

LOWER SONOMA CREEK FLOOD MANAGEMENT & ECOSYSTEM ENHANCEMENT

INTRODUCTION & BACKGROUND

Portions of Schellville and surrounding areas, in southern Sonoma County, California, are frequently flooded during relatively small winter storm events that cause flows to overtop the banks of Sonoma and Schell Creeks. Recurrent flooding has caused economic loss and considerable damage to private property and roadways. The Sonoma Resource Conservation District (District) undertook the management of the Lower Sonoma Creek Flood Management and Ecosystem Enhancement project to identify and evaluate opportunities to address flooding issues and ecosystem enhancement. The study focuses on the southern portion of the Sonoma Creek watershed, within the reaches of Sonoma Creek and Schell Creek from immediately upstream of Highway 121 to San Pablo Bay. The study was funded by the US Army Corps of Engineers, California Coastal Conservancy and the Sonoma County Water Agency. Consultants, ESA PWA, performed the basin hydrologic investigation, developed the hydrodynamic model, and performed the technical analyses and evaluation of project elements/alternatives, in addition to participating in public outreach with stakeholders. Watershed Sciences performed a geomorphological analysis and assessment of existing drainage system as baseline information. Public involvement and outreach to stakeholders was an integral component of the technical studies.

FEASIBILITY STUDY PURPOSE & GOALS

The goal of the study was to identify a project or projects to alleviate flooding and reduce flood-related damage to public facilities, structures, roads, railroad tracks, pasture lands and crops while restoring and enhancing habitat and improving ecological and hydrological functions. The primary focus of the study was to develop a project concept to accomplish flood management and habitat restoration in the Schellville area. The original study scope was expanded to include evaluation of sea level rise and identified climate adaptation opportunities in Lower Sonoma Creek that are consistent with habitat enhancement goals.

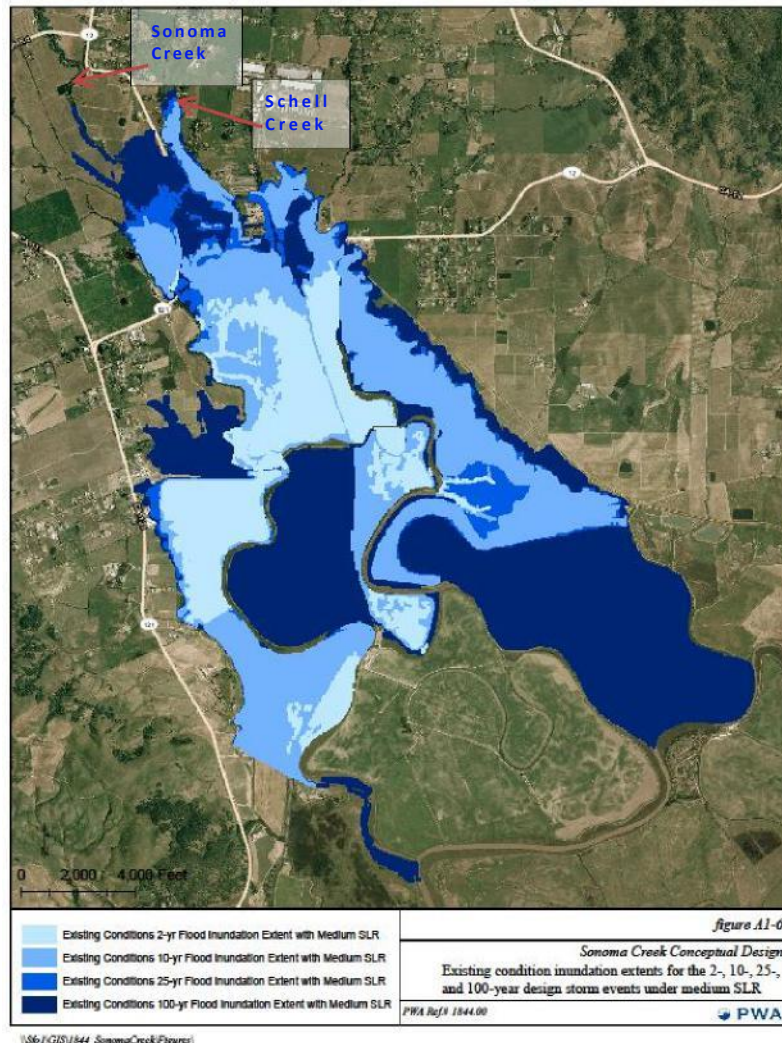


OPPORTUNITIES AND CONSTRAINTS

The study identified the opportunities and constraints noted below.

OPPORTUNITIES:

- + Work with willing and engaged landowners
- + Create upstream detention or retention in the watershed to reduce flood flows
- + Shift to flood-compatible land uses, including tidal wetland restoration
- + Restore tidal wetlands for habitat and climate change resilience
- + Enhance flood conveyance above zone of San Pablo Bay influence (potential cost-share funding for wetland restoration for eligible agricultural producers)



