CWCB Watershed Restoration and Protection Project

Glen Cove 'Tin Barn' Wetland Restoration Project
Final Report
June 28, 2013

Project Proposal Summary Sheet

1. Project Title: Upper Glen Cove Creek Watershed Erosion Control and Restoration Project
2. Project Location: Pikes Peak, CO Lat. 38°53'01" N, Long. 105°04'24" W
3. Grant Requested Amount: $29,500
4. Cash Match Funding: $35,666
5. In-Kind Match Funding: $6,188
6. Project Sponsor: Rocky Mountain Field Institute
7. Contact Person/Title: Amber Shanklin, Program Director
8. Address: 815 South 25th Street, Suite 101 Colorado Springs, CO 80904
9. Telephone/ E-mail: (719) 471-7736, rmfi@rmfi.org
10. Project Type: Watershed Restoration and Protection

Summary

This report details the actions taken to fulfill all tasks as outlined within the Scope of Work for the *Upper Glen Cove Creek Watershed Erosion Control and Restoration Project*, part of the *Pikes Peak Watershed Restoration Project (PWRP)*. The project was a cooperative effort between the Rocky Mountain Field Institute (RMFI), the Pikes Peak Chapter of the Sierra Club, the City of Colorado Springs, and the USDA Forest Service to improve water quality and protect natural resources in the watershed. The area has been impacted by decades of previously uncontrolled stormwater runoff from the Pikes Peak Highway.

The goal of the *Upper Glen Cove Creek Watershed Erosion Control and Restoration Project* was to restore a sub-alpine wetland located within the headwaters to Glen Cove Creek on Pikes Peak at an elevation of 10,965'. Glen Cove Creek is a tributary to South Catamount Creek, which feeds into the South Catamount Reservoir, a primary source of drinking water for the City of Colorado Springs. The wetland, known as "Tin Barn" due to its proximity to an old tin storage building, was severely impacted by sedimentation carried by stormwater flow through a conveyance channel emanating from the Pikes Peak Highway. This sediment formed a large alluvial fan that completely buried the pre-existing wetland. A stratigraphy study of the alluvial deposit indicated a typical fan formation with the deepest accumulations near the center of the fan and thinning towards the edges. At its deepest, over 6 feet of alluvium buried the original wetland soils. Stormwater discharge through the conveyance channel was eliminated in 2011 as part of the engineered design for paving the Pikes Peak Highway.

Restoration of this wetland took place in two phases. Due to the Waldo Canyon Fire and subsequent forest closures in 2012, phases were slightly altered from the original proposal and project completion was pushed to June 2013. The final work completed during each phase is described in detail below. Completion of the project resulted in the following:

- Restoration of ½ acre of sub-alpine wetland, providing sediment protection to the headwaters of Glen Cove Creek
- Restoration of 1 acre of disturbed forest lands through seeding and transplanting native vegetation
- Restoration and stabilization of 300' of closed conveyance channel by recontouring and seeding with native grasses
- Engagement of 69 community volunteers and 1 youth corps team in the project

Project Implementation

Phase 1 (July 11, 2012 – December 31, 2012):

Phase 1 work consisted of removal of the deposited alluvium and initial revegetation within the wetland. Chaparral Construction began removing sediment from the wetland on July 30, 2012. Sediment removal was overseen by RMFI staff and Fin-Up Habitat Consultants. A total of 46,035 cubic feet (1,705 cubic yards) of material was excavated and moved to an approved disposal site (Figure 1). Chaparral Construction also installed 4 log 'rock and roll' structures (Figure 2) and 6 waterbars along the newly created access road to catch sediment prior to wetland deposition. RMFI engaged volunteers to complete initial revegetation work within the wetland. Native seed was spread over a third of an acre which was then covered with an aspen matting to prevent erosion. Volunteers also stabilized 300 feet of an old conveyance channel.

Phase 2 (January 1, 2013 – June 31, 2013):

Phase 2 work consisted of final revegetation of the wetland (Figures 3 and 4) and decommissioning the access road used by the heavy equipment. Work was completed by RMFI staff and a Mile High Youth Corps crew during the week of May 27, 2013. The access road created the previous year for heavy equipment removal was hand decompacted and seeded with a native seed mix (Table 1) (Figure 5). Biosol® fertilizer was spread over the road to increase germination rates of the seeds. Trees were felled along the upper part of the road to create 24 contour logs to minimize future disturbance and to provide microhabitats to improve seedling germination rates. 5 log erosion barriers were installed near the end of the road (nearest the wetland) to ensure minimization of future sediment deposition into the wetland. Though a small portion of the wetland was seeded the year before, additional revegetation was required. Local sedges (*Carex aquatilis*) and willows (*Salix sp.*) were collected from a wetland near South Catamount Reservoir for transplant into the Tin Barn Wetland. Using locally collected species ensures native species are used and ensures a high establishment rate since plants are well adapted to the environment. Native seed species purchased from a local company were also spread within the wetland area to establish a greater diversity of species (Table 2) (Figure 7). Approximately 1,000 square feet of erosion control matting was placed along the banks of the wetland and in key areas along the road to prevent erosion (Figure 6).

