INVENTORY SITE CS4: Middle Slough and Whitaker Slough

Summary Information

Watershed: Columbia Slough

Neighborhood: Cully, Sumner, Parkrose

USGS quadrangle and quarter section maps: 1N2E07, 1N2E15, 1N2E16, 1N2E17, 1N2E18, 1N2E21

River Mile: 10.2-13.7 (beginning at the confluence of Whitaker Slough and the Columbia Slough main channel and extending to the Interstate 205 bridge over the Columbia Slough)

Site Size: 1,097 acres

Previous Inventories: Inventory and Analysis of Wetlands, Water Bodies and Wildlife Habitat Areas for the Columbia Corridor: Industrial/Environmental Mapping Project (City of Portland January 1989)

Zoning: General Industrial 2 (IG2)
Open Space (OS)
Single Dwelling Residential (RF and R20)
General Employment (EG2)
Aircraft Landing overlay (h)
Airport Noise overlay (x)
Environmental Conservation overlay (c)
Environmental Protection overlay (p)

Existing Land Use: industrial; golf course; residential; natural area

General Description: This site includes most of the main channel of the Middle Columbia Slough and Whitaker Slough, Whitaker Ponds and Johnson Lake. The site also contains a few wetlands and secondary drainageways, primarily found in and around the Colwood Golf Course. Narrow riparian gallery forest habitat, dominated by black cottonwood and Pacific willow, surrounds the open water features. The understory contains red osier dogwood and alder but is dominated by Himalayan blackberry and other invasive species. Much of the riparian areas have been revegetated by the Bureau of Environmental Services. The natural resources are generally degraded by extensive industrial development, Cornfoot Road and multiple culvert crossings.

Resource Features: open water stream/drainageway channels; open-water, scrub-shrub and forested wetlands; vegetated flood area; bottomland hardwood forest; grasslands

Functional Values: microclimate and shade; stream flow moderation and water storage; bank function, and sediment, pollution and nutrient control; large wood and channel dynamics; organic inputs, food web and nutrient cycling; wildlife habitat; habitat connectivity/movement corridor

Special Habitat Area:
- CS16: Whitaker Slough – bottomland hardwood forest (B); wildlife habitat connectivity corridor (C); resources or structure that provides unique habitat function in natural or built environment (U)
- CS16.B: Whitaker Ponds – wetland (W); bottomland hardwood forest (B); migratory stopover habitat (M); area critical to sensitive species (S)
- CS16.C: Johnson Lake - bottomland hardwood forest (B); wildlife habitat connectivity corridor (C); migratory stopover habitat (M); resources or structure that provides unique habitat function in natural or built environment (U)
• CS29: Colwood Golf Course Forested Wetland - wetland (W); bottomland hardwood forest (B); wildlife habitat connectivity corridor (C); migratory stopover habitat (M)
• CS30: Middle Slough – area vital to at risk species including Western painted turtle and Northern red-legged frog (S); migratory stopover habitat (M); and wildlife connectivity corridor (C)

Special Status Species:
• Birds: willow flycatchers, belted kingfishers, great blue herons, common merganser
• Reptiles: Western painted turtle
• Mammals: American beaver, northern river otter, California myotis, yuma myotis and silver-haired bat

