Meeting Summary

Flood Control 2.0 Workshop I:
San Francisquito Creek Flood Reduction, Ecosystem Restoration and Recreation Project, San Francisco Bay to Highway 101

SFEI, 8/31/2012

On July 23, 2012, a workshop was held to brainstorm the potential addition of elements to improve the multiple benefits of a nearly completed design of new flood infrastructure downstream from Highway 101 on San Francisquito Creek. The workshop was conducted by the San Francisco Estuary Institute (SFEI) in concert with the San Francisco Bay Joint Venture (SJBJV), on behalf of the San Francisquito Creek Joint Powers Authority (SFCJPA), and as part of the new regional project *Flood Control 2.0*. It was held at the Palo Alto Municipal Golf Course and included a field trip walking along the project footprint. This document describes some of the outcomes of that inaugural workshop. We briefly summarize key points from the workshop discussion and describe several project adjustments that may warrant further investigation. During the brainstorming session two such elements were identified for immediate consideration and others were identified that could be addressed during future project stages or adaptive management phases.

List of workshop participants

Lester McKee, SFEI; Robin Grossinger, SFEI; Julie Beagle, SFEI; Letitia Grenier, tidal marsh ecologist; Laurel Collins, Watershed Sciences; Jeremy Lowe, PWA-ESA; Roger Leventhal, Marin County Flood Control and Water Conservation District; Shaun Horne, Napa County Flood Control and Water Conservation District; James Ujah, Santa Clara Valley Water District; Sergio Jimenez, HDR; Lance Jones, HDR; Sandra Scoggins, SFBJV; Christina Sloop, SFBJV; Kevin Murray, SFCJPA; Len Materman, SFCJPA.

Background

The public agencies in the Bay Area and across the country who operate and maintain flood control channels are coming under increasing pressure to effectively manage or redesign flood infrastructure to address beneficial uses beyond flood conveyance, including fish migration, in-channel habitat, and downstream wetland restoration. There is also increasing effort to maximize sediment transport and reuse, attempting to minimize maintenance to reduce both financial costs and the biological impacts of channel de-silting on species of concern. In addition, there is increasing pressure to address challenges associated with rising sea levels including the potential for wave erosion of shoreline and levees, migrating head-of-tide, and flooding during storm surges. As a result, permits to de-silt these channels are more closely scrutinized by the National Marine Fisheries Service (NMFS), the California Department of Fish and Game (DFG), and the San Francisco Bay Regional Water Quality Control Board (Water Board).

In many instances, constraints such as very large flood capacity requirements, dense urbanization, public utilities, topography, sites of historic value, and other confining factors can limit the opportunity for designing project elements that address at least some of these multiple benefits. In some cases, however, there are significant opportunities to address these constraints if other challenges are addressed. These challenges may include difficult permitting frameworks or a lack of tested examples, funding sources, information about the possibilities, or political/social will. Addressing these issues is the primary objective of Flood Control 2.0, a project recently awarded by US EPA to a San Francisco Estuary

Partnership (SFEP) team that includes the SFCJPA. The grant includes funds to advance design review considerations, post-project monitoring, and lessons learned for the region from the San Francisquito Creek Capital project.

The San Francisquito Creek Capital project is an ambitious effort to provide flood protection in a highly developed setting while expanding fluvial and tidal habitat, incorporating levee setbacks and periodic overflow. The aim of this workshop was to build on the extensive research and design work to date -- as well as the lessons learned through the project planning process -- to both inform final design of the project and influence future planning efforts by other flood control agencies around the Bay.

Identified Opportunities and Challenges

As part of the workshop, participants received brief presentations on the historical form and function of lower San Francisquito Creek (SFEI) and the history and current status of the project design (SFCJPA/HDR). Participants discussed key elements of stream function at the Bay interface for flood protection and target species, and considered the opportunities and constraints for regaining some of these functions through the project.

a. Ecotone and upland connectivity

One opportunity that was identified at the workshop as having both potential for improved beneficial uses and potential feasibility was to consider enhanced development and management of vegetation on the outboard slope of the south side levee downstream from the floodwall infrastructure. This design enhancement would more closely mimic natural riparian levee function, providing high tide and high fluvial flow refugia for endangered tidal marsh species that occupy the lower portion of the channel and adjacent wetlands. Elements discussed included a flatter outboard levee slope on average over its length, more variability in slope and shape than the current outboard levee slope design, active planting of the outboard levee slope with a native plant palette perhaps mimicking historical ecological elements, a broader width of the riparian zone transitioning into the grasslands of the golf course, and an active post-project vegetation management program (perhaps co-managed with the golf course). Appropriate native shrub vegetation was noted on the existing channel levee and would be expected to recolonize the new project. Proactive planting of selected native plants on the inboard levee slope could also be considered if Army Corps regulations allow.

