

Greenspaces Habitat Restoration Grant Program
U.S. Fish and Wildlife Service and Metro
Final Report: OMSI/Springwater Corridor Revegetation Project
Co-operator: Portland Parks & Recreation - Natural Resource Program
Project Title: OMSI-Springwater Trailside Savannah Habitat Revegetation
Cooperative Agreement Number: 1448-13420-01-142
Project Time Period: July 2002 through July 2005

The Savannah Landscape

Prior to the pioneer settlement of the Portland metropolitan area, the savannah was a very common landscape feature in the Tualatin Valley, on Sauvie Island, and on portions of the Willamette Escarpment - a nearly continuous bluff paralleling the east bank of the Willamette River from Canby to Ross Island and again from the Overlook to the St. Johns neighborhoods of Portland. Historically, the Garry oak (*Quercus garryana*) savannah was a mosaic of open canopy woodlands, grasslands and shrub patches and an extremely important terrestrial habitat for now uncommon plants, invertebrates, mammals and birds. Today, little remains of the savannah landscape in the metro area other than isolated open grown Garry oaks. Regionally, Metro Regional Government and



The Willamette Escarpment near Ross Island
Garry oak habitats are being restored in green and yellow areas; the blue areas await funding.

the Oregon Department of Fish and Wildlife have identified savannahs in the Willamette Valley and throughout the Portland metro area as critical habitats. Locally, the Natural Resource Program of Portland Parks and Recreation (PP&R NR) and the Watershed Revegetation Program of Portland Environmental Services (BES) have initiated multi-year savannah habitat restoration projects on approximately 60 acres of public and private lands on the Willamette Escarpment. *See map to the left.*

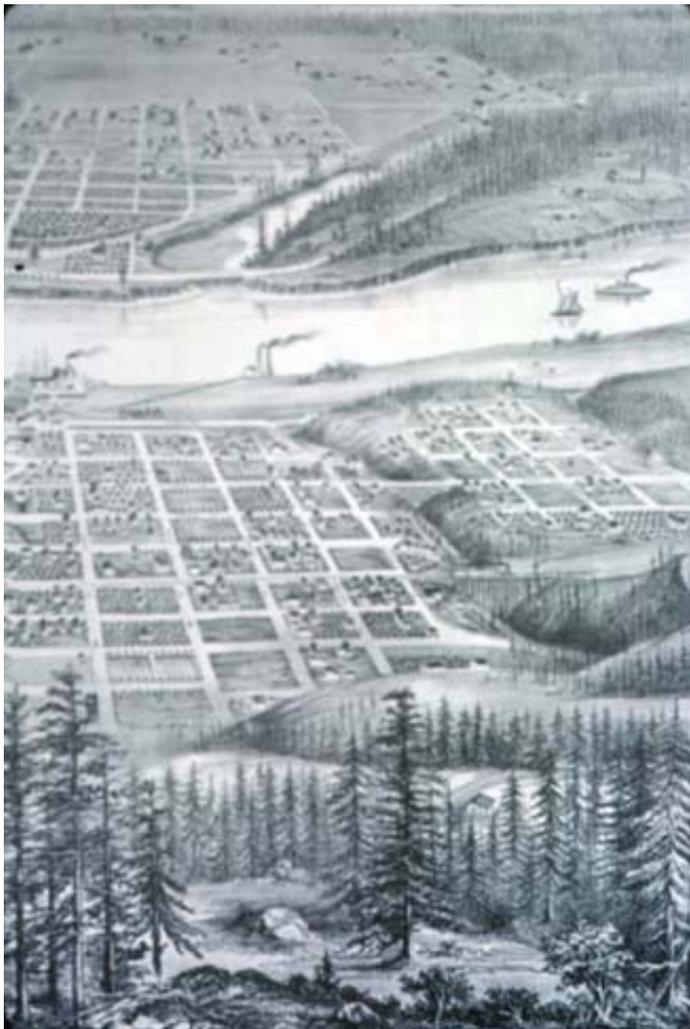
Project Setting and Background:

The US Fish and Wildlife (USF&W) Service funded *Savannah Project* is alongside the Springwater Trail, a railroad right of way that is being converted over time to a regional recreation trail. The 5.5 acre *Savannah Project* site is just south of the Ross Island Bridge on two linear and nearly

level benches at the top of a slope overlooking the Willamette River. *See Aerial Map in the Appendix.* The successful realization of the *Savannah Project* is a result of successfully integrating the planning and design work for two additional landscape improvement projects constructed during the same time of period of 2000-2005:

1. The new OMSI - Springwater Trail segment was designed and built by PP&R in 2000-2002 and opened in 2003.
2. A 5 acre section of highly disturbed slope on the east bank of the Willamette River was revegetated with riparian species by (BES) in 2001-2002.

