Jamaica Bay – Big Egg Marsh

August 2016

Location: Jamaica Bay – Big Egg Marsh

Type: Marsh restoration/habitat restoration

Area: 2 acres

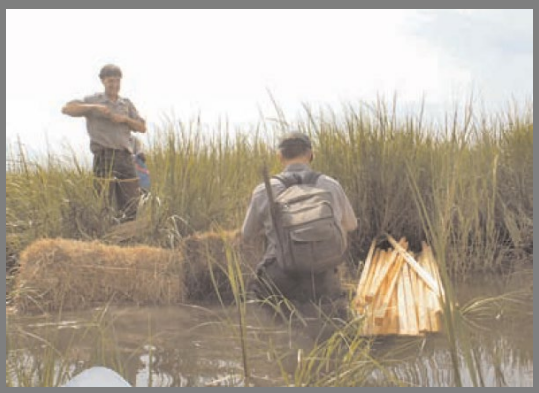
City: New York City (Brooklyn and Queens Boroughs)

County: Queens

Agencies: National Park Service, Aquatic Resources and Environmental Assessment Center (AREAC) at Brooklyn College, US Geological Survey, Environmental Protection Agency, Natural Resources Conservation Service, Department of Environmental Conservation, Department of Parks and Recreation

State/Province: New York

Country: United States



Taken from Harmon 2006

Background

The marsh islands located in Jamaica Bay have experienced an accelerated loss from 26 acres/yr in the 1970s to 44 acres/yr in the 2000s (Frame 2003). The marsh loss in this area is attributed to sediment subsidence, sea level rise, erosion, plant mortality, and the bay isolation. Big Egg Marsh was identified as a restoration site by the Jamaica Bay Research and Restoration Team (JABERRT) in 1999 and recommended as a restoration project by the Gateway National Recreation Area (GNRA) (GNRA 2007). One of the reasons for which this site was selected for restoration was because it is transforming from Smooth Cordgrass to a bare mudflat. Also, its location has easy access for interpretative activities and public's participation (Harmon 2006). This marsh is located in the southern side of Jamaica Bay and adjacent to Broad Channel village. The main objectives of this project were to evaluate the results of a new method of sediment transfer and placement used to increase marsh elevation, the growth of marsh vegetation through thin layer placement, and pre- and post-construction inventory and monitoring data (Frame 2003). This project incorporated the three pronged approach developed by the National Park Service, which includes a protection, investigative/restorative, and educational component.

Project Description

In September 2003, approximately 8,000 CY of dredged material was placed on the surface of a 2-acre area located at Big Egg Marsh. The material consisted of 90% and was removed from an adjacent tidal creek with a 20-cm swing ladder dredge and placed with a 10 cm diameter nozzle (high-pressure spray). The spray range was approximately 130 ft. This placement technique was expected to be less destructive to the marsh than conventional dredging (Harmon 2006). The material placement was guided by polyvinylchloride pipes arranged in a grid pattern. The thin layer placement thickness was generally 8 in.; however, a maximum of 17 in. was placed in certain areas that required more material in order to be above the reference plane. Areas with the lowest-lying

mudflats and drainages required an approximate thickness of 39 in. The final thin layer thickness was designed to cover most of the marsh by the daily high tide in order to prevent the invasion of the alien genotype of common reed.

A silt fence was placed around the low-lying areas of the marsh. Hay bales, wooden stakes and sisal twine were used to provide primary containment for the placement area. Supplemental containment was provided in areas with high turbidity using a black plastic construction fence. Dredging and placement activities were completed within a month. Once these activities were completed, the site was planted with smooth cordgrass by volunteers and NPS staff for approximately 6 weeks. A plastic fence was also installed in the site during planting to keep geese from eating the plants.

The project site along with a 2-acre control site was monitored one year pre and post-construction. The following aspects were monitored: ecological, physical and chemical characteristics (particle size and sulfides), plant cover, changes in animal occurrence (birds, mammals, insects, spiders, macroinvertebrates), and water table. Each site had three surface elevation tables (SETs), grid markers with elevations, and permanent vegetation plost (Harmon 2006). The project site also included unplanted plots to monitor regrowth of the original vegetation and colonization by new seedlings. The tidal creek from which the material was dredged was also monitored.

Findings

Repairs to the plastic fence installed to keep geese away had to be done frequently during the winter due to damage from debris. The final thick layer thickness ranged from 16 to 20 in. Erosion affected the elevation of the SETs by several cm. The northwest and southeast edges of the placement area were affected eroding waves that caused an erosion belt and thus a loss of 8 to 16 in. of material. Smooth cordgrass showed 100% survival, germination (maximum seedling density was 74 seedlings/ft^2 at placement site), and regrowth in most of the site, with the exception of the areas affected by erosion. One year after placement, smooth cordgrass did not survive when the thin layer thickness was greater than 8 in.; survival and layer thickness had an inverse relationship (Harmon 2006). The plastic fence kept geese away until summer 2004. The placement site was successfully transformed into a silty-organic saltmarsh, covered with smooth cordgrass, and colonized by different animal communities.

References

Frame, G. (2003) Big Egg Marsh Restoration: Pilot Project To Begin at Jamaica Bay Wildlife Refuge. Tidal Exchange: Summer 2003 Issue. Harbor Estuary News Contents

Harmon, David, ed. 2006. People, Places, and Parks: Proceedings of the 2005 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites. Hancock, Michigan: The George Wright Society.

GNRA, National Park Service, US Department of Interior, Jamaica Watershed Protection Plan Advisory Committee (2007). An Update on the Disappearing Salt Marshes of Jamaica Bay, New York.

Points of Contact

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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