

FOOTHILLS REACHES

Left Hand 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



LEFTHAND WATERSHED
oversight group

Multiple Benefits

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

In September 2013, a catastrophic flood occurred in the Left Hand Creek watershed. The Lefthand Watershed Oversight Group (LWOG), already an established organization prior to the flood, was poised to implement numerous restoration projects identified in the watershed recovery Master Plan they developed in 2014.

Based on the Master Plan's recommendations, four projects in the foothills region of the Left Hand Creek watershed, collectively referred to as the "Foothills Reaches," were designed and implemented to lessen the consequences of future flooding, stabilize the damaged streambed and banks, restore the ecological health of the creek, and improve human health and safety in the affected reaches. The projects were identified by LWOG and scoped during the Natural Resources Conservation Service (NRCS) and Colorado Water Conservation Board's (CWCB) damage survey of the area in 2015.

The Foothills Reaches project aimed to reduce future flood damage to existing infrastructure built within the active river corridor. Key project features include bank protection, reestablishment of floodplain benches, sediment removal, buried riprap set back to protect existing dwellings while allowing for natural channel meandering, and native revegetation.

The Foothills Reaches projects are located along Left Hand Creek, where it transitions from a mountain canyon stream to a lower-gradient plains stream in the vicinity of US Highway 36. The Foothills Reaches footprint includes three reaches located near US 36 (Streamcrest, Left Hand CD, and Ranch), and an additional reach located near the Altona neighborhood along Left Hand Canyon Drive (Upper Left Hand).



Watershed
Left Hand Creek



Locale
Boulder County



Local Sponsor
Lefthand Watershed
Oversight Group



Property Ownership
99% private
1% public



Project Cost
\$5,061,385

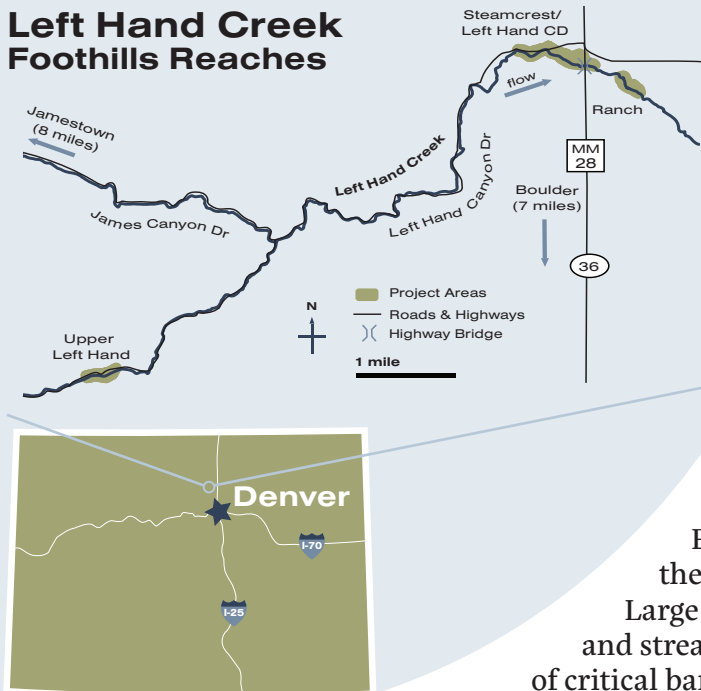


Construction Dates
Mar. 8 - Nov. 9, 2017
(247 days)

Left: Flood sediment and debris nearly burying a vehicle in the Streamcrest neighborhood (photo credit: Teri Morelli); Right: Post-construction photo of the Ranch reach, where eroded cut banks were graded back, revegetated, and covered with biodegradable erosion control fabric and WoodStaw mulch to protect bare soils until vegetation is established.



Left Hand Creek Foothills Reaches



River Corridor Rehabilitation

Floodplain grading, including bank reconstruction, benching, and channel shaping, was used in the Foothills Reaches project to increase water and sediment storage capacity for future flood events. In some locations, this required reestablishing a low-flow channel. In other locations, this required excavation of an overflow channel to provide strategic alternative pathways for high flows.

