







USING DREDGED SEDIMENTS TO CREATE ELEVATED NESTING HABITATS FOR SPECIES OF CONCERN IN WETLAND AREAS

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High Tide Flooding (MHW)







Changing Practices



Seven Mile Island Innovation Laboratory (SMIIL)

- Multi-agency initiative to advance and improve dredging and marsh restoration techniques in coastal New Jersey
- Innovative research, collaboration, knowledge sharing, practical application, and adaptive management
- Back bay marsh dominated system with shallow bays, sounds and tidal inlets bisected by the NJ Intracoastal Waterway





NESTING HABITAT CLUSTERS



THE PROBLEM AND THE **OPPORTUNITY**

- Shoaled Portion of NJIWW
- Historic dredging projects in vicinity of shoals and repetitive dredging needs
- Sandy sediments

- **Ecologic Value**
 - Creates network of nesting sites for beach-nesting birds at different stages of succession
 - Separates populations for resiliency
 - Mimics historic distribution of colonial nesting birds
 - Reduces footprint of marsh disturbance
 - **Dredging Value**
 - Provides for repetitive placement cycles
 - Creates more volume utilization
 - Minimizes permitting and reduces costs

Ring Island Elevated Nesting Habitat Repetitive Placement

- Elevated Nesting Habitat (ENH)
 - ► Creation: Fall 2014 1 acre, 6000 cy
 - ► Maintenance: March 2018 1200 cy
 - ► 5.5' ecological goal (6.5' construction)
 - Sandy dredged materials
- Sandy Thin Layer Placement
 - ► 2 sites Fall 2014 0.9 acre 1000 cy







MONITORING EFFORTS

- Documented habitat usage, nesting success, nest site selection, and vegetation succession
- Strong species response to available nesting habitat
- Colony varied annually in composition and numbers

Nesting Occurrence on Ring Island ENH







RING ISLAND ENH: American Oystercatcher Nest Success

	No. pairs	No. nests	No. hatch (%)	Productivity [*]
2015	2	3	2 (67)	2.5
2016	1	2	1 (50)	2.0
2017	4	6	3 (50)	1.5
2018	3	3	3 (100)	0.7
2019	2	0	-	0.0
2020	2	3	2 (67)	1.0
TOTAL	14	17	11 (65)	1.2







Great Flats Elevated Nesting Habitat Cluster Addition

- Site selection considerations for 2nd habitat:
 - Pumping distance
 - Marsh platform stability
 - Proximity to existing high marsh area
- Located on prior placement site





- Creation: December 2018 1 acre, 6,000 cy
- ► Maintenance: January 2021
- ► 5.5' ecological goal (6.5' placement)
- Thin layer placement of mud on surrounding marsh platform



GREAT FLATS ENH MONITORING

Marsh platform had 0.1 -0.4' elevation gain(mud)

Nesting Habitat had 3-4' elevation gain © 2018 Google (sand)



1 pair AMOY

- ▶ 50% hatch success (2019 and 2020)
- ▶ 0 productivity in 2019, 1 chick fledged in 2020
- Great Black-backed Gulls nesting in prior placement area adjacent to ENH
 - ▶ 11 nests in 2019 (0% hatch success)
 - 2 nests in 2020 (100% hatch success)

 No other colonial nesters (terns, skimmers) confirmed on habitat

HABITAT MANAGEMENT CHALLENGES

- Movement and settling of dredged materials
- Succession of vegetation on habitats
 - Control methods: burning, hand pulling, concentrated salt solution spray
- Avian and mammalian predation/presence
 - ▶ Fox present on both ENH habitats in 2019 (not observed in 2020)
 - ▶ Fish crows abundant on Ring Island ENH in 2020
 - Roosting and nesting gulls on Great Flats ENH



Great Flats 10/2020

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Adaptive Management and Site Succession

- Vegetation cover limited site utilization by colonial nesting birds after three years (Ring Island)
 - 2-3 year dredging and ecosystem maintenance cycle
- Refurbish site with additional sand and remove vegetation or manage for colonial wading bird colonies?

DREDGE PLACEMENT CONSIDERATIONS

- Funding for monitoring and adaptive management to control vegetation and predators
 - Select sites where human disturbance can be managed (or avoided)
 - Consider proximity of access for mammalian predators
- Accessibility for dredge placement and monitoring
- Available sediment near proposed site
 - ▶ Grain size sand vs mud (%)
 - Does material meet ecological use standards?
- Understand benchmark elevations of ecological targets
 - ► Flood elevation
 - Vegetation occurrence
- Containment or repetitive placement cycles may be needed to build elevation over small areas

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 - ➢ NJ DEP
 - > USACE

OTHER BENEFICIAL USE PROJECTS

- Marsh island elevation enhancement, marsh edge protection, tidal flat enhancement, and intertidal shallows
 - Gull Island
 - Sturgeon Island
- Marsh elevation enhancement and thin layer placement
 - ► Ring Island
 - Avalon marsh

