

North End Restoration Project Annual Report: 2007
Courtney Schupp, Assateague Island National Seashore
March 12, 2008

Overview

The North End Restoration Project is a comprehensive restoration plan that focuses on restoring Assateague Island to as natural a condition as possible, mitigating the sediment starvation of Assateague Island caused by the 1934 stabilization of the Ocean City Inlet. Project partners are the U.S. Army Corps of Engineers (USACE), Assateague Island National Seashore (ASIS), the state of Maryland, Maryland Department of Natural Resources, Worcester County Maryland, and the Town of Ocean City Maryland.

The project has two phases. The first, or “short-term,” phase of the restoration program was designed to provide a one-time infusion of sand to replace a portion of the sediment lost over the past 60 years due to the effects of the jetties; that phase was completed in 2003. The second phase, the “long-term sand management” component, began in January 2004 and addresses the ongoing and future effects of the jetties by re-establishing a “natural” sediment supply for northern Assateague that reflects historic, pre-inlet rates.

This report documents the efforts made in 2007 to evaluate and restore the island’s North End as part of the long-term sand management phase of the project. The report does not serve as a synthesis of project performance to date, but rather lists the major events, collected datasets, and documents created in 2007 and related to the North End Restoration project.

Team Meetings

The North End Restoration Team consists of representatives from USACE, ASIS, Maryland Department of Natural Resources, Maryland Geological Survey, Worcester County Maryland, Town of Ocean City Maryland, Minerals Management Service, and U.S. Fish and Wildlife Service.

The Team met on February 23, 2007 to share information on a Hot Spots EIS, total bypassing and backpassing volumes during the fall dredging cycle, discussion of the depth of closure for profile change analysis, nearshore profile changes along the North End since sand bypassing began, recent trends in the evolution of the ebb shoal, creation of overwash pathways in the constructed berm, status of ecosystem monitoring, and progress in modeling multiple breaches. The Team also discussed the possibility of creating a North End Restoration website or DVD archive of all Team presentations, documents, and activities. Finally, the Team chose borrow sites for the upcoming dredging cycle.

The Team met again on September 11, 2007, to share information on the Hot Spots EIS, total bypassing and backpassing volumes during the spring dredging cycle, beach volume change to the depth of closure, nearshore volume and shoreline changes along the North End, status of berm modifications and timeline for future alterations, and updates on threatened and endangered species and vegetation communities. The Team also discussed the potential benefits and drawbacks of a North End Restoration website or DVD archive, and chose borrow sites for the upcoming dredging cycle.

Dredging

Two rounds of dredging delivered an estimated total of 114,476 m³ to ASIS. No shoal bathymetry was surveyed in 2007 due to poor weather conditions during planned survey windows. Details of the dredging dates, along with volume sources and destinations, can be found in Table 1.

Pre-Dredging Survey	Dredging	EBB Shoal Area A (cubic meters)	EBB Shoal Area B (cubic meters)	EBB Shoal Area C (cubic meters)	Flood Shoal (cubic meters)	Flood Shoal (cubic meters)	Inlet Throat (cubic meters)	Other (cubic meters)	Total (cubic meters)	To ASIS	To OC	Post-Dredging Survey
	4/22/07 thru 6/7/07 9/23/2007 to 12/05/07	5382		45720			5585		56687	56481	206	None
none		841	14282	61581	3418		1044	5784	86949	86322	627	March 2008

Table 1. Dates of bathymetry surveys and dredging, and sources and destinations of dredged volumes.

Constructed Berm Alteration

In February 2007, two 120-m wide pathways were created across the constructed berm to allow natural overwash at two locations (details available in the construction proposal on the Park's Electronic Library and in the 2006 North End Restoration Project Annual Report). The southern pathway was completed by February 7 with 2270 m³ sediment moved. The northern pathway was completed by February 20 with 1922 m³ sediment moved. The slope and height of these pathways superimposed the natural overwash profile on the constructed berm, and therefore is westward of where a natural overwash profile would be located relative to the shoreline.

Constructed Berm Behavior

The North End experienced minimal wave overtopping of the natural berm in April of 2007. Although at times water reached the crest of the constructed berm at the new overwash pathway locations, no water flowed across and westward of the constructed berm crest.