Floodplain benches were established to provide the channel room to spread out and dissipate energy. Large wood structures were used in both the channel and streambanks to increase roughness, redirect flows off of critical banks, and improve habitat for fish and other aquatic organisms. Brush trenches, which consist of live branches buried in a trench perpendicular to the river contour, were installed to trap debris on the slope, reinforce soil with unrooted branches, and provide stability and microclimates for vegetation establishment. Riffle-pool sequences were added to the channel to alternate between areas of relatively shallow, fast-moving water and areas of deeper water. These help to provide a diversity of habitats for aquatic organisms and help maintain channel stability by dissipating erosive energy. Offset protection, or buried riprap, was installed close to structures in need of protection and as far away from the active channel as possible in order to allow it to naturally adjust its shape and location as needed.

Project Objectives

- Stabilize the main channel, increase roughness, and improve floodplain connectivity by removing sediments, grading, and benching
- Restore and enhance native vegetation cover to improve riparian habitat and stabilize embankments
- Protect buildings, dwellings, and ditch diversion structures by installing buried rock revetments and offset protection
- Increase habitat complexity and connectivity with in-stream habitat enhancements, including large wood structures
- Increase conveyance during high flows by creating overflow channels
- Coordinate all work with parties relocating powerlines and two private wells

In the Streamcrest reach, the restoration project necessitated the relocation of a power line and associated utility poles, as well as two private water wells. The utility relocation involved more than a year's worth of work, landowner support, and perseverance, but was critical to safely bringing the project's goal of increased floodplain capacity to fruition while also providing long-term protection to that critical infrastructure.

Construction was followed by revegetation, including seeding with native seed mix, staking live willow and cottonwood material, and planting trees and shrubs.

Wildlands Restoration Volunteers hosted volunteer events at Foothills Reaches to help with revegetation efforts. This effectively engaged the community in the project and extended the project budget.





Before

Flooding, accompanied by its sediment and debris delivery out of the mountain canyons, caused the creek to migrate and experience deposition, erosion, and loss of riparian vegetation. The high sediment load naturally transported from the upper watershed quickly plugged undersized private crossings, resulting in sediment deposition, channel avulsion, and substantial bank erosion. To prevent further damage to property, residents used the deposited material to create makeshift levees, many of which were unstable, exacerbating the hazard for future flooding.

Pre-construction channel in the Streamcrest neighborhood lacking complexity, floodplain connection, stabilizing vegetation, and sinuosity.

After

The completed project directly improves the ecology, safety, and quality of life for private landowners within the project areas, including improved home protection, landowner access, reduction of hazards, and enhanced riparian and aquatic habitat.

The rehabilitation of this reach benefits many residents and recent restoration projects downstream by reducing the risk of unstable sediments migrating downstream and causing further problems. In addition, this project improves water delivery reliability and reduces maintenance needs for the Left Hand Ditch Company and Left Hand Water District.

