



NATIONAL *fish, wildlife & plants*
CLIMATE ADAPTATION STRATEGY

Project Title: Restoration of the Salmon Creek Delta

Headline Title (2-5 words): same as above

Brief Summary (Abstract): In 2010-2011, areas of former salt marsh around Humboldt Bay that were diked and drained in the early 1900s that have experienced significant subsidence were identified for potential restoration. A team of Refuge and Coastal Program staff and local non-profit conservation organizations designed a plan to raise the elevation of subsided areas to a level consistent with salt marsh elevations across the bay. Fill was generated from a Refuge creek channel restoration project, and within two years the filled areas were almost completely covered by pickleweed, a native salt marsh plant. This project has helped offset the loss of approximately 95% of historic salt marsh around the Bay, and builds resiliency to climate change and sea level rise by providing areas for salt marshes to migrate to behind dikes. Due to the success of this project, a larger salt marsh restoration effort is being designed for the White Slough Unit of Humboldt NWR, with implementation scheduled in 2014-15.

Project Location: Salmon Creek Unit of Humboldt Bay National Wildlife Refuge, Humboldt County, CA

Partners: FWS Coastal and Partners for Wildlife Program, CA Dept. of Fish and Wildlife, CA Coastal Conservancy, Pacific Coast Wetlands, Wildlife, & Restoration Association, Michael Love and Associates, Ducks Unlimited

Background: . Like coastal locations around the country and world, the Humboldt Bay area is and will continue to be impacted by effects of climate change, especially sea level rise (SLR). Models and predictions vary geographically but for the state of California, the conservative SLR estimate is 6" by 2030, 12" by 2050, and 36" by 2100. The CA Coastal Commission requires projects to assess impacts from a minimum SLR of 3' and a maximum of 6' by 2100, the rest of the California Resource Agencies use 55" by 2100. But on Humboldt Bay the north Spit station record gives us a relative SLR of 18.6" per century, due to subsidence. Based on a recently completed vulnerability assessment a SLR of 2' to 3' will be a significant tipping point on Humboldt Bay.

Project Goals: The goals of the Salmon Creek Delta restoration project include: restoration of ecosystem function to the extent possible, increased fish passage, increased channel and habitat complexity and off-channel rearing sites for salmonids, increase in topographic elevation in subsided former tidal salt marsh areas to regain salt marsh and increase resiliency from impacts of CC?SLR.

Strategy Goals Implemented: N/A

Climate Impacts Addressed: Impacts on estuarine dependent species vulnerable to SLR

Status of Project Implementation (Timeline, Milestones, Next Steps): The Salmon Creek Delta Restoration Project is largely completed, however adaptive management is ongoing and lessons learned



from that project have led to additional projects proposed around the bay; such as the one we have commenced on at White Slough.

Project Outcomes: The Salmon Creek Delta Restoration has had some documented successes in fish use of off-channel rearing habitat and recovery of native salt marsh in filled areas. Challenges we will need to adapt and respond to include sedimentation in newly excavated areas.

There are also additional proposals now beginning to be vetted by the local, state, and federal conservation community that will be necessary to: provide needed habitat for fish, wildlife, and plants; protect existing infrastructure; and provide the adaptive resiliency needed for coastal communities to deal with future challenges brought about by the impacts of CC/SLR. Many of these projects will necessarily require fill in existing jurisdictional wetlands, so the permitting, assessment of impacts and implementation will be challenging and costly.

Funding Sources: USFWS, CA Coastal Conservancy, CA Dept. of Fish and Wildlife, Ducks Unlimited

Photos/Attachments:

Photo/Figure Credits (do we have permission to print): Yes. Photo taken by Dave Kenworthy.

Suggested Photo Caption: Aerial photo of a portion of the Salmon Creek Delta restoration.



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