Broadkill Beach to Receive Storm Damage Reduction Project

Thanks to the collaborative efforts of the Department of Natural Resources and Environmental Control, the US Army Corps of Engineers and the community of Broadkill Beach, all of the real estate that was required in order to place 1.9 million cubic yards of sand on Broadkill Beach has been acquired. The sand will be moved from the bottom of the Delaware River/Bay as part of the Main Channel Deepening Project being conducted by the US Army Corps of Engineers. The placement of sand on Broadkill Beach is a beneficial reuse of the dredged material. However, the sand that will be placed in Broadkill is also the initial construction of a 50 year Storm Damage Reduction Project.

The project will create a beach and a dune system unlike any one seen in Broadkill Beach before. The dune will be 25 feet wide at the crest and at an elevation of 16 feet above mean sea level. The berm (dry beach) will be approximately 150 feet wide at an elevation of 8 feet above mean sea level. The project stretches the length of Broadkill from Alaska Avenue in the North Shores Section II subdivision to approximately where the last house is located before Beach Plum Island State Park.

The Delaware Department of Natural Resources and Environmental Control (DNREC) will be planting beach grass on the dunes, fencing the dunes and constructing dune crossovers in various areas throughout the dunes for pedestrian and limited vehicular access. Not only will the dunes provide much needed protection against coastal storms, but they will also provide habitat for beach critters and privacy to bayfront property owners.
Beneficial Reuse of Dredged Material Results in Marsh Restoration By Thin-Layer Spray Application

Delaware’s first foray into beneficial-reuse marsh restoration recently combined maintenance dredging and “thin-layer” spray application of dredge spoil material as a one-two punch for reinvigorating a faltering marsh on Pepper Creek in Dagsboro. The project – a collaborative effort with the Center for Inland Bays, spearheaded by DNREC’s Division of Watershed Stewardship and entailing many other department programs – involved extensive planning, environmental permitting and the customizing of equipment for the innovative dredging and thin-layer application.

The opportunity was ripe for a thin-layer beneficial-reuse restoration project at the 47-acre site within a state wildlife area on Piney Point in Sussex County. Upland dredge spoil disposal sites used in the past are filling up, and also can be costly to lease and maintain. The alternative of applying dredge material back onto tidal wetlands supplies wetlands with extra sediment that helps maintain surface elevations above rising sea levels. Wetlands also use the nutrients in the supplemental material to increase plant cover and surface stability. At Pepper Creek, thin-layer dredge disposal applied sediment in the form of silt slurry to the marsh surface by pumping dredge material through a specially-constructed pipeline and spray-nozzle system. Specialized equipment for the project – to transport the dredged material from the main barge in the navigation channel to the shoreline – included flexible piping and a pivoting nozzle mounted on a mini-barge that can be moved along the marsh edge and up channels to extend the reach of sprayed material.

The Shoreline & Waterway Management Section (SWMS) needed to explore alternatives for disposing of material from maintenance dredging. The SWMS has an in-house dredge crew that does many projects along our inland waterways. The Watershed Assessment Section has long been interested in the potential of thin-layer application for improving coastal wetlands. DNREC’s Division of Fish & Wildlife has a vested interest in preparing its wildlife areas for sea level rise by way of maintaining important coastal habitat. The Division of Water’s Wetlands and Subaqueous Lands Section was keen on researching the dredge and spray technique to support their permit reviews. Meanwhile, DNREC’s Delaware Coastal Programs lent support during planning and permitting phases, while the Center for Inland Bays was a major partner throughout the project. The CIB also supplied funding for a portion of the pipeline needed on Pepper Creek and continues to monitor aspects of it while helping with planning for future projects using the thin-layer technique.

DNREC’s research crew originally selected the thin-layer spray disposal site along Pepper Creek because it is adjacent to the dredging project and was deemed in need of restoration. Highly-sensitive equipment for measuring surface elevation found it to have lower elevation than other tidal wetlands in the Inland Bays, and therefore more vulnerable to rising sea levels. If tidal wetlands cannot accrete or accrete sediment quickly enough to keep pace with water levels, a marsh will eventually convert to open water. Coastal wetlands can also migrate inland slowly if the shoreline is unobstructed by manmade materials.

The silt slurry was sprayed on the marsh at approximately 3,000 gallons per minute. The slurry was composed of approximately 85-90 percent water with sediment particles suspended in the water. Part of the planning effort involved anticipating potential runoff and reduced water clarity. As a precaution, the team also installed sediment traps in the major wetland guts and ditches using hay bales and straw logs secured with wooden stakes. The traps allowed water to flow past during the tide cycles and did not cutoff fish passage, but caught and held sediment particles until they could settle out of the water column. Work on the project also adhered to state and federal permit conditions that called for avoiding negative impacts to fisheries and marsh dwelling species.

DNREC applied up to 6 inches of sediment to the large emergent wetland. With each tide cycle, the applied material dispersed across the marsh surface, leaving an even layer that will settle over the next few months. The areas of marsh where the work was conducted were monitored daily and found to be accreting uniformly at acceptable levels. Results gathered from the Pepper Creek project will be used to support similar projects in the future.
State Agencies Working Together to Protect Natural Resources and Public

A coastal grass planting effort capitalizing on Department of Correction’s VOP (violation of probation) laborers and privately-donated resources has helped DNREC’s Division of Watershed Stewardship bolster the north side of the Indian River Inlet against lost or displaced sand from future weather events.

