Trinidad’s Integrated Coastal Watershed Management Plan Succeeds in Water Quality Improvements

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ABSTRACT

The City of Trinidad and its planning partners undertook an integrated coastal watershed planning effort that resulted in a prioritized plan to protect water quality in the Trinidad Bay Area of Special Biological Significance (ASBS). The City is implementing multiple strategies to protect the Bay. The City recently completed implementation of two projects that improve water quality in the Bay. The first is the Trinidad ASBS Stormwater Improvement Project which reduced discharge of urban runoff from the City of Trinidad to the ASBS by over 36%. The second is the Luffenholtz Creek Source Water Protection Project which reduced sediment loading to a tributary of the Trinidad Bay through multiple forestland sediment reduction strategies located on private timberland. These projects prove a small community can accomplish a great deal to protect its watershed and water resources through dedicated planning.

KEYWORDS: Stormwater, Low Impact Development, LID, Water Quality, Nonpoint Source, Coastal, Funding.

Introduction:

In 2004, the City of Trinidad received a letter prohibiting discharge of polluted water to Trinidad Bay and the area surrounding Trinidad Head, which was declared an Area of Special Biological Significance (ASBS) by the State in 1974. Trinidad Bay lies directly to the west of the City of Trinidad, which is approximately 250 miles north of San Francisco. The area was declared an ASBS due to the presence of a bull kelp forest, which provides food and shelter for fish and invertebrates, making it both biologically and economically important in maintaining the robust ocean ecology. Bull kelp forests are relatively rare along the coast and can be adversely affected by polluted waste discharges. Potential contaminants to the ASBS could include urban runoff from the City of Trinidad, contaminated groundwater seeping from coastal bluffs (likely associated with septic systems), sediment from erosion and/or logging operations, and commercial and sport fishing operations.

As a result of receiving the letter from the State, the City of Trinidad and its planning partners completed an Integrated Coastal Watershed Management Plan (ICWMP) in 2008. The plan identified water quality problems, pollution sources, and practical, community oriented solutions to address these issues. The planning area included nine watersheds covering approximately 9.9 square miles, with over half of the land used for timber production. The ICWMP was developed with input from Local Governments, Tribes, State Agencies, Humboldt State University, and private companies. Water pollution management strategies identified in the ICWMP included:

- Water Quality Monitoring Projects
- OWTS Management Projects
- Road-Related Sediment Reduction Projects
- Public Outreach Projects
- Water Conservation Projects
- Stormwater Management Projects
- Erosion Control Projects
- Collaborative Watershed Planning
- General Plan Updates
Actions have been taken in all of the areas above. The Trinidad Bay Watershed Council was formed and is leading public outreach on watershed protection. The City has adopted On-site Wastewater Treatment Guidelines, and water quality monitoring is ongoing. This abstract focuses on two major implementation projects.

Methodology:

In 2014 two major water quality improvement projects were completed. The Trinidad ASBS Stormwater Improvement Project resulted in the construction of low impact development (LID) improvements which passively collect, treat, store, and infiltrate storm water, eliminating a portion of urban runoff that would otherwise have been routed to Trinidad Bay.

The second project was the Luffenholtz Creek Source Water Protection Project. This project was an innovative public-private partnership project whereby the City of Trinidad implemented sediment reduction improvements on privately owned timberland which drains to Luffenholtz Creek, the City’s source water, which discharges near the ASBS.

ASBS Stormwater Improvement Project:

The ultimate goal of the multi-phased Trinidad ASBS Stormwater Improvement Project is to eliminate discharge of urban runoff from the City of Trinidad to the ASBS.

Project planning began in 2008, and the solution incorporated LID storm water treatment technologies with existing infrastructure, including a native plant rain garden, street-side parkable vegetated bioswales, and underground storm water treatment chambers and infiltration pipes. BMPs were designed to treat the 2 year design flow while accommodating a 50 year design storm volume.

To develop this solution, data collection, modeling, and analysis prior to project design, and mitigation and monitoring during construction was needed to overcome several challenges related to site conditions.

One challenge was that space and parking in Trinidad is limited, thus, improvements had to be located entirely within the City Right-Of-Way, and street side bioswales were engineered to be lined with permeable paver systems to support vehicular loads while providing passive natural treatment and infiltration of urban runoff.

Another is that the City sits atop coastal bluffs which are naturally subject to erosion. To identify suitable locations for infiltration, soils and bedrock beneath the City were mapped and characterized, and a groundwater model was created to simulate the effects of infiltrating storm water into the ground.

Finally cultural resources were a sensitive issue as several Yurok village sites were historically located within city limits. Locations for improvements were selected to avoid archaeological sites, and cultural monitors were onsite during construction.

Construction of Phase 1 was completed in 2014, which diverted 35% of the storm water flow from discharging to Trinidad Bay. The project was generally well received by the community, with some residents reporting that past storm water problems on their properties had been addressed. Flow monitoring and water quality sampling is ongoing to quantify project impacts.

Luffenholtz Creek Source Water Protection Project:

The objective of the Luffenholtz Creek Source Water Protection Project was to reduce sediment inputs into Luffenholtz Creek from upper watershed nonpoint source discharges. The project was 100% grant
funded by the State Division of Drinking Water as it improves water quality at City of Trinidad’s Water intake.

Luffenholtz Creek watershed is primarily owned by Green Diamond Resource Company (GDRC), who purchased the land in 1998. GDRC inherited a legacy problem dating back to the 1940s when one of the main haul roads was built within the riparian zone along Luffenholtz Creek. The road cut off creek meanders, reducing the stream’s natural wetlands retention and filter system, which caused negative impacts to fish habitat and water quality. The ICWMP included an extensive roads assessment and water quality evaluation, wherein treatments were prioritized based on relative contributions of sediment to Luffenholtz Creek.

The project included re-routing two haul roads away from Luffenholtz Creek and decommissioning old roads. An existing quarry was utilized for rock production during the project, then closed and vegetated. Modifications also included installation of critical dips, removal of Humboldt crossings, rocking roads near drainages, culvert removal and bridge installation, stream channel restoration, and seeding, all of which reduced sediment loading to Luffenholtz Creek.

This was a unique public-private project. GDRC obtained all permits and completed California Environmental Quality Act documentation. The City worked closely with GDRC during construction, and committed to a 20-year maintenance agreement to annually inspect and maintain new improvements. Both the City and GDRC are very happy with the result.

Conclusions:

Implementation of the ASBS Stormwater Project and the Luffenholtz Creek Source Water Protection Project are shining examples of a small community tackling a big issue through cooperation between governing bodies, regulatory agencies, private land owners, and local stakeholders. Together they were able to take a proactive approach to identifying issues that needed to be resolved, develop partnerships and procure matching funds to leverage state grant funds, and implement large scale projects that protect the unique ecology of their community.

Construction of both projects is now complete. Large volumes of storm water are being treated and diverted from the City’s ocean outfall, and it is anticipated that there will be a measurable reduction in pollutant loading to the ASBS. Efforts to monitor water quality and further reduce pollution in accordance with the ICWMP are ongoing.