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USA: Maryland: Salt Marsh Restoration on Barren Island in Chesapeake Bay

Overview

Over the past century, the Chesapeake Bay has lost hundreds of acres of tidal wetlands due to human related and natural factors. The National Aquarium in Baltimore initiated a wetland restoration project on Barren Island in order to help offset these losses and restore critical habitat in the Bay region. Since 2001, the Aquarium has been working with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Maryland Conservation Corps, Friends of Blackwater and community volunteers to restore portions of the island. Not only was the project site planted with native marsh grasses, dredge material was put to beneficial use in augmenting and stabilizing the island's eroding shoreline. Post-planting observations have shown that sediment is accreting at the site and that the newly created habitat is nurturing several species of birds, fish and invertebrates.

Quick Facts

Project Location:

Barren Island, 6, Hoopers Island, MD, USA, 38.32812920000001, -76.25442929999997

Geographic Region:

North America

Country or Territory:

United States of America

Biome:

Coastal/Marine

Ecosystem:

Estuaries, Marshes & Mangroves

Area being restored:

21 acres

Project Lead:

The National Aquarium in Baltimore

Organization Type:

NGO / Nonprofit Organization

Project Partners:

U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Maryland Conservation Corps, Friends of Blackwater

Location



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TIMEFRAME

Project Stage:

Implementation

Start Date:

2001-07-10

End Date:

2001-07-10

DEFINING THE PROBLEM

Primary Causes of Degradation

Invasive Species (native or non-native pests, pathogens or plants), Urbanization, Transportation & Industry

Degradation Description

Wetlands throughout the Chesapeake Bay region are being lost at an alarming rate as a result of coastal construction, rising sea levels, erosion, ship wakes, land subsidence and damage from non-native species. Thousands of acres have been destroyed and are lost every year.

PLANNING AND DESIGN

Project Goals

The National Aquarium in Baltimore is working with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Maryland Conservation Corps, the Friends of Blackwater and community volunteers to restore 10 acres of salt marsh in the northern and central portions of Barren Island. Two hundred thousand units of salt marsh grasses, including smooth cordgrass (*Spartina alterniflora*) and salt meadow hay (*Spartina patens*), will be planted which will insure added site stability, reduce the potential for erosion and provide habitat for wildlife. The project targets key recreational fish species including striped bass, speckled trout, weakfish, shrimp, and blue crabs. Restoration will also create habitat for avian species including black ducks, herons, egrets, and bald eagles.

Monitoring

The project does not have a monitoring plan.

PROJECT ACTIVITIES

Description of Project Activities:

The project included filling large, geotextile fabric "tubes" with sand and placing them strategically just offshore of the existing shoreline. Between these tubes and the shore, material dredged from an adjacent channel maintenance project was pumped to fill in and recreate lowland and intertidal

marsh habitat. Once the material consolidated and drained, the Aquarium used its Aquarium Conservation Team of trained and motivated volunteers to complete the planting and monitoring of the Barren Island site. During the summers of 2001 and 2002, 140,000 units of *S. alterniflora* (smooth cordgrass) and 10,000 units of *S. patens* (salt meadow hay) were planted over 7 acres of land. To date, over 302,000 native marsh grasses have been planted with the help of 927 volunteers totaling 7,700 volunteer hours. Aquarium staff and Friends of Blackwater have returned to the site quarterly to monitor the success of this restoration project. Topographic, vegetative, and fish usage data have been collected. In addition, photo station pictures are taken. Long-term monitoring activities have been planned, and they will include topography surveys, vegetative analysis, and faunal observations. For the topography component, volunteers will measure the advance or retreat of marsh edge vegetation (marsh edge change) during fall and spring via equally spaced transects within each treatment plot. Additionally, channel and rivulet formation will be measured through elevation change of the sediment along the treatment plot transects. To aid in measuring topography, uniformly spaced transects will be established across the restored area. Elevation surveys were conducted and vegetation transects were conducted along or near some of the topography transect locations. This allows information gathered in both events to be further used to understand the patterns of site development through the examination of topography on plant survival, coverage and ultimate zonation at no additional cost. This information will assist with future restorations. For the vegetative analysis, survival estimates and vegetation parameter measurements for the created marsh will be made through the direct survey of live versus dead planting units within the replicate plots during the fall of year one and during spring and fall thereafter until planting unit coalescence occurs. During each collection period, percent vegetation cover will be documented using a 2 m² (2m x 1 m) quadrat, which will be subdivided into 32, 0.25m x 0.25m subsections. On at least one randomly selected location along each transect the presence/absence of the target species will be noted within the 2 x 1 m quadrat and the number of subsections with live vegetative stems will be recorded. In addition, at each of these locations, plant stem densities will be estimated by counting the number of live and dead stems from one randomly selected subsection of the quadrat. Vegetation canopy height will be determined from each stem count quadrat for up to 10 randomly selected live and dead stems. Finally, faunal observations will be made via post-planting faunal collections taken from the restoration site by volunteers under the direction of the Aquarium to compare pre- versus post-planting utilization patterns. Fauna will be collected using fyke and possibly gill nets. Collections will be performed during late summer/early fall.

PROJECT OUTCOMES

Ecological Outcomes Achieved

Eliminate existing threats to the ecosystem:

Initial monitoring from 2002-03 indicates that the project has been successful as wake energy is being absorbed and sediment is in fact being accreted. A very natural marsh community which includes small invertebrates that live in the sediments, larger invertebrates including crabs and shrimp, and fish and birds can be found in the more mature parts of the site that were planted in 2001. The more recently planted areas appear to be progressing well toward a similar community.

Socio-Economic & Community Outcomes Achieved

KEY LESSONS LEARNED

LONG-TERM MANAGEMENT

Long-Term Management

Long-term maintenance and monitoring of the site will be performed by the Aquarium, the Friends of Blackwater and other local volunteers. Long-term site monitoring is an integral component of the Barren Island project. By collecting data on various physical and biological parameters, we will contribute to an improved understanding of created wetland function, both immediately post-construction and over time. Monitoring variables will include: topographic surveys, vegetative analysis, and faunal observations.

FUNDING

Sources and Amounts of Funding

This project has received funding through its federal partners and has benefited greatly from thousands of volunteer hours.

LEARN MORE

Other Resources

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