



The Sonoma Creek Enhancement Project
Audubon California
September 2014-2015

The Sonoma Creek Enhancement Project provides long-term enhancement and conservation of an impounded San Pablo Bay tidal wetland by improving the hydrological and ecological function of 400 acre Sonoma Creek Marsh. Designated an Important Bird Area, the San Pablo Bay and its fringing wetlands provide critical decreasing habitat for the birds of the Pacific Flyway. The construction of a network of tidal channels within the marsh will drastically improve tidal exchange and nutrient cycling and provide habitat to a myriad of marsh-dependent wildlife species, including federally endangered species such as the California Clapper Rail (*Rallus longirostris obsoletus*), and the Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*). The channels will also provide spawning and feeding grounds for endangered and commercial fishes. Improving hydrology will improve water quality by increasing circulation and drastically reducing the amount of pesticides applied to areas of ponded water that currently facilitate heavy mosquito production. Furthermore, the construction of a gently-graded (20:1) high marsh transition zone connecting the lower marsh to the existing agricultural levee will reduce flooding of adjacent private lands and provide critical high tide refugia for rails and small mammals. High tide refugia is particularly critical as sea-level rises and extreme storm events brought about by climate change become more frequent and more intense. Implementation of the project will also provide hands-on educational opportunities for students who would not otherwise experience natural history in the field setting. Finally, the project, part of a larger conservation vision, is preceded by a successful tidal marsh enhancement pilot project and has the potential to set precedence for other large-scale tidal marsh enhancement projects in the Bay area.

Project Proponents/Partners: UFSWS, Marin Sonoma Mosquito & Vector Control District

Funding: Funding for this project has been provided by The National Coastal Wetland Conservation Grant (USFWS), The Wildlife Conservation Board, the U.S. EPA (San Francisco Bay Water Quality Improvement Fund), the National Fish and Wildlife Foundation, The California Coastal Conservancy (Climate Ready Grant), and the Marin-Sonoma Mosquito Vector and Control District. In-kind match is provided by Audubon volunteers, the San Pablo Bay National Wildlife Refuge (USFWS), Friends of the Refuge, and Point Blue Observatory's STRAW program (Students and Teachers Restoring a Watershed).

Project timeline: September 2012 –December 2015

Environmental Benefits and Results

- **Improved water quality.** Reduce application of pesticides by $\geq 75\%$ within two years.
- **Improved tidal circulation.** Acres of water impounded areas will be reduced by $\geq 75\%$ within 2-3 years.
- **Healthy tidal marsh.** Will continue to improve beyond the project period, measured as an increase in mean height (*Sarcocornia pacifica*) and presence of native halophytic plants.
- **Benefit to Threatened and Endangered species.** Abundance of Salt Marsh Harvest Mouse, California Clapper Rail, California Black Rail, and San Pablo Song Sparrows within the impounded areas will remain stable or increase within the project area 3-5 years after construction.
- **Reduced mosquito populations.** The Mosquito District will expend at least 50% fewer resources and pounds of pesticide applied will be reduced by $\geq 75\%$.
- **Information sharing.** All monitoring results will be shared through the San Francisco Bay Joint Venture Project tracking website and via local conferences and prepare/distribute a final report.
- **Community engagement.** Public engagement in pre- and post-enhancement monitoring. At least 200 volunteer hours will be contributed annually.

