



SEDIMENT SOURCES AND DEPOSITIONAL RATES IN THE LAGUNA DE SANTA ROSA

Summary: Working with the US Army Corps of Engineers, PWA devised a solution to reduce sediment transport and prevent further deterioration of the Laguna de Santa Rosa's flood protection capacity and wetland ecology.

Date: 2001-2003

Location: Sonoma County, California

Client: US Army Corps of Engineers

The Laguna de Santa Rosa is the Russian River's largest tributary and the second largest freshwater wetland in Northern California. As a valuable environmental resource, the Laguna serves as a natural detention basin that lowers the River's downstream flood levels by more than 10 feet. Over the last 200 years, land clearance, farming, urbanization and channelization in the 250-square-mile watershed have accelerated erosion and sedimentation. The result has been a reduction in the Laguna's flood storage capacity and loss of wetland area. In order to preserve this important resource, it was critical to identify the source of the sediment and the rate of sediment deposition in the Laguna. Working with the US Army Corps of Engineers, PWA devised a solution to reduce sediment transport and prevent further deterioration of the Laguna's flood protection capacity and wetland ecology.

The first challenge was to assess the water and sediment movement in the system. To determine the main sediment source areas, the sediment yield and the rate of sediment deposition within the Laguna, the team:

- Conducted a field-based watershed geomorphic assessment
- Used numerical models of soil erosion to predict sediment yield
- Undertook floodplain surveys that replicated historic survey locations to measure sediment deposition volumes.
- Confirmed the results with data from reservoir surveys and a network of continuous suspended sediment monitors installed in the watershed.

Based on these findings, PWA identified strategies for the reduction of sediment delivery, including erosion control and sediment trapping in key source areas, and the development of geomorphically-stable flood channels.

