Restoration of a Reach of the San Diego River within the Unincorporated Community of Lakeside, San Diego County, California

The San Diego River is approximately 45 miles long and extends from the mountains in the Cleveland National Forest to the Pacific Ocean. The River flows through unincorporated areas (including the community of Lakeside), the City of Santee, and the City of San Diego. In a portion of Lakeside, the River was been mined for aggregate for some 60-80 years. After various mining projects were completed, abandoned mining pits were left in the active channel, banks, and floodplain of the river. Also, mining waste – aggregate material not suitable for sale – was dumped on the floodplain, on the banks, in the channel, and in riparian areas. Over the years, these disturbed areas became infested with invasive, non-native plant species, such as *Arundo donax* (giant reed). The combination of these impacts degraded water quality, beneficial uses, and habitats. In response to these problems, local citizens formed the Lakeside Conservancy, with the purpose of implementing projects to restore a reach of the San Diego River. These restoration projects improved water quality functions, beneficial uses, and habitats.

Fig. 1. Invasive, non-native *Arundo donax* (giant reed) stand before removal.

The lower 20 miles of the San Diego River is on the 303(d) list for TDS, phosphorus, and low dissolved oxygen. A TMDL has not been developed for this portion of the river and there are no immediate plans to develop one. The reach of the San Diego River where this restoration project was implemented is within the lower portion of the River that is 303(d)-listed and is approximately 1.5 miles long and 0.25 mile wide. A tributary to the river, Los Coches Creek, drains an urbanized watershed and meets the River in this reach.

Fig. 2. First constructed wetland treatment cell before construction.

Over time, groundwater flowed into the abandoned mining pits and the mining pits became deep, open water lakes. The pits / lakes had steep-sides, which limited establishment of marshes, which in turn limited pollutant and nutrient sequestration and transformation. The mining waste that was dumped (discharged) was very fine-grained sands, silts, and clays. Invasive, non-native plants in riparian areas replaced most of the native riparian vegetation and impacted WILD, RARE, REC-1, and REC-2, beneficial uses.

In 2005, the non-profit Lakeside Conservancy broke ground on the San Diego River Restoration Project. The goals of the project were to restore riverine and riparian functions - habitat, water quality, and beneficial uses. These goals were accomplished by removing fill in floodplain and riparian areas, filling most of the depth of the mining pits with clean fill, eradicating invasive, non-native plant species, planting native plants, and constructing a treatment wetland to treat urban runoff in Los Coches Creek before it entered the river. Real time water quality data from one pit / lake is being collected and transmitted telemetrically.

Fig. 3. First constructed wetland treatment cell after grading.

Most of the project goals were met. Additional fill will be removed in January 2008, more native riparian plants will be planted, and more floodplain will be restored. By summer of 2008, telemetrically transmitted water quality data will be available at the Lakeside Conservancy website (http://www.lakesideriverpark.org/index.html).

Fig. 4. Removed *Arundo donax* (giant reed) biomass stockpiled for grinding.

As of December 2007, this project has resulted in significant restoration of the physical and biological integrity of this reach of the San Diego River. Additional restoration will be accomplished with the removal of additional mining waste from the floodplain starting in January 2008. Water quality has been improved through the removal of fine-grained mining waste, the installation of a treatment wetland at the Los Coches Creek confluence, and the introduction of freshwater marsh where only open water or fill was present. The project has resulted in significant restoration of WILD, RARE, REC-1, and REC-2 beneficial uses.

Fig. 5. Constructed wetland (1st and 2nd cells) during final grading.

The success of this 1.5-mile long project will not result in removing the lower 20 miles of the San Diego River from the 303(d) list. However, this project should be viewed as a model for improving water quality, beneficial uses, and riverine functions elsewhere along the San Diego River. Implementation of projects like this in other degraded portions of the San Diego River would result in significant restoration of the physical and biological integrity of the river as a whole and could result in removal of the entire river from the 303(d) list.

Project partners include:

- California State Water Resources Control Board (Proposition 40 grant)
- California Resources Agency (Environmental Enhancement and Mitigation Program)
- California Department of Water Resources (Proposition 40 grant)
- California Coastal Conservancy
- San Diego River Conservancy
- California Wildlife Conservation Board
- California Department of Transportation
- U.S. Fish and Wildlife Service
- Metropolitan Water District of Southern California
- San Diego County Water Authority
- San Diego Association of Governments
- Riverview Water District (now merged with Lakeside Water District)
- San Diego River Park Foundation
- Hanson Aggregates
- Union Bank of California
- The Parker Foundation
- The Ed and Mary Fletcher Family Foundation
- Las Patronas
- The Hattie Ettinger Fund
- The Linnie Cooper Fund
- The Bill Kuni Fund
- The Szekely Farley Foundation
- The McCarthy Fund

Over $16.5 million has been raised for the project, most of which has been used to acquire land for restoration. This project did not receive 319 funds. However, the San Diego Regional Water Quality Control Board used 319 program resources to provide project oversight and consultation.

The project site is located in the 52nd Congressional District.

Baseline water quality data has been collected since the bioswales and constructed wetland for water quality treatment were graded. However, bioswales and constructed wetlands are not functional until they are fully vegetated as designed. The baseline water quality data collected (previous and ongoing) during the vegetation planting and vegetation maturation phases will be compared to future data when the bioswales and constructed wetlands are fully vegetated as designed. It is anticipated that vegetation will be mature, as designed, by fall 2008.

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