In early 2000, a year before the initiation of the USF&W funded *Savannah Project*, PP&R NR obtained several historic prints and narratives from City archives. These documents suggested that the area around the former confluence of Crystal Springs Creek and the Willamette River had been an emergent marsh and riparian woodland prior to the placement of fill along the east bank of the river and the construction of a railway in the late 1800's. *See the historic print below.* The historic landscape was not to be restored but a conceptual site analysis for the project was conducted by PP&R staff and determined that



A view of Ross Island and the mouth of Crystal

the existing views of Ross Island and the downtown skyline from the *Savannah Project* site were very important site features. The PP&R decision to preserve these views resulted in an opportunity to establish a savannah landscape. An open landscape provided a setting for the creation of a small demonstration habitat that could be interpreted to educate trail-users about a rare regional landscape and the concurrent oak savannah revegetation work on the adjacent Willamette River Escarpment. The establishment of a meadow of grasses with widely spaced patches of native trees and shrubs also accommodated a public art installation. After formalizing the two site goals of protecting views and creating a savannah landscape, PP&R staff reviewed the BES planting plan for the riparian revegetation project and modified it to complement the desired future condition of the landscape— an open savannah on the banks of

Springs Creek from the west hills of Portland.

the Willamette River. Copses of trees were planted to frame the views and the remainder of the slopes were seeded and densely planted to riparian shrubs.

Initial Site Preparation Work in 2001

In early 2001 PP&R composed a conceptual rehabilitation plan for the site and began groundwork on the flat benches to the west of the future trail location. BES began similar site preparation work on the adjacent slopes below. When work began the existing vegetative cover on the benches was composed of dense thickets of the noxious weeds butterfly bush (*Buddleia* spp.), Scot's broom (*Cytisus scoparius*), and Himalayan blackberry (*Rubus discolor*). And on the steep slopes a few black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) grew midst patches of English hawthorne (*Crataegus monogyna*) and Japanese knotweed (*Polygonum* spp.) and Himalayan blackberry and clematis (*Clematis vitalba*) covered the remaining patches of rubble and Reed Canary grass (*Phalaris arundinacea*) grew at the river's edge. As a first step of site preparation work the rank growth of the weeds was cut using a tractor drawn flail mower on the benches and by hand on the steep slopes. Cutting revealed old construction debris (cable, railroad ties, etc.) and rubble such as large boulders, concrete and pilings on the benches and fill slopes below. After the construction debris was removed the soil substrates throughout were discovered to be a mix of materials: compacted railroad ballast (rock), coarse cobble, and fine sediments. These disturbed site and soil conditions verified what had been suggested in the historic documents and prints obtained from City archives – the former wetlands and riparian woodlands on site had been filled. During the late summer and early fall of 2001 PP&R NR made two applications of herbicide on the weeds (*Buddleia*, *Cytisus* and *Rubus*) that had resprouted after cutting the bench areas. But soon after the fall 2001 rains began PP&R NR staff inspected the site and observed that most of the site had greened up again with a new suite of noxious weeds [sweet clover (*Melilotus* spp.), Canada & Bull thistles (*Cirsium* spp.) and noxious annual and perennial grasses (*Bromus* spp., spp., etc.)] In some areas of the site no vegetation grew due to highly compacted soil conditions. At minimum another season of site preparation work (including decompaction) was necessary before seeding the savannah grassland. Unfortunately, this decompaction work would most certainly bring more noxious weed seed to the surface of the soil exposing them to light (and germination) and extend the time needed to prepare the site for planting.

The USF&W Funded Savannah Project (2002 through 2005)

In the late winter of 2001 PP&R submitted a Willamette Greenway permit application for construction of the OMSI Springwater Trail to the City for approval. And in February 2002 PP&R NR submitted an application to the USF&W Service to secure 25,000. in grant funding for the *Savannah Project*; in June a \$20,000 grant was awarded. The grant application identified the primary goal of the *Savannah Project* to successfully re-establish appropriate savannah tree, shrub and grassland species on a highly disturbed project site. The secondary goals of the project were to provide opportunities for environmental education and interpretation and to directly link to other savannah habitat restoration projects on public lands and private properties on the adjacent Willamette Escarpment.