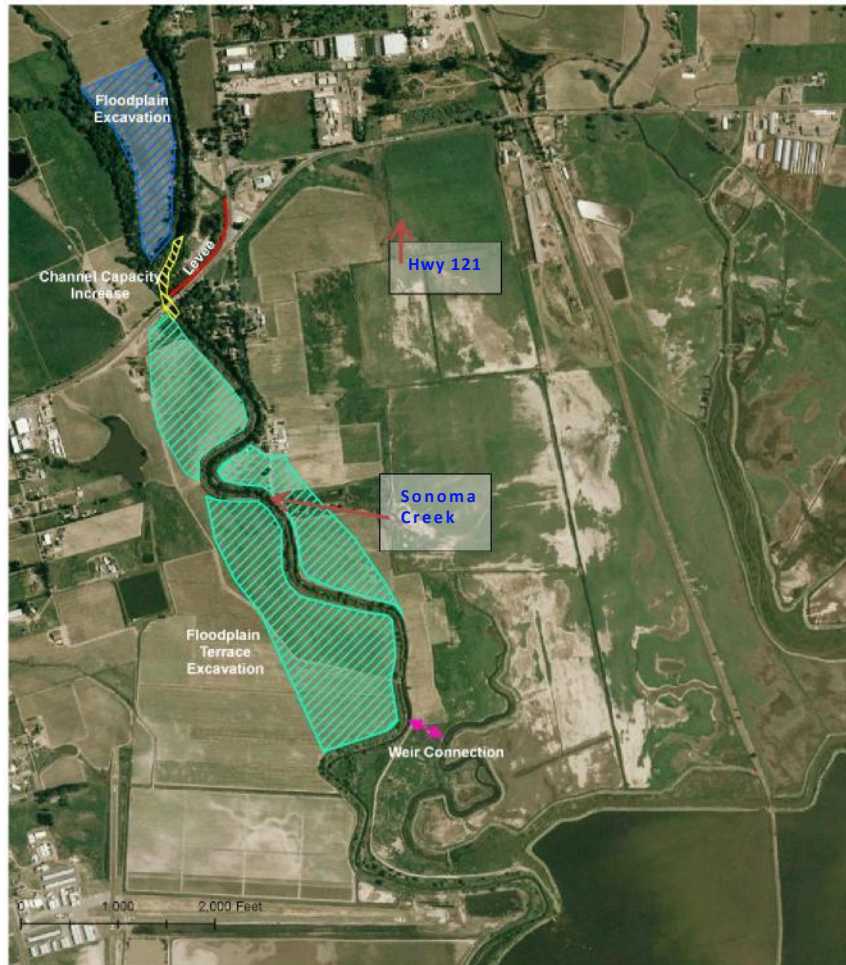
CONSTRAINTS:

- + Topographic setting and San Pablo Bay influence on water levels
- + Adjacent lands are high-value (e.g., vineyards)
- + Lack of funding support for extensive new levees or dredging
- + DFG Camp 2 Unit is managed for freshwater wetlands, upland game
- + Flow interactions between Sonoma and Schell Creeks can mean that “solutions” redirect flood hazards
- + Fiscal constraints: minor benefits for significant costs; lack of funding mechanisms; limitations on land purchase prices if publicly funded
- + Existing infrastructure: County and State roadways, railroad embankment, bridges, channels, culverts, and levees/berms

ALTERNATIVES EVALUATED

ALTERNATIVE PROJECT ELEMENTS EVALUATED

- + Full-length, wide lowered floodplain terrace or short, narrow lowered floodplain terrace
- + Levee spur upstream of Highway 121 to contain and redirect flood flows
- + Sonoma Creek right bank levee shift west downstream of Highway 121
- + Weir connection between Sonoma Creek and Railroad Slough
- + Tidal wetland restoration near Wingo
- + Creek channel expansion at the Highway 121 bridge
- + Floodplain lowering/reconnection at the junction of Sonoma Creek and Fowler Creek



Schell Creek overflow channel and culvert under Highway 121 **KEY FINDINGS**

In essence, most flooding below Highway 121 is controlled by San Pablo Bay water levels. Flooding above Highway 121 is controlled by a combination of creek flood flows and high water levels downstream.

Initial testing suggested that none of the project elements would yield significant benefit on their own. To ensure that cumulative benefits were not being overlooked, subsets of these project elements were combined to create a series of possible project scenarios and modeled to evaluate their ability to reduce flooding. The modeling results indicated that none of the alternatives evaluated were able to generate significant flood hazard reductions except in minor flooding events. No alternative was deemed to be viable as a multi-objective flood hazard reduction project from the point of view of funding feasibility.

RECOMMENDATIONS FOR THE FUTURE

A watershed-wide approach is recommended, consisting of three main elements: 1) stormwater detention/retention in the upper watershed, 2) facilitation of a shift to flood-compatible land uses along Lower Sonoma Creek, such as through the acquisition of easements on flood-prone lands for seasonal flooding, and 3) acquisition of flood-prone lands for restoration to tidal wetlands.

FUTURE IMPLEMENTATION

- + Upper watershed stormwater management to reduce flood peak flows and reduce overbank flow into Schell Creek and across Highway 121 through attenuation or diversion into storage.
- + Elevating or flood proofing some buildings or constructing small lengths of levee to protect remaining developments within the floodplain from most hazards.
- + Restore valuable tidal wetlands in Schellville area for endangered species habitat, managed retreat to protect some inland uses, carbon sequestration, promotion of tidal scour, and potential reduction in levee maintenance costs. There is significant potential to create valuable wetlands and expand areas on San Pablo Bay with good opportunity to create valuable mid-elevation, or middle, marsh habitat. Timing of such creation of middle marsh is important to initiate marsh accretion and thereby attain marshes that are sustainable in the mid-term, given sea level rise.
- + Initiate and continue landowner outreach to conduct appraisals, solicit funds, and negotiate purchase agreements and/or flood easements.
- + Leverage infrastructure investments (highway and rail) and initiate climate change adaptation planning to benefit climate change resilience and reduce flood risks in the Schellville area.
- + Collaborate and seek funding for watershed-wide effort to establish parameters of a multiple-benefit project involving elements of: water quality improvement, surface and groundwater storage, rainwater harvesting, use of recycled water, wetland restoration, and seasonal flood easements to allow continued agriculture.



For more information on this Study please contact the Sonoma RCD at (707) 569-1448 ext. 104