BY THE NUMBERS



**project length:
4,702 linear feet**



**30 participating
landowners**



**37 in-stream
structures**



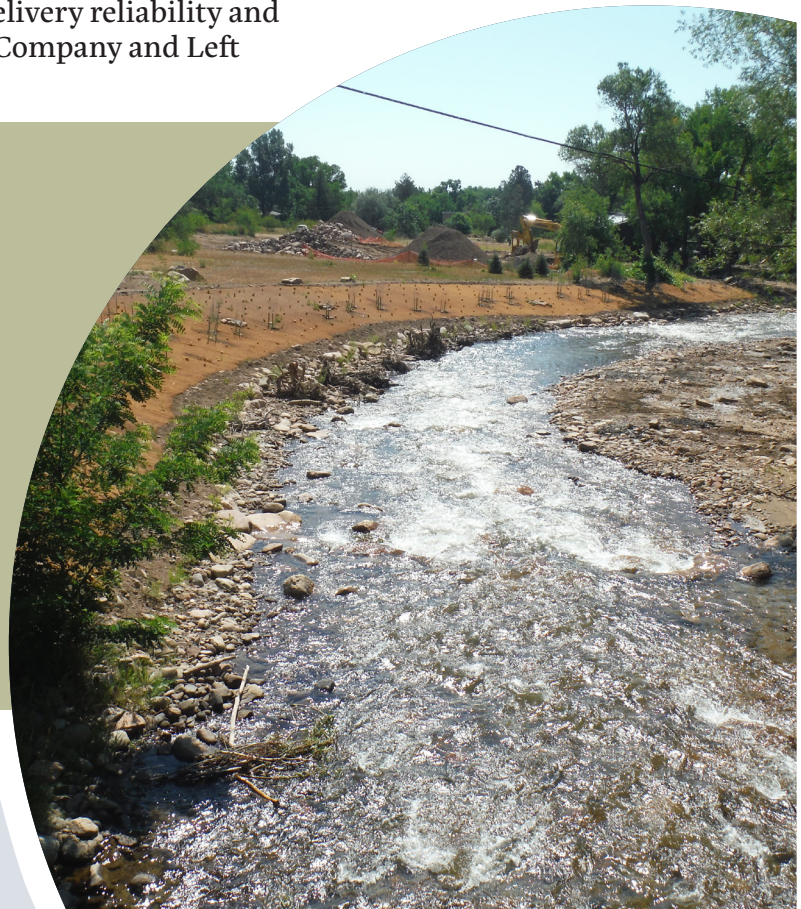
**5,034 linear feet
of bioengineered
streambanks**



**7,963 willow &
cottonwood live
stakes**



**12 acres
seeded**



Post-construction channel with pool-riffle sequences, large wood structures to stabilize banks and increase roughness, a graded point bar on the inside of the meander bend, and planted native riparian vegetation.

PROJECT TEAM

Living together in a dense-rural environment, landowners in the Streamcrest neighborhood joined forces immediately after the 2013 flood event to help implement a Phase I Recovery Project funded by the NRCS. With a significant amount of work remaining, the neighborhood pooled their money to develop a cohesive conceptual design for the restoration of the creek.

As a stakeholder-driven non-profit watershed group, LWOG applied for funding from the Colorado Department of Local Affairs (DOLA) to take advantage of the NRCS EWP Program and CWCB funding that was available for Streamcrest. With the landowners already working well as a team, LWOG contributed the funding, engineers, contractors, and assistance in overseeing the final design and implementation phase of the project. Partnerships between LWOG, private landowners, consultants, and contractors were key to successfully completing the Foothills Reaches project.

FOR MORE INFORMATION

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www.ColoradoEWP.com

Extensive revegetation was installed to stabilize the riparian corridor in the Upper Left Hand Reach.

Partners

- Private landowners and neighbors
- Xilinx volunteers
- Wildlands Restoration Volunteers
- Left Hand Ditch Company
- Left Hand Water District
- Boulder County
- Colorado Water Conservation Board (CWCB)
- Colorado Department of Local Affairs (DOLA)
- Natural Resources Conservation Service (NRCS)

Contractors

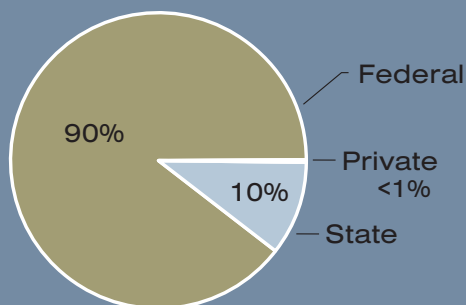
- Otak
- Iron Woman Construction and Environmental Services
- FlyWater
- Resilient Watershed Partners (RWP)



BUDGET

TOTAL: \$5,061,385

Project Funding by Source



Project Cost Breakdown

