

# **Middle Fork Willamette Watershed Council**

## **Elijah Bristow Riparian Restoration and Reforestation (Phase 1) Monitoring Report for OWEB Project #204-204**



**May, 2008**  
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## Background on the problem that generated the project:

Studies completed for the southern Willamette Valley show that historically the project site was a floodplain forest consisting of biodiverse native plant species. The site was clearcut in about 1960, probably for agricultural use, and since that time has remained unforested. Blackberries and Scot's broom overtook the site, and dominated in a majority of the open, unvegetated areas. In the open, mowed areas, mugwort, stinging nettles and snowberry were the only natives present in significant populations. In addition to blackberries, weedy annual bromes and other Eurasian species dominated the site. Reed canarygrass dominated moist portions of the site, along the north side of the slough bordering the south edge.

Flow modifications along the main stem Middle Fork of the Willamette River also affected species diversity and stabilization at the project site. Since the construction of dams and in the mid- 1900s, the resulting modification of peak flood flows and channel stabilization has allowed the development of stable, mature vegetation communities immediately abutting the Willamette River. Large swaths of riparian forest associated with former multi-channel river patterns were greatly reduced in favor of agriculture and development, and riparian forests currently exist now primarily immediately adjacent to the single, stabilized river channel.

## Solution to Problem and Project Implementation:

In spring and summer of 2003, Phase One of the Elijah Bristow Restoration Project site was managed for invasive weed control. Blackberries and Scot's broom were aggressively treated using three methods for control. The most successful method for treatment was noted and integrated into the planning for subsequent phases of this 30-acre restoration project. Once the 3.5-site (Phase 1) was cleared of invasive weed species, over 1,000 native trees were planted on site.

Salix Associates developed a restoration plan for reforestation of the project site that would best resemble the historical biodiverse conditions of the site. Minor modifications to the original plan were necessary to complete the entire tree planting within the narrow winter planting window. The plan called for all 1,000 of the trees to be planted by volunteers. Three consecutive Saturdays at the end of January 2004 were scheduled for volunteer tree planting. We had excellent volunteer turnout and reasonable weather conditions on all three days. Nonetheless, rocky soil conditions, relatively sophisticated planting techniques and the sheer volume of work resulted in a total volunteer planting of approximately 700 trees. The rest of the planting was contracted out to Walama Restoration Project.

Bare-root trees were transported to the site in five-gallon buckets containing a Soil Moist slurry to aid in soil moisture retention around the roots after planting. Two Plant Success tablets (Mycorrhizal Applications, Inc.) containing 13 species of Mycorrhizae were added to each hole at the time of planting. About 800 of the trees were protected with solid plastic tubes, about 75 of the cedars were protected with plastic deer netting, about 75 trees were protected with custom-built wire cages and about 50 trees were left unprotected. All trees were mulched with sterile wheat straw around the base to help retain moisture and retard weed growth. Tree species planted on site include black cottonwood, Oregon ash, Big leaf maple and cedar.



*Volunteers planted approximately 700 native trees for Phase I*

### Post-Project Monitoring Year Two:

**Tree Survival:** In Summer 2004, tree survival was between 75-100% in the Phase 1 area and four years after the initial planting (Spring 2008), tree survival is 66-90% depending upon the species. We have had excellent survival, though some damage and loss has been noted in the areas with high concentrations of gravel substrate, disease to black cottonwoods and animal foraging (See Tables below for more detailed information). Applications of wheat straw mulch have been a critical factor in protecting the trees from drought during hot and dry periods over the years from 2004 through 2008. The straw mulch has provided some weed suppression and excellent soil moisture retention. Additionally, continued maintenance such as irrigation through summer of 2007 and continued mowing of grass and blackberry has resulted in the high success rate of the planted trees at Phase 1.

The restoration management plan identified irrigation as one of the critical needs for newly planted trees because of the sandy, well-drained soils that comprise the site. A solar-powered drip irrigation system designed and installed at the site provided water to the trees at the rate of approximately 4-5 gallons per day every other day during the period from late June to late September of 2007. Trees at Phase 1 were irrigated summer of 2004, 2005, 2006 and 2007. Irrigating for four years is a high number of years to continue irrigation and the decision was based on a recommendation from a local botanist. The botanist recommended the trees be irrigated summer 2007 due to the high air temperatures.

Tree growth and survival appears to be compromised in the northern-most section of Phase 1. Trees in this area lack the height demonstrated in other areas of Phase 1 and some loss has been noted. Upon review of this situation, it was determined that this area was the most difficult to plant because of the gravelly soil substrate in this zone. The soil is comprised mostly or rocky substrate, most likely the site of an abandoned depositional bar. We will replant this section if the trees do not survive past summer 2008.