Construction of the OMSI Springwater trail segment began in late spring 2002 and PP&R

staff coordinated all trail construction, the BES riparian revegetation and *Savannah Project* site preparation work. In order to conserve grant funds, the trail construction contractor, BES contractors and PP&R NR staff all prepared portions of the *Savannah Project* site in 2002. The trail contractor graded the *Savannah Project* site, and decompacted the soils. BES prepared the slopes and controlled the noxious weeds. USF&W grant funding was used to provide additional resources for the preparation of the soils on the *Savannah project* site for seeding, purchase and sow native grass and wildflower seed, and purchase and plant woody shrub and wildflower plug propagules.

The following work task schedule summarizes the site work accomplished from July 2002 through June of 2005 using USF&W Grant funds:

2002

Summer 2002

Prepare Site & Establish Seedbed [rock pick, grade, rip/cross rip, disc]

Early Fall 2002

Install art and other site improvements [seating, paths]

Early Fall (October 1-15) 2002

Seed grasses to control erosion*

Mid Winter

Plant 3" caliper oaks (*Quercus garryanna*) and maples (*Acer macrophyllum*)

**The serious soil disturbance on the Savannah Project site required several years of work to remediate so the use of low cost wheat (a non-invasive annual cereal grain cover crop) or straw to control winter erosion was specified in the Willamette Greenway permit application. Permit reviewers denied that request however and required that native grass seed be used to control erosion despite the fact that slow growing native grasses would allow the seed of winter annual weeds to germinate and the grasses themselves would be destroyed during the subsequent year of site preparation. The requirement to use native grass seed to control erosion added significant costs to the project and prevented timely weed control work. This resulted in the need for an additional year of site preparation and a request to extend the USF&W Grant until June 2005.*

2003

Late Spring through Early Fall

Prepare Site for Seeding [Control Weeds & Establish/Manage Seedbed]

Irrigate savannah trees

Early Fall

Place 2" of sterile compost mulch on entire project site [72 cubic units]

Early Fall (October 1-15)

Sow native grass on mulch

2004

Late Spring through Early Fall

Manage and Control weeds in native grassland

Early Fall

Place additional compost on grassland areas to be planted to shrub patches
Seed native annual wildflowers in shrub patch areas

2005

Winter

Plant perennial wildflower plugs in grassland
Plant patches of native shrubs

Spring through early Summer

Manage and Control weeds in native grassland
Project Monitoring

Starting site work in the summer of 2002, the trail contractor used a tractor drawn rock picker to remove the larger rocks from the *Savannah Project* site. Then the site was ripped and cross ripped to de-compact the soils, additional rocks were removed and the seedbed for the grasses and wildflowers was established using a tractor drawn disc. At the close of the growing season the savannah trees were planted and grasses were sown on the site to control erosion through the winter. Early the following spring of 2003 site preparation started again and weed control continued on the site until native grasses were established in the fall. During the entire 2004 growing season grassland weeds were controlled. Finally in the fall of 2004 wildflower plugs were planted throughout the grassland and shrub patches were planted near the trees.

Monitoring of *Savannah Project*

Site monitoring was carried out during all phases of the three year project from site preparation and planting through the first year of the establishment period.

Weed Control Monitoring to determine the success of efforts to control herbaceous and woody weeds began in 2001 during the initial site preparation phase of the project and continued for a four year period until the spring of 2005. Weed control monitoring documented the *occurrence, frequency, and rate of spread* of site weeds. After analysis and interpretation, the monitoring results were used to document weed control progress, compare one season to another, determine true costs, and serve as a reference point for making decisions about future maintenance and management.

Native Grass and Wildflower Seeding Monitoring to determine the success of native grass and wildflower seeding began soon after seed sowing had been completed in the fall of 2003 and will continue until the fall of 2006. Native grass & wildflower monitoring will be done in conjunction with weed control monitoring [see above] and will document the *occurrence, frequency, and rate of spread* of all native grasses and wildflowers (both introduced and colonizing).

Native Tree and Shrub Plantings Monitoring to determine the success of the reintroduction of native shrubs and trees on the site was implemented semiannually

beginning in 2002 and will continue until 2006. Monitoring will determine the percent survival of each species planted. If monitoring results determine that percent survival is less than the required 80%, additional plantings will be made during the late fall or winter.

