
FINAL PROJECT MEMORANDUM

TO: WRIA 54 WIT
FROM: THE LANDS COUNCIL
SUBJECT: WRIA 54 DEEP COULEE CREEK WATERSHED RESTORATION
PROJECT 2013 UPDATE
DATE: 7/2/2013
CC: SPOKANE COUNTY WATER RESOURCES



INTRODUCTION

This memorandum describes the work completed and presents initial data collected for the WRIA 54 Deep Coulee Creek Watershed Restoration Project (project) between July 1, 2012 and June 30, 2013. The project is funded by Washington Department of Ecology (Ecology) and is administered by Spokane County Water Resources under Professional Service Agreement Contract number P7390.

This project began on July 1, 2012. Work completed between July 1, 2012 and June 30, 2013 includes the following:

- Upland vegetation planted 2012 watered weekly through fall of 2012. Various herbivory repellants were applied regularly through summer and fall of 2012.
- Some fall planting on largest site along Coulee Creek in 2012.
- Native willow whips and poles collected from healthy population along Deep Creek in winter of 2013, planted later that spring.
- Door-to-door and selective mailing outreach conducted to 10 and 21 residences, respectively, on properties along Deep and Coulee Creeks in winter of 2013.
- Site visits and assessments conducted on two new properties, which both received restoration treatment.
- Spring re-vegetation actions implemented on two new sites and one previous site, including willow whips, willow poles, and sedges planted along riparian zone, and upland trees and shrubs planted where appropriate.
- Materials planted catalogued and photo points taken.
- Upland vegetation from 2012 and 2013 watered regularly through May and June 2013. Competing vegetation surrounding the plants, such as reed canary grass, was trimmed or removed.

Figure 1 shows the site locations while Figures 2-5 show the individual site maps.

IMPLEMENTATION ACTIONS

Outreach

Targeted outreach was conducted by The Lands Council (TLC) staff and volunteers in the winter of 2013. Based off of observations from 2011 and 2012, specific sections of Deep and Coulee Creek were targeted based on need for restoration. Using Spokane County Assessor's interactive parcel map, properties along these sections of Deep and Coulee Creeks were identified. Staff and volunteers went door to door, reaching 10 residences. A letter of request from TLC and a letter of support from WRIA 54 Watershed Implementation Team were sent to an additional 21 residences. Of these, 2 residences responded positively to restoration actions and requested site visits.

Additionally, plans to employ a work crew from Geiger Corrections Center for the more labor-intensive restoration activities were put in place. A series of meeting between TLC staff and Sheriff Knezovich, Lt. Lake, Sgt. Robison, and Sgt. Simbler in the winter and spring of 2013 established a strong relationship between TLC and the Spokane County Correctional Department. While work crews were not used during the timeframe of this grant, the relationship is established and plans to use work crews are in place for the following restoration season.

Site Assessment and Selection

Site assessments were conducted at 2 properties in the winter of 2013. Qualities that were required for final selection included easy access to the riparian area due to the need to bring materials and volunteers to the site, perennial stream flow, and a need for restoration. Final site selection for restoration in 2013 was narrowed down to both new sites on Deep Creek and one site from 2012 on Coulee Creek which had the greatest need for restoration and largest amount of riparian area. Table 1 describes the restoration sites.

Table 1 – Site Descriptions

Site Name	Parcel No.	Stream Name	Acres	Stream Miles
C1.12.13	06295.9003, 06295.9002	Coulee Creek	629	1.2
D1.13	05125.9060	Deep Creek	143	0.2
D2.13	05135.9021	Deep Creek	149	0.5

Re-Vegetation Actions

A variety of re-vegetation actions were employed. In late-fall of 2012, site C1.12.13 was planted with leftover potted plants from the previous restoration season. In the spring of 2013, further re-vegetation actions were employed at each site. Similarly to the previous winter, branches of willow trees from a harvest site on Deep Creek, which contained a few mature, healthy, native willow trees, were cut in the winter 2013. These branches, known as willow poles, were soaked in water before being planted in the spring. Because these poles were successful in 2012, more than triple the amount was harvested in 2013. Additional willow poles, six feet in length, were purchased from the Spokane Conservation District (SCD) tree sale in April, 2013, along with willow whips. Whips were up to 36" long and included *Salix exigua* and *Salix lasiandra*.

