

UPPER COAL CREEK REACHES

Coal Creek Watershed

2013 Colorado Flood Recovery



COLORADO
Department of Local Affairs
Community Development Block Grant –
Disaster Recovery



COLORADO
Colorado Water
Conservation Board
Department of Natural Resources



United States Department of Agriculture
Natural Resources Conservation Service



Multiple Benefits

- **Protect life, property, and infrastructure**
- **Mitigate flood risk**
- **Engage local community**
- **Enhance ecosystem structure & function**

In September 2013, Coal Creek Canyon experienced a flood event that significantly impacted this small mountain community. Highway 72, built largely of fill placed in the active creek corridor, washed out in multiple areas, and many private homes and access roads were damaged or destroyed. The conventional approach of building creek crossings of minimum width resulted in their being clogged with sediment and debris naturally transported downvalley during the flood. Once these crossings were obstructed, flood flows and sediments overflowed into the surrounding properties, amplifying damages in the narrow canyon.

The Upper Coal Creek project aimed to protect infrastructure located within the river corridor from future flood damage while enhancing ecosystem function. Activities included sediment removal, bank and channel stabilization, and native riparian revegetation. These efforts improve channel capacity, deter lateral migration into critical infrastructure, stabilize banks, and support healthy ecological function.



Watershed
Coal Creek



Locale
Jefferson County



Local Sponsor
Coal Creek Canyon
Watershed Partnership



Property Ownership
95% private
5% public



Project Cost
\$1,334,127



Construction Dates
Mar. 1 - Aug. 18, 2017
(171 days)

The Coal Creek Canyon Watershed Partnership (CCCWP) formed out of a resident-supported planning effort to oversee implementation of flood recovery and resilience-building projects. CCCWP worked with experts and local stakeholders to develop a Master Plan to guide restoration work. The plan identified and ranked creek recovery projects, prioritizing Reaches 4 and 5, the most populated stretch of the canyon, due to damage severity and importance for emergency access via Highway 72.

In 2015, Natural Resource Conservation Service (NRCS) and Colorado Water Conservation Board (CWCB) surveyors completed Damage Survey Reports detailing three suitable projects within Reaches 4 and 5, setting the stage for flood recovery work in these areas.

Erosion control and revegetation with native plants



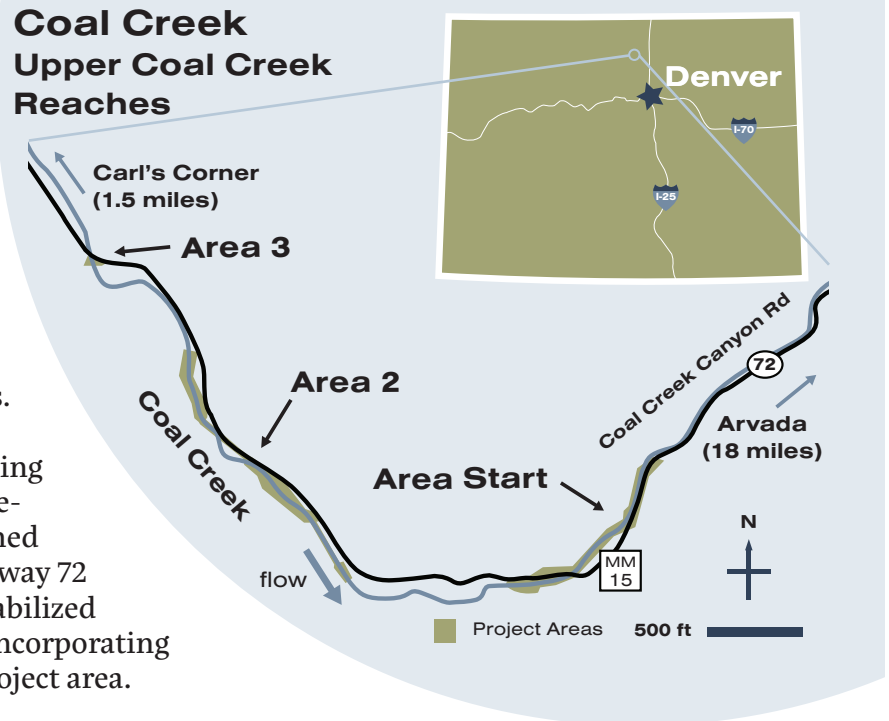
River Corridor Rehabilitation

The locations addressed by the Upper Coal Creek project are not contiguous, but total approximately 3,100 linear feet along 1.25 miles of Highway 72. They are referred to as Area Start, Area 2, and Area 3, and are located within Master Plan Reaches 4 and 5. The project directly assisted 11 private landowners.