Relic Berm Area Enhancement Features

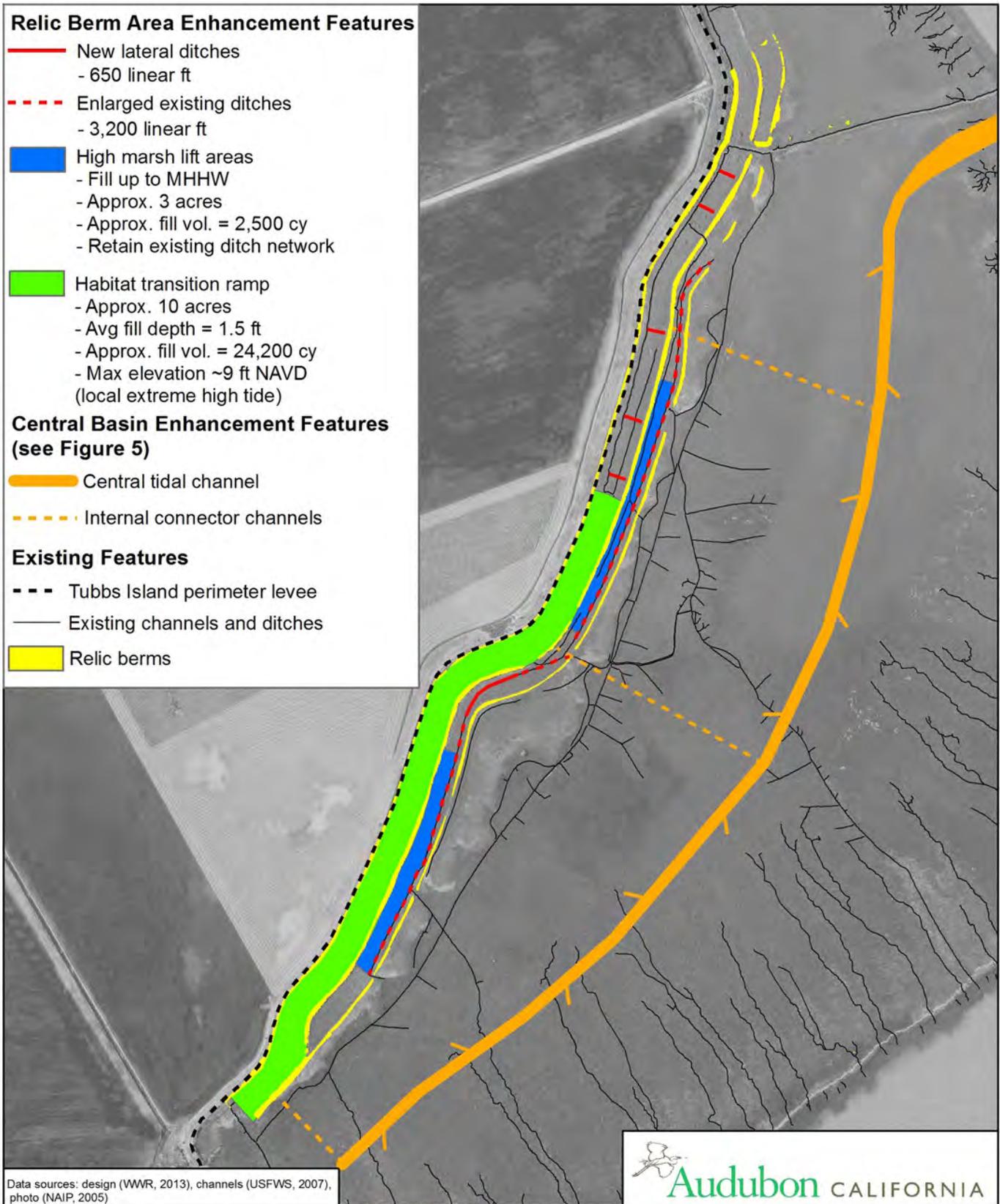
-  New lateral ditches
- 650 linear ft
-  Enlarged existing ditches
- 3,200 linear ft
-  High marsh lift areas
- Fill up to MHHW
- Approx. 3 acres
- Approx. fill vol. = 2,500 cy
- Retain existing ditch network
-  Habitat transition ramp
- Approx. 10 acres
- Avg fill depth = 1.5 ft
- Approx. fill vol. = 24,200 cy
- Max elevation ~9 ft NAVD
(local extreme high tide)

Central Basin Enhancement Features (see Figure 5)

-  Central tidal channel
-  Internal connector channels

Existing Features

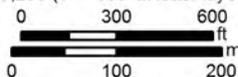
-  Tubbs Island perimeter levee
-  Existing channels and ditches
-  Relic berms



Data sources: design (WWR, 2013), channels (USFWS, 2007), photo (NAIP, 2005)



1:7,200 (1" = 600' at letter layout)



RELIC BERM AREA ENHACEMENTS

Sonoma Creek Marsh Enhancement Project
Sonoma County, California
Marin-Sonoma Mosquito and Vector Control District

Produced by WWR, January 2014
Map file: relic-berm-design-proposed-project_1123_2014-0114ekc.mxd

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Project No. 1123

Figure 6

