Seal Beach National Wildlife Refuge

August 2016

Location: Seal Beach National Wildlife Refuge

Type: Habitat restoration

Area: 8 acres of TLP plus 6 acres of "buffer" in a 965-acre marsh site

City: Seal Beach

County: Orange

Main Agencies: USFWS, OC Parks, CA Dept. of Fish and Wildlife, California Coastal Conservancy, USACE, Naval Weapons Station Seal Beach, CA State Lands Commission, , UCLA, USGS, CSULB, Chapman University

State/Province: California

Country: United States

Taken from USFWS presentation

Background

The Seal Beach National Wildlife Refuge (NWR) is administered by the U.S. Fish and Wildlife Service as part of the National Wildlife Refuge System and is collocated within the boundaries of Naval Weapons Station Seal Beach. This 965-acre refuge is dominated by tidal salt marsh that supports the third largest breeding population of the federally endangered light-footed Ridgway's rail.

The thin-layer Salt Marsh Sediment Augmentation Pilot Project encompasses an area of 8 acres of low salt marsh in the center of the refuge. It is the first known application of TLP on the west coast of the US (Coastal Conservancy 2014). The site's cordgrass-dominated salt marsh habitat has been adversely affected by subsidence, sea level rise, and alteration of natural sediment inputs. The site is experiencing a relative sea level rise (SLR) of 6.23 mm/yr, a rate three times higher than that of similar southern California marshes not affected by subsidence. The main objective of the project is to improve habitat quality by Rising the marsh elevation and improving cordgrass heights, and to determine the effectiveness of TLP as a regional SLR adaptation strategy.

Project Description

A 10 inch (plus/minus and average of 2 inches) thin layer of dredged material was placed over 8 acres of low elevation salt marsh from Dec 2015 to Mar 2016. This site has the lowest mean elevation (1.34 m relative to NAVD88) and mean elevation relative to MHW (0.01 m relative to NAVD88) of 8 CA marshes where survey-grade elevations were conducted by USGS (Takekawa et al. 2013). Approximately 17,000 CY of clean dredged material from the Main Channel West of Sunset/Huntington Harbour was placed on the site via rainbow sprayer, and end-of-pipe baffle impingement. A hay bale barrier and a 6-acre vegetated buffer was maintained between the TLP site and adjacent channels in order to

reduce sediment runoff and avoid impacts to marine species including eelgrass beds and marine mammals. A control site within the refugewas established as part of the experimental design. The cost of project construction and long term biological and physical monitoring is $3,305,554, which was obtained from the following agencies: Orange County Parks, CA Dept. of Fish & Wildlife, CA Coastal Conservancy, USFWS, and USACE-ERDC. Monitoring is an essential component of this project since TLP has not been used in this area. Pre- and post-construction monitoring on the project site and control site includes assessing the plant and benthic invertebrate communities and associated abiotic parameters (e.g., temperature, porewater salinity, redox); conducting monthly bird surveys and directed surveys for light-footed Ridgway's rail; measuring the thickness and bulk density of added sediment in the augmented area over time; assessing the morphology of tidal creeks following TLP; assessing net sediment accretion rates and the carbon accumulation rate; evaluating sediment flux; and measuring seasonal emissions of CO2, CH4 and N2O. Pre-construction monitoring was completed in December 2015. Post-construction monitoring started immediately following dredged material placement and will continue over a time period of 5 years. Mitigation measures were incorporated as part of this project to address potential impacts associated with biological resources and water quality.

Findings

Please visit the Seal Beach NWR Thin-layer Salt Marsh Sediment Augmentation web site which is updated regularly with quarterly reports, annual reports, lessons learned documents, and time lapse videos of construction and recovery:https://www.fws.gov/refuge/seal_beach/what_we_do/resource_management/Sediment_Pilot_Project.html

References

California State Coastal Conservancy and U.S. Fish and Wildlife (2014) Memorandum of Agreement Between the State Coastal Conservancy, Orange County and the U.S. Fish and Wildlife Service Regarding the Seal Beach National Wildlife Refuge Thin-layer Salt Marsh Sediment Augmentation Pilot Project.

California State Coastal Conservancy and U.S. Fish and Wildlife (2014) Final Mitigated Negative Declaration for the Seal Beach National Wildlife Refuge Thin-layer Salt Marsh Sediment Augmentation Pilot Project (Orange County, California).

Coastal Conservancy (2014) Seal Beach National Wildlife Refuge Thin-Layer Salt Marsh Sediment Augmentation Pilot Project. Staff recommendation.

Takekawa, J.Y., K. M. Thorne, K. J. Buffington, C. M. Freeman, and G. Block. 2013. Downscaling climate change models to local site conditions: San Diego National Wildlife Refuge Complex. Unpubl. Data Summary Report. U.S. Geological Survey, Western Ecological Research Center, Vallejo, CA.

U.S. Department of the Interior Fish and Wildlife Service (2014) Finding of No Significant Impact (FONSI) for the Seal Beach National Wildlife Refuge Thin-layer Salt Marsh Sediment Augmentation Pilot Project Orange County, California.

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Main Agencies:

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California Department of Fish and Wildlife - Greenhouse Gas Reduction Program
U.S. Army Corps of Engineers - Ecosystem Management & Restoration Research Program

Information on thin layer placement (TLP) case studies has been compiled as part of a DOTS/EWN project to provide a source of information, knowledge, and experience on TLP of sediment or dredged material in aquatic environments. The Thin Layer Placement Website and Map-Portal are funded by the US Army Engineer Research and Development Center (ERDC). POCs for the Thin Layer Placement Website and Map-Portal are:

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