Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island - Beneficial Use of Dredged Material

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Objectives:
• Location
• Background and Need
• Goals
• Habitat Restoration Goal Details
• Future
Project Location: Maryland
Mid-Chesapeake Bay
Project Beginnings: Vanishing Habitat & Need For Dredged Material Placement

- Approximately 10,500 acres of remote island habitat in the Chesapeake Bay has been lost in the last 150 years as a result of erosion and sea-level rise.

- The Port of Baltimore must maintain over 100 miles of shipping channels and place approximately 4 mcy of dredged material annually.

- Beneficial reuse of dredged material creates a win-win for the Port of Baltimore, the community, and the environment.
Project Beginnings: Poplar Island

- Poplar Island eroded to remnants totaling only about 4 acres by the early 1990s.
- 1994- Maryland Port Administration and the US Army Corps of Engineers developed plan to reconstruct Poplar Island with dredged material from navigational channels to approximate the footprint of the 1840s.
Project Goals of Poplar Island:

• Restore remote island habitat in the mid-Chesapeake Bay using clean dredged material from the Chesapeake Bay approach channels to the Port of Baltimore;
• Optimize site capacity for clean dredged material while meeting the environmental restoration purpose of the project; and
• Protect the surrounding environment
**Goal: Restore remote island habitat using clean dredged material**

- Create tidal marsh habitat for Chesapeake Bay fish and wildlife.
- Create bare or sparsely vegetated nesting islands for colonial waterbirds (i.e. terns).
- Create vegetated islands for other waterbirds (such as egrets and herons).
- Create upland habitat.
- Create a diversity of habitat types for fish and wildlife.
- Create quiescent condition for SAV recovery.
- Minimize and offset loss of benthic habitat.
Goal: Restore remote island habitat using clean dredged material.
Goal: Restoring remote island habitat using clean dredged material

- The Port of Baltimore maintains a 50-ft. deep shipping channel.
- Poplar Island has received approximately 24 mcy of material to date, creating 177 acres of wetland habitat.
- Wetland habitats at Poplar Island have become magnets for bird species of concern such as least and common terns.
- Nekton use the tidally influenced restored wetlands.
- Diamondback terrapins nest on sandy flats outside and inside restored wetland cells.
- To date over one hundred species of birds have been observed utilizing the site, and 27 species have been recorded as nesting.
Material dredged from the navigational channels is transported to Poplar Island aboard scows.

Material is then hydraulically unloaded in slurry form into the receiving cell.

After placement, material will be allowed to settle through dewatering, and trenches will be cut to channel water out of the cell.
Goal: Optimizing site capacity - Crust management

Volume In-Situ Before Dredging (85% Water)

Volume After Dredging (Clamshell) (87% Water)

Volume At Deposition in Placement Site (91% Water)

Volume In Site 2 Months After Placement (Decanting, Drying, Consolidation) (89% Water)

Volume After 12 Months in Site (Exceeds Length of Typical Drying Season) (82% Water)

Volume After 2 to 3 Years and 1 to 2 Additional Placement Lifts (75% Water)
Goal: Protecting the environment

- The Poplar Island Monitoring Framework established continued monitoring for the life of the project.
- Multiple agencies conduct monitoring programs.
- Adaptive Management techniques are used to address issues.
Restoring habitat with dredged material: Dike Construction

- Prior to being able to accept dredged material, a boundary must be placed around the footprint.
- Armorstone is used to create a permanent boundary, resistant to erosion.
- The current perimeter dike comprises about 40,000 feet (7.5 miles).
Restoring habitat with dredged material: Creating a variety of habitats

- To provide the greatest benefit for the most number of species, more than one type of habitat is being created.
- Low marsh comprises 80% of the wetland cells and benefits aquatic as well as terrestrial species.
- High marsh comprises 20% of the wetland cells and also provides habitat for many terrestrial species.
- Habitat islands in wetland cells provide nesting areas for colonial nesting birds.
- Hummocks to provide nesting areas for ducks as well as other species.
- Upland areas (out of tidal influence) provide habitat for tree nesting birds and many other bird species.
Restoring habitat with dredged material: Wetland cell development

- Alternating dredged material inflow and crust management occur for approximately 1 – 4 years into a cell.
- Wetland cell development planning occurs approximately 2 years with input from agencies.
- Earthwork, including channel excavation, marsh grading, and tidal inlet construction, occurs in year 5 of development.
- Vegetation is planted in the marshes in year 6 of development.
Cell 3A/C is the most recent cell undergoing final wetland design and development.

Lessons learned from previous cells are being applied: planting density, fence spacing, amendments, seeding, etc.

Cells will be interconnected and have two tidal exchanges.

Interior dikes will be modified to provide additional habitat.

Planting will occur over two years due to the large size of this cell.
Project Future: Poplar Island with Expansion

- Size: 1,715 acres
- Capacity: 68 mcy
- Cost: $1.4 billion
- Uplands: 840 acres
- Tidal marsh: 737 acres
- 80% low marsh/20% high marsh
- Open Water Embayment: 110 acres
- Poplar Island is expected to accept its final dredged material ~2029, and be completed by ~2041.
Questions?

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www.mpasafepassage.org

www.nab.usace.army.mil/Missions/Environmental/PoplarIsland.aspx