Project Success Criteria

Portland Parks Natural Resources staff developed and implemented qualitative monitoring protocols to document the success of the *Savannah Project*. The success criteria were based on the projects primary goal:

The primary goal of the proposed savannah project is to successfully re-establish appropriate native tree, shrub and grassland species on a highly disturbed 5.5 acre site on the east bank of the Willamette River.

The project will be considered successful if the following criteria are met by the end of the 2006 growing season:

- The vegetative cover of noxious weed cover is < 10%
- The grassland has a minimum vegetative cover composition of >80% native species.
- The native woody trees and shrubs have achieved a minimum 80% survival rate

To date the native grass, wildflower, shrub and tree plantings have been successful but the cover of noxious weeds still exceeds the success criteria of <10% cover. During the 2005 and 2006 growing seasons the following weed control and site management work tasks will be continued:

2005 & 2006

Spring through Fall

Manage and Control weeds in native grassland
Project Monitoring

Project Partners

In addition to several private contractors the following project partners provided volunteer services, contracted labor and/or materials for the *Savannah Project*:

Government Agencies

Portland Parks- Natural Resources

Design & Management of the *Savannah Project* and BES revegetation project, Coordination with Trail construction project, Volunteer Recruitment and Coordination, Project Monitoring

Portland Parks- Planning & Development

Project Management of Trail Construction project

Portland Parks- Native Plant Nursery & Horticulture Services

Native Plant Production [trees, shrubs, seed and wildflowers]
Integrated Weed Management Services

Portland Parks- Equipment Services

Site Preparation

Portland Environmental Services- Watershed Revegetation Program

Willamette riverbank revegetation (Ross Island Bridge to Oaks Park).

Community Groups

Sellwood Moreland Improvement League and Friends of Oaks Bottom

Volunteer recruitment and planting day food/refreshments.

Non-Profit Organizations

Friends of Trees

Coordination and Staffing of two community planting events

Schools

Winterhaven Middle School

Shrub and wildflower propagation and planting.

Portland State University

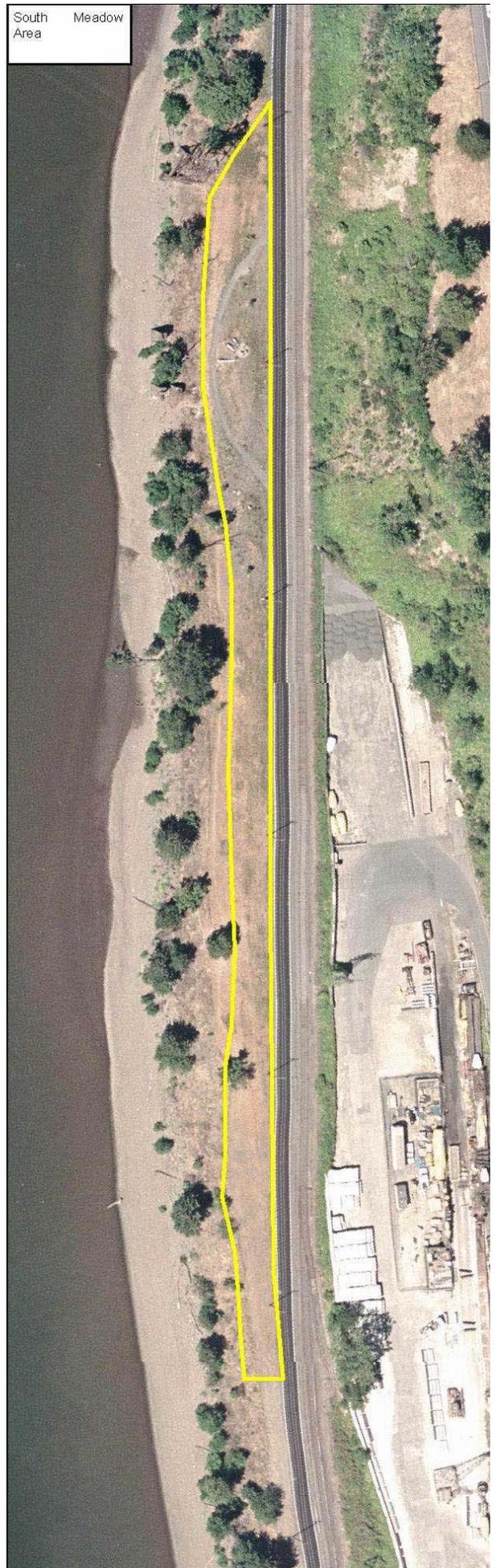
Monitoring of savannah plantings.

