Pajaro River Watershed Study Summary

Background

The Pajaro River Watershed Flood Prevention Authority (Authority) was established in July 2000 by State Assembly Bill 807 in order to "identify, evaluate, fund, and implement flood prevention and control strategies in the Pajaro River Watershed, on an intergovernmental basis." The watershed covers areas of four counties and four water districts and the board is comprised of one representative from each of the eight following agencies:

- County of Monterey;
- County of San Benito;
- County of Santa Clara;
- County of Santa Cruz;
- Monterey County Water Resources Agency;
- San Benito County Water District;
- Santa Clara Valley Water District; and
- Santa Cruz County Flood Control and Water Conservation District, Zone 7.

The Authority acts as a governing body through which each member organization can participate and contribute to finding a method to provide flood protection in the watershed and promote general watershed interests.

The Pajaro River Watershed Study (Study) has been the primary body of work through which the Authority has started to accomplish its mission. The Authority has been involved in all aspects of the study including providing direction for the study, reviewing results of the work completed for the Study, making critical decisions, and adopting the selected project recommended and developed through the Study.

Originally, the Pajaro River Watershed Study was to have led to a structural flood protection project. Based on the answers to questions posed in the early phases of the Study though, the direction of the Study shifted to better meet the condition of the watershed and other activities within it. The box below summarizes the four phases of the Study.

Pajaro River Watershed Study Summary

Phase 1 Stream Flow Modeling –
Modeled both the hydrologic and sediment regimes of the watershed. Provided a better understanding of the effects that land use changes over time have on flooding frequency and magnitude.

Phase 2 Development of Flood Protection Alternatives –
Identified project alternatives that would provide protection for the Pajaro River from the 100-year flood flows identified in Phase 1. These alternatives included conveyance and storage methods of protection.

Phase 3 Selection of Projects and CEQA Analysis –
Soap Lake Floodplain Preservation Project is identified as critical to the Corps' downstream flood prevention projects. Prepared the CEQA document and other studies including definition of the floodplain.

Phase 4 Flood Protection Implementation –
Developed implementation plan for the selected project and finalized the CEQA document. Also completed studies examining sediment impacts, a flood forecasting capabilities, and a fisheries study.

Phase 1: Stream Flow Modeling

The Phase 1 report was completed in July 2002. Phase 1 consisted of modeling both the hydrologic and sediment regimes of the watershed and land use changes over time that affect flooding frequency and flooding potential in the downstream reaches of the Pajaro River. Specifically, the objectives were to determine:

- Source of flood waters and sediment;
- Effects of recent land-use changes on flooding and sediment generation; and
- 100-year flows along the Pajaro River.

Land use is one of the factors that affect flood frequency and magnitude. Four different land-use conditions were chosen to span the extent of the reasonable land use changes and associated flooding effects. These included a historical scenario, a future scenario based on existing general plans, a future scenario representing growth beyond the general plans, and a scenario that tested the impact of different types of agriculture on flooding.

The conclusions of the Phase 1 work that impacted the direction of the study included:

- Flood protection provided by the Hernandez, Uvas, Chesbro, and Pacheco Reservoirs and the Soap Lake floodplain, a natural detention basin upstream of the confluence between the Pajaro and San Benito Rivers, are critical to maintaining downstream flows;
- Urbanization will increase the runoff from smaller storm events (2-year to 25-year), but causes little change in runoff from larger storms (50-year to 200-year). For large storm events, the soil can absorb only a certain amount of water, and after that point the water runs off, just as it would over paved surfaces; and
- The flooding along Soap Lake limits sediment discharge from the Pajaro River upstream of the San Benito River confluence.

Phase 2: Development of Flood Protection Alternatives

Phase 2 began immediately after completion of Phase 1 and was completed in April 2003. The purpose of Phase 2 was to identify project alternatives that would provide flood protection for the Pajaro River from Chittenden Pass to Monterey Bay from the 100-year flood flows identified in Phase 1.

This phase identified project alternatives that provided 100-year flood protection, and the selection of the most feasible alternatives for more detailed study in future phases. The Phase 2 projects were developed to coordinate with a concurrent U.S. Army Corps of Engineers (Corps) Lower Pajaro River flood protection project.

Flood protection measures that include both upstream and downstream alternatives were identified and defined. The alternative projects were conceptually defined by identifying a possible project location and size, the advantages and disadvantages, a planning level cost estimate, and the approximate level of flood protection.

The main conclusions reached from Phase 2 included:

- The Soap Lake floodplain is a necessary component for any of the downstream Corps alternatives to provide 100-year protection;
- If the Corps selected a project that provided less than 100-year protection, then additional Phase 2 projects would be added to ensure 100-year protection; and
- If the Corps selected a project that provided 100-year protection, then only the preservation of the Soap Lake floodplain is needed upstream.

Phase 3: Selection of Projects and CEQA Analysis

In January 2004, the Corps selected the 100-year project (Alternative 2A for the mainstem and T4 for the tributaries) as their National Economic Development (NED) Lower Pajaro River flood protection project. In March 2004, the Counties of Monterey and Santa Cruz adopted this alternative as their locally preferred plan as well. Since the Lower Pajaro River project will provide protection from the 100-year event, the preservation of the Soap Lake floodplain was the only necessary project analyzed further in Phase 3 of the Study.

Phase 3 work, completed in February 2005, included:

- Mapping of Soap Lake;
- Hydraulic Modeling of Soap Lake;
- Floodplain Delineation for Soap Lake;
- Identify alternatives to maintain the Soap Lake flood protection benefits;
- Floodplain impacted facilities assessment;
- Land acquisition needs and cost assessment;
- Enhance public outreach and agency coordination; and
- Prepare CEQA documentation.

The Soap Lake Floodplain Preservation Project, the Authority's selected project, includes no structural facilities. Instead the proposed project includes either purchasing land or obtaining flood easements for the land within the Soap Lake floodplain. The objective is to maintain the current flood protection benefits provided by the Soap Lake floodplain by protecting the area from changes that would impact the flood protection properties of the floodplain.

Phase 4: Flood Protection Implementation

Originally Phase 4 was scoped to provide implementation criteria for the selected project, expand on the conceptual design developed under Phase 3, and generate a preliminary design report. However, selection of a non-structural project, the Soap Lake Floodplain Preservation Project, required a change to the scope as defined in the state contract. The focus of this Phase was to prepare an implementation plan for the Soap Lake Floodplain Preservation Project rather than a design report. The implementation plan include information on:

- Program administration including partnership arrangements, costs, and schedule;
- Acquisition methods and process process, easement provisions, and strategies;
- Funding options;
- Recommendations and policies for the Authority and each member agency; and
- Numerous resources available to assist in implementing the Project.

In addition to completing and appending the implementation plan to the CEQA documentation, the change in scope allowed the Authority to complete studies that support the downstream Corps flood protection project and provide building blocks for improving flood protection throughout the watershed. These additional studies included:

- Sediment models – 2D and transport models for the Pajaro and San Benito Rivers;
- Flood protection studies – Assessment of an existing rating curve, ALERT gages, and opportunities for gage rehabilitation as well as a time of travel analysis for parts of the watershed; and
- Fisheries Study – Original research for San Felipe Lake (within Soap Lake floodplain) that can be used to identify or eliminate potential impacts from special status species.

Work in this phase was completed by or in December 2005.