

**RESTORE Act Bucket 2 Round 1 November 2014
Council Member Proposal – State of Texas
Beneficial Use of Dredged Material
Project Design Fund Phase I**

(1) SUMMARY SHEET

Appendix A: Council Member Applicant and Proposal Information Summary Sheet

<p>Commissioner Toby Baker Texas Commission on Environmental Quality Council Member: MC 100 P.O Box 13087 Austin, TX 78711-3087</p>	<p>Point of Contact: Jane Sarosdy, Texas General Land Office Phone: (512) 475-3786 Email: jane.sarosdy@glo.texas.gov</p>
Project Identification	
Project Title: Texas Beneficial Use of Dredge Material Project Design Fund Phase I Project	
State(s): Texas	County/City/Region: Jefferson County & Harris County, Texas
General Location: <i>Projects must be located within the Gulf Coast Region as defined in RESTORE Act. (attach map or photos, if applicable)</i> Professional services for engineering and design, wherever they occur, will substantially benefit projects within the Gulf Coast Region. See maps.	
Project Description	
RESTORE Goals: <i>Identify all RESTORE Act goals this project supports. Place a P for Primary Goal, and S for secondary goals.</i>	
<input checked="" type="checkbox"/> Restore and Conserve Habitat <input checked="" type="checkbox"/> Restore Water Quality <input type="checkbox"/> Restore and Revitalize the Gulf Economy	<input checked="" type="checkbox"/> Replenish and Protect Living Coastal and Marine Resources <input checked="" type="checkbox"/> Enhance Community Resilience
RESTORE Objectives: <i>Identify all RESTORE Act objectives this project supports. Place a P for Primary Objective, and S for secondary objectives.</i>	
<input checked="" type="checkbox"/> Restore, Enhance, and Protect Habitats <input checked="" type="checkbox"/> Restore, Improve, and Protect Water Resources <input checked="" type="checkbox"/> Protect and Restore Living Coastal and Marine Resources <input checked="" type="checkbox"/> Restore and Enhance Natural Processes and Shorelines	<input checked="" type="checkbox"/> Promote Community Resilience <input type="checkbox"/> Promote Natural Resource Stewardship and Environmental Education <input type="checkbox"/> Improve Science-Based Decision-Making Processes
RESTORE Priorities: <i>Identify all RESTORE Act priorities that this project supports.</i>	
<input checked="" type="checkbox"/> Priority 1: Projects that are projected to make the greatest contribution <input type="checkbox"/> Priority 2: Large-scale projects and programs that are projected to substantially contribute to restoring <input checked="" type="checkbox"/> Priority 3: Projects contained in existing Gulf Coast State comprehensive plans for the restoration ... <input checked="" type="checkbox"/> Priority 4: Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries ...	
RESTORE Commitments: <i>Identify all RESTORE Comprehensive Plan commitments that this project supports.</i>	
<input checked="" type="checkbox"/> Commitment to Science-based Decision Making <input checked="" type="checkbox"/> Commitment to Regional Ecosystem-based Approach to Restoration <input checked="" type="checkbox"/> Commitment to Engagement, Inclusion, and Transparency <input checked="" type="checkbox"/> Commitment to Leverage Resources and Partnerships <input checked="" type="checkbox"/> Commitment to Delivering Results and Measuring Impacts	
RESTORE Proposal Type and Phases: <i>Please identify which type and phase best suits this proposal.</i>	
<input checked="" type="checkbox"/> Project <input checked="" type="checkbox"/> Planning <input type="checkbox"/> Technical Assistance <input type="checkbox"/> Implementation <input type="checkbox"/> Program	
Project Cost and Duration	
Project Cost Estimate:	Project Timing Estimate:
Total : \$968,000	\$ 968,000
	Date Anticipated to Start: 6 / 15
	Time to Completion: 18 months / years
	Anticipated Project Lifespan: 3 years

(2) EXECUTIVE SUMMARY

Over the past two decades, erosion on the Texas Gulf coast has been rapid and ravaging. Mean sea level rise, subsidence, development, lack of natural sediment supplies, and coastal storm damage have all played a part in the process. This erosion has caused alarming land loss as well as degradation of naturally occurring wetlands. The beneficial use of dredged material (BUDM) to transform open water areas into shallow coastal wetlands has proven to be a highly effective method of restoring and creating habitat for fish and wildlife, improving water quality and increasing needed storm buffers. Moreover, sediment used for habitat restoration remains in the active sediment system, tempering erosion and retaining fast land.