*Tree survival and growth is good with a 66-90% survival rate after four years.*

**Challenges:** About 600 of the 1000+ trees planted on-site are black cottonwood (*Populus trichocarpa*). They suffered from a significant number of insect and disease attacks during the first few months after planting. Consultation with Lane County Extension agents indicated the following problems:

- Alder flea beetle (or other skeletonizing beetle) infestation
- 2-3 different leaf and twig blights (one burns margin, one burns main vein)
- Leaf rust
- Oyster shell insect scale
- Unidentified caterpillar

The forestry agent indicated that in a worst-case scenario the cottonwoods might lose all of their leaves during this first year yet would most likely survive. Since we were not concerned with tree form, the decision was made not to treat for any of these threats. An assessment of the black cottonwood in Phase 1 indicate healthy leaf growth and tree survival, with only a few trees lost to early disease attacks.

The overall damage has increased from last years' measurements, in large part due to the progression of disease that is prevalent among the Cottonwoods (*Populus balsamifera*) as seen to the right. Though the disease appears often, it has rarely proven fatal for the trees. The actual effect it will have on the survival of the Cottonwoods in the future is hard to speculate at this time. Another possible reason for increased damage is the fact that these trees are now outgrowing their protection and are more vulnerable to browsing from local animals.



Table 1: Showing tree survival from 2005 to 2007 for Lost Creek Confluence Project. UO Monitoring Program: *Phillip Sprague*

	2005 Live Tree Count	2006 Live Tree Count	2007 Live Tree Count	% Survival 2005-2006	% Survival 2006-2007	% Survival 2005-2007
<b><u>Big Leaf Maple</u></b>						
<i>Acer macrophyllum</i>	30	28	23	93.3%	82.1%	76.6%
<b><u>Red Alder</u></b>						
<i>Alnus rubra</i>	3	3	2	100.0%	66.6%	66.6%
<b><u>California Incense Cedar</u></b>						
<i>Calocedrus decurrens</i>	27	25	22	92.5%	88.0%	81.4%
<b><u>Oregon Ash</u></b>						
<i>Fraxinus latifolia</i>	4	3	3	75.0%	75.0%	75.0%
<b><u>Black Cottonwood</u></b>						
<i>Populus basimifera</i>	102	93	92	91.1%	98.9%	90.2%

Table 2: Showing tree Height Change from 2005-2007 for Lost Creek Confluence Project.

Species	Change in Growth (inches) 2005-2006	Change in Growth (inches) 2006-2007	Change in Growth (inches) 2005-2007	% Change in Growth 06-07	% Change in Growth 05-06	% Change in Growth 05-07
<b><u>Big Leaf Maple</u></b>						
<i>Acer macrophyllum</i>	6.8	2.8	9.6	7.5%	22.3%	31.4%
<b><u>Red Alder</u></b>						
<i>Alnus rubra</i>	31.7	34.0	65.7	47.2%	78.6%	163.0%
<b><u>California Incense Cedar</u></b>						
<i>Calocedrus decurrens</i>	6.1	5.2	11.3	15.9%	22.9%	42.4%
<b><u>Oregon Ash</u></b>						
<i>Fraxinus latifolia</i>	18.8	12.6	31.4	31.0%	85.8%	143.3%
<b><u>Black Cottonwood</u></b>						
<i>Populus basimifera</i>	5.7	5.6	11.3	9.3%	10.5%	20.8%

**Invasive Weed Control:** In 2003, Phase 1 was overgrown with Armenian blackberry and Scot's broom. These invasive weed species were over five feet tall and covered the entire site, including the riparian zone of the Middle Fork Willamette River. Invasives were cleared from the site in preparation for the planting of native trees. In 2004 and 2005, there was a moderate amount of regrowth of the blackberry and Scot's broom within the project site. Regrowth did not reach the density it was in 2003 before this restoration project began. Scot's broom along the riparian was rampant and dense. We mowed the entire site of Phase 1 1-2 times a month during June, July, August and sometimes September for the seasons of 2004, 2005, 2006 and 2007. This past year, we did not have the blackberry return within the planted site and mowing consists of removing nonnative grasses throughout the site. Scot's broom has not returned throughout the planted site, however it has remained prolific along the west bank of the Middle Fork Willamette River. In June of 2007, we hired the Northwest Youthcorps to hand remove the Scot's broom along the river corridor and the English Ivy from trees along the slough abutting Phase 1. The Youthcorps has done a phenomenal job in clearing this area of Scot's broom and English Ivy. The Northwest Youthcorps was hired one more time to remove Scot's broom regrowth and at this time the site is well maintained and without Scot's broom.

