

## [ SEDIMENT MANAGEMENT ]

# Bridge Over

## Troubled Water

Caltrans restores a riparian area and its water quality while conducting an emergency bridge restoration project

By Katherine Brown & Joni LaFave



The Rincon Creek valley in California is sparsely developed with orchards, farmlands and ranchlands, and it virtually shapes the boundary between the coastal counties of Santa Barbara and Ventura. Rincon is one of the few semipermanent creeks in the area and was likely a freshwater source for Native Americans.

Both Santa Barbara and Ventura counties have designated the riparian corridor along the creek as an environmentally sensitive habitat area.

As part of the California Department of Transportation's (Caltrans) original proposed bridge replacement and

roadway realignment project along Rte. 150, two existing pony truss, single-lane bridges were to be removed and replaced with two-lane bridges. Also, rock weirs would be constructed to allow for the upstream migration of anadromous steelhead trout.

The old alignment was continuously subjected to flooding, erosion and closures during storm events. The project was intended to prevent further and future disruptions to the traveling public, enhance the safety of the roadway for motorists, bikers and pedestrians and reduce environmental impacts.

During the winter of 2005, one of

the bridges was washed away and the other damaged, thus replacing both bridges became a priority and an emergency project for Caltrans. Concerned for the environment and the rural, coastal location, project designers used context-sensitive solutions with the aim of restoring the riparian areas and returning the creek to its natural setting.

### Vegetation Restoration

The new alignment moved the roadway further inland, which allowed for greater filtering of runoff through vegetated swales. This promoted infiltration and pollutant removal, thereby lessening the impacts to Rincon Creek and surrounding wetlands. This improvement would render the highway less susceptible to flooding and erosion, plus help ensure its continued use during storm events. The alignment work also moved the road further away from large native oak trees, which contributed to the preservation of this valued community resource.

All drainage systems were upgraded to meet current hydraulic standards. The contractor controlled temporary construction site water quality impacts



Rincon Creek experienced frequent flooding and erosion.



Caltrans plans to pilot more streambank stabilization projects to establish uniform standards.

by adhering to Caltrans' standard specifications and conditions contained in the National Pollutant Discharge Elimination System (NPDES) permit.

The storm water pollution prevention plan contained a schedule detailing the implementation of best management practices (BMPs), soil stabilization and sediment control measures coordinated with the various construction operations and staging. Project design also incorporated BMPs as permanent water pollution prevention features.

These innovatively designed pollution prevention techniques "acted to stem a historical tide of pollutants from this site into a very sensitive ecosystem and highlight the department's commitment to environmental stewardship," according to Pete Riegelhuth, District 5 NPDES permit coordinator.

Mitigation of native plant material was an integral design component of the Rincon Creek restoration project, which included native willow cuttings from the Rincon Watershed and oak, walnut, cottonwood, white alder and

sycamore trees. The design team used a new brushlayering/bioengineering method at the ends of the bridge's rock slope protection (RSP) and at a narrow portion of the stream.

Restoring vegetation to the creek not only armored the streambank but also shaded its south side and improved the habitat for potential migrating steelhead. Overhanging vegetation provided cover and promoted oxygenated and cooler water temperatures.

"The combined actions reduce or eliminate sloughing of bank material into Rincon Creek and improve fish habitat and water quality," said a U.S. Department of the Interior spokesperson. "Reduced sedimentation is particularly beneficial for anadromous steelhead, which require gravel to cobble substrate with little or no silt for spawning."

### Project Evaluation

Due to the sensitive habitat status of the area and to further the success of the project, Caltrans will continue to maintain the woodland and wetland

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revegetation areas for a period of five years and monitor for three more years.

The design team from Caltrans included staff from Landscape Architecture, Environmental Planning, NPDES/Storm Water, Hydraulics, Engineering and Construction departments. Partnering between Caltrans and the contractor was implemented, and it was evident throughout the project that quality and reducing environmental impacts were key objectives.

Despite the challenges of negotiating the use of this unusual mix of both RSP and planting techniques to protect Rincon Creek's banks, as well as the use of nonstandard details and specifications, the team succeeded in providing a successful solution to restoring this riparian area. Overall, the innovative design and engineering methods used in the Rincon Creek project have proven positive results environmentally, hydraulically and visually.

### More to Come

Caltrans is continuing to explore various options for providing vegetative enhancements and softer treatments for streambank stabilization.

Until more extensive performance data is generated on the various techniques commonly used in stream restoration applications, Caltrans will continue to pilot a number of projects in varying hydraulic, climatic and environmental conditions so that uniform standards can be adopted and published.

Long-term evaluation of sites such as Rincon Creek will be instrumental in establishing the basis of these future standards that balance environmental stewardship with protection of public safety and infrastructure. **[SWS]**

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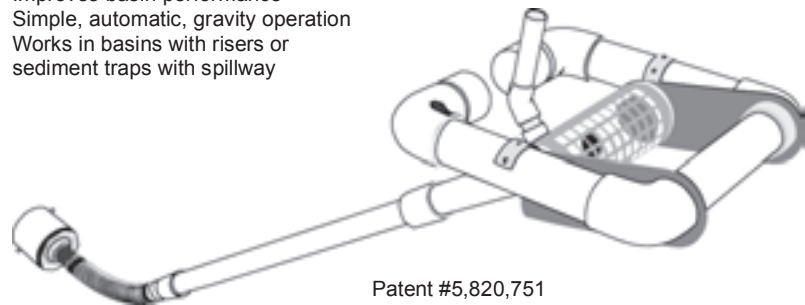
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