

2006 Monitoring Report of Riparian Restoration
At Camp Polk Meadow Preserve

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Introduction

Recent emphasis on improving water quality due to human land use practices has prompted many communities to reevaluate the role wetlands play in providing safe and clean water sources for the benefit of society and wildlife. Studies show that healthy wetlands provide many essential functions such as flood abatement and preservation of fish and wildlife habitat. Wetlands enrich soils, encourage plant vigor, and act as a biofilter cleansing pollutants from drinking water sources and other groundwater corridors that reach humans, wildlife and fish populations in adjacent streams and ponds.

In 2000, The Deschutes Basin Land Trust purchased 145 acres of meadow and wetlands in the Wychus Creek drainage area, formerly known as Squaw Creek. The decision was made to restore the wetlands and repair the riparian margins of Hindman Springs and the upper meadow. The mid and lower meadows were purposely avoided because a large stream restoration project was planned there for the future. Years of extensive cattle grazing had depleted soils and caused the eruption of invasive species such as cheat grass in areas where native plant populations had thinned due to soil compaction and other plant disturbances.

A few healthy willow patches already existed in isolated areas around Hindman Springs and the decision was made that additional willows (*Salix sp.*) should be planted

as well as dogwood (*Cornus sericea*) and cottonwood (*Populus balsamifera*) trees to encourage a diverse mix. Groundwater wells, also known as piezometers, were installed to determine ground water levels and moisture content for optimal planting success.

Because some plants are region sensitive, willow cuttings to be planted were taken from existing plants on the Preserve in the winter of 2000 to ensure a greater success rate. Mt. Jefferson Farms grew the plants from cuttings. Cuttings were transported to the Preserve where the first plantings took place in the spring of 2002. Additional plantings occurred in the spring of 2003. A total of approximately 2,200 willows and dogwoods were planted in 2002, and 5,889 willow, dogwood, and cottonwood trees were planted in the spring of 2003.

Allen (2004) describes details of planting procedures. The focus of our study involved monitoring the 2002 and 2003 plantings to determine current survival rates, and reevaluate the health and vigor of existing plants. Adaptive planting decisions, if needed, will be based on the results of our study.

Methods

Our study took place on September 2, September 7, and September 9, 2006, at three locations at the Camp Polk Preserve, located approximately 7 miles west of Sisters, Oregon. Sites surveyed were: Hindman Springs, in the SW corner of the Preserve, the Upper Meadow area, south of Hindman Springs, and the Spring Channel/Wychus Creek area south of the Upper Meadow.

The four members of the survey group broke into two groups. One group surveyed all of the Willows and dogwoods from the 2002 plantings and the other group

surveyed all of the willows and dogwoods from the 2003 plantings. Each group had plantings in both the Hindman Springs area and the Upper Meadow area. The planting years were identified by a pre-punched numbered silver tag and were hung on the north side of the planting patch enclosures. The tags for 2002 and 2003 were similar but the 2002 tags were shinier and less sturdy than the 2003 tags. Both groups surveyed the 2003 cottonwood plantings in the Spring Channel/Wychus Creek area.

Using the 2004 data sheets as a reference and location guide, all planting patches were to be evaluated for percentage of foliage coverage within each wire enclosure and an estimate was to be made of the average height of each patch by using the 48" tall wire enclosure as a focal point. A notation was to be made in the 2002 planting patches if fabric had been laid down prior to planting the stems. Also the study group surveying the 2002 plantings counted individual living stems within each enclosed patch whenever possible and counted individual living stems that had been placed in Vexar sleeves (a long plastic tube designed to protect young plants from browsing damage). None of the 2003 plantings were encased in Vexar sleeves. Other factors noted by both groups and recorded on the data sheets included the presence of browsing, galls, tree frogs, and any other notable condition that might warrant further attention. Data collected in all three sites was entered into an Excel spreadsheet and is the basis of this report.

Results

The 2006 study showed that the average height for all 2002 and 2003 plantings at Hindman Springs was 58" while the average height at Polk Meadow was 49". In 2004 the 2002 fabric plantings average height was 27" while the non fabric plantings averaged

21”, but by the time the 2006 data was taken, even though 6 fabric plants did not survive, the average height of the remaining 4 plants reached a height of 67”, showing an exceptional growth rate of 50” in 28 months. The non fabric plantings had only gained 16” for the same period of time. It was consistently observed that fabric plants had a higher mortality rate, possibly due to heat absorbed in the soil from the black plastic. Plants that did survive appeared to have a larger girth at the base indicating hardiness as well as exceeding the non-fabric plants in height. See table below.