The project removed unstable sediment, opening up capacity in the corridor for future floods, re-established a vegetated floodplain, and realigned Coal Creek to better cross under existing Highway 72 bridges in several areas. Streambanks were stabilized by adding rock and wood toe protection and incorporating bioengineering techniques throughout the project area.

Disturbed areas throughout the project site were planted with native trees and shrubs, seeded with native grasses and forbs, and mulched. A gravity-fed irrigation system was set up to water plants until they are established.

Wherever possible, this project utilized bioengineering techniques that involve using plant materials to stabilize and reduce erosion on streambanks (sometimes referred to as “soft” engineering), in order to meet project goals. This approach included aggressive seeding with native mixes and planting with riparian species in order to bind soils with roots and slow flood water velocities as they pass through the dense vegetation. Both aquatic and terrestrial ecosystems benefit from healthy riparian vegetation. Further, the restoration of riparian areas leaves this project more resilient to future threats such as drought, fire, and flood by promoting native species who are adapted to deal with these threats.



Above: Crews install bank protection to protect critical highway infrastructure.
Below: Volunteers harvest willows for revegetation.



Project Goals

- Reconnect floodplain and increase floodplain capacity through sediment and debris removal
- Stabilize streambanks to protect existing infrastructure from further damage through bioengineering and armored resiliency
- Control stream channel incision via grade control structures
- Realign channel to improve hydraulic conditions, particularly at crossings
- Establish vegetative cover on critically eroding land
- Enhance riparian and aquatic habitat



Before

Significant erosion and deposition occurred along many reaches of the Coal Creek, particularly on outer bends of the channel and adjacent to undersized crossings. Imminent threats to structures and infrastructure were addressed with emergency repair projects implemented by the NRCS (termed Phase I repairs). The intent of this second phase of Emergency Watershed Protection (EWP) projects (Phase II) was to accomplish longer-term restoration and protection measures.

A project reach before construction with significant sediment accumulation from the flood and very little riparian vegetation in the affected area.

After

In addition to protecting private infrastructure and crossings, this project realized substantial benefits to public safety by protecting streambanks along the state highway and increasing floodplain capacity. State Highway 72 is the major emergency access route for Coal Creek Canyon residents and the highway was inundated and damaged in several places along Reaches 4 and 5 during the 2013 flood. The Upper Coal Creek project mitigated some of the flood risk to the highway by using a combination of bioengineering and armoring to protect critical streambanks, and by increasing floodplain capacity through sediment and debris removal and stream channel shaping.

BY THE NUMBERS



project length:
3,100 linear feet



11 participating
landowners



19 in-stream
structures



30
volunteer
hours



3,580 riparian plants



3 acres seeded

This project succeeded in reconnecting the floodplain bench to the creek, protecting the road, and planting native riparian vegetation to restore this ecosystem.



PROJECT TEAM

With funding from the CWCB, the Colorado Department of Local Affairs (DOLA), and the NRCS Emergency Watershed Protection (EWP) Program, the CCCWP worked primarily with Olsson Associates and Great Ecology to develop the designs for this project and oversee construction.

All of the project work occurred on private land, and the CCCWP and their team worked closely with landowners to accommodate their specific requests and achieve project objectives. The Coalition also worked with the Colorado Department of Transportation (CDOT) to tie stream restoration work into future CDOT plans for culvert upgrades on State Highway 72.

FOR MORE INFORMATION

Coal Creek Canyon Watershed Partnership
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www.cccwp.org
www.ColoradoEWP.com

Partners

Private landowners
Local Coal Creek residents and volunteers
Colorado Water Conservation Board (CWCB)
Colorado Department of Local Affairs (DOLA)
Colorado Parks and Wildlife (CPW)
Colorado Department of Transportation (CDOT)
Natural Resources Conservation Service (NRCS)

Contractors

Olsson Associates
Frontier Environmental Services
Resilient Watershed Partners (RWP)

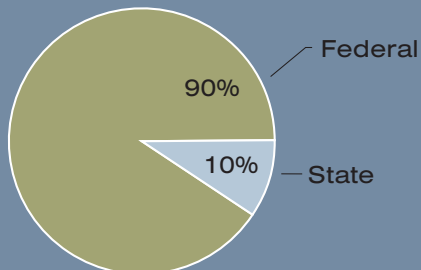
Water tank in the project reach for irrigating newly planted vegetation.



BUDGET

TOTAL: \$1,334,127

Project Funding by Source



Project Cost Breakdown

