

**USFWS Greenspaces Program Grant
Final Project Report
Gresham Woods Phase 3 – Wet Meadow
July 30, 2007**

Cooperator: City of Gresham, Dept. of Environmental Services, Stormwater Division

Project Title: Gresham Woods Phase 3 Restoration – Wet Meadow

Cooperative Agreement Number: 13420-04-J430

Project Time Period: September 2004 – July 2007

Section I: Project Overview

Project Purpose and Description

The purpose of this project is to enhance existing wetlands, create new wetlands, and improve wildlife habitat within a publicly owned parcel containing an 8 acre area of largely degraded wetland. Historic hydrologic support for this area has been negatively affected over the years by (1) the construction of a railroad bed in 1903 at the toe of a slope adjacent to these wetlands; (2) agricultural tile drains installed approximately 60-80 years ago for farming and ranching; and (3) creation of subdivisions through the 1970s that covered the area upslope of the wetland, collecting runoff in a newly constructed stormwater system and discharging it directly into Johnson Creek.

Initial investigations looked at using treated stormwater runoff from the subdivision to increase wetland extent and function in the area. Due to challenges with grades and discharge volumes, this did not prove to be a viable option. Instead the project team designed a creation and enhancement plan focused on better utilizing direct precipitation and lateral subsurface flow through the creation of shallow pools; replacing the dominant non-native pasture grasses with a diverse mix of native trees, shrubs, and forbs; and the installation of large woody debris for wildlife habitat. The shallow pools (6"-12" deep) were designed to capture and hold surface water on site. These pools were located in areas of existing hydric soils. Following construction, the pools were seeded with a native seed cover, and are slated this fall/winter to be planted with emergent vegetation to replicate existing emergent wetlands adjacent to the Springwater Trail. The combined area of ground disturbance resulted in 0.4 acres of created wetland, and 0.2 acres of enhanced wetland. Revegetation of all wetland project site (including areas with and without ground disturbance) will result in 4 acres of improvement in total. Areas adjacent to created pools will be planted with shrub/shrub species that are found near the project site. In addition, several hummocks of tree and shrub species will be planted to provide vegetative diversity and structure and long-term woody material for the site.

Project Staff and Partners

Jennifer Thompson: *US Fish and Wildlife Service* (project review and funding)

Kathy Majidi - City of Gresham – Department of Environmental Services (property owner and funding)

James Allison, Damion Coe, Lloyd Stauling: *City of Portland – Watershed Revegetation Program* (permitting, design, and construction team)

Christine Hurst: *Johnson Creek Watershed Council* (outreach and committed to assist with Winter 2007 planting). Estimated volunteer hours for winter planting: 100 hours

Anil Devnani: *Friends of Trees* (committed to assist with Winter 2007 planting). Estimated volunteer hours for planting and ongoing maintenance: 200 hours

Expected and Actual Goals

The project team originally planned to accomplish 2 main goals with this project: (1) provide for wetland enhancement and/or creation through the wet meadow/prairie area; and (2) capture currently untreated stormwater from the upslope subdivision, treat the stormwater, and use the treated water to enhance the wet meadow. The second goal was found to be infeasible due to constraints with grades and discharge velocities. Both proprietary and low impact treatment methods were investigated. We were unable to utilize a Stormwater Management Inc. treatment system vault at this site due to the topography required for the vault system to work. Inadequate “drop” existed to realize stormwater treatment from this method. The upside of this discovery was that we were able to utilize a more desirable outfall (and redirect more water) when we no longer had the restriction of needing to site the vault near Towle Street. Exploration of a bioswale option was then conducted. Though the bioswale is a viable option for treating the stormwater, and adequate area and run within the open space was found, we were not able to use this as a water source for the wetland. The project team has however committed to conducting a second project that will focus on the creation, vegetation, and long-term maintenance of a bioswale in this area in order to treat 150 acres of stormwater runoff prior to its discharge into Johnson Creek. This Phase II bioswale will be shallow, broad, and outfitted with log check dams to slow flow and provide greater treatment for the 2-year design storm. Higher flows will continue to be discharged to the existing ditch system.

Due to the results of the hydrologic modeling, enhancement of the wet meadow was been pulled out as a Phase I project, to be constructed independent of the bioswale, and thus this wet meadow enhancement represents the entirety of this grant-funded project. The hydrologic support comes from catchments of direct precipitation and lateral subsurface flow as opposed to stormwater runoff. Dimensions of the study area were not changed. 4.2 acres of non-native wet meadow are still enhanced through the construction of rain catchments, removal of invasives, and revegetation.

Implementation and Project Schedule

Methods:

Revegetation – Native seed was collected on site and as close to the site as possible and used to develop a seed bank for the site. Species of trees, shrubs, and forbs native to this ecoregion were pre-ordered so that adequate sizes and species were available. A wide diversity of wetland plugs were ordered to greatly increase the biodiversity and habitat value of this area which was previously dominated by non-native pasture grasses sown for past farming and grazing. At

present, the site has been seeded with a diverse mix of native forbs at a rate of 20 lbs/acre.

