

RIVERFRONT PARK RIPARIAN & WETLAND RESTORATION

The Initial Vision

Wasco County Soil and Water Conservation District worked closely with Icon West who were developing the Lone Pine area on the Columbia River next to The Dalles Dam. They had 10 acres of wetland that was part of the Lone Pine development that needed to be restored. In the process of providing technical assistance to the Lone Pine developers, Josh Thompson, one of the district's Conservation Planners, realized that what was achieved with the wetland at Lone Pine Village could be achieved with the rest of the degraded riverfront. He envisioned a continuous strip of restored riverfront that stretched from Lone Pine all the way to Riverfront Park that would provide not only incredible wildlife habitat, but make a once vegetative wasteland an integral part of The Dalles community. Josh brought his proposal to the district's Board of Director's and with their blessing set about to make that vision happen.

A Vision Shared

Wasco County Soil and Water Conservation District acknowledges a project of this scope could not be possible without the support of the community and agency partners. The district is grateful to all those who have lent their support, time and effort to make this project possible.

Northern Wasco County Parks and Recreation
Area Manager, Scenic Area Fisheries Biologist
USDA NRCS, State Fisheries Biologist
Mid-Columbia District Biologist

City of The Dalles
Riverfront Trail, Inc.
Northwest Weed Management Partnership
Ellett Construction

The Dalles Watershed Council
Oregon Dept of Fish and Wildlife

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Wasco County Soil and Water
Conservation District
www.wascoswcd.org



Oregon Watershed Enhancement Board
<http://cms.oregon.gov/oweb/pages/index.aspx>



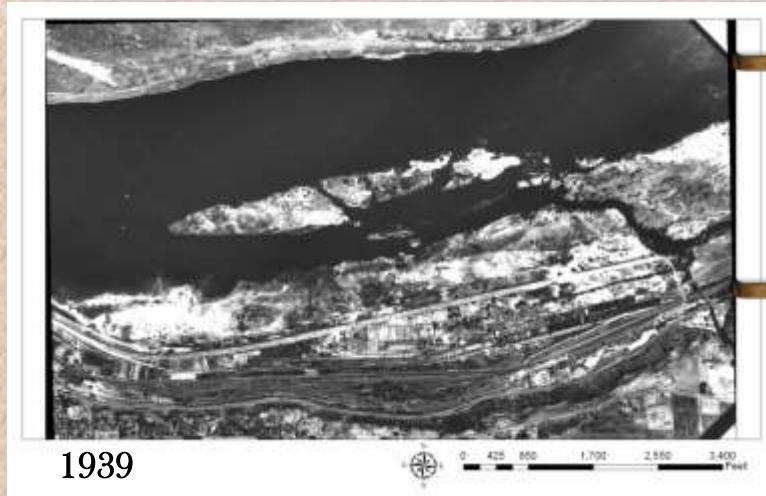
Fish America Foundation
www.fishamerica.org

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Excerpt from the Riverfront Park Riparian & Wetland Restoration Plan as researched and compiled by Josh Thompson, Planner, Wasco Co. SWCD

Location

Riverfront Park is located between interstate 84 and the Columbia River between milepost 85 and 87 in The Dalles, Oregon. The legal description is, donation land claim 38, township 1 north, range 13 east, Willamette Meridian. This site can be accessed from the west by entering Riverfront Park, or from the east through the Lone Pine Development. The area is closed from November 1st to the Memorial Day for wildlife nesting.



General Description

The Park consists of 50 acres. 10 acres of this park is developed and features restrooms, picnic tables, a covered shelter, a children's play structure and a roller hockey rink. The undeveloped portion of Riverfront Park consists of 40 acres to the east. The 40 acres was set aside as a natural area as part of the mitigation for the wetland fill involved in the development of the Park in 1989.

Riverfront Park is also on the path of Riverfront Trail, which is a 10 mile trail that connects The Dalles Dam Visitor's Center to the Columbia Gorge Discovery Center. Other features along this trail include, Port of The Dalles Marina, Downtown The Dalles, Lone Pine Village, Crates Point Wildlife Area and The Dalles Industrial Park.