Alder, *Alnus incana*, 4 cubic inch plugs were purchased from Plants of the Wild and planted in the riparian zone. A variety of sedge plugs, 10 cubic inch in size, was also purchased from Plants of the Wild and planted in the riparian zone. Species include *Carex amplifolia*, *Carex lasiocarpa*, *Carex utriculata*, and *Carex nebrascensis*. Finally, a variety of potted, native upland plants from TLC's nursery were used. These plants were initially obtained from SCD's tree sale in April, 2012. Species include *Larix occidentalis*, *Pinus ponderosa*, and *Ribes aureum*.

Table 2 shows the date, method, and number of plants that were planted at each site, and the totals for each category.

Table 2 – Re-Vegetation Actions by Date Implemented

Date	Site	Poles	Whips	Alders	Sedges	Potted	Total
7-Sep-12	C1.12.13	0	0	30	0	45	75
27-Sep-12	C1.12.13	0	0	0	0	30	30
1-May-13	D1.13, D2.13	20	200	0	0	25	245
9-May-13	C1.12.13	30	300	20	100	65	515
20-June-13	C1.12.13	300	0	0	0	0	300
25-Jun-13	C1.12.13	100	250	0	0	0	350
	Totals:	450	750	50	100	165	1515

Monitoring and Maintenance

During planting and follow-up neem oil, an organic repellent, was applied to plants in order to reduce herbivory. Plants from spring '12 that were missing tubes, along with plants from fall '12 and spring '13 had tree tubes installed over them to protect against herbivory, though plants nearest the floodplain did not receive tree tubes due to the risk of being knocked over and injuring the plant during high flow. In the previous year, a repellent called Plantskydd® was used, though in 2013 neem oil was favored for its low cost and more pleasant odor.

Once planting was complete, former potted plants were watered by hand on average once a week until June 30, 2013, though unseasonably wet weather in June made the workload light. During June further maintenance actions included trimming and digging vegetation, mostly reed canary grass, which surrounded any of the newly planted material. Unlike the previous year, upland plants did not have 3' x 3' squares of ground cloth staked in around them because within a month of applying, most of the ground cloth had been eaten by rodents.

Photo points were taken with a 2 meter, striped photo pole visible in each photo to show scale. These pictures can be seen in Figures 6-12. More qualitative monitoring was done at each site during maintenance, mainly assessing plant health and rate of herbivory.

DISCUSSION

As in the previous year, all sites were prone to significant ungulate browsing pressure and shading from reed canary grass (RCG). Plantskydd was used through the fall of 2012 as an herbivory repellent, but use desisted when it appeared to cause leaf scorch, and due to its unpleasant odor. Neem oil was applied in its place to plants where tree tubes couldn't be used in the flood-prone zone with strong currents, and to plant parts protruding from tree tubes. However, it required regular application, especially following precipitation events.

Many willow whips from the previous year were planted in shallow water during the spring, just above the summer water height. Once water levels lowered whips were susceptible to rodent herbivory around the base of the plants. To combat this effect in 2013 whips were planted in deeper water in the spring where they will remain slightly submerged even during low summer water levels.

The use of six to ten foot cuttings (poles) of willow increased from 31 poles in 2012 to 450 in 2013 due to high survival rates from poles in 2012. The hope is that these taller plants will establish more easily and provide shade and thus stream-cooling as quickly as possible.

Regular watering through summer and fall 2012, combined with a wet spring in both 2012 and 2013, had a positive effect on survival rates. After one full year, survival rates on 2012 plants are on average 70%. Initial survival rates from 2013 plantings are over 80% at all sites.

Ground cloth was quickly torn apart by rodents, and was therefore not effective at reducing competing vegetation around plantings. The best management strategy appears to be digging up invasive and competing vegetation by hand, though this involves large amounts of manual labor.

