				✔	✔	✔			
Willamette River	W12.F	Oaks Bottom Complex - Oaks Bottom Savanna and Meadow South			✔	✔				✔				
Willamette River	W13.A	Ross Island Complex - Toe Island				✔	✔		✔	✔				
Willamette River	W13.B	Ross Island Complex - East Island				✔	✔		✔	✔	✔			
Willamette River	W13.C	Ross Island Complex - Hardtack Island				✔	✔		✔	✔				

Attributes

Watershed	Site ID	Site Name	P	W	O	B	I	D	M	C	S	E	G	U
Willamette River	W13.D	Ross Island Complex - Ross Island				✓	✓		✓	✓	✓			
Willamette River	W14	Cottonwood Bay				✓			✓	✓				✓
Willamette River	W15	Stephens Creek Bottomland		✓		✓			✓	✓	✓			
Willamette River	W16	Powers Marine Park Mudflats				✓			✓	✓				
Willamette River	W17	South Sellwood Bluff			✓					✓				
Willamette River	W18	Riverview Cemetery							✓	✓				
Willamette River	W19	Dunthorpe Oak	✓		✓									
Willamette River	W2	Harborton Forest & Wetlands Complex		✓		✓			✓	✓	✓			
Willamette River	W20	Sullivan's Gulch												✓
Willamette River	W3.A	Willamette Bluff Complex - Roberts/ Railroad Bluff			✓					✓				
Willamette River	W3.B	Willamette Bluff Complex - Weyerhauser Ave Woodlands			✓					✓				
Willamette River	W3.C	Willamette Bluff Complex - Edison Street Woodlands			✓					✓				
Willamette River	W3.E	Willamette Bluff Complex - Willamette Bluff North			✓					✓				
Willamette River	W3.F	Willamette Bluff Complex - Willamette Bluff Central			✓					✓				
Willamette River	W3.G	Willamette Bluff Complex - Willamette Bluff South			✓					✓				
Willamette River	W3.H	Willamette Bluff Complex - Riverwood Woodland			✓					✓				
Willamette River	W4	Willamette Cove Bottomland			✓	✓				✓			✓	
Willamette River	W5	Edgewater Street Forest and Ravine			✓					✓				
Willamette River	W6	Forest Park			✓	✓			✓	✓	✓	✓		
Willamette River	W7	North Doane Lake, Doane Creek and Wildlife Habitat Area		✓		✓			✓	✓	✓			
Willamette River	W8	Swan Island Lagoon Beach and Wapato Wetland		✓					✓		✓			✓
Willamette River	W9	Mt. Tabor							✓	✓			✓	

P - Area contains sensitive or rare plant populations
W - Wetlands and associated seeps, springs and streams that are part of the wetland complex
O - Native oak
B - Bottomland hardwood forest
I - Riverine island
D - River delta
M - Migratory stopover habitat

C - Corridor between patches or habitats
S - Area critical to sensitive species life history, on more than an incidental basis; critical habitats as designated by NOAA
E - Elk migratory corridor
G - Upland meadow, prairie or grassy area important to migrants and grassland-associated species
U - Resource or structure that provides critical or unique habitat function in natural or built environments (such as bridges or street trees)