Dredged materials are plentiful because of the need to maintain basins and channels for navigation, and the U.S. Army Corps of Engineers (USACE) actively supports beneficial use projects whenever feasible. But the proper placement of dredged materials to restore or create viable wetland habitat is a challenging engineering task. It requires advance planning through careful site selection, preparation of engineering and design plans, environmental compliance, and permitting. Texas natural resource managers have selected a number of sites favorable for BUDM projects. While the USACE and other dredgers are ready and willing to contribute materials, project proponents often lack funding for project design and for the higher cost of beneficial use over traditional disposal methods.

This project addresses goals, objectives, priority criteria, and commitments identified in the Comprehensive Plan of the RESTORE Council and RESTORE Act. The primary goal addressed by this project is to create shovel ready BUDM projects to restore and conserve habitat, and the primary objective of the shovel-ready BUDM projects is to restore, enhance, and protect habitats. Upon ultimate construction and planting with native marsh vegetation, the individual projects will make significant contributions to restoring the natural resources, ecosystems, fisheries, marine and wildlife habitats, and coastal wetlands of the Gulf Coast region. The BUDM projects will also restore long-term resiliency of the natural resources, ecosystem fisheries, marine and wildlife habitats, and coastal wetlands of the type most impacted by the Deepwater Horizon oil spill. The projects are ideally suited for the selected focal project areas of habitat and water quality for this round of Comprehensive Plan funding.

Texas proposes the BUDM Project Design Phase I to provide funding for advance planning for three proposed BUDM projects: (1) Marsh Restoration in the Nelda Stark Unit of TPWD's Lower Neches Wildlife Management Area (WMA) within the Sabine Lake-Neches River Watershed; (2) Marsh Restoration in the Salt Bayou Unit of the J.D. Murphree WMA in the Salt Bayou Watershed; and (3) Marsh Restoration in Pierce Marsh on West Bay in the Galveston Bay Estuary. Texas has a history of successful BUDM projects. Cooperative agreements among Texas natural resource agencies and the USACE are in place through the Texas Coastal Management Program. Good working relationships exist between those agencies, federal natural resource agencies, local governments and the nongovernmental organization (NGO) community. Attached are letters of recommendation from Jefferson County Judge Branick, the General Land Office, and Ducks Unlimited. The funding of project design to generate shovel-ready

projects will greatly enhance the ongoing shared goal of a thriving and resilient Gulf coastal shoreline.

Implementation information

Concepts for the three individual projects have been completed by resource managers. Preliminary work, design and engineering by experienced coastal engineering firms should take 6-8 months. During the development of project design features, individual project managers and coastal engineers will coordinate with the state and federal natural resource agencies to ensure that all design features comply with statutory obligations. When engineering and design is complete, project managers will pursue required permitting, which can take an additional 3-12 months, depending on the type of permitting required. It is anticipated that engineering, design and permitting for the three individual projects should be completed by 12-24 months from the date that project design funding becomes available.

Monitoring and measures of success of the project

Monitoring and measures of project performance will be applicable to the wetland construction that will follow the completion of the planning phase. Construction funding will be sought for these individual projects from this and other potential sources of funding. Project proponents will monitor the design and permitting activities to ensure that the planning activities are progressing in a satisfactory manner. The measure of success of a project design will be the successful completion of environmental compliance, permitting, and final budget development.

Uncertainties and risks associated with the project

Project design uncertainties are closely akin to project construction uncertainties. Planners must account for the risk of unknown future events that may affect the feasibility and efficacy of the marsh construction itself. There are always uncertainties in the using dredged materials to support habitats because of potential variations in dredged material composition. The length of time it takes for sediment to become suitable for a particular marsh application is sometimes hard to predict. Tropical weather events can also adversely affect the completion of a BUDM project. The planners for these individual projects will need to take these uncertainties into account in preparing the required plans and obtaining the necessary permits

(3) PROJECT NARRATIVE

1. Proposal introduction & background.

The Texas BUDM Project Design Fund Phase I will provide project design funding for planning, which includes preliminary topographic and bathymetric surveys, engineering, design, permitting, and budget development for individual projects. The goal is to move each project to a shovel-ready state. Working with coastal professionals, proponents will design projects that beneficially use dredged materials to restore elevations within individual project areas to those suitable to support emergent marsh vegetation. Potential sources of suitable dredged material will also be identified.