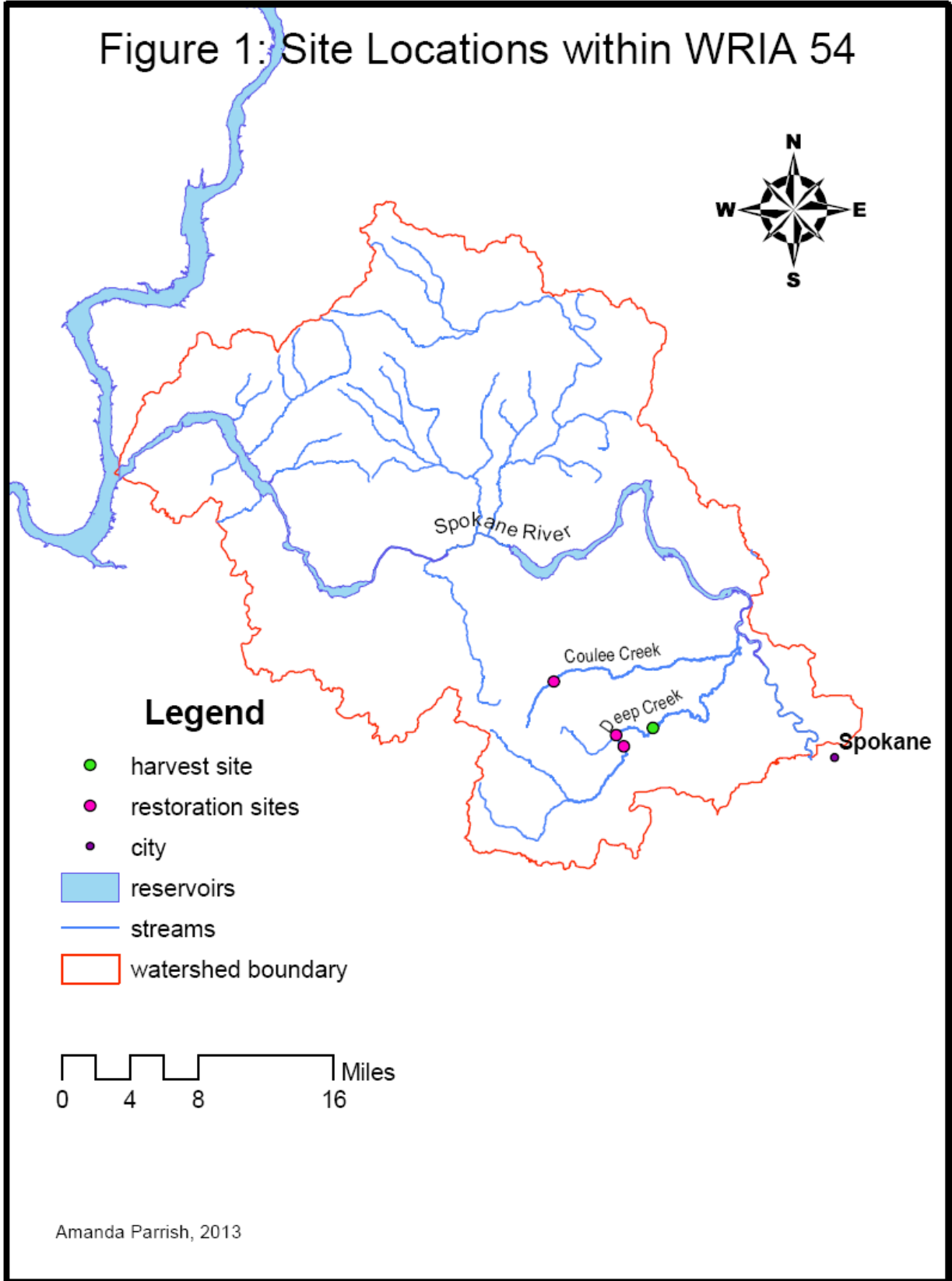
RECOMMENDATIONS

Following the 2012 and 2013 seasons' riparian restoration procedure, combined with input from collaborating programs, TLC has developed the following recommendations toward future projects and adaptive management:

- Larger, more mature planting materials provide environmental benefits quickly for little investment and should be used- especially if height can exceed browse zone and RCG height
- Cuttings should be planted in-stream and remain partially submerged throughout the year to avoid rodent herbivory and reduce RCG shading
- Ideally, RCG should be completely removed surrounding new plantings until the plantings become established
- Herbivory is hard to manage, and a combination of tree tubes and neem oil, while at times effective, need to be monitored regularly in case tubes fall over or neem oil wears off
- Plants should receive water at least once a month during dry seasons for a minimum of one year after planting to maximize survival rates