Riverfront Park is owned by Northern Wasco County Parks and Recreation District (NWCPRD). The Northern Wasco County Parks and Recreation District is a special services district which was established in 1984. The District employs 6 full-time employees, 30 seasonal employees and recruits numerous volunteers annually. Riverfront Park is one of many sites that are managed by NWCPRD. The sheer scope of the project funding wise, has hindered restoration efforts of the undeveloped portion of the park.

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Topography and soils

Topography

The topography of the site is relatively flat, the riverfront trail bordering the south side of the area is the highest point before the freeway berm, it is 11 feet above the river level at its highest point on the East side. The Ordinary high water elevation has been determined to be 83 feet (National Geodetic Vertical Datum).

Soils

The entire site was disturbed for the construction of the freeway in 1960. Aerial photos show that much of the topsoil was scraped off and above water area was reduced by 28 acres for the construction of interstate 84. The USA NRCS Soil Survey for Northern Wasco County was completed after the construction of the interstate, and any history of soil disturbance was not noted in the published findings.

Current Vegetation

In July 2010 vegetation mapping was performed throughout the site. The massive extent of the invasive vegetation physically limited the access to the trails. Aerial photos were used to map out the vegetation types with ground truthing as much as access allowed. The sheer mass of vegetation has made the area an ecological wasteland that has reduced, and in many instances eliminated, habitat for native bird species, mammals, amphibians and insects. It has also prevented any type of recreational use for the community.

Special Features

Riverfront Park is the largest shallow water habitat areas in the Bonneville pool of the Columbia River. Its gentle sloping banks are rare as most of the Bonneville pool is confined by vertical basalt walls or riprap banks. Many of the natural shallow water areas have been isolated by riprap berms associated with Interstate 84 and the Union Pacific railway on the south and Highway 14 and the Burlington Northern railway to the north. These gently sloping banks create near shore shallow water rearing habitats that are an important habitat for outgoing spring Chinook salmon. This section of the Columbia River is a migration route and provides rearing habitat for both threatened and endangered runs of spring Chinook.

There is a known breeding population of peregrine falcons within $\frac{3}{4}$ of a mile from Riverfront Park. Peregrine Falcons were listed as endangered in 1973 and were delisted in 1999 due to recovery. Some of the best roost and forage habitat for eagles is within the area. It is also a common winter roost site for wintering bald eagles, and nearly 100 eagles have been found within the project vicinity in winter months. The area also plays host to two known active osprey nesting sites. The project location is within a habitat mitigation area designed to benefit waterfowl and associated habitats lost due to construction of the Columbia River hydroelectric systems. This parcel provides excellent nesting potential for a variety of species, as well as off-channel loafing habitat for wintering waterfowl.

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Recreational uses

Recreational use of the park is primarily limited to walking and biking along the trail. Access to the majority of the site is physically limited by the extent of the invasive vegetation. This project will build upon the riverfront trail and offer the public opportunities to access the riverfront in ways that have been unavailable. Once restored to a native plant community featuring a more open setting, the park will provide ample opportunity for wildlife viewing, fishing, picnicking, and swimming.

Vision

The overall vision for this site is to restore 5,600' of the Columbia River shoreline to create near-shore rearing habitat for spring Chinook salmon and have a functioning wetland / riparian ecosystem that can be used by the public for recreation and education. Riverfront Park east is a 40 acre riparian / wetland. The management of this facility should be a model for other land managers, both public and private. Today's society has put land managers under ever increasing pressure to be good stewards and manage for more natural conditions that benefit native species and a broad spectrum of recreational uses. The proximity of Riverfront Park to The Dalles, which is the highest populated city in Wasco County, makes it a valuable resource for recreation and as wildlife habitat amidst the surrounding urban sprawl. Currently the site does not function properly due to the massive extent of invasive vegetation. The vision includes replanting with all native vegetation consisting of grasses, shrubs and trees. The landscape in its original condition would provide plenty of open space for recreation and allow for access of the site's ¼ mile beach. This access would be utilized for various recreational and educational activities such as fishing, hiking, and bird watching.

Objectives

The objective is to remove invasive vegetation, restore native functioning plant community, improve wildlife habitat, and provide public recreational and educational access.