Natural Hazards: flood area

Contamination: Yes
Site Description

The Middle Columbia Slough inventory site is 1,097 acres in size. The southern boundary of the site is formed by Columbia Boulevard. The eastern boundary is Interstate 205 and the western boundary is NE 42nd Avenue. The northern boundary generally follows NE Cornfoot Road and Alderwood Drive (Map 26). The site includes industrial land uses around the Columbia Slough and Whitaker Slough including Costco, Native American Youth and Family Center and Early College Academy; Colwood Golf Course; a few residential areas; and vacant lands. There are approximately 501 acres of impervious area, including 17.2 miles of roads, located the site. Site CS4 Map 1 shows an aerial view of the Middle Columbia Slough inventory site.
A roughly 3.5-mile long section of the Columbia Slough main arm, the confluence of Whitaker Slough to I-205, Whitaker Slough, Whitaker Ponds and Johnson Lake are part of this site. There are also 26 acres of wetland and 2,220 linear feet of secondary drainageways, located in the site. The 173-acre flood area includes 66 acres of open water, 56 acres of vegetated flood area and 51 acres of non-vegetated flood area. (CS4 Map 2). The Multnomah County Drainage District (MCDD) maintains the levees and water levels in the Columbia Slough to provide flood protection and stormwater conveyance. The management of the Columbia Slough waterways riparian reduces flooding and affects the riparian functions. The inventory models have been adjusted to reflect a lesser level of function than assigned to more active flood areas in the rest of the City.

Vegetated areas at least ½ acre include approximately 98 acres of forest or dense tree canopy, 40 acres of woodland, 29 acres of shrubland and 214 acres of herbaceous cover.

| Study Area (1,097) | 
|-------------------|-------------------|
| Stream/Drainageway (miles) | 8.2 |
| Wetlands (acres) | 26 |
| Flood Area (acres)* | 173 |
| Vegetated (acres) | 56 |
| Non-vegetated (acres) | 52 |
| Open Water** (acres) | 66 |
| Vegetated Areas >= ½ acre (acres)** | 381 |
| Forest (acres) | 98 |
| Woodland (acres) | 40 |
| Shrubland (acres) | 29 |
| Herbaceous (acres) | 214 |
| Impervious Surfaces (acres) | 501 |

* The flood area includes the FEMA 100-year floodplain plus the adjusted 1996 flood inundation area.
** Open Water includes portions of the Columbia Slough within the site.

The City of Portland Bureau of Environmental Services (BES) has conducted revegetation around the slough. The site contains ten active, eleven completed and two prospective revegetation sites. Much of the revegetation has occurred in riparian areas around the Columbia Slough, Whitaker Slough, Whitaker Ponds and Johnson Lake.

The Multnomah County Drainage District (MCDD) maintains the levees and water levels in the Columbia Slough to provide flood protection and stormwater conveyance for developed lands.

The Oregon Department of Environmental Quality (DEQ) has identified confirmed and suspected contaminated areas within the site (Map 27). Soil, groundwater and surface water within the site contain contamination resulting from past and current activities including oil tank leaks, pressure washing, waste discharge to dry wells, oil refining processes, electroplating operations, oil and diesel spills, fill materials, buried equipment debris, and solvent releases. Types of pollutants found in the site included petroleum hydrocarbons, PCBs, trichloroethylene, chloroform, dichloroethylene,1,2-CIS, tetrachloroethylene, trichloroethylene, benzene, benzo(a)anthracene, ethylbenzene, methylene chloride, toluene, vinyl chloride, xylenes, acetone, cadmium, chromium, copper, cyanide, lead, nickel and zinc. Potential environmental and health risks include exposure to contaminated soil, consumption of fish, water contact recreation, agricultural plant uptake. Bioaccumulation may post a particular risk to animals at the top of

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the food chain. For more information regarding contamination, visit the DEQ website at http://www.deq.state.or.us/lg/ecsi/ecsi.htm.

Map 27. CS3 Columbia River - Contamination
Natural Resource Description

The natural resources are described for subareas of the inventory site (Map 28).

