

NORTH 83RD STREET

Little Thompson 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 critical infrastructure**
- **Mitigate flood risk**
- **Enhance ecosystem structure & function**
- **Increase floodplain capacity**

As the Little Thompson River emerges from the foothills to meet the plains, the stream gradient decreases dramatically, causing the river to naturally deposit material gathered upstream. During the 2013 flood, two events occurred that intensified sedimentation in this reach. In the upstream part of the reach, the river created an overflow channel at a sharp bend. At the downstream end of the reach, the undersized North 83rd Street culvert crossing quickly clogged with debris and sediment. Both events caused the Little Thompson to avulse (or change course), severely damaging several residences located within the river corridor.

The Little Thompson Watershed Coalition (LTWC) formed shortly after the 2013 flood with a mission “to restore and maintain the resiliency, ecological integrity, and agricultural heritage of the Little Thompson watershed.” LTWC began by developing a Master Plan to provide assessment and guidance for flood recovery. Strategies and recommendations from the Master Plan were incorporated into the North 83rd Street project design.

In conjunction with Boulder County’s construction of a new crossing (a floodplain-spanning bridge), this project restored channel and floodplain capacity and aimed to improve the conveyance of future high water and sediment away from the seven residences in the river corridor. Activities included clearing debris, sediment removal, grading, bank and bed stabilization, and revegetation.

The North 83rd Street project removed 12,600 cubic yards of sediment deposited by the 2013 flood, restoring capacity for future storm events. A compound channel cross section was established to reconnect the stream to the floodplain and encourage a more species-rich and functionally interactive riparian community.



Watershed
Little Thompson



Locale
Boulder County



Local Sponsor
Little Thompson
Watershed Coalition



Property Ownership
100% private



Project Cost
\$994,330

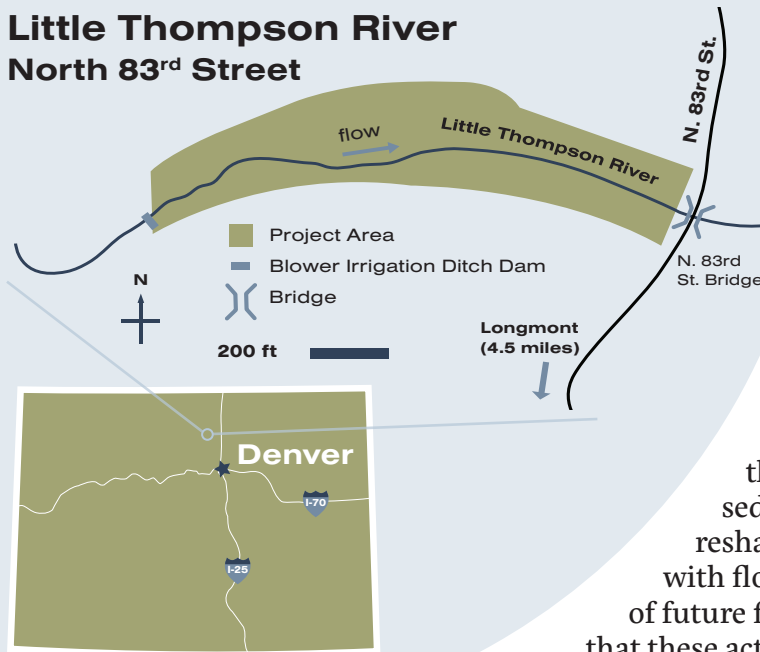


Construction Dates
Mar. 24 - Jul. 14, 2017
(112 days)

Immediate post-flood conditions (North 83rd Street is the road on the right side of the photo).



Little Thompson River North 83rd Street



River Corridor Rehabilitation

The North 83rd Street project reach is approximately 2,100 feet long, stretching from below the Blower Irrigation Ditch dam to approximately 300 feet upstream of the North 83rd Street Bridge. The first major project task was to remove the sediment deposited in the project area by the 2013 flood, which measured approximately 5-6 feet deep over the entire river reach when the project began. As sediment and debris were removed, the channel was reshaped to include a meandering low-flow channel with floodplain benches to accommodate a wide range of future flow conditions. Computer modeling indicates that these activities significantly improved sediment transport through the reach. A guide bank was added in one sensitive location to direct floodplain flows back towards the channel.

The project incorporated several innovative practices, including the use of large woody material in the floodplain for energy dissipation and along the banks for channel stability. An additional benefit of the addition of woody material is the enhancement of aquatic and terrestrial habitat. This also served to incorporate material that would otherwise have been removed as trash. In certain areas, riprap was buried to provide additional infrastructure protection.