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Removal of Invasive Vegetation

The removal of the invasive species throughout the site will be the most labor intensive and costly part of this restoration. It consists of the initial mechanical removal and 3 years of intense annual follow up involving mechanical and chemical treatment. The method of removal will vary based on the vegetation type, with extra effort taken to reduce the damage to existing native vegetation. The four methods of mechanical removal will consist of, pull and grind, mulch in place, mowing and hand removal.

List of Invasive Plant Species Found to Date

Russian Olive, *Elaeagnus angustifolia L.*
Poison Hemlock, *Conium maculatum L.*
Diffuse Knapweed, *Centaurea diffusa L.*

Common Mullein, *Verbascum thapsus L.*
White Mulberry, *Morus alba L.*
Tree of Heaven, *Ailanthus altissima*

Desert False Indigo, *Amorpha fruticosa L.*
Himalayan Blackberry, *Rubus armeniacus Focke*



Josh Thompson, Wasco Co. SWCD

Russian Olive, *Elaeagnus angustifolia L.*

Description:

Russian-olive is a small deciduous tree or large thorny shrub in the oleaster family (*Elaeagnaceae*) that can grow 15 to 30 feet in height. It is generally rounded in shape with loose arrangement of branches. Its stems, buds, and leaves have a dense covering of silvery to rusty scales. Twigs have silvery scales and thorns on the ends. Leaves are simple, alternate, 1-3 inches long, lance-shaped and silvery on both sides. Flowers appear in June and July. They are bell-shaped, single or clustered in the leaf axils, fragrant, yellowish on the inside and silver outside. Olive fruits are drupe-like, .5 inches long, light green to yellow with silvery scales, hard and fleshy.

This invasive plant can interfere with natural plant succession, nutrient cycling, and tax water reserves. Because Russian-olive is capable of fixing nitrogen in its roots, it can grow on bare, mineral substrates and dominate riparian vegetation where over-story cottonwoods have died. Although Russian-olive provides a plentiful source of edible fruits for birds, ecologists have found that bird species richness is actually higher in riparian areas dominated by native vegetation.

Site Distribution:

Found throughout the site, with the highest concentration in the west end of the park.

Status: State and federally listed as invasive. Non-native.

Poison hemlock, *Conium maculatum* L.



Description: Poison hemlock is a biennial (usually) herb that can grow from 3-10 ft. (1-3 m) in height. Stems are hollow, ribbed and purple-spotted. Plants begin as a rosette of leaves and flower in the second year of growth. Leaves are opposite, finely dissected, 8-16 in. long, triangular and emit a foul odor when crushed. The petioles often sheath the stem. Flowering occurs from May to August, when many umbrella-shaped heads (umbels) of small, white flowers develop at the apex of the stems. Umbels are 2-2.5 in. (5-6.2 cm) in diameter and contain many 5-petaled flowers. One plant can produce over 30,000 seeds. Plants, when eaten, are highly poisonous to most animals and people.

Poison hemlock can sometimes be confused with water hemlock (*Cicuta maculata*) and giant hogweed (*Heracleum mantegazzianum*). The leaf veins in water hemlock end in the notches between the teeth of the leaflets and in poison hemlock the veins end at the tips of the teeth. Giant hogweed has larger, less divided leaves and a hairy stem.

Site Distribution: Poison hemlock found along the edges of the trail, ponds, and moist areas.

Status: State listed as noxious. Non-native.



Diffuse knapweed, *Centaurea diffusa* Lam.

Description: Diffuse knapweed is an annual, biennial, or short-lived perennial that is 8-40 in. (20-101.6 cm) tall. The basal leaves are lobed and stalked. The leaves become sessile, smaller, and less divided as they move up the stem. Flowering occurs from July to September, when white flowers develop in urn-shaped heads, in clusters, at the ends of the branches. The heads are subtended by leathery bracts. The lower and middle bracts have brown margins with spreading spines at the tips.

Site Distribution: Diffuse knapweed is found along the trail and disturbed areas throughout the site.

Status: State listed as noxious, Class C weed in Wasco County. Non-native.

Common Mullein , *Verbascum thapsus* L.



