

**North End Restoration Project Annual Report: 2004**  
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## 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 2004 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 2004 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 North End Restoration Team met on January 13, 2004, to review the project’s original goals, construction status, and recent geomorphologic and biologic trends; to hear a presentation on overwash processes and modeling; and to assign specific tasks to each agency. The Team also chose borrow sites for the upcoming dredging cycle.

The Team met again on September 7, 2004, to share information on total bypassing and backpassing volumes, berm breaching models, topographic changes, and status of plover and amaranth monitoring. The Team also chose borrow sites for the upcoming dredging cycle.

## Dredging

Two rounds of dredging delivered an estimated total of 126,446 m<sup>3</sup> to ASIS. Bathymetry of the shoal was surveyed both before and after both rounds of dredging. Details of the dredging and survey 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) | Total (cubic meters) | Post-Dredging Survey |       |                      |
|---------------------|---------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------|----------------------------|-----------------------------|----------------------|----------------------|-------|----------------------|
|                     |                     |                                 |                                 |                                 |                            |                            |                             |                      | To ASIS              | To OC |                      |
| 1/13/04 to 1/24/04  | 1/30/04 to 4/1/04   | 49531                           |                                 |                                 | 13601                      |                            |                             | 63132                | 56352                | 4442  | 4/15/04 to 4/17/04   |
| 9/10/04 to 9/13/04  | 10/1/04 to 11/26/04 |                                 | 67197                           |                                 |                            | 5834                       |                             | 73031                | 70094                | 2554  | 12/02/04 to 12/04/04 |

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

## **Constructed Berm Alteration**

In October 2004, ASIS and USACE team members met to discuss the little to no overwash that has occurred since the berm was rebuilt in 2002 and the resulting unnatural changes in the ecosystem. Alterations to the constructed berm were deemed necessary to increase the potential that overwash during moderate storms will overtop the berm and stimulate habitat change needed to sustain use by piping plover. Three primary factors were considered in developing the proposed alterations: 1) the need to increase overwash frequency for the maintenance of desired habitat conditions; 2) the need for a conservative approach to avoid increasing the risk of breaching to an unacceptable level, and; 3) a desire to use the alterations to advance scientific understanding of overwash processes.

The meeting resulted in a proposal outlining the schedule, modifications, and monitoring of berm alterations. This proposal was then distributed to the entire North End Restoration Team for comments. Concerns and questions were addressed in November 2004, and the Team approved the final proposal to create six notches of lowered elevation in the berm. These documents are available in the park's Electronic Library. No physical modifications occurred in 2004.

## **Assateague State Park Modifications**

Between April 4 and July 30, 2004, Assateague State Park hauled 15,100 yd<sup>3</sup> of sand to the island in order to restore 1,200 feet of the maintained dune.

## **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:

- Overwash fan perimeters, March 11, 2004
- Sediment Bypassing borrow and placement locations, January 2004
- Sediment Bypassing borrow and placement locations, October 2004
- Sediment Bypassing sample grain sizes, October 2004
- Multibeam bathymetry survey of the inlet, nearshore, and ebb tidal delta, January 2004
- Multibeam bathymetry survey of the northern ebb tidal delta and part of the inlet, April 2004
- Multibeam bathymetry survey of the northern and eastern ebb tidal delta and part of the inlet, September 2004
- Multibeam bathymetry survey of the northern and eastern ebb tidal delta and part of the inlet, December 2004
- Beach and nearshore bathymetry profiles, November 2004
- Topographic profiles, April 2004
- Topographic profiles, September 2004
- Topographic profiles of Assateague State Park constructed dune (available from MD DNR)
- High water shoreline position, February 2004
- High water shoreline position, March 2004
- High water shoreline position, July 2004
- High water shoreline position, November 2004
- 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
- EAARL data, base and first return, August 2004
- Piping plover nest locations
- Delineation of vegetation line (related to piping plover mobility)

- Seabeach Amaranth locations
- North End vegetation communities
- State-listed rare plant species

### **Documentation and Data Synthesis**

Documentation and data synthesis of the North End Restoration efforts in 2004 were in the form of internal reports:

- Piping Plover Annual Report (NPS Internal Report summarizing plover reproductive success and distribution)
- Seabeach Amaranth Monitoring Report (NPS Internal Report)
- North End Seabeach Amaranth summary maps and graphs (NPS Internal Report)
- Meteorological Monitoring Program Annual Report (NPS Internal Report)
- Geomorphological Monitoring Program Annual Report (NPS Internal Report)