2002 Planting progress at Upper Meadow and Hindman Springs

		2004			2006		
		All	fabric	No fabric	All	Fabric	No fabric
Upper Meadow	Height range	14-30”	22-30”	12-28”	5-58”	no data only 1 fabric	5-84”
	Avg. of avg height	23”	27”	21”	49”	67”	37”
	# of stems living (total of “all”; avg. for fabric/no fabric)	589	10	7.4	225	4.0	3.5
Hindman Springs	Height range	12-33”	12-33”	12-26”	8-94”	8-94”	20-82”
	Avg. of avg height	22”	22.3”	21.4”	58”	63.5”	55”
	# of stems living (total of “all”; avg. for fabric/no fabric)	416	9.3	7.5	174	5.0	4.7

The 2006 study showed that all 2002 and 2003 enclosed patch plantings at Hindman Springs had at least 50% foliage coverage with 29 patches having greater or equal to 80% coverage. This compared to the Upper Meadow 2002 and 2003 plantings where only 18 patches had greater or equal to 80% coverage. See table below.

2006 Data showing percentage of plant foliage in wire enclosure

	% cover (from 0 to 100)			
	≥ 80%	≥70%	≥60%	≥50%
2003 plantings				
Hindman Springs (28 patches)	18	5	4	1
Upper Meadow (56 patches)	7	11	16	22
2002 Plantings				
Hindman Springs (60 patches)	11	13	17	21
Upper Meadow (120 Patches)	11	17	22	25

In 2003 1,124 cottonwoods were planted. By 2004 only 243 remained alive. The 2006 data shows a high mortality rate with only 62 cottonwood plantings surviving. See table below.

2006 Date: Spring Channel/Wychus Creek: cottonwoods

Spring Channel/Wychus	2004	2006
# stems living	243	62
Avg, Height	Not available	36''

Discussion

Our 2006 study shows that the overall health of willows planted in the Hindman Springs areas exceeded the health of plantings in the Upper Meadow , were taller, and the foliage more robust. The study group found that the Hindman Springs area was wetter than the Upper Meadow area which could account for the more robust plantings.

While some fabric plantings in 2002 did well, the study group did not feel fabric should be used on future plantings because of the high mortality rate and labor involved in preparing the sites.

We observed the disturbance of deer browsing on almost all planting patches. It appears that the plantings in the Vexar sleeves will never gain height or girth beyond the

safety of the plastic netting protection. For this reason the study group recommends removal of the sleeves and lumping the plants in a wire enclosure similar to the other plantings. At the same time, the group is recommending that some wire enclosures be removed from some of the healthier taller willow patches to allow for less growth restriction. Once the enclosure is removed the plantings should be monitored closely for any excessive browsing disturbance and if found, re-evaluated.

In 2003, 200 dogwood trees were planting and enclosed in patches around the Upper Meadow area. In the 2004 report, of the 200 planted only 76 had survived. The 2006 study group found only 18 plants living. The study group suggests that if additional dogwoods are to be planted in the meadow they should be planted in the shade of the healthier willow patches. Because most of the existing dogwoods are less than 36” tall, another option to explore would be to transplant the surviving dogwoods in the shade of the healthy willows at Hindman Springs in the spring of the year where more moisture and sun protection would be available.

At Spring Channel and Wychus Creek the cottonwoods are competing for space with herbaceous plants. Additionally, the prevalent cobbly soil along the channel was very difficult to work up for planting so some plants may not have been planted deep enough. Also the rocky soil has a very porous texture with little moisture retention. All cottonwood plantings were protected with little evidence of browsing. The remaining living cottonwoods will continue to be protected and monitored.

In 2002, 2,100 willows were planted in the Hindman Springs and Upper Meadow areas. An additional 4,400 willows were planted in both areas in 2003. It was not possible to count all of the live stems in the study because most planting patches are enclosed and

not accessible. The study group that worked with the 2002 plantings attempted to count stems and recorded 1,005 plantings. They were able to do this because a large portion of the plantings were more viewable due to the fabric cover and because some plantings were still enclosed in the Vexar sleeve. Since both study groups surveyed about the same number of patches in both sites, one can assume the second study group would have counted approximately the same number of live stems were it possible. If approximately 6,500 willows were planted over the two year period and 2,010 are still living, one could assume an overall survival rate of 31%.

The Willow planting project at Camp Polk Meadow Preserve was never intended to be an experimental design restoration project. Not all numbers in the project are exact because of the nature of the project. Some plants in 2002 that did not survive were over-planted in 2003. The exact numbers of stems planted, foliage coverage, and plant heights were based on consistent procedural estimates. During the course of the planting years, several different methods were tried and some enclosures were removed when no results were found. One of the goals of the project was to enhance biodiversity in the area. While surveying the plantings, we encountered an abundance of wildlife. One common sight was the presence of the Pacific tree frog. We frequently observed deer, rabbits, dragon flies, and many different species of birds in the area. The meadow is teeming with diversity.

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References

Allen, K.K., 2004. 2004 Monitoring Report for Riparian Restoration Camp Polk Meadow Preserve. April 26, 2004.