Description: Common mullein is a biennial forb native to Eurasia and Africa. Plants are unbranched and can grow to more than 6.6 ft. (2 m) tall. First year plants develop as a basal rosette of felt-like leaves. Basal leaves are 4-12 in. (10.2-30.5 cm) long, 1-5 in. (2.5-12.7 cm) wide and covered with woolly hairs. The plant bolts in the second year. Flowering occurs in June to August, when five-petaled, yellow flowers develop at the apex of the shoot. Cauline (stem) leaves are decurrent, alternate and decrease in size towards the apex. The fruit is an ovoid capsule that splits releasing many seeds that germinate in water

Site Distribution: Common mullein is found along the roadways and trails throughout the site.

Status: Listed as noxious in Oregon. Non-native.



White mulberry, *Morus alba* L.

Description: A deciduous shrub or tree, 30 to 50 feet in height and approximately 1.5 feet in diameter. It has low branches and a wide spreading crown. Bark is orange-brown with lenticels when young, becoming gray with long narrow irregular ridges. Glossy green leaves that turn yellow in autumn are 3 to 6 inches long, alternate, stipulate, and variable in shape. Unisex flowers are small, greenish-yellow, with dense spikes. The blackberry-like aggregate fruits, 1 to 1 1/4 inch long, turn from green to white to red to black as they ripen, May to August.

Site Distribution: Mulberry are found scattered throughout the site, they are in relatively small numbers compared to the other invaders. While they are not as noxious as other plants, they are non native and can be an alternative host for orchard pests.

Status: Listed as invasive by the Pacific Northwest Exotic Pest Plant Council. Non-native.

Himalayan Blackberry, *Rubus armeniacus* Focke



Description: Himalayan blackberry is a perennial shrub native to Eurasia. Stems grow to 15 ft. (4.6 m) before arching and then trailing over the ground for up to 40 ft. (12.2 m). As stems touch the ground they root at the nodes, producing a dense thicket. The leaves of the prima cane (first year shoots) are 2.8-7.9 in. (7-20 cm) long and palmately compound with 5 leaflets. No flowers are produced on the first year's growth. In the second year several side shoots are produced (flora canes) having smaller leaves with 3 leaflets. The leaflets are oval and toothed with thorns along the underside of the mid-rib. Flowering occurs in late spring to early summer; when white to pale pink flowers develop on the flora canes. Flowers have 5 petals, numerous stamens and are 0.8-1 in. (2-2.5 cm) in diameter. Fruits are an aggregate of drupelets that are black, when mature, and 0.5-0.8 in. (1.2-2 cm) in diameter.

Site Distribution: Throughout the park.

Status: Listed as noxious in Oregon. Non-native.

Special note: Blackberries are an alternate host for the spotted wing drosophila, which poses a threat to commercial fruit production.

Tree of Heaven, *Ailanthus altissima*



Description: Tree of heaven is a rapidly growing, typically small tree up to 80 ft. (24.4 m) in height and 6 ft. (1.8 m) in diameter. It has pinnately compound leaves that are 1-4 ft. (0.3-1.2 m) in length with 10-41 leaflets. Flowering occurs in early summer, when large clusters of yellow flowers develop above the leaves. Fruit produced on female plants are tan to reddish, single winged and wind and water-dispersed. Tree of heaven resembles the sumacs and hickories, but is easily distinguished by the glandular, notched base on each leaflet and large leaf scars on the twigs. It is extremely tolerant of poor soil conditions and can even grow in cement cracks. Dense clonal thickets displace native species and can rapidly take over fields, meadows and harvested forests. It is a prolific seed producer, grows rapidly, and can overrun native vegetation. It colonizes by root sprouts and wind- and water-dispersed seeds. They produce toxins that prevent the establishment of other plant species.

Site Distribution: Throughout the park.

Status: State and federally listed as noxious weed. Non-native.



Paul Cox, Lady Bird Johnson Wildflower Center

Description: *General:* Bean family (Fabaceae). Desert false indigo is a native, deciduous shrub growing between three to ten feet high. The leaves are four to eight inches long, with eleven to twenty-five leaflets, ovate to oblong. This species is highly variable as regards to shape of the leaf and pubescence (The Great Plains Flora Association 1986). The scented flowers are purplish blue with orange anthers and occur in three to six inch long upright spikes in June (Dirr 1997). The fruits are short, smooth or hairy, glandular legumes containing a single smooth brownish seed (Freeman & Schofield 1991).