Middle Columbia Slough
The site contains approximately 3.5 miles of the Columbia Slough main channel; this section of the Columbia Slough is called the Middle Slough. The portion of the Middle Slough within the site is characterized by a low gradient channel and excess macrophyte growth that can impact flow and water quality. The riparian area adjacent to the Middle Slough is generally one to two trees in width. These areas are generally bottomland hardwood forest comprised of black cottonwood and red alder. Other native vegetation species present include Douglas-fir, western red cedar, snowberry, red-flowering currant, red-osier dogwood, Indian plum, Oregon grape, Nootka and swamp rose, and vine maple. Invasive plant species found throughout in the riparian area include Himalayan blackberry, Japanese knotweed and reed canary grass.
The Middle Slough and associated waterways are completely surrounded by levees and are within the Multnomah County Drainage District (MCDD). As a result, the water can only reach the Lower Slough if pumped or allowed to flow through the levee’s gravity gates in the MCDD levee. In an average year, MCDD is able to allow Middle Slough water to flow through the floodgates into the Lower Slough by gravity for several months (generally late fall to early winter). During the other months, or when water levels in the Lower Slough are higher than those in the Middle Slough, water must be pumped against the gradient. Pump Station No. 1 has a pumping capacity of 250,000 gallons per minute (gpm).

Estimates of groundwater flow in the Slough vary from 50 to 100 cubic feet per second (cfs).

The width of the Middle Slough mainstem waterway varies in general from 30-100 feet. A section just upstream of MCDD Pump Station No. 1 (where the Vanport Flood broke the levee and gouged out the channel) was 90 feet deep after the 1948 flood, but now is approximately 10 to 16 feet deep. The average channel depth in the Middle Slough ranges is 6 to 8 feet. The Columbia Slough is water quality limited for multiple parameters including bacteria, temperature, dissolved oxygen and biochemical oxygen demand (BOD), eutrophication (phosphorus, chlorophyll a, pH), heavy metals and total suspended solids. In general, the Middle Slough has better water quality than the Upper and Lower Slough. Water temperatures are generally cooler in the Middle Slough, due in large part to cool groundwater inputs. Macrophyte and algae growth is extensive in the Middle Slough. This is a result of slow flows, solar access (lack of shading) and high concentration of nutrients. Macrophytes and algae produce oxygen during the day but at night they respire using oxygen and producing carbon dioxide. This can result in the dissolved oxygen concentration and pH becoming low during the morning hours and creating inhospitable conditions for some species of fish, amphibians and macroinvertebrates.

The Middle Slough provides habitat for numerous fish and wildlife species including willow flycatchers, belted kingfishers, great blue herons, common merganser, western, painted turtle, river otter, nutria and beaver are some of the wildlife species that routinely use this riparian area.

Habitat in the Middle Slough is affected by nearby development. Industrial development, including buildings, loading areas and parking lots, encroach into the riparian area fragmenting habitat and reducing shade potential from riparian vegetation. Comfoot Road, north of the Middle Slough between NE 47th Avenue and Alderwood Road, is in close proximity (between 25 and 100 feet) of the waterway and impacts riparian vegetation, wildlife habitat and water quality.

Whitaker Slough
Whitaker Slough is a southern arm of the Middle Columbia Slough. Approximately 3.5 miles of Whitaker Slough, from the confluence with the Middle Slough to I-205, is located in this inventory site. There are multiple ponds (e.g. Whitaker Ponds, Johnson Lake) and inlets that are hydrologically connected to Whitaker Slough. Whitaker Slough has significant areas of groundwater upwelling. The cool groundwater helps to moderate summer water temperatures. Cool water is a basic requirement for many aquatic species. The surrounding land uses are primarily industrial and commercial with a few remnant residences along the north bank of Whitaker Slough.

A narrow strip of riparian vegetation, two to three trees deep, surrounds Whitaker Slough. The dominant tree species include black cottonwood and red alder along with a heavily mixed understory of planted native trees and shrubs. Species present include: Douglas-fir, western red cedar, snowberry, red-
flowering currant, red-osier dogwood, Indian plum, Oregon grape, Nootka and swamp rose, and vine maple. Some naturally-occurring western hazel, red-osier dogwood, and Pacific ninebark are additionally scattered in the understory. Invasive plant species found throughout the riparian area including Himalayan blackberry, Japanese knotweed and reed canary grass. Leaf litter is the primary ground cover component, along with some grass, palmate coltsfoot, shining geranium, creeping buttercup, and English ivy. The established tree canopy and overhanging shrubs shade the waterway, reducing in-water water temperatures during the summer and creating a localized microclimate affect that is beneficial for many wildlife species.