The individual projects are located at the Bessie Heights Marsh in the Lower Neches WMA in the Sabine Lake-Neches River Watershed, the Salt Bayou Unit of the Salt

Bayou Watershed in the J.D. Murphree WMA, and Pierce Marsh in West Bay in the Galveston Bay Estuary. These three wetland restoration projects have been contemplated by Texas natural resource agencies for years. Although dredged material is readily available on the Texas coast, these BUDM projects have been hampered by the lack of funding for project design. Making these three projects shovel ready will greatly improve the chances of funding construction.

Marshes maintain the productivity of coastal ecosystems. They provide wildlife with nutrition and refuge from predators. Marsh wetlands can trap, precipitate, transform, recycle, and export waterborne sediments, nutrients, trace metals, and organic waste, and improve the quality of water leaving the marsh (Mitsch and Gosselink, 1993). Marshes are also effective at decreasing storm surge impacts. The USACE has estimated that each 2.7 miles of emergent marsh present along the Gulf Coast can reduce storm surge by one foot, although an accurate prediction of storm hazard reduction requires analysis of factors such as landscape position, storm intensity, storm track, storm speed, slope from sea floor to coastal marshes, bottom friction, and marsh conditions (Resio and Westerink, 2008).

Undoubtedly, wetlands are a valuable benefit to Gulf coastal ecosystems. But those ecosystems are increasingly threatened by human activities, such as coastal development, oil and gas exploration, marine transportation, and interruption of sediment cycles, as well as natural events, such as mean sea level rise, subsidence, catastrophic weather events and high tides. These events and processes have taken a heavy toll on ecosystem resources through erosion and land loss. Particularly troubling is the disappearance of saline, estuarine and freshwater marshes, which provide essential ecosystem services and vital buffers to flooding and storm hazards for communities (USACE 2013). The conversion of coastal wetlands to open water has been quite significant. Texas has lost 52 percent of its original wetland base (Mitsch and Gosselink, 1993). The Texas coastal plain experienced a loss of approximately 200,000 acres of wetlands between the mid-1950s and the early 1990s (from 4.1 million acres to 3.9 million acres). This loss equates to an average annual net loss of about 5,700 acres (Moulton et al., 1997). Of 3.9 million acres remaining in the early 1990s, about 85 percent were freshwater wetlands (3.3 million acres) and about 15 percent were estuarine wetlands (0.6 million acres) (USEPA 2007). The rate of land loss since the 1990s has increased rapidly (Paine et al. 2013). Slowing land loss and restoring wetlands are primary goals of recent efforts to improve the health of the Gulf. Achieving those goals will protect and conserve the natural ecosystem and enhance natural and community resilience to coastal hazards.

An aggravating factor in detrimental coastal erosion and land loss is removal of sediment from the coastal sediment budget. Sediment is generally delivered by rivers that flow into the Gulf. The damming and placing of levees on these rivers is the primary cause of this sediment budget deficit. The confinement of dredged materials to placement areas also removes valuable sediment from the system (GOMA 2012). The beneficial use of dredged sediments to increase elevation and create shallow marsh habitat greatly enhances natural sediment exchanges that create a more stable shoreline and temper land degradation.

The beneficial use of dredged materials for marsh restoration, fast land creation, beach nourishment, and shoreline protection returns valuable sediment to the system. Several

recent efforts to address Gulfwide issues have recommended a sediment management approach to address land loss (Mabus 2010). The Gulf Ecosystem Restoration Task Force recommended the maximization of BUDM from dredging navigational channels for effective and sustainable habitat resources (GCERTF 2011).

The goal of regional sediment management is shared by all five Gulf coast states, numerous federal agencies and nongovernmental organizations. Each additional designed project creates valuable data that can be shared with the public to increase knowledge about sediment transport rates and magnitudes. Texas is working towards a regional sediment management approach with the USACE and other stakeholders. The project design funded by this project will move these efforts closer to fruition.

