– South Platte River –

STATE HIGHWAY 60

Middle South Platte River Watershed

2013 Colorado Flood Recovery

USDA United States Department of Agriculture Natural Resources Conservation Service

COLORADO Colorado Water Conservation Board Department of Natural Resources

MSPRA Middle South Platte River Alliance

Multiple Benefits

- Protect critical infrastructure
- Mitigate flood risk
- Enhance ecosystem structure & function
- Improve water quality

Watershed
South Platte

Locale
Weld County

Local Sponsor
Middle South Platte River Alliance

Property Ownership
100% private

Project Cost
$602,547

Construction Dates
Sep. 8 - Nov. 9, 2017 (63 days)

Heavy, sustained rains in September 2013 caused significant flooding along the South Platte River. Shortly thereafter, a diverse group of stakeholders came together to form the Middle South Platte River Alliance (MSPRA), with the common vision of a healthier and more flood-resilient river corridor.

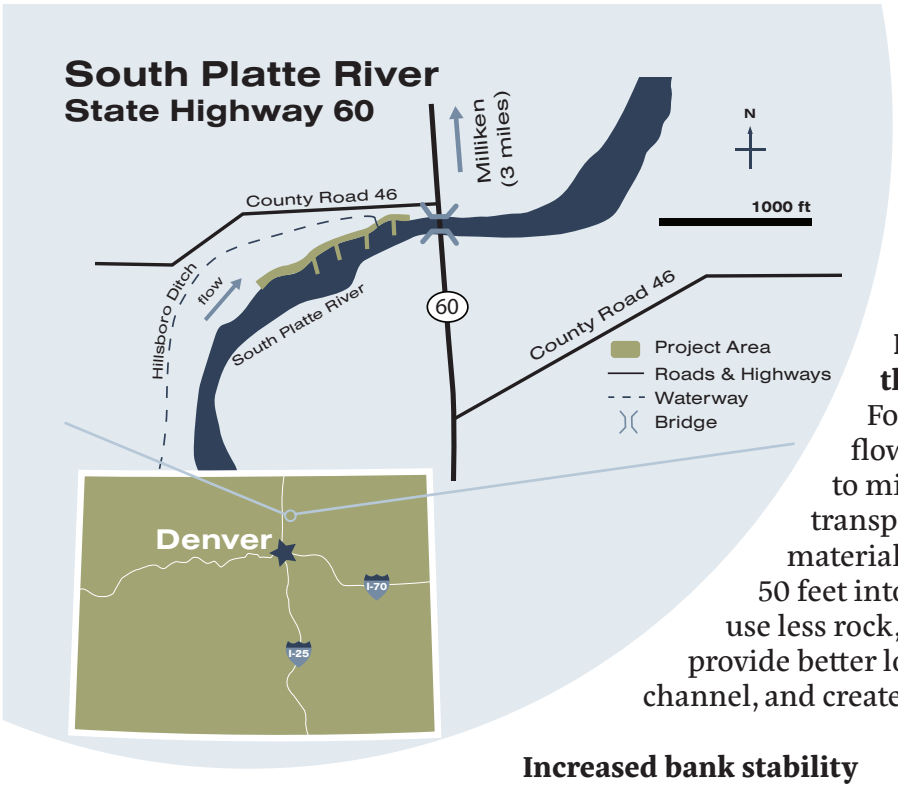
The flood resulted in both aggradation and degradation of sediment, changing the location of the channel and shape of its banks and floodplain. In some areas, streambank erosion, a natural process that can create beneficial habitat, jeopardized critical infrastructure. At the State Highway 60 (SH 60) bridge, 2.5 miles southeast of the Town of Milliken in Weld County, the river upstream of the bridge had been migrating to the north as a result of natural channel migration processes. The flood accelerated this migration, threatening to outflank the bridge.

The SH 60 project sought to guide the channel alignment of the South Platte River to protect the SH 60 bridge, a critical emergency access route. Four bendway weirs were designed to redirect flows and sediments through the bridge. Native vegetation was installed to improve long-term bank stability, protect water quality, and enhance riparian and riverine habitat.

The MSPRA sought funding from the Natural Resources Conservation Service (NRCS), the Colorado Water Conservation Board (CWCB), and Weld County for a project to redirect the river towards the center of the SH 60 bridge and attempt to protect private property from further erosion.

Post-construction photo looking east toward the SH 60 bridge, capturing the entire project area.