Summary

Thus far the *Savannah Project* has successfully established a small patch of native grasses, wildflowers, shrubs and trees adjacent to the high use Springwater Trail. This patch is already functioning as a place to educate visitors and Trail users about the aesthetic and functional values of the historic savannah landscape. In the foreseeable future, the small *Savannah Project* will increase in value by being directly linked to oak savannah restoration work on the adjacent Willamette Escarpment. Currently approximately 30 acres of public lands are being revegetated and managed as oak savannahs and woodlands at the nearby Oaks Bottom Wildlife Refuge and adjacent State lands. In the future additional restoration work on Ross Island Sand & Gravel properties immediately to the east and south of the *Savannah Project* will connect the small 5.5 acre site to the larger landscape.

Appendix

- *Aerial map of the Savannah Project site*
- *Plant Materials for 5.5 acre Savannah Project*
- *Project Budget*



Aerial map of the Savannah Project site

Plant Materials for 5.5 acre Savannah Project

Trees

- 4 - *Acer macrophyllum* (big-leaf maple)
- 7 - *Quercus garryana* (Oregon white oak)

Shrubs

- 103 - *Juniperus communis* (common juniper)
- 200 - *Mahonia aquifolium* (Oregon grape)
- 200 - *Mahonia repens* (creeping Oregon grape)
- 200 - *Spiraea betulifolia* v. *lucida* (willow leaf spiraea)
- 200 - *Symphoricarpos mollis* (creeping snowberry)

Grasses

- 100 pounds *Elymus glaucus* (blue wild-rye)
- 10 pounds *Festuca rubra* v. *comutata* (fescue)

Wildflowers

- 100 - *Achillea millefolium* (western yarrow)
- 100 - *Anaphalis margaritacea* (pearly everlasting)
- 100 - *Aster subspicatus* (Douglas aster)
- 200 - *Camassia leitchlinii* (giant camas)
- 1 oz. - *Clarkia amoena* (farewell to spring)
- 1 oz. - *Clarkia purpurea* (farewell to spring)
- 1 oz. - *Collomia grandiflora* (large leaf collomia)
- 100 - *Fragaria virginiana* v. *platypetala* (field strawberry)
- 1 oz. - *Gilia capitata* (blue field gilia)
- 1 oz. - *Lotus purshiana* (Mexican clover)
- 15 - *Lupinus rivularis* (field lupine)
- 90 - *Lupinus polyphyllus* (lupine)
- 1 oz. - *Madia elegans* (tarweed)
- 1 oz. - *Madia gracilis* (tarweed)
- 100 - *Potentilla gracilis* (slender cinquefoil)
- 140 - *Sidalcea campestris* (meadow checkermallow)
- 100 - *Solidago canadensis* (goldenrod)

Project Budget (2002 through 2005)

<i>Description of Expense</i>	<i>Provider</i>	<i>USF&W grant</i>	<i>PP&R match funds</i>
<i>Labor</i>			
Manage Project	PP&R NR [Wilson]		\$7,500.00
Manage Project Volunteers	PP&R NR [Shorr]		\$1,000.00
Apply Approved Herbicides	Major Spray Service	\$900.00*	\$900.00
Prepare Seedbed	PP&R Equipment		\$1,200.00
Coordinate with Trail Project	PP&R Planning		\$12,000.00
Coordinate Planting	Friends of Trees	\$2,000.00	
Seeding	Rexius, Inc.	\$1,305.00	
Planting (volunteers)	Friends of Trees		\$3,900.00
<i>Supplies</i>			
Purchase stakes, flagging, etc.	Home Depot	\$18.00	
Purchase & Place mulch	Rexius, Inc.	\$10,510.00	
<i>Plant Materials</i>			
Savannah Trees	Big Trees Today		\$1,500.00
Grass and Wildflower seed	Kenagy Family Farm	\$450.00	
Grass seed	PNW Natives	\$312.50	
Wildflowers & Shrubs	PP&R Hort Services	\$3,757.60	
Subtotal		\$19,253.10	+ \$28,000.00
<u>Total Project Cost</u>			<u>\$47,253.10</u>

*All USF&W funded herbicide applications on project site were made in accordance with the requirements stipulated in August 16, 2002 memo from USF&W to Portland Parks. (See attached)