RESTORATION

BENEFICIAL USE OF DREDGE MATERIAL COASTAL RESTORATION CASE STUDY

Hickory Cove Marsh Restoration and Living Shoreline

Partners

- U.S. Army Corps of Engineers (USACE) Galveston District (SWG)
- Ducks Unlimited—submitted 1122 proposal, technical assistance
- Orange County Navigation and Port District, non-federal sponsor
- Hawk Club, landowner

Key Information

PROJECT LOCATION
Bridge City, TX

HABITAT	LANDSCAPE	PROJECT SIZE
Marsh	Inland open water habitat	190ac

USACE DISTRICT
Galveston District

PROJECT WEBSITE
https://www.swg.usace.army.mil/Business-With-Us/Planning-Environmental-Branch/Documents-for-Public-Review/

PROJECT STATUS
Planning phase

ABSTRACT

Galveston District secured Water Resource Development Act (WRDA) 2016 Sec. 1122 pilot project funding to beneficially reuse post-Hurricane Harvey shoaled sediment in the Sabine Neches Waterway (SNWW) to restore the erosion-degraded Hickory Cove Marsh of Bridge City, TX.

Approximately 3.5 million cubic yards of material dredged from the SNWW will be hydraulically pumped to add ~1.2 ft of elevation to approximately 670 acres of emergent marsh, using training dikes and native vegetation plantings. Placement of material would occur over three phases as funding and sediment material becomes available (1.3mcy; 2.2mcy; 2.2mcy). The existing containment levee would be repaired to 5.0 feet and slopes restored to 3:1. Approximately 2.8mi of 3.5ft breakwater will be constructed parallel to the SNMM and a 95ac living shoreline will be planted between the containment levee and breakwater.

One of ten pilots out of 95 submissions approved in the first 1122 tranche. The project brings together the Corps, the Orange County Navigation and Port District (non-federal sponsor), Ducks Unlimited (which developed the proposal and provides technical assistance), and the Hawk Club (landowner). Project plans were prepared in compliance with Continuing Authorities Program Sec. 204. The project will provide habitat, erosion stabilization, recreational, and hazard mitigation benefits; cultivate institutional experience in aligning dredging and marsh restoration needs and schedules over multiple dredging cycles; demonstrate BUDM efficiency, cost savings, and multiple benefits; and trailblaze additional BUDM opportunities along the waterway.

PROJECT GOALS

- protect and preserve nesting, roosting, and foraging habitat
- floodplain capacity
- erosion control/ shoreline stabilization
- water quality/ water filtration
- recreation amenity

Focal Species

Grass/ marsh nesting waterbirds

Additional Species

Central and Mississippi Flyway waterfowl species; no critical habitat; Essential Fish Habitat (EFH) for postlarval, juvenile, and subadult life stages of white shrimp, brown shrimp, and red drum

Data sources and decision support tools used

Ducks Unlimited General Marsh Model

PARTNERSHIP DEVELOPMENT AND MAINTENANCE

The local partners saw the 1122 program as an opportunity to remedy a habitat area along the channel within the navigation district's area of responsibility and develop BUDM experience/precedent in the area. The district sought to cultivate a safe/effective disposal option for a channel missing confined disposal facility capacity and improve coordination with partners.

Partner Contact: Melinda Fisher, USACE: melinda.fisher@usace.army.mil

Restoration Outcomes and Lessons Learned

Project is underway.

LESSONS LEARNED

- The 1122 pilot program incentivized partners to come together to propose a pilot that would prove cost savings for linking sediment supply from regular / backlogged maintenance dredging with nearby restoration priority areas.
- Because the pilot would involve dredging only a subset of a shoaled channel, the District determined that dredging to authorized depth (without restoring the full channel to authorized depth) was not a cost in the federal interest and therefore did not benefit from the 100% federal cost share incentive at the core of the 1122 program. Likewise, the breakwater was not considered eligible for 1122's cost share.
- The proposal envisioned placement on a privately held wildlife protected area along a channel within the port authority's responsibility. The property owner and port authority were both on the initial proposal partnership. USACE placement on private land requires an easement which may require more extensive negotiation and planning, extending the timeline.
- A typical consequence of planning or implementation delay is rising costs relative to earlier estimates.
- Despite designation as a pilot, the project design was still completed to meet CAP 204 requirements.