The following narratives describe the three BUDM projects for which project design funding is requested:

(a) Marsh Restoration in the Nelda Stark Unit on the Lower Neches Wildlife Management Area

The Sabine and Neches Rivers, both of which flow hundreds of miles through East and North Central Texas, flow into the Sabine Lake complex, a rich and productive collection of rivers, bays, estuaries and marshes on the Texas-Louisiana border. The smallest of the seven major estuaries on the Texas Coast, the Sabine Lake complex receives more freshwater inflows and rainfall than any other bay system. Subsidence, mean sea level rise, and shoreline hardening have converted acres of its productive wetlands into shallow open water. Its once pristine marshes, bayous, and bays are now crisscrossed with ship channels, canals and pipelines. The watershed is bisected by the Gulf Intracoastal Waterway (GIWW), whose high banks cut off freshwater sheet flow that formerly maintained freshwater and brackish marshes to its south. These changes to its coastal landscape have exposed the Sabine-Neches Watershed to powerful current inflows from the Gulf. During certain times of the year, salt water runs for miles up the Sabine and Neches rivers, which flow into the north end of the estuary. These processes have significantly degraded and destroyed wetlands.

The 7,998-acre Lower Neches WMA is located between Sabine Lake and the Neches River, southwest of Bridge City in Orange County. Part of the Texas Chenier Plain and the westernmost geologic delta of the Mississippi River, its freshwater marshes, low level coastal plains, rivers, bayous, and shoreline provide an environment ideal to many migratory birds on the Central Flyway and a home for thousands of native and wintering waterfowl.

The Bessie Heights Marsh, located in the Nelda Stark Unit of the Lower Neches WMA, was once a richly vegetated freshwater marsh. Before industrialization, the marsh consisted of approximately 17,000 acres of emergent wetland plants dominated by Jamaican sawgrass (White et al. 1987) with small ponds scattered throughout. Canals were dredged into the marsh during development of the Bessie Heights oil field beginning in the 1930s. Until Hurricane Carla in 1962, the canal levees were effective in containing saline waters from the Sabine Neches Ship Channel and thus preventing marsh loss from salt water stress. After Hurricane Carla, the levees failed and the emergent marsh quickly converted to open water (White et al. 1987).

TPWD acquired the Nelda Stark Unit in 1987, after nearly complete conversion to open water had occurred. As part of its mission to provide wildlife habitat, TPWD has committed to restoring marsh within the Nelda Stark Unit using the technique of BUDM. TPWD, the Sabine Neches Navigation District, and USACE conducted a beneficial use project completed in 2005 in the area that has shown good development of wildlife and fisheries habitat, but encompasses only 75 acres. The USACE and regulatory permit review agencies are strongly encouraging applicants for dredging permits to beneficially use the material to create or enhance coastal marshes. These applicants are potential partners in TPWD's efforts to restore marshes within the Nelda Stark Unit, but are prevented from doing beneficial use work by the lack of funding for design, engineering, and permitting. By conducting needed program design work, TPWD can provide benefits to the coastal environment, fish and wildlife communities, local industries and communities, and recreational users of these resources.

The proposed project is for completing topo-bathymetric and magnetometer surveys, designing and engineering, and permitting for construction of the a containment system for consolidation of dredged material for approximately 1,000 acres in Bessie Heights Marsh. The proposed project would fund the engineering of levees and terraces that will contain beneficial use material from small projects and create a range of elevations that provide wetland habitat types that vary from shallow open water and submersed aquatic vegetation to high marsh. By completing the levees and terraces in advance of beneficial use projects, benefits are realized with the increase in edge habitat. Several studies have documented that edge created by terraces benefits fish and shellfish (Rozas and Minello 2001) and nekton (Merino et al. 2010; Rozas and Minello 2007) as compared to open water habitats.

During the time from vegetating of these features to placement of beneficial use material, the levees and terraces will provide edge habitats. Once these areas receive beneficial use material, the benefits to fish and wildlife will change in nature. Restored marsh provides habitat used by fish and wildlife (Craft et al. 1999; Madrid et al. 2012; Minello and Zimmerman 1992; Minello et al. 1994). While restored marsh provides similar structure, productivity, and habitats for wildlife as natural marsh (Craft et al. 1999; Madrid et al. 2012), there are differences that may not make them a one-to-one replacement for natural marsh (Delaney et al. 2000; Fennessy et al. 2008; Madrid et al. 2012). With careful design and placement of dredge material during beneficial use activities, the apparent loss of edge from putting dredge material within the terraces and levees can be offset by providing features (channels, tidally connected ponds) within expanses of restored marsh that provide edge habitat and benefit aquatic organisms (Minello et al. 1994).