Wildlife using Whitaker Slough and the riparian area include beaver, nutria, coyote, Great Blue Heron, Great Horned Owl, goldfinch, black cap chickadee, Oregon junco, American robin, violet-green swallow, Cooper's hawk and American widgeon. Migratory birds using Whitaker Slough include Western Tanager, Cassin's Vireo, and Black-throated Gray Warbler. Fish found in Whitaker Slough include Three-spined Stickleback, Mosquitofish, and Prickly Sculpin.

In November 1996 a survey of aquatic macroinvertebrates in Whitaker Slough was performed by Parametrix, Inc. Five samples were taken along the vegetative edge, and four samples were taken from open water benthic sediments (Wisseman, 2001). Diversity was higher in the vegetative edge and included Gastropoda (snails), Pelecypoda (clams), Ephemeroptera (mayfly), Sialis (alderfly), Trichoptera (caddisfly), and Gyriniidae (whirligig beetle). Other species found included Chironomid midges, ostracods, oligochaete worms, Amphipoda (scuds-crustacea), Copepoda (microcrustaceans), Cladocera (microcrustaceans), and Corixidae (water boatmen).

Whitaker Slough has been designated Special Habitat Area CS16.A South Arm Complex – Whitaker Slough because it is an active groundwater upwelling areas with visible springs; is surrounded by a bottomland hardwood forest; and provides a wildlife habitat connectivity corridor.

Whitaker Ponds
Whitaker Ponds consist of two ponds and surrounding riparian vegetation totaling about 14 acres just east of NE 47th Avenue. The western ponds and most of the eastern pond are owned and operated by City of Portland Bureau of Parks and Recreation and Metro Regional Government. The western pond is home to the Columbia Slough Watershed Council headquarters.

The forested banks of Whitaker Ponds are predominantly black cottonwood and red alder along with a heavily mixed understory of planted native trees and shrubs. Species present include: Douglas-fir, western red cedar, snowberry, red-flowering currant, red-osier dogwood, Indian plum, Oregon grape, Nootka and swamp rose, and vine maple. Some naturally-occurring western hazel, red-osier dogwood, and Pacific ninebark are additionally scattered in the understory. Leaf litter is the primary ground cover component with some grass, palmate coltsfoot, shining geranium, creeping buttercup, and ivy. Poison hemlock is also locally abundant in the wetter areas.

The southeastern forested area is primarily composed of black cottonwood with a western hazel and sword fern understory. The eastern end of the pond is populated mostly with willow species and red-osier dogwood, including one huge European weeping willow, and the ground cover is downed wood and
water. Areas without tree canopy are almost entirely covered in Himalayan blackberry. The northern two patches have been cut however. There is virtually no ground cover layer in these parts.

The southwest corner of ponds complex is a native shrubland comprised of young red alder, Douglas spirea, and willow which surround a small wetland containing small-fruited bulrush, common rush, and slough sedge. Along NE 47th Avenue, in front of the Columbia Slough Watershed Council headquarters, is a maintained turf grass field.

The ponds provide habitat for Western painted turtles, wintering waterfowl, songbirds, nesting great horned owls, and other wildlife species. During a spring 2009 site visit many birds were observed: great blue heron, goldfinch, black cap chickadee, Oregon junco, American robin, violet-green swallow, Cooper’s hawk, ringneck duck, American widgeon, western merganser, mallard, and Canada goose. There was evidence of heavy beaver work on the cottonwoods on the north shore of east pond and on the red cedars just upslope. Coyote scat was also observed. Bat species that use Whitaker Ponds include California myotis, yuma myotis and silver-haired nat.