Erosion Control – As the site was flat, well-vegetated and hundreds of feet from open water, and as the 4-day construction window was timed for dry weather, erosion control materials were kept on site, but were not installed. Standards for process and materials as specified in the City of Portland’s Erosion Control Manual were followed.

Future planting – A combination of plugs, bareroot, and container stock will be installed throughout the 4.2 acres. 5,000 wetland plugs will be installed in late winter/early spring 2008. Scrub/shrub at a density of 2000 plants per acre. Trees will have vexar tubes placed around them to protect against rodent browsing. All trees and shrubs will be mulched with chipped wood mulch to increase plant survival.

Future maintenance and monitoring – Maintenance will happen throughout the project duration within the 4.2 acres of the project boundary. Workers will selectively remove invasive plants from amongst planted native vegetation using chainsaws, hand tools, herbicide application tools, and where possible, mowing equipment. BES monitors planting survival and exotic vegetation re-growth, and prescribes additional treatments as needed. A description of the maintenance and monitoring protocol is attached.

Implementation Schedule:

- Fall 2004** Site surveys
Collecting of native seed on site to be used in revegetation
- Winter 2005** Hydrology modeling
Proprietary device investigations
Preliminary wetland design
- Spring 2005** Wetland delineation
Engineering review of vault and bioswale options
- Fall 2005** Design modification utilizing bioswale option
Plant stock preorders to ensure adequate species/sizes
- Winter 2006** Initial permit package prepared
Wetland delineation report prepared and submitted to DSL
- Fall 2006** Re-design of wetland without proprietary device or bioswale as a component of enhancements
Wetland delineation area expanded and report re-submitted
- Spring 2007** Submission of permit application to DSL/Army Corps (copy attached)
- Summer 2007** Permit approved, wetland delineation approved
Archaeological investigations of site to ensure no negative impacts to cultural resources (report attached)
Construction of 0.6 acres total of shallow pools (see concept plan, attached)
Site stabilization and seeding

Accomplishments and Benefits

This project resulted in the creation of multiple wetland pools that drain often enough to prevent occupation by bullfrogs. Grading disturbance was minimal, and native vegetation was preserved while non-native vegetation was removed. Wood was imported to provide habitat structure for amphibian use. The site was outside the 100-year floodplain for Johnson Creek and therefore posed no fish trapping hazard for listed salmonids. The Hydrogeomorphic Assessment for the site showed that the enhancement activities provide for an increase in the functional scores of the following assessed conditions: water storage and delay, sediment stabilization & phosphorous retention, amphibian habitat, and wintering and migrating waterbird support.

Also, initial investigations on hydrology patterns in this area uncovered the opportunity for an additional project which the Cities of Portland and Gresham have committed to completing over the next 5 years, namely the creation of a 300-foot long bioswale that will provide water quality treatment for 150 acres of residential stormwater runoff, prior to its discharge into Johnson Creek.

Future Actions

As mentioned above, extensive planting will be conducted at this site during the next planting season, with 5000 wetland plugs installed in the new pools, and the remainder of the 4.2 acres planted with trees and shrubs at a density of 1680 trees and shrubs per acre. Vexar tube protectors will be installed on each tree, and each tree and shrub will be mulched to improve survival by decreasing immediate weed competition and increasing water retention.

The City of Gresham has also contracted the City of Portland to conduct 5 years of maintenance and monitoring on this project site. The protocol that will be followed for maintenance and monitoring is attached.

Summary and Conclusions

Significant staff changes at the City of Gresham and the City of Portland delayed the construction and planting of this project by one year, but funding and staff resources have been identified to complete the planting, maintenance, and monitoring of for the wet meadow through 2012. Planting will be conducting this coming planting season. Construction and wood placement (18 trees placed) is complete.

The project evolved multiple times due to results of early hydrological investigations and modeling. Because use of stormwater (and treatment of stormwater) was removed from the project, the budget was significantly decreased (from \$328K to \$51K). Both the Cities of Portland and Gresham have committed to use the modeling results and design work done at the early stages of this process to conduct a Phase II project in order to provide treatment to 150 acres of residential runoff. The cost estimate for construction of a 300-foot bioswale that treats the runoff to our design standards (80% treatment for the 2-year storm event) is \$60K. Construction is anticipated in Summer 2008. Staff from both Cities are pleased to be pursuing the less expensive bioswale option as opposed to the installation of the proprietary stormwater vaults due to the additional habitat values the bioswale will provide. In addition, the stormwater vault system would have proved more costly to maintain.

Section II: Supplemental Information

Attachments:

1. Project area map
2. Project activities map
3. Final project designs
4. Final budget detail
5. Wetland delineation map
6. Archaeological report
7. Project area photos