Figures

Figure 1: Site Locations within WRIA 54



Amanda Parrish, 2013

Figure 2: Harvest Site Map



Legend

— stream

□ area harvested

Amanda Parrish, 2013

0 0.0175 0.035 0.07 0.105 0.14 Miles

Figure 3: C1.13 Site Map

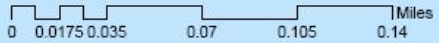


Legend

- stream
- ▭ area restored



Amanda Parrish, 2013




0 0.0175 0.035 0.07 0.105 0.14 Miles

Figure 4: C2.13 Site Map

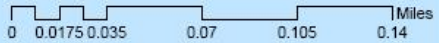


Legend

- stream
- ▭ area restored

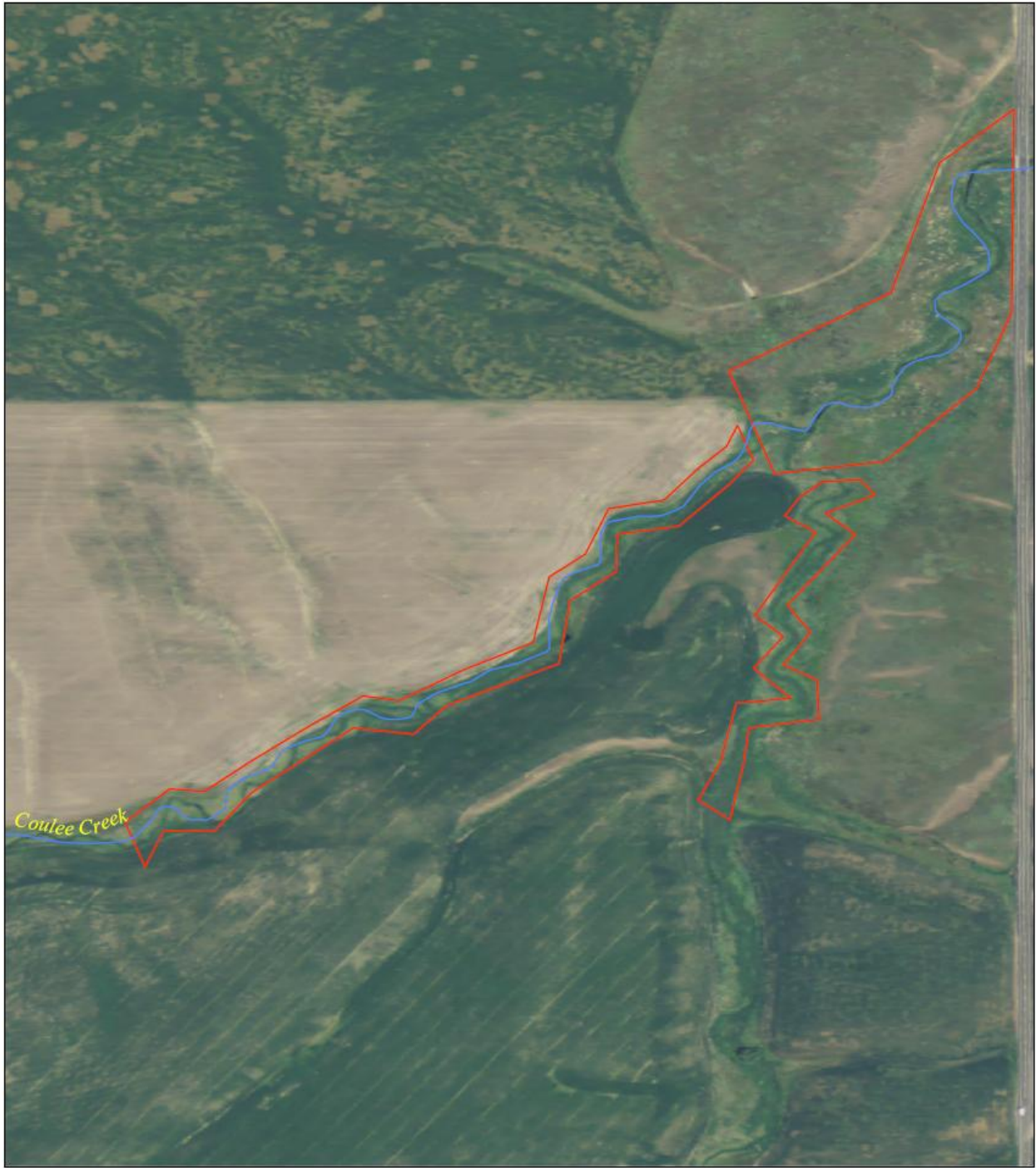


Amanda Parrish, 2013



0 0.0175 0.035 0.07 0.105 0.14 Miles

Figure 5: C1.12.13 Site Map



Legend

- stream
- ▭ area restored

Amanda Parrish, 2013

0 0.025 0.05 0.1 0.15 0.2 Miles

Figure 6: Photo Point, site D1.13



Photo taken 13 June 2013

Figure 7: Photo Point, site C1.12.13



Photo taken 17 April 2012

Figure 8: Photo Point, site C1.12.13



Photo taken 25 June 2013

Figure 9: Photo Point, site C1.12.13



Photo taken 17 April 2012

Figure 10: Photo Point, site C1.12.13



Photo taken 25 June 2013

Figure 11: Photo Point, site C1.12.13



Photo taken 17 April 2012

Figure 12: Photo Point, site C1.12.13



Photo taken 25 June 2013