A Sussex County farmer, William Wolter, Jr., donated several truckloads of established panic grass through DNREC’s Office of Community Services, and DOC Sussex Community Correction Center VOP laborers overseen by DNREC’s Shoreline & Waterway Management Section planted it at the Inlet earlier this spring. The VOP laborers also loaded the grass from Mr. Wolter’s Owens Station farm and hunting preserve near Greenwood and transported it to the planting site.

Panic grass is prime vegetation for stabilizing dunes—the back side of the dunes and has widespread use for coastal dune erosion control. Panic grass roots can grow six feet deep and its thick fibrous root system forms a barrier against erosion. As each plug of panic grass was planted on the west side of the dune at Indian River, it was supplemented with fertilizer donated by Perdue AgriRecycle LLC that helped establish the grass along the dune.

Perdue offered a ton of its microSTART60 Plus 7-2-2 fertilizer to the Shoreline & Waterway Management Section to get the panic grass growing as a windbreak and stabilizer along the inlet’s often-shifting sands. VOP laborers gave each plant hole a dose of granular fertilizer, then sprinkled additional fertilizer over it once the grass was planted.

The collaborative venture between Mr. Wolter, who grows panic grass for covering duck blinds, Dept. of Correction’s VOP program, and Perdue drew praise from the DNREC program manager who oversaw the planting. “A genuine example of citizens, the State and private industry working together to do something positive for the environment and help stabilize the sand north of the Inlet,” said Maria Sadler, DNREC Division of Watershed Stewardship environmental program manager for field operations.

Ms. Sadler noted that Dept. of Correction’s VOP program also helps with DNREC’s annual beach-grass planting along Delaware’s coastal beaches, an annual event which has planted more than 5 million stems of American beach grass over the last 24 years since it began in 1990.
Annual Beach Grass Planting Featured on Outdoors Delmarva

Outdoors Delmarva filmed a segment during the Annual Beach Grass Planting which was held on March 23, 2013. The segment aired on the June 15, 2013 broadcast. This year approximately 950 volunteers planted 150,000 2-stem planting units of Cape American Beach Grass (Ammophila breviligulata) along more than 3 miles of Delaware Bay and Atlantic Ocean coastline. The planting areas that were the focus consisted of Lewes Beach, North of the Indian River Inlet, South Bethany and at Battery 519 at Fort Miles in Cape Henlopen State Park.

Lewes Beach was recently renourished with sand through a truck haul project. 18,000 cubic yards of sand were placed on the beach and dunes from Oregon Avenue to Missouri Avenue. Beach grass was planted on the face of the dunes to stabilize them.

In Delaware Seashore State Park, from the Indian River Inlet Lifesaving Station to just north of the Indian River Inlet bridge, beach grass was planted to help rebuild the dunes that were breached during Superstorm Sandy. The beach grass will help trap windblown sand in this area, which will not only build the dunes, but also will keep the sand off of Route 1.

Hurricane Irene in August of 2011, took a toll on the dunes of South Bethany. Although Beach Nourishment by hydraulic dredge soon followed, the dunes were not quite ready for beach grass in time for the March 2012 planting. Superstorm Sandy spared most the repair work that occurred in the Spring of 2012, therefore volunteers were able to finish the job by planting beach grass this past March. A much needed 44,000 units of grass were planted there.

Located within the dunes of Cape Henlopen State Park is Battery 519. Battery 519 houses an extremely heavy 12-inch gun. After undergoing repairs to the leaking ceiling, installation of a geothermal heat pump system, an electrical repowering project and upgrades to the sewer system, areas above and around Battery 519 were in need of dune vegetation. Approximately 90 volunteers, consisting mostly of Boy Scouts, Girl Scouts and members of Ft. Miles Historical Association, were able to cover the bare areas with beach grass. This grass will help create immediate stabilization of the exposed sands, with hopes that in the near future other forms of native vegetation will grow and create a diversely vegetated dune.

Outdoors Delmarva met us in Delaware Seashore State Park and focused on groups of volunteers such as Dover High School, the Civil Air Patrol and the Delaware Mobile Surf-Fisherman, Inc. It is groups such as these that make the planting a success year after year. Outdoors Delmarva also stressed the importance of dunes. Beach grass helps to build and stabilize dunes by trapping windblown sand. As the grass traps the sand, it builds the dunes higher and wider, which makes dunes more protective of the structures behind them. Sand dunes are essential for protection against damaging coastal storms. When sand dunes are destroyed, storm waves can rush inland, flood properties and put lives at risk. Stabilized dunes absorb wave energy and act as major sand storage areas, which replenish sand to eroded beaches during a storm.

The Shoreline and Waterway Management Section would like to thank the many volunteers who came out on March 23, 2013 to plant Delaware's coastal dunes with Cape American Beach Grass. We would also like to thank for their support of the annual beach grass planting the Delaware Mobile Surf Fisherman, the Indian River Inlet Life Saving Station, the Children's Beach House, Pepsi Co., Masley Enterprises, Inc., Giant Foods, Safeway, Outdoors Delmarva and Delaware State Parks.
For Your Reference:

Beach Preservation Act
Title 7, Chapter 68

Regulations Governing Beach Protection and the Use of Beaches
http://www.dnrec.state.de.us/bechregs.htm

Link to Applications for Coastal Construction
Scroll to the bottom of the page for list of applications
http://www.swc.dnrec.delaware.gov/services/Pages/PermitsLicensesApprovals.aspx

FEMA’s National Flood Insurance Program
http://www.fema.gov/about/programs/nfip/index.shtm

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