The Novato Creek Dredged Sediment Beneficial Reuse Project: Demonstrating the Technical and Regulatory Feasibility of Local, Opportunistic, Beneficial Reuse

Christina Toms, San Francisco Bay Regional Water Quality Control Board, christina.toms@waterboards.ca.gov
Roger Leventhal, Marin County Flood Control District, rleventhal@marincounty.org

The beneficial reuse of dredged sediment to nourish wetlands and construct levees is emphasized in the Baylands Ecosystem Habitat Goals Update (BEHGU), SFEI's Flood Control 2.0 Novato Baylands Vision Plan, and the Marin County Flood Control District's Novato Flood Protection and Watershed Program. The 2016 Novato Creek Dredged Sediment Beneficial Reuse Project provided a unique opportunity to couple the flood control and habitat restoration elements of these plans, demonstrate the feasibility of local beneficial reuse, and examine the regulatory framework through which it can be implemented. The Project increased the flow capacity of over 8,000 linear feet of channel through downtown Novato, and used sediments from 2016 and previous dredge rounds to initiate construction of ecotone levees within Deer Island Basin. These levees will be necessary to restore expansive tracts of diked baylands within the basin to tidal action, and protect low-lying areas of Novato (including the Novato Sanitary District wastewater treatment plant) from long-term tidal and watershed flooding. The Project constructed approximately 1,900 linear feet of future levee "core" with close to 7,400 cy of sediment from past dredge rounds, and tested four hydraulic application methods to place about 6,500 cy of 2016 dredged sediments to form the foundation of a future ecotone slope. Hydraulic application facilitated placement of sediment in thin layers, simulating natural depositional processes and minimizing net loss of seasonal wetland habitats. When complete, the levee's gentle side slopes will facilitate ecologically functional estuarine-terrestrial habitat gradients in the short-term, and allow for the sea level rise-driven transgression of tidal marsh habitats over uplands in the long-term. SF Bay Water Board staff worked closely with District staff and partner agencies to develop a project description and permitting strategy for the Project, with the hopes that both will serve as viable, cost-effective models for future beneficial reuse projects.

Keywords: Wetland, restoration, tidal, beneficial, reuse, sediment, permitting, flood, deposition, dredge

Poster Topic Habitat Restoration - Sediment

Beneficial Use of Dredge Material in Wetland Restoration: Progress at the Cullinan Ranch Restoration Project

Don Brubaker, San Pablo Bay National Wildlife Refuge, don_brubaker@fws.gov
Natalie Washburn, Ducks Unlimited, Inc., nwashburn@ducks.org
Russ Lowgren, Ducks Unlimited, Inc., rlowgren@ducks.org
Steve Carroll, Ducks Unlimited, Inc., scarroll@ducks.org

Tidal marsh restoration in the San Francisco Estuary often occurs on diked baylands that have subsided several feet below sea level. When breached, they may take decades or, with sea level rise, may never accumulate sufficient sediment to support tidal marsh habitat. In order to accelerate formation of habitat at one such restoration site in San Pablo Bay, the project is incorporating the beneficial use of dredged material. The Cullinan Ranch Restoration Project is a 1,500-acre tidal marsh restoration located on the San Pablo Bay National Wildlife Refuge (Refuge). In January 2015, 1,210 acres of the site was breached to the tides. The remaining 290 acres are being managed by the Refuge and Ducks Unlimited (DU) for beneficial use of dredge material. The goal is to expedite tidal marsh habitat by increasing ground elevation 6 feet through the import of 3 million cubic yards of dredged sediment.

To date, the project has imported 370,000 cubic yards of sediment. The material has been imported and placed using different techniques: truck, mechanically by barge, and hydraulically by barge. Import by truck proved effective for small quantities moved over short distances. While this method allowed for exact placement within the project site, the site location made it impractical at a large scale. Mechanical placement from a barge was more efficient in importing large quantities of sediment, but it was spatially restricted and necessitated the relocation of the material, which proved difficult and costly. Hydraulic placement has proven to be the most scalable, although this method requires the most specialized equipment, extensive site preparations, and substantial onsite water management. In 2017, DU expects to hydraulically import an additional 350,000 cubic yards of dredge sediment. Project success requires well-coordinated planning and partnership with dredgers, regulatory agencies, and conservation entities throughout the San Francisco Estuary.

Keywords: restoration, marsh, wetland, habitat, sediment, subsidence

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