Total Work Completed:

Wetland Restored (.43 acre)

- All non-local sediment removed from wetland
    - 46,035 total square feet (1,705 cubic yards) removed from site
- Revegetation of wetland soils
    - 7.5 lbs native wetland seed mix broadcast
    - 400 willow stakes transplanted
    - 1,100 local sedge plugs transplanted
    - 1,000 square feet erosion control matting placed
- Additional stabilization work

- 4 log 'rock and roll' structures installed
- 6 waterbar structures installed

Conveyance Channel Stabilized (300')

- 1/3 acre seeded
- 200 square feet erosion control matting installed

Forest Land Restored (1 acre)

- ¼ mile access road and surrounding impacted area decommissioned and restored
  - 60 lbs Biosol® fertilizer applied
  - 50 lbs native seed mix broadcast
  - 5 log erosion barriers installed
  - 24 contour logs installed

Monitoring and Evaluation

RMFI has established a comprehensive monitoring and evaluation plan that has been used to measure the effectiveness of prescriptions implemented to reduce runoff velocity, enhance channel stability, and increase vegetative cover within its projects completed on Pikes Peak. Monitoring and evaluation is undertaken over a period of three years after project implementation utilizing several methodologies and is funded by monies from the Pikes Peak Fund.

Monitoring of this site will continue to 2016 to determine the effectiveness of the revegetation and the erosion control measures. Vegetation monitoring sites will be installed to measure success rates of reseeding and transplanting. The majority of monitoring will be completed by student interns through UCCS. A final report will be completed in the fall of 2016 analyzing the overall effectiveness of the implemented techniques. Results in table and graph form will be presented to show changes in vegetation cover and species frequency. Upon completion, the report will be available on RMFI's website, www.rmfi.org, as well as distributed to the Pike Ranger District and the City of Colorado Springs. Presentations at conferences such as the Sustaining Colorado Watersheds and the High Altitude Revegetation Workshop are anticipated.

Partners

A combination of youth corps, volunteers, interns, RMFI staff, and the project's supporting sponsors has made this project possible. Volunteers included University of Colorado at Colorado Springs students, Colorado Springs Utilities employees, Colorado State University students, and individual community members. A Mile High Youth Corps crew was utilized for transplant collection and planting in spring 2013. Project partners include USDA Forest Service—Pike

National Forest, City of Colorado Springs, and Pikes Peak Chapter of the Sierra Club. Funding partners include the Pikes Peak Fund and Colorado Water Conservation Board.

The success of this project has shown promise that sub-alpine wetland soils may have the capacity to recover after being completely buried by alluvium for many years. Many thanks to all the partners who helped make this project a success.

Table 1. Seed mix used along the decommissioned road at the Tin Barn Wetland Site during 2013.

Common Name	Percent of Mix
Streambank Wheatgrass	20
Mountain Bromegrass	20
Slender Wheatgrass	10
Blue Wildrye	10
Sherman/Canby Bluegrass	5
Rocky Mountain/Idaho Fescue	10
Alpine/Sandberg Bluegrass	10
Prairie Junegrass	5
Tufted Hairgrass	10

Table 2. Seed mix used within the Tin Barn Wetland during 2013.

Common Name	Percent of Mix
Tufted Hairgrass	14
Aquatic Sedge	2
Giant Mannagrass	12
Fowl Bluestem	12
American Sloughgrass	12
Slender Sedge	10
Nebraska Sedge	10
Beaked Sedge	8
Creeping Spikerush	8
Lens Sedge	5
Baltic Rush	3
Small Fruited Bulrush	2
Meadow Rush	1
Yellow Monkey Flower	1

Figure 1. Heavy equipment used to remove alluvium deposition in Tin Barn Wetland during 2012 work.

Figure 2. Log 'rock and roll' structures installed during 2012 work.

Figure 3. Tin Barn Wetland during restoration during 2013. Notice visible water within the wetland.

Figure 4. Tin Barn Wetland 1 month post-restoration during 2013.

Figure 5. MHYC members hand decompacting wetland access road during 2013.

Figure 6. Installation of erosion control matting near Tin Barn Wetland during 2013.

Figure 7. Newly seeded native grasses emerging 1 month post-restoration at the Tin Barn Wetland during 2013.