Three riffle-pool structures were added to the river reach to manage the transport of sediment, prevent downstream bank erosion from progressing upstream, control the grade of the river, and improve aquatic habitat. Willows, cottonwoods, and other container plants were strategically placed to help stabilize the floodplain and banks while also reducing out-of-bank water velocity and providing habitat.

Right: Newly planted seedlings on temporary drip system.

Below: Laying out fiber blankets for erosion control.



Project Objectives

- Improve conveyance capacity and drainage
- Reduce the likelihood that future floods will damage critical infrastructure
- Reclaim eroded overbank surfaces
- Remove flood debris
- Re-establish vegetation



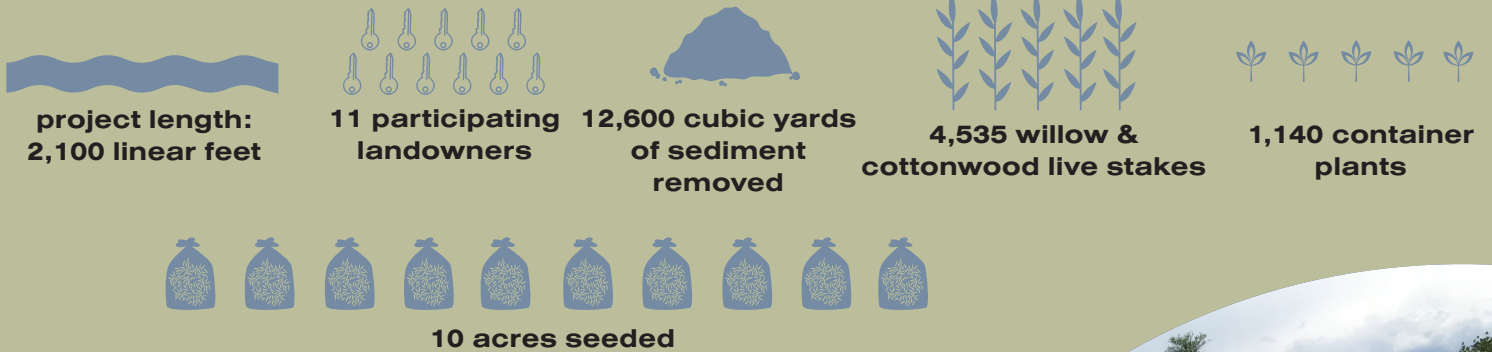


Before

The plugging of the undersized culverts at the North 83rd Street crossing caused the 2013 floodwaters to overtop the road and deposit an enormous amount of sediment upstream. As a result of the deposition, floodwaters migrated north and damaged several residences both inside and outside of the mapped 100-year floodplain. The sediment wedge made damage to these residents from future floods very likely.

Sediment deposits before construction.

BY THE NUMBERS



After

Today, a restored channel meanders through the central portion of the river bed with slopes gradually leading up from the water's edge. Bank stabilization features installed in certain locations on the outer banks, as well as the riffle structures, will reduce erosion and protect infrastructure in an environment of naturally shifting sediments. In spring of 2017 and 2018, the new channel successfully conveyed the high waters during runoff with limited new erosion or sediment deposition.

Between the construction of the North 83rd Street project and Boulder County's new bridge downstream, the ability of the river reach to convey future high waters and floods has been dramatically improved.



Riffle-pool sequences are now providing habitat, water quality benefits, and improved sediment transport after construction.

PROJECT TEAM

The LTWC received funding from both the Colorado Water Conservation Board (CWCB) and the Colorado Department of Local Affairs (DOLA) to complement Natural Resources Conservation Service (NRCS) Emergency Watershed Protection (EWP) Program funds. Local landowners were actively invested in the project's success throughout design and construction.

LTWC and its project team also worked with Boulder County to coordinate project design and construction to ensure that the rehabilitation project would meld with the new North 83rd Street bridge construction and adjacent work being conducted by the County downstream of the bridge.

Partners

Private landowners

Boulder County

Colorado Water Conservation Board (CWCB)

Colorado Department of Local Affairs (DOLA)

Natural Resources Conservation Service (NRCS)

Contractors

Engenuity Engineering Solutions

Frontier Environmental Services

Resilient Watershed Partners (RWP)

Vegetation returning to the North 83rd Street project site (July 2018).



FOR MORE INFORMATION

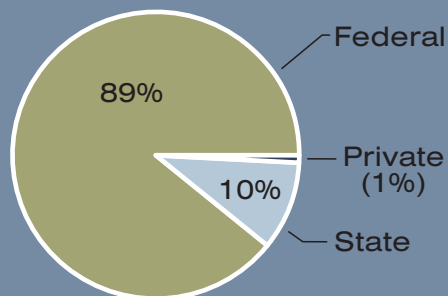
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BUDGET

TOTAL: \$994,330

Project Funding by Source



Project Cost Breakdown

