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Meadowview Stream



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by US Army Engineer Research and Development Center



Temecula, California, United States

Banding together as a community to tackle a dangerous hazard. The Meadowview Stream Restoration Project is a small, regionally novel project located in the heart of a community-owned open space. The stream was originally a sandy wash that was straightened in the 1950s and then turned into a dangerous chasm with greater than 3-meter-high collapsing banks as a result of hydromodification from upstream development. The community was concerned with the public safety hazard this posed to residents and visitors who use the open space for recreation, especially after a young boy died when the banks collapsed on him downstream from the homeowner association's property line. With assistance from other partners, the association modified the channel and installed a bioengineering component. Instead of an inorganic, concrete channel, the community has a 3:1 slope planted with Californian native plants and stabilized with compost rolls seeded with native grasses. The stream is now a beautiful and peaceful place—a home to wildlife and a much safer place for families. The Meadowview Stream restoration won the American Association of Engineers' Inland Empire Environmental Engineering Project

of the Year 2019 award and serves as an example of how nature can be leveraged in engineering projects.

Article cover: The project included strategic placement of riprap, compost socks filled on-site with native soil and native grass seed, logs from on-site to hold soil, pole plantings of mule fat (*Baccharis salicifolia*), and willows (*Salix* spp.), September 2019. (Photo by J. Snapp-Cook, U.S. Fish and Wildlife Service)

Producing Efficiencies

The project team created an on-site nursery, buying small plants and growing them larger themselves, reducing planting costs by a third. They then enlisted AmeriCorps volunteers to install the new plants, a great service-learning project. Further, at just under 2 hectares, the project's small scale and on-site impact mitigation received an exemption from the California Environmental Quality Act. As similar creek management issues are common for homeowner associations across California, the Meadowview proponents are working to have this type of project more widely adopted for ephemeral streams throughout Southern California.

Using Natural Processes

The team avoided a traditional trapezoidal concrete channel by taking advantage of natural processes and materials. Stream barbs, which force water back into the stream channel, create eddies and encourage sediment placement, which in turn encourages habitat formation. Instead of the more traditional rock riprap, highly absorbent compost rolls stabilize the toe of the eroding banks and prevent transport of pollutants. Willow and mule fat bolster the compost socks, native soil and recycled organics stabilize the toe, and native plants hold the soil in place. Finally, a layer of natural mulch suppresses weedy growth.





This series of panoramic photo shows the before, during, and after photos of one section of the site. Top, the 3-to-4-meter-high banks (Aug. 2018). Second, the graded bank at approximately 3:1 slope (Sept. 2018). Third, the site just after it was planted with native plants, but before they started to grow larger. A break in the irrigation caused erosion that needed to be repaired (Feb. 2019). Bottom, the site with the young native plants off to a strong start (July 2019).

(Photo by J. Snapp-Cook, U.S. Fish and Wildlife Service)

Broadening Benefits

This restoration project enhanced the natural beauty of the common area, used by both residents and visitors, while simultaneously eliminating a public safety hazard. Downstream water quality improved because of a reduction in unnaturally high sediment transfer, and the new slope created more edge habitat for wildlife to congregate in the transitions between riparian and upland environments. Economically, the city has reduced costs at a downstream detention basin due to less sediment entering the stream, the district waterline here is protected from erosion, and the slowing down and capturing of precipitation helps recharge the local aquifer.



Volunteers from Meadowview, staff and families from Riverside County Flood Control and Water Conservation District, and AmeriCorps National Civilian Community Corps (NCCC) planting native plants on the south bank of Meadowview Stream, December 2018.

(Photo by Teri Biancardi, Meadowview)



Meadowview citizen science volunteers conducting postinstallation monitoring at the project site, June 2019.

(Photo by J. Snapp-Cook, U.S. Fish and Wildlife Service)

Promoting Collaboration

Knowing they lacked the experience to undertake the project alone, the homeowners association partnered with the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program, the Natural Resources Conservation Service, and the Riverside County Flood Control and Water Conservation District. That expertise in explaining and navigating regulations and devising bioengineering solutions was critical. In all, the association received technical and financial support from 12 different agencies, many going to great lengths to advance the project and all recognizing the benefits of using nature to solve infrastructure issues.



Group photo of volunteers from Meadowview, agency Partners, and AmeriCorps NCCC after a day of planting native plants at the site, December 2018.

(Photo by U.S. Fish and Wildlife Service)



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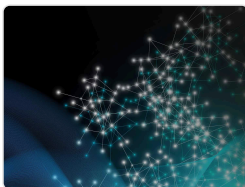
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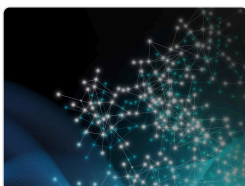
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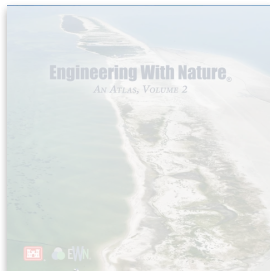
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