Vegetation Manipulation

On the second week of March 2007, to allow plovers to move through dense vegetation to the bay, eight paths were mowed through dead standing vegetation left over from the 2006 growing season. Four paths led from the two new berm pathways, and four were elsewhere along the berm length. The paths ran from the foot of the berm west to where the vegetation stopped and open habitat was obvious. After mowing, the paths, which were an average of 8 meters wide and 70 to 220 meters long, still had a lot of short vegetation in place.

In early April 2007, a 2-3 meter wide path of vegetation in the middle of the mowed paths was sprayed in order to kill the re-emerging vegetation. The spraying killed only some of the vegetation that had begun to grow. Other plants not exposed to herbicides began to grow at a later date, so were not affected by the spray. Late-spring spraying was not possible because the spray on any insects could have been ingested by piping plovers.

Although vegetation manipulation resulted in reduced vegetation in the mowed and sprayed paths, it did not achieve habitat creation that benefited plovers during the breeding season. Although there was some limited use of mowed paths by plovers, the birds appeared to use other non-treated areas just as frequently as they used the mowed paths, and nest placement did not show a trend that indicated that plovers were placing nests to be close to these paths.

The treatment met with limited success for several reasons. The mowed pathways were narrow and quickly became revegetated as the growing season progressed. Because birds defend their territory, each pathway, if functional, was capable of supporting only one brood at a time. Broods that successfully used the pathways to migrate to bayside foraging areas (areas kept unvegetated by their relatively low elevation and their frequent exposure to bayside flooding) were ultimately exposed to flood conditions

during June's high tides; many chicks likely drowned when flood waters eventually forced them into the adjacent densely vegetated areas (Piping Plover Annual Report, 2007).

Assateague State Park Modifications

Between March and June 2007, Assateague State Park repaired the maintained dune that was impacted by Hurricane Ernesto.

Datasets

Many spatial datasets were collected in conjunction with the North End Restoration Project, and most are available on the NPS Data Store <http://science.nature.nps.gov/nrdata/>. This year's activities resulted in the following relevant datasets:

- Pre-construction pathway surface topography surveys, December 2006
- Post-construction pathway surface topography surveys, February 2007
- Pathway profile topography surveys, November 2007
- Sediment Bypassing borrow and placement locations, Spring 2007 (points shapefile)
- Sediment Bypassing borrow and placement locations, Fall 2007 (points shapefile)
- Sediment Bypassing sample grain sizes, March 2007
- Sediment Bypassing sample grain sizes, September 2007
- Nearshore Bathymetry profiles, November 28 – December 1, 2007
- Topographic profiles, April 2007 (points shapefile)
- Topographic profiles, November 2007 (points shapefile)
- High water shoreline position, January 2007 (points and line shapefiles)
- High water shoreline position, March 2007 (points and line shapefiles)
- High water shoreline position, September 2007 (points and line shapefiles)
- High water shoreline position, November 2007 (points and line shapefiles)
- Wave data as measured at the USACE Off-Shore Wave Gauge
- Weather data from the ASIS Remote Automatic Weather Station
- Environmental and weather data from the NOAA Offshore Buoy 44009
- Tide data from NOAA Tide gauges at Ocean City Inlet and Lewes, DE
- Piping plover nest locations
- Delineation of vegetation line (related to piping plover mobility)
- Seabeach Amaranth locations
- North End vegetation communities

Documentation and Data Synthesis

Documentation and data synthesis of the North End Restoration efforts have taken several forms:

- North End Vegetation Monitoring Report 1996-2007 (NPS Internal Report)
- Piping Plover Annual Report (NPS Internal Report summarizing plover reproductive success and distribution)
- Meteorological Monitoring Program Annual Report (NPS Internal Report summarizing weather data from RAWs station)
- Project results were presented at a public conference, resulting in the following publication:
Schupp, C.A., Bass, G.P., and Grosskopf, W.G. 2007. Sand bypassing restores natural processes to Assateague Island National Seashore. In: Proceedings of Coastal Sediments '07, eds. N.C. Kraus and J.D. Rosati, ASCE, Reston, VA, pp. 1340-1353.