

Natural Resource Inventory Update  
**wetland data refinement project | February 2010**

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

# Natural Resource Inventory Update

## wetland data refinement project

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## project description

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### *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.

<b>Watershed</b>	<i>Columbia Slough</i>	<i>Fanno Creek</i>	<i>Johnson Creek</i>	<i>Tryon Creek</i>	<i>Willamette River</i>	<i>Other Watersheds*</i>
<b>Approximate Acres of Wetlands</b>	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 DLCDC 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<sup>1</sup>. 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<sup>2</sup>. 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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<sup>1</sup> The City did not complete a full Local Wetlands Inventory as part of this project.

<sup>2</sup> *Just the Facts...About the National Wetlands Inventory*, Oregon Department of State Lands - Wetlands Program, Revised November 2004

## wetland mapping protocol

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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

- 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.



Original NWI mapping



New & modified wetland boundaries

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



## **accomplishments and results**

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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**

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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

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.

## project contacts

For more information about the City of Portland wetland mapping project, please contact:

Roberta Jortner  
Bureau of Planning and Sustainability  
*Senior Environmental Planner*  
503-823-7855  
[rjortner@portlandoregon.gov](mailto:rjortner@portlandoregon.gov)

Mindy Brooks  
Bureau of Planning and Sustainability/BES  
*Environmental Technician*  
503-823-7662  
[mbrooks@portlandoregon.gov](mailto:mbrooks@portlandoregon.gov)

Susan van Staveren  
Bureau of Planning and Sustainability  
*Environmental Technician*  
503-823-7701  
[Susan.vanstaveren@portlandoregon.gov](mailto:Susan.vanstaveren@portlandoregon.gov)

Kevin Martin  
Bureau of Planning and Sustainability  
*GIS Analyst*  
503-823-7710  
[kmartin@portlandoregon.gov](mailto:kmartin@portlandoregon.gov)

Additional assistance on this project was provided by:

Emily Roth  
*Senior Environmental Planner*  
Portland Parks and Recreation  
503-823-9225  
[Emily.roth@portlandoregon.gov](mailto:Emily.roth@portlandoregon.gov)

Mary Bushman  
Environmental Specialist  
Willamette Watershed Team  
Bureau of Environmental Services  
503-823-2073  
[mary.bushman@portlandoregon.gov](mailto:mary.bushman@portlandoregon.gov)

**FIELD DATA FORM  
WETLAND INDICATOR IDENTIFICATION**

Site Address/location	N. PORTLAND RD <sup>between Market Columbia</sup> (N of Slough)	Date:	11/20/09
Property Owner:	METRO	Weather	Clouds/rain
Tax ID Number	12314582	Date of recent measurable precipitation	11/20/09
Describe Overall Site Conditions: PFO - Pulaskian Forested Metro mitigation site for fill in St Johns Topography? Sloped down		Investigators: Susan van Staveren - BTS Emily Roth - PARUS	

**VEGETATION**

Remarks: Forest  Woodland  Shrubs \_\_\_\_\_ Herbaceous \_\_\_\_\_  
(Structure, canopy, understory, contiguosness, fragmentation, wetland species, etc.)  
Cottonwood (Populus), alder (alnus) rose understory, elderberry  
planning complement Smith Lake (spiraea douglasii), (sambucus) cattails (Typha latifolia)  
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?  (N) Sahraid

**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