b. Connectivity between the Faber Tract marsh and San Francisquito Creek

A second opportunity that has some potential for exploration at the 90% design stage is a modification of the northern levee berm to allow greater exchange of water, sediment, and biota between the flood channel and the adjacent marsh. The objective of this design enhancement would be to more closely mimic the complex historic nature of the fluvial-tidal interface to allow dispersive release of fluvial energy, sediment transport, and refugia or rearing habitat for salmonids. Options discussed included carving entry channels from the main flood control channel, notching the north degraded levee along Faber Tract, and/or the use of culverts or flap-gates to control the exchange of water and sediment between the marsh and the main flood channel. Although further study would be required, the potential benefits discussed at the workshop included improved hydrologic connectivity between channel and marsh, extended channel and off channel network for migrating fish, exchange of nutrients between channel and marsh, and enhancement of exchange of sediment. In contrast the existing design would only allow the upper portion of the water column during high flows to interact with the marsh, greatly limiting its benefit to the marsh.

A significant concern was recognized with connectivity between the marsh and creek. The use of the marsh to dissipate high stream flows may impact one of the Bay's important Clapper Rail populations, by increasing flood stage and/or frequency on the marsh plain. Because the natural high tide refugia provided

by transition zones to the adjacent lowlands and natural stream levees have been developed, the species is highly vulnerable when the marsh is flooded. While providing a flood protection benefit, there is concern that the use of the marsh for high flows without true tidal connectivity to the channel or sufficient high tide refugia may not provide net benefits to the marsh.

It was recognized that changes in the relationship between lower San Francisquito Creek and the Faber Tract have the potential to provide either positive or negative impacts on the marsh. The design should ideally be related to a larger vision and overall plan for Faber Tract, including delivery of stream sediment to sustain the marsh in the face of sea level rise, improved quantity of tidal marsh channel habitat, availability of high tide refuge, and other factors. Reestablishing tidal marsh channels connecting the marsh to the creek channel could potentially increase Clapper Rail habitat. It is also possible that increased high tide refugia could be created along the channel levee as islands. This part of the discussion focused on providing more heterogeneity at the channel-marsh interface, including subtidal and supratidal portions, rather than the currently-proposed uniform degrading to slightly above marsh surface. However, such changes might have significant flood protection impacts, particularly the potential for erosion of the existing levee along the golf course and/or the north levee along East Palo Alto.

Other design considerations that were discussed included the potential for trapping fishes if flow back into the flood channel does not occur due to marsh gradients and ensuring sufficient tidal prism to maintain channels. The potential for root wads and other natural materials to provide habitat quality as well as bank protection in the channel in place of riprap was also discussed.

Next Steps

Workshop participants recognized that the project reflects many of the challenges and opportunities of attempting multi-benefit flood protection within a highly constrained setting. In the short term, some potential project adjustments were identified that could significantly improve the ecological benefits of the project. The viability and benefits of these ecological improvements will be considered by the JPA team, in conversation with project consultants and other interested parties, including the permitting agencies.

In the longer run, it was recognized that much greater ecosystem and flood protection benefits could be gained by considering the project in the context of anticipated projects covering the adjacent levees and lands. For example, adjacent levees will be strengthened through subsequent coastal protection projects, which might reduce concerns about erosion of surrounding levees if the channel-marsh levee was further degraded to improve tidal connectivity. Similarly, planning for the evolution of the golf course in response to sea level rise in coming decades will likely affect the potential for modifications of the lower stream reaches. Lastly, as the rate of sea level rise increases and impacts to local marshes become better understood, the importance of maximizing direct sediment delivery from the creek to the marsh may become a higher priority, and may be implemented as a future project. An important outcome of the workshop and the Flood Control 2.0 project may be to help shape a longer-term adaptive management plan that maximizes the ecological functions generated by the flood protection project over time, as changes in the surrounding landscape make new opportunities available.