

4 MINUTE READ

Lower Boulder Creek Ecosystem Restoration Project



from **Engineering With Nature: An Atlas, Volume 1.**

by **US Army Engineer Research and Development Center**



Boulder County, Colorado, United States

This reach of the Lower Boulder Creek floodplain was completely altered by gravel mining in the 1960s and 1970s. The floodplain and creek meander belt were mined, and the stream was realigned into a straight channel with low levees built on its banks. As a result, the riparian habitat and wetlands were significantly modified, and invasive plants posed a problem.

Restoration of the Lower Boulder Creek, which was completed in 2016 by the U.S. Army Corps of Engineers (USACE) Omaha District (NWO) in partnership with the Boulder County Parks and Open Space Department (BCPOSD), included creating a meandering creek for approximately 6,400 feet between where it leaves and rejoins the existing channel alignment. Natural stream geomorphology was restored by creating riffle-pool complexes, point bars, and numerous in-stream large woody debris structures. The hydrologic connection of the stream to the floodplain was also restored, along with a low floodplain bench that created temporary to seasonally flooded wetlands. These wetlands consisted of herbaceous, shrub, and tree plantings tolerant of prolonged periods of inundation.

Riparian connectivity and sustainable habitat diversity have been restored as a result of the project.

Article cover: Lower Boulder Creek Ecosystem Restoration Project, 2018.
(Photo by Ron Beyer, USACE Omaha District)

Producing Efficiencies

Efficiency in project construction was achieved by using materials that were found on-site, including cobble and large woody debris. These materials were used as in-stream habitat structures, as topsoil and willow poles, and for wetland plantings. The excavated material was also used to fill the pre-existing channel as well as a portion of two pre-existing reclaimed gravel mine pits. These actions effectively replaced water used in the project, and offset the sponsor's water augmentation requirements at those sites in accordance with Colorado water law.



Lower Boulder Creek, pre-project condition, 2015.
(Photo by Harry Weddington, USACE Omaha District)

Using Natural Processes

The new channel was designed to allow natural hydraulic processes to form a stable, meandering stream alignment. The sinuous channel alignment resulted in riffle and pool complexes with depth diversity—ultimately benefiting aquatic species. In addition to a more natural channel design, native and locally sourced trees, shrubs, and herbaceous species—including willow poles—were harvested and planted along the streambank and floodplain to prevent erosion and increase habitat value by providing shade, food, and cover for terrestrial and aquatic species. The use of native species will increase bird activity; this increase has already been observed along the shoreline.



Lower Boulder Creek, channel and riffle restoration, 2016.
(Photo by Harry Weddington, USACE Omaha District)

Broadening Benefits

Reconnecting the creek with its natural floodplain provided economic and societal benefits, such as improved water quality and reduced potential for flashier flooding. Numerous environmental benefits were provided in the form of restored riparian habitat for native species' foraging, breeding, and wintering. Less than 3 percent of land in Colorado is considered riparian; however, 75 percent of wildlife species in the state are dependent on those riparian areas during all or a portion of their lifecycles. Construction and monitoring of the project also provided localized economic benefits for workers and a higher quality of life for the residents of Boulder County.



Lower Boulder Creek, channel meander and floodplain bench construction, 2016.
(Photo by USACE Omaha District)

Promoting Collaboration

Throughout the feasibility study and construction process, the USACE has partnered closely with Boulder County Parks and Open Spaces (BCPOS) to achieve common program goals of ecosystem restoration and enhancement of natural features. This was achieved by realizing the

BCPOS vision first identified in their 1998 master plan. Coordination was conducted with numerous agencies, including the U.S. Fish and Wildlife Service, the Natural Resources Conservation Service, Colorado Parks and Wildlife, Colorado Department of Health, Colorado State Engineer's Office, and Colorado State Historic Preservation Office. The project was designed in close collaboration with the Urban Drainage and Flood Control District and BCPOS to ensure it was low maintenance, it did not impact drainage in the basin, and it preserved existing water rights.



Lower Boulder Creek, wildlife and restored channel meander, 2016.

(Photo by Harry Weddington, USACE Omaha District)



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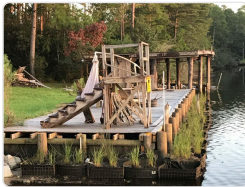
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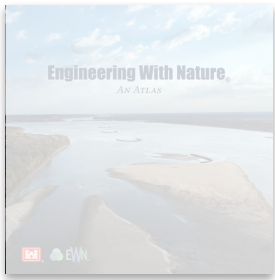
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