A bathymetric survey on the proposed 1,002-acre project area is needed. The survey will be conducted from an airboat or outboard, as appropriate, using GPS surveying equipment with centimeter or sub-centimeter accuracy. During this survey, the elevations of the existing bottom within the boundary of the Nelda Stark Unit designated for restoration will be recorded on a 300-foot by 300-foot grid across accessible portions of the site. This spacing is considered sufficient by engineers to determine an accurate topography/bathymetry in the upper coast. Areas with limited access or suitability for marsh restoration, such as actively producing oil fields or debris fields posing hazards to

safe navigation and restoration activity, would be excluded from the survey. Existing levees and channels will be surveyed to obtain an accurate cross section so that proper engineering can be done to incorporate or work around these features. A magnetometer survey will be conducted across the project area to locate potential impediments to restoration work and allow engineering around those impediments. Such impediments include, but are not limited to, archeological sites, buried pipelines, submerged debris, abandoned wellheads, and debris from previous storms.

Once the surveying is complete, engineers will work to develop plans for the series of levees and terraces that will act as the dividers within the site for making smaller beneficial use sites. Engineers also will calculate the capacities of the areas defined by the terraces so that planning for placement of dredge materials can occur as projects become available. The acres of impact and volumes of dredge or fill material used in the project are required by the USACE in the permit application in sufficient detail for the USACE and other agencies which review Section 404 applications to determine what the total impacts will be.

TPWD will apply for an individual permit with the USACE to cover the construction of the terraces and levees and placement of beneficial use material. Because of its unusual nature, TPWD may need to work with the USACE Regulatory Branch frequently before making formal application so that the USACE and reviewing agencies understand the intents and purposes of the entire project before they begin review of the application and send it out for public comments. The pre-submittal coordination will likely streamline the application process overall. The pre-submittal consultations can occur concurrent with the surveying and engineering for the project. The length of time needed to complete the pre-submittal consultations is unknown. For this reason, the estimated time needed to obtain a permit may be 12 months.

(b) Marsh Restoration within the Salt Bayou Watershed on the J. D. Murphree Wildlife Management Area

Located west of Sabine Lake in Jefferson County on the Texas upper coast is the Salt Bayou Watershed. It contains the largest contiguous estuarine marsh complex in Texas, covering approximately 139,000 acres in the Texas Chenier Plain, the westernmost geologic delta of the Mississippi River, which extends from Vermillion Bay, Louisiana, to Galveston Bay, Texas. The Salt Bayou ecosystem includes freshwater to estuarine marsh, coastal prairie grasslands, tidal flats, creeks and basins and associated aquatic vegetation. It is widely recognized for its fishing, hunting, and wildlife viewing opportunities, fisheries productivity and wintering and migratory bird habitat (TPWD 2013).

The Salt Bayou Watershed area is suffering from substantial shoreline erosion and retreat, resulting in land loss comparable to that of coastal Louisiana. Hurricanes Rita and Ike severely degraded the historic barrier/beach dune system on the area's shoreline at both the Texas Point and McFaddin National Wildlife Refuges (NWR) (USFWS 2008). On average, the shoreline in Jefferson County has been retreating 9.2 ft/year and land loss rates have averaged 35.7 acres/year (Paine et al. 2012).

These events and processes have lowered the resiliency of the Salt Bayou Watershed, making it more vulnerable to assaults such as extreme weather and frequent overwash

from the Gulf of Mexico. Hurricane Ike, which made landfall approximately 65 miles to the southwest, resulted in land loss of 14.8 km² (5.7 mi²) (Barras et al. 2010). A year-long drought of record in 2011 resulted in a lack of freshwater inflows and rainfall that exacerbated salinity levels throughout the area. These conditions have resulted in plant death and loss of organic soils to shallow open water.

The J. D. Murphree WMA is a 24,250-acre tract of fresh, intermediate and brackish water marsh located in the northeast region of Salt Bayou Watershed area. The WMA is managed by TPWD as wetland habitat with a special emphasis on migratory waterfowl habitat. The GIWW divides the Salt Bayou Watershed into two units -- the northern Big Hill Unit consisting of 8,900 acres of fresh to intermediate marsh, and the southern Salt Bayou Unit, which is comprised of approximately 15,300 acres of brackish to salt marsh.