Whitaker Ponds has active groundwater upwelling areas, with visible springs, that helps keep the water temperatures cool during the summer. Cool water is a basic requirement for many aquatic species.

Whitaker Ponds is designated Special Habitat Area CS16.B: South Arm Complex – Whitaker Ponds because is it is a wetland surrounded by bottomland hardwood forest; is an active groundwater upwelling area with visible springs; provides stopover habitat for migratory birds; and it provides habitat critical to sensitive species including Western painted turtles.

**Colwood Golf Course**

Colwood Golf Course is a 115-acre open-space site located along the Columbia Slough and Whitaker Slough. Colwood is located halfway between two regionally significant and publicly-owned natural areas: Whitaker Ponds to the west and Johnson Lake to the east. Stretches of both the Middle Slough and Whitaker Slough flow through the golf course and there are four wetlands located here. The predominant vegetation type in the golf courses is maintained turf grasses with narrow strips of large trees. Several mature Oregon white oaks are present. The grassy areas are utilized by migratory geese and red tailed hawk.

The southeastern most wetland is an open pond with riparian vegetation. The woodland vegetation contains mostly black cottonwood and red alder with a heavy Himalayan blackberry understory. Red-osier dogwood is additionally present. Buildings and access roads are in very close proximity (50-60 feet) of the wetland.

The eastern small remnant forested wetland, which is designated as Special Habitat Area CS17: Colwood Golf Course Forested Wetland, provides excellent foraging, nesting, perching and roosting habitat for flycatchers, which are a species of concern, warblers, woodpeckers, reptiles, and amphibians. The vegetation is dominated an ash-cottonwood forest with a robust snowberry-gooseberry understory. Red-osier dogwood and Pacific ninebark are present here as well, along with a stand of paper birch near the southern slough branch. Nettles and fringe cup form the native ground cover. There are also trace amounts of ivy, Himalayan blackberry, and holly within this area. The wetland and forest vegetation provides habitat connectivity between the Middle Slough and Whitaker Slough. The wetland can provide flood storage capacity during large rain events.
The western small forested wetland is included in Special Habitat Area CS16.B: South Arm Complex – Whitaker Slough. The in the wetland and along Whitaker Slough is predominantly ash-cottonwood with a strong presence of Himalayan blackberry and some wild clematis. The wetland provides foraging, nesting, perching and roosting habitat.

Wildlife observed using the slough arms and the southern wetlands include American robin, marsh wren, redwing blackbird, Oregon junco, song sparrow, Anna’s hummingbird, mourning dove, mallard, ringneck duck, American widgeon, beaver and nutria.

In the northern portion of the golf course there is a 1-acre pond. The western edge of the pond is surrounded by establish trees including black cottonwood and willow. A line of trees, one tree deep, exist along the southern bank and the northern bank is dominated by turf grasses. During a site visit in March 2009, migratory Alaskan Geese were observed in the pond.

The wetlands and arms of the slough are likely impacted by golf course maintenance including fertilizers, herbicides, pesticides and mowing.

Colwood Golf Course, along with other locations in the study area, were recently surveyed by US Fish and Wildlife Services for bat use (2009). *Myotis lucifugus* (MYLU) was documented at the golf course. The bats utilize water bodies for drinking and foraging and the trees for roosting, both day and night. MYLU can roost in varying structures from buildings to snags. The complex of habitat features at Colwood Golf Course (Middle Slough, Whitaker Slough, multiple wetlands and riparian tree canopy) provide habitat for MYLU.

Colwood Golf Course is designated a Special Habitat Area (CS29) because it provides migratory stopover habitat (M), is a connectivity corridor between the Columbia Slough and Whitaker Slough (C) and provides habitat for at risk bat species (S).