Origin: It was not reported for the Pacific Northwest by Hitchcock and Cronquist; however, records in Washington date back to 1974 at Rooks Park, Walla Walla County. It has since been reported along the lower Columbia river as far inland as Klickitat County and from Central Ferry on the Snake River.

Site Distribution: Along the Columbia River shoreline and throughout the park.

Status: Oregon has not listed false indigo as an invasive species, however Washington has. The plant is being noticed more as it is starting to appear in the lower Columbia River. Refuge managers in both Washington and Oregon are making efforts to limit spread into the lower estuary. However, it is also the larval host to several species of butterfly

Invasive Vegetation Removal Methods

Pull and Grind

This method is the most costly and will be used on the Russian olive, mulberry and false indigo dominated sites. A tracked excavator with a thumb will be used to physically remove the tree or shrub and the majority of its roots from the ground. The removed debris will then be concentrated in as few locations as possible. A mobile grinder will be brought in, or the debris hauled to a tub grinding location. The grindings will then be hauled to a composting facility or utilized in a nearby co-generation facility.

This method will be used in the false indigo dominated areas adjacent to the river. A fill and removal permit from the Corp of Engineers and the Department of State Lands will be required for this activity and in-stream work periods for the Columbia River and all other permit conditions will have to be followed. Since this activity will be taking place above normal water line (but still in the jurisdictional area) an extension to work outside the in-stream work period might be obtainable.

Where feasible, blackberries will be taken to the grinder too. This will depend mainly on the machine's ability to access and remove the blackberry.

Invasive Species Removal Methods Continued

Mulch in Place

This method will be used on areas dominated by Himalayan blackberry that are unable to be ground. This method will utilize a large machinery powered brush grinder, such as a hydroaxe or heavy flail. These machines are capable of grinding full size stumps down to ground level. The effectiveness of these types of equipment is based on the weight of the cutting head and the horsepower driving them. Some machines are as high as 500 horsepower and capable of mowing over an acre of 4 to 5 inch brush per hour. The residual material left behind is generally the consistency of bark chip. The amount of residual material can be problematic for revegetation due to the physical barrier created and the amount of nitrogen that is tied up during the decomposition process.

Mowing

Mowing will take place along the weedy areas of the grass/ shrub vegetation type. This will utilize a tractor driven mower, such as the SWCD's Schulte mower, which is capable of mowing up to 3" brush. This will be good for weedy areas, such as those covered in Poison hemlock and Tree of Heaven sprouts.

Hand Removal

Everything between the trail and the freeway will have to be treated by hand to avoid damage to the trail. Hand crews will also be utilized to clean out around desirable vegetation, such as the entire cottonwood vegetation type.

These methods are listed by the most mechanically intense to the least. For efficiency, the most that can be done with the larger equipment the more efficient it will be. For instance, a large Russian olive can be pulled with an excavator and ground in less than two minutes, if it has to be picked up by the hand crew, it will take roughly 20-30 minutes to buck it up, load it, hauled off and unloaded again.



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The vegetation removal part of the project has been put out to bid as of August 2012.
As the project progresses we will be adding to the Riverfront restoration story as it unfolds. Stay tuned!!!

References

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IPM Practitioners Association - [Knapweeds \(Spotted, Diffuse, & Russian\) - Noxious Weed Integrated Vegetation Management Guide](#)

Maryland Department of Natural Resources. Forest Service - [Tree-of-Heaven Control](#)

USDA. FS. Northeastern Area. Forest Health Protection. Identification/Description; Photographs; Introduction History; Impacts; Habitat; Distribution; Controls - [Russian Olive - Weed of the Week \(Mar 10, 2005; PDF | 108 KB\)](#)

National Invasive Species Information Center - <http://www.invasivespeciesinfo.gov>

Washington State Department of Ecology, Non-native Invasive Freshwater Plants - <http://www.ecy.wa.gov/programs/wq/plants/weeds/>

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