PLANNING	
Overall cost	Project is underway; final costs not available.
Cost summary	• Dredging and marsh construction: $7.7 million ($7.1 million fed; $600 thousand Non-Federal Sponsor) • Breakwater: $19.5 million ($12.7 million fed; $6.83 million), excludes management costs • Living shoreline: $2.6 million ($1.7 million fed; $875 thousand Non-Federal Sponsor), excludes management costs
Link to USACE dredge project	US Army Corps of Engineers
Beneficial use	Yes – 1122 pilot project
Funding source types	Federal, local government
Funding source priorities	The project was selected to align with the goals of the 1122 pilot program. Project design was prepared to comply with Continuing Authorities Program Sec. 204 to ensure USACE requirements were met.
Low cost / no cost alternative to USACE	No
Federal Standard	• After comparing the cost of placement in existing designated placement areas to the Hickory Cove Marsh placement alternatives, it was determined that placement at Hickory Cove Marsh is the lowest cost alternative and designated to be the Federal Standard. Existing upland confined disposal facilities require improvements to receive the material, and the dredge pipeline distance to the placement area site would be 3 mi, greater than the 2mi to Hickory Cove Marsh. • SWG determined that dredging to the authorized channel depth is not in the best interest of the government because upstream channels would remain depth-limited. On the basis that the 1122 program provides for 100% cost share only of dredging found to be in the federal interest, dredging costs are to be cost shared at the regular 65/35 CAP 204 rate.
Cost share partner	The non-federal sponsor, the Orange County Navigation and Port District, has confirmed its ability to cost share the effort.
Cost estimate strategy	The cost applicable to dredging and transportation under the 1122 program is distinct from the cost share for marsh construction, living shoreline, plantings, and breakwater. Costs for each component were estimated for three dredging depth alternatives.
Alternate sediment relocation if BUDM project hadn't happened	Upland disposal
Placement coordination mechanism	• 2017 Texas General Land Office Coastal Resiliency Plan – priority area/ strategy • Ducks Unlimited General Marsh Model (2013) – high/medium priority shoreline protection candidate
Data to support necessity of project	The Ducks Unlimited General Marsh Model documented historic and anticipated future habitat loss from shoreline erosion.
Pilot project	Yes
Project championed by	Ducks Unlimited developed the 1122 pilot proposal submission in collaboration with the district, non-federal sponsor (Orange County Navigation and Port District), and landowner (Hawk Club).
Public outreach/education efforts	None
Public perception challenges	None

PERMITS	
Required permits	US Fish and Wildlife Service, and National Oceanic and Atmospheric Administration, National Marine Fisheries Service (Endangered Species Act, Marine Species Act); USACE 404, Rivers & Harbors; State Water Quality Standards (401); Federal Consistency
Responsible party	USACE SWG ensured compliance with relevant requirements.
Adaptive management considerations	Standard USACE adaptive management planning requirements.
Policy incentives and regulatory barriers	The 1122 program incentivized partners to come together to propose a new approach to BUDM to serve as a model that can be replicated at other dredge sites in the region.
Impact on design or implementation	Relevant avoidance, minimization, and mitigation measures are incorporated into Appx. A of the Integrated Feasibility Report / Environmental Assessment.

DESIGN/CONSTRUCTION ELEMENTS	
Lifespan of project	50 years
Materials used	mud/clay, rock, vegetation plantings, geotextile fabric (breakwater)
Volume of material used	Up to 1.35mcy
Sediment volume and composition sufficient or augmented	NA
Key design elements	Restore marsh to a target elevation for vegetation establishment utilizing dredged material. Restore an existing containment dike and restore marsh habitat. Construct a detached breakwater to armor the shoreline along the Sabine River to reduce erosion of sediment and ensure marsh sustainability. Develop a living shoreline composed of additional sediment and vegetation between the containment dike and the breakwater to produce additional habitat.
Containment actions	An existing containment dike will be restored. Training dikes will be used as needed.
Protective measures	A breakwater and living shoreline will be developed to minimize erosion. Typical best management practices were accounted for in the impact analysis.
Equipment required	Cutterhead dredges, pipelines (submerged, floating, and land) and one booster pump. Bulldozers, front-end loaders, track-hoes, marshbuggies, track-hoes, and/or backhoes. Barge; crane or hopper barge. Crew and work boats, trucks, trailers, construction trailers, all-terrain vehicles, floating docks, and temporary access channels.
Distance material was transported	2mi
Method of sediment suitability assessment	The project relied on past sediment suitability assessments conducted for Sabine Neches Waterway maintenance dredging. Material placed into the marsh and on the existing containment levee would have similar properties to the existing native material.

MAINTENANCE AND MONITORING	
Ongoing maintenance	None (anticipated)
Monitoring provided by	USACE
Monitoring funding	Yes – standard USACE WRDA 2007 sec. 2039 monitoring.
Monitoring details	10 yrs environmental monitoring per WRDA 2007 sec. 2039 (as amended by WRDA 2016 sec. 1161)
Monitoring protocol	Required per WRDA 2007 sec. 2039.

Design/Planning Reports

- **Draft Integrated Feasibility Report and Environmental Assessment (EIFR/EA)** (https://www.swg.usace.army.mil/Business-With-Us/Planning-Environmental-Branch/Documents-for-Public-Review/)
- **1122 proposa**l (https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll5/id/35507)

THIS PUBLICATION WAS MADE POSSIBLE BY:

- A grant from Wildlife Conservation Society through its Climate Adaptation Fund. The Climate Adaptation Fund was provided by a grant to the Wildlife Conservation Society from the Doris Duke Charitable Foundation.
- A grant from the National Fish and Wildlife Foundation, with support from National Oceanic and Atmospheric Administration.

ACKNOWLEDGEMENTS:
This factsheet was produced by Manomet Conservation Sciences, in partnership with Coastal States Organization. We would like to thank the many interviewees and State Coastal Zone Management staff who contributed content or reviewed earlier drafts of this document.

CONTACT

MIKE MOLNAR
Director, Coastal Zone Initiative
mmolnar@manomet.org
508. 434.6364

Rev 042825