**Johnson Lake**

Johnson Lake is a 42-acre remnant lake that is characteristic of historic lakes and wetlands in the Columbia Slough Watershed. It is the largest and most natural lake in Middle or Upper Columbia Slough. Johnson Lake discharges into Whitaker Slough. The lake experiences significant groundwater upwelling that introduces cold water into Whitaker Slough.

The forested areas surrounding Johnson Lake are composed of black cottonwood, red alder, and Oregon ash, some quite large. Several old snags are found throughout. Some western red cedar is also present (planted). The understory is quite diverse with native shrubs including: red elderberry, snowberry, Pacific ninebark, western hazel, wild gooseberry, tall Oregon grape, Douglas spirea, red-osier dogwood, and black hawthorn. Much of the area was planted; however, there are some naturally-occurring shrub thickets particularly along the south side of the lake.

Extending north from Johnson Lake is forest vegetation approximately 300 feet wide that provides a wildlife habitat corridor between the lake, Whitaker Slough and the Middle Slough. This is a high quality patch of ash-cottonwood forest with a snowberry-gooseberry understory and a nettle-fringecup herb layer. There are some bird cherry and holly trees within the site as well as ivy, wild clematis, and blackberry.
Johnson Lake and forested riparian area are important remnant habitats and home to nesting great horned owl, Osprey, numerous neotropical migratory songbirds and wintering waterfowl. Bird species found here include bufflehead, ring-necked duck, gadwall, American widgeon, lesser scaup, Wood Duck, Canvasback, Pied-billed Grebe, Double-crested Cormorant, goldfinch, scrub jay, song sparrow, American robin, European starling, downy woodpecker, mallard, juvenile bald eagle, and great blue herons and loons. Downed and floating logs in the pond provide turtle habitat.

There are multiple homeless camps around Johnson Lake and some trash accompanies these sites.

The lake and riparian vegetation is designated Special Habitat Area CS16.C: South Arm Complex – Johnson Lake because it is an active groundwater upwelling areas with visible springs; provides stopover habitat for migratory birds; is surrounded by a bottomland hardwood forest; and provides a wildlife habitat connectivity corridor.

**McBride Slough**

Located to the west of NE 82\textsuperscript{nd} Avenue is a secondary drainageway called McBride Slough. McBride Slough flows under NE 82\textsuperscript{nd} where it connects up with another secondary drainageway called the PIC Ditches.\textsuperscript{1} There are multiple remnant channels, located outside this inventory site, that make up the PIC Ditches. All of the drainageways are hydrologically connected and flow to the Columbia Slough at approximately NE 92\textsuperscript{nd} Avenue.

Riparian vegetation west and south of McBride Slough is composed of black cottonwood and Oregon ash with a dense understory of snowberry and wild gooseberry. Several large oaks between 24-36 inches in diameter are present on the golf course edge of the forest. Ground cover is primarily moss and nettles. The east and north riparian vegetation is primarily Himalayan blackberry and reed canary grass. During a site visit in March 2009, coyote, great horned owl, Cooper’s hawk and red tailed hawk were observed.

The portion of the PIC Ditches located within the site has similar vegetation assemblages along its banks as McBride Slough: black cottonwood, Oregon ash, snowberry, gooseberry, Himalayan blackberry, nettles and reed canary grass.

Buildings, parking lots and roads are in close proximity to both drainageways, encroaching into the riparian area and impacting natural resource functions.

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\textsuperscript{1} Portions of the PIC Ditches are also know as Green Heron Slough.
Natural Resource Evaluation

The natural resources located within this site have been evaluated for relative riparian and wildlife habitat quality. Relative quality is presented in the form of relative functional value ranks for riparian corridors, wildlife habitat, and riparian/wildlife habitat value combined (Table 21). The relative ranks are produced using GIS models and information on Special Habitat Areas. The model criteria are not sensitive to the species of vegetation present or whether vegetation is native or non-native. However, the model criteria do assign different riparian functional values to cultivated, heavily manicured and managed landscapes and semi-natural and natural vegetation. The approach used to generate the relative ranks is summarized in the introduction to the inventory sites. Additional detail is provided in the Methodology Overview section of this report and the Natural Resource Inventory Update: Riparian Corridors and Wildlife Habitat (City of Portland, 2008).