In conclusion, we are very pleased to have gotten the invasive weed species under control and or eradicated from Phase 1 site. With the exception of 10-15% of the native trees planted, the trees are vigorous and doing exceptionally well at the site. We will continue to perform maintenance on this site including invasive weed removal, mulching and removal of tubes as needed. Partners assisting in this maintenance have increased to include the high school of Thurston and Lundy school districts, Oregon State Parks, Emerald Horseback Empire, Northwest Youthcorps and Council volunteers.

1) A description of maintenance performed:

- Irrigation equipment removed from site in September 2007;
- Winterization of irrigation pump and system 2007;
- Mowing and weedwhacking entire site 1 time/month during June-September season for 2007 and continuing;
- Hand removal of Scot's broom and English Ivy around boundary of project site; and
- Mulching with sterile wheat straw around all planted trees in 2007.

2) An accounting of any costs associated with maintenance and monitoring:

- Mowing: \$2,650.00
- Irrigation system maintenance: \$1640.00 (\$820.00 cash and \$820.00 in kind);
- Hand removal of invasive species: \$4,000.00 (\$2,000.00 cash and \$2,000.00 in kind);
- Mulching: \$3,000.00
- Monitoring: \$4000.00 (2007 and 2008; \$2,000.00 cash and \$2,000.00 in kind)
- Project Management: \$803.00

A total expense for post-project maintenance and monitoring is \$ 16,093.00 for period June 2007 to May 2008.

3) An assessment of whether the project continues to meet the goals specified in the grant agreement:

Please see description of "Tree Survival" and "Invasive Weed Control" above for a detailed assessment of how the project continues to meet the goals specified in the grant. Generally, we continue to work toward the goals set forth in the grant application and agreement for project 204-204. Goals being met include invasive weed removal, establishment of a diverse healthy floodplain forest at the confluence of Lost Creek and the Middle Fork Willamette River, opportunities for public involvement and educational tours, increased awareness from the public on the benefit of restoration activities and increased partnerships and support.

4) A summary of any public awareness or educational activities related to the project, including identification of any tours or presentations and copies of newspaper or other media coverage about the project:

Phase 1 of the Elijah Bristow Reforestation project continues to be used as a demonstration project for the community within the Middle Fork Willamette Watershed. The Middle Fork Willamette Watershed Council host 1-2 tours per year of the Phase 1 restoration project at the confluence of Lost Creek and the Middle Fork Willamette River. Phase 2 of this 30-acre reforestation project is currently being implemented and all volunteer activities and tours related to Phase 2 initiate with a tour and description of Phase 1. Additionally, this restoration

project is highlighted in all presentations on the Council's activities and or restoration opportunities. The following is a list of a few tours that focused exclusively on Phase 1 and or included Phase 1 as part of a tour;

- February 9, 2008: Tree planting event for Phases 2 and 3; began with public tour of Phase 1;
- Students involved in our Watershed Education Program; *Watershed Rangers*, visited the site in November 07 to replant salvaged plants from Phase 2; took a tour of Phase 1. The same students return this month (May 08) to conduct water quality monitoring information along Lost Creek
- Project photos and description presented to numerous special interest groups since project completion. Interest groups include, but not limited to, Emerald Horseback Empire, Kiwanis Club, Lowell public meeting, Oakridge public meeting, Council members and Board.

**Please see Supplements A and B for photo coverage of public events and tree establishment.**

**Middle Fork Willamette Watershed Council  
Elijah Bristow Reforestation Restoration Project  
Oregon Watershed Enhancement Board Project # 204-204  
Supplement A  
May, 2008**

**Public Tours and Participation**



*UO students monitor Phase 1 for tree growth and survival.*





*Volunteers Visit Restoration Site to Plant for Phase 2 & 3*





*Watershed Education Program, Lundy Watershed Rangers, visit restoration site with their parents to plant for Phase 2 & 3*



Middle Fork Willamette Watershed Council  
OWEB Project 204-204 Post-Project Monitoring Photos  
May 2008



Photo 1: May 2008



Photo 2: May 2008



Photo 3: May 2008



Photo 4: May 2008



Photo 5: May 2008



Photo 6: May 2008



Photo 7: May 2008



Photo 8: May 2008



Photo 9: May 2008



Photo 10 May 2008



Photo 11: May 2008