River Corridor Rehabilitation



Several methods were employed to achieve project objectives:

Retraining the river to the center of the channel

Four bendway weirs were installed to redirect flows towards the center of the channel as a way to minimize erosion and encourage sediment transport. These were constructed out of rock material of various sizes and extend approximately 50 feet into the river. Unlike traditional riprap, these use less rock, are designed to have minimal visual impact, provide better long-term access for landowners to the channel, and create improved in-channel habitat.

Increased bank stability

Soil-stabilizing vegetation, erosion control matting, and rock armoring were installed behind the bendway weirs in order to protect the weirs and provide another line of defense from bank-scouring flows.

Employing a coordinated approach to mitigation of existing and future damage

The anticipated reconstruction of the SH 60 bridge in 2019 will increase the overall span of the structure while decreasing the number of sediment and debris catching pillars in the channel. This, in conjunction with the river training structures, should provide improved resiliency during future floods.

Establishment of woody material to increase habitat for aquatic life

Mimicking natural habitat critical in a sand bed river system, a engineered revetment structure made of salvaged trees was installed at the upstream end of the project to stabilize the bank while providing aquatic habitat benefits. Small woody material found onsite was repurposed to create a wood habitat structure to enhance avian and riparian habitat. Finally, sand bars with woody snags were re-established through the project site to resemble existing natural features on the South Platte River and provide additional habitat.

Restoration of native plant communities

Native riparian species were installed along the banks and floodplain to provide long-term stability while improving the quality of riparian and riverine habitat. In addition, the vegetation may provide long-term water quality benefits through shading and filtering of pollutants.

Woody habitat refuge at upstream end of project, log revetment on left bank (right side of photo), and sand bar with woody snags.

Project Objectives

- Retrain river to the center of the channel to minimize erosion and encourage sediment transport
- Increase bank stability
- Mitigate existing and future flood damage
- Enhance aquatic and riparian habitat through addition of woody material
- Restore native plant communities

Before

A detailed sediment transport study indicated that the altered hydrology (from urbanization of the watershed and numerous diversions), combined with historic channelization prevalent in the Middle South Platte River, has exacerbated instability in the project area over time. The result was erosion of land and a threat to state highway infrastructure.

Bank erosion upstream of the SH 60 bridge, looking northwest toward the future location of Weir 1.

After

With improved bank stability and flow returning to the center of the channel, it is anticipated that in future high water events, the impacts to local landowners and the SH 60 bridge will decrease substantially.

In an area where conventional streambank stabilization practices typically involve placing concrete rubble or even car bodies along the streambank, the SH60 project restoration approach offers a different perspective on ways to effectively address erosion concerns while also increasing habitat and resilience. The riparian buffers created in this project benefit private and public interests by enhancing or maintaining water quality, habitat, and flood resilience.

BY THE NUMBERS

project length: 3,100 linear feet

4 bendway weirs

1,798 riparian plants

1.7 acres seeded

Post-construction aerial view of Weir 1 and the SH 60 bridge looking east.

– PROJECT – TEAM

Each partner and consultant involved in the project remained actively involved throughout its duration. The CWCB provided technical assistance from the beginning, which helped the MSPRA to remain compliant with all expectations of the NRCS Emergency Watershed Protection (EWP) Program and to work toward a more innovative and resilient project.

The SH 60 project provided a platform from which the newly emerging MSPRA non-profit is gaining local, regional, and national support. In addition, this was an ideal situation for groups with different interests to collaborate and work toward a common goal. As MSPRA's ability to foster mutually beneficial projects increases, the group will reduce the duplication of efforts across parties – subsequently increasing overall benefit to the local community, region, landowners, and all external partners.

Partners

Private landowners

Weld County

Colorado Water Conservation Board (CWCB)

Natural Resources Conservation Service (NRCS)

Contractors

CH2M HILL Engineers, Inc.

Naranjo Civil Constructors

Resilient Watershed Partners (RWP)

Installing woody material to provide aquatic habitat.

FOR MORE INFORMATION

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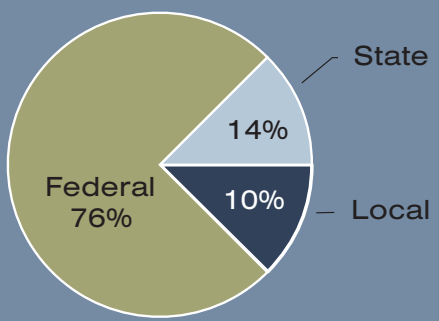
www.MiddleSouthPlatte.org
www.ColoradoEWP.com

VISIT
www.bit.ly/StateHwy60
TO VIEW THE VIDEO

BUDGET

TOTAL: $602,547

Project Funding by Source



Project Cost Breakdown