All of the ranked resource areas provide at least some important riparian and habitat value, recognizing that current condition and function levels may vary considerably. The relative ranks can inform planning programs, design of development or redevelopment projects, mitigation and restoration activities.

Riparian Corridors

The site contains portions of the Columbia Slough, multiple wetlands, vegetated and non-vegetated flood area, riparian forest with associated shrub and groundcover, as well as other types of vegetation that contribute to the riparian functions as detailed in the natural resource description. These landscape features provide the following riparian functions:

- Microclimate and shade
- Stream flow moderation and water storage
- Bank stability, and sediment, pollution and nutrient control
- Large wood and channel dynamics
- Organic inputs, food web and nutrient cycling
- Riparian wildlife movement corridor

High relative functional ranks are assigned to the Columbia Slough, Whitaker Slough, wetlands, and secondary drainageways. Riparian forests and areas of dense tree canopy receive a high or medium relative ranks depending on proximity to open water. Medium and low relative ranks are generally assigned to lower structure riparian vegetation. Other areas are assigned a high, medium or low relative rank depending on the proximity and extent of vegetation relative to the water body (CS4 Map 4).

Wildlife Habitat

A wildlife habitat patch is, for purposes of the inventory model, defined as forest and/or wetland areas, 2 acres in size or greater, plus adjacent woodland vegetation (note Special Habitat Areas may be smaller and may contain different types of vegetation or other resource features).

The site contains forested areas and wetlands that provide wildlife habitat and connectivity between habitat patches. The forested areas provides nesting, breeding and foraging habitats for a diverse range of bird and mammal species, as well as amphibians, reptiles, and invertebrate species.

Based on the wildlife habitat model criteria, a medium relative rank is assigned to the forest/wetland patches because of patch size, interior area and proximity to water and other patches.

Special Habitat Areas (SHA) descriptions

SHAs contain unique features and provide critical wildlife habitat as described in the Natural Resources Description section above. SHAs receive a high relative rank for wildlife habitat. The SHA ranking
supersedes lower rankings generated by the GIS model. Therefore, all SHAs within the site rank high for wildlife habitat (CS4 Map 5).

There are four SHAs designated within the site.
- **CS16: Whitaker Slough** – bottomland hardwood forest (B); wildlife habitat connectivity corridor (C); resources or structure that provides unique habitat function in natural or built environment (U)
- **CS16.B: Whitaker Ponds** – wetland (W); bottomland hardwood forest (B); migratory stopover habitat (M); area critical to sensitive species (S)
- **CS16.C: Johnson Lake** - bottomland hardwood forest (B); wildlife habitat connectivity corridor (C); migratory stopover habitat (M); resources or structure that provides unique habitat function in natural or built environment (U)
- **CS29: Colwood Golf Course Forested Wetland** - wetland (W); bottomland hardwood forest (B); wildlife habitat connectivity corridor (C); migratory stopover habitat (M)
- **CS30: Middle Slough** – area vital to at risk species including Western painted turtle and Northern red-legged frog (S); migratory stopover habitat (M); and wildlife connectivity corridor (C)

**Combined Relative Riparian/Wildlife Habitat Ranking**

Where areas mapped as riparian corridors and wildlife habitat overlap, and their relative ranks differ, the combined relative rank will be the higher of the two ranks. For example, an area that ranks medium for riparian function and low for wildlife habitat will receive a medium combined relative rank (WR1 Map 6).

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<thead>
<tr>
<th>Table 21: Summary of Ranked Resources in CS4: Middle Slough and Whitaker Slough</th>
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<tr>
<td><strong>Total Inventory Site</strong> = 1,097 acres</td>
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<tr>
<td>Riparian Resources*</td>
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<td>Special Habitat Areas**</td>
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<td>percent total inventory site area</td>
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<td>Wildlife Habitat - adjusted by Special Habitat Areas ***</td>
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<td>percent total inventory site area</td>
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* High-ranked riparian resources, Special Habitat Areas, and wildlife habitat includes the Willamette River
** Special Habitat Areas rank high for wildlife habitat
*** Because riparian resources, Special Habitat Areas, and wildlife habitat overlap, the results cannot be added together to determine the combined results.
Site CS4a - Map 5: Middle Slough/Whitaker Slough

Wildlife Habitat Relative Rankings

- **High relative value - Special Habitat Areas**
- High relative value
- Medium relative value
- Low relative value
- Stream/Drainage
- Culvert or Piped
- Site Boundary
- City Boundary
- Urban Services Boundary

INFORMATION SOURCES:

- The National Resource Inventory (NR-I) is a digital product to evaluate and support natural resource conservation and planning efforts. This product is maintained by the USDA's Natural Resources Conservation Service (NRCS) and is available at https://nationalresourceinventory.usda.gov/nr-i/

**SITE: inspection and mapping by NR-I team.**

- Large areas represent the most valuable sites for wildlife habitat.

NOTE: Portland's wetland inventory is being evaluated for accuracy and consistency and considerable research is still required. This inventory has not been adopted by the City of Portland.

Offices consulted from source materials on different scales, including Portland's Master Plan, City Code, and Portland's Bureau of Planning & Sustainability.

Scale: 1:4000

City of Portland Bureau of Planning & Sustainability
Sam Adams, Mayor; Susan Anderson, Director
Site CS4a - Map 6: Middle Slough/Whitaker Slough

Combined Riparian / Wildlife Habitat

Relative Rankings

- High relative value - Special Habitat Areas **
- High relative rank
- Medium relative rank
- Low relative rank
- Stream/Drainage
- Culvert or Piped
- Site Boundary
- City Boundary
- Urban Services Boundary

INFORMATION SOURCES:
The National Resource Inventory (NRI) is a collaborative project to update and improve wildlife habitat mapping in forests, grasslands, and wetlands. This project is based on the NRI data and U.S. Fish and Wildlife Service (USFWS) data.

** Slight rendering porosity based on relative value.

For more information, visit the NRI website: http://nationalresourcereport.gov

NOTES:
- The data used in this map was created by the City of Portland and is based on the NRI data.
- The map was created using Adobe Illustrator and is not intended for legal use.
- The City of Portland does not guarantee the accuracy of the data.
- The map was created by the City of Portland.
- The City of Portland Bureau of Planning & Sustainability.

City of Portland Bureau of Planning & Sustainability
Sam Adams, Mayor
Jason Anderson, Director
Site CS4b - Map 5: Middle Slough/Whitaker Slough

Wildlife Habitat Relative Rankings

- **High relative value - Special Habitat Areas**
- **High relative value**
- **Medium relative value**
- **Low relative value**
- **Stream/Drainage**
- **Culvert or Piped**
- **Site Boundary**
- **City Boundary**
- **Urban Services Boundary**

INFORMATION SOURCES:
The Natural Resources Inventory (NRI) is a citywide project to collect and update natural resource information. Information on fish, streams, wildlife habitat, etc. in Portland is compiled and maintained by the Portland Bureau of Environmental Services.

**Site names are provided for reference, not accuracy.**

NOTES: The City’s natural boundary is the boundary established for inventory and monitoring purposes. The City’s boundary has not been adopted by the City of Portland.

Affiliates consulted from existing maps on different scales, which are not precisely aligned. For more detail, please refer to the City of Portland, Bureau of Planning and Sustainability.

Scale: 1" = 200' - 1:2400

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