Hurricane Ike converted over 800 acres of emergent marsh into open water by scouring vegetation from the marsh within the Salt Bayou Unit. The storm damage exacerbated the ongoing land degradation in the Salt Bayou. Local authorities and state and federal natural resource agencies have recognized the vital importance of maintaining the marshes in the Salt Bayou area in the face of these challenges. These stakeholders collaborated to create the Salt Bayou Watershed Restoration Plan (TPWD 2013). One of the recommendations of the Salt Bayou Plan is to beneficially use dredge material to restore elevation to eroding marsh in the Salt Bayou Unit. Through 2014, approximately 2,300 acres of marsh within the WMA have been enhanced or restored using dredged materials.

This project would provide funding for project design to facilitate additional BUDM marsh restoration within the Salt Bayou Unit. The project proponent TPWD will plan projects to restore marsh elevations using dredged soils from nearby commercial sources along the Sabine Neches Waterway. Initial survey work is needed to determine soil placement capacities for the Salt Bayou Unit Compartments 13 (1,072 acres), 16 (3,814 acres), 17, (2,133 acres) and 18 (1,832 acres) for the approximate total area of 8,442 acres. A bathymetric survey is needed. The survey will be conducted from an airboat or outboard, as appropriate, using GPS surveying equipment with centimeter or sub-centimeter accuracy. During this survey, the elevations of the existing bottom within the boundary of the Salt Bayou Unit designated for restoration will be recorded on a 300-foot by 300-foot grid across accessible portions of the site. This spacing is considered sufficient by engineers to determine an accurate topography/bathymetry in the upper coast. Areas with limited access or suitability for marsh restoration, such as actively producing oil fields or debris fields posing hazards to safe navigation and restoration activity, would be excluded from the survey. Existing levees and channels will be surveyed to obtain an accurate cross section so that proper engineering can be done to incorporate or work around these features.

Once the surveying is complete, engineers will work to develop plans for the placement of BUDM, including required depths of material to reach target elevations and any levees or canal plugs needed to contain the material within the permitted site. The acres of impact and volumes of dredge or fill material used in the project are required by the USACE in the permit application in sufficient detail for the USACE and other agencies which review Section 404 applications to determine what the total impacts will be.

TPWD will apply for an individual permit with the USACE to cover the construction of the terraces and levees and placement of beneficial use material. Pre-submittal consultations can occur concurrent with the surveying and engineering for the project. The length of time needed to complete the pre-submittal consultations is unknown. For this reason, the estimated time needed to obtain a permit may be 12 months.

Sources of desirable fluid dredge materials at this time are limited to the Golden Pass LNG Marine Terminal Basin located east of the WMA on the Sabine Neches Waterway. Each dredge cycle should provide enough soil to enhance 400 to 600 acres of existing and former emergent marsh habitat. This process will restore marsh soil elevations and provide soil elevations capable of restoring and then maintaining tidal emergent marsh plant communities throughout the enhancement areas. Settled marsh soil elevation targets will likely be .9' to 1.3' NAVD88 plus or minus .5'. Vegetative response to newly placed soil materials should be monitored using aerial photography and ground level vegetative surveys to determine vegetative cover and emergent marsh habitat quality.

(c) Marsh Restoration in Pierce Marsh on West (Galveston) Bay

Galveston Bay, surrounded by the urban, commercial, and industrial complexes of Houston, Texas City and Galveston, is located on the Upper Texas coast and is the second largest estuary in the Gulf of Mexico. The system is composed of four bays: East Bay, West Bay, Galveston Bay and Trinity Bay, and includes numerous other small bays. It is separated from the Gulf of Mexico by the Bolivar Peninsula, Galveston Island and Follets Island with tidal exchange occurring through the Bolivar and San Luis Passes. In this large and complex system, freshwater inflows from the Trinity and San Jacinto Rivers, bayous and streams mix with salt water from the Gulf of Mexico. This mixing provides a unique environment that offers a nutrient-rich nursery for juvenile marine organisms and submerged aquatic vegetation (TCEQ 2011).

Wetlands in the Lower Galveston Bay watershed are a part of important processes that support the bay ecosystem. Estuarine or fringing marsh and freshwater wetlands filter polluted runoff, which enhances water quality. Freshwater wetlands serve as buffers against flash flooding from rain, and vegetated wetlands absorb storm and wave energy to reduce shoreline erosion. Most importantly, the wetlands provide habitat for many species of plants, fish, birds, and other wildlife. The principal commercial and recreational fishery species of Galveston Bay rely on estuarine wetlands during at least some part of their life cycle. The wetland edge is a particularly important habitat for white and brown shrimp (Whaley and Minello 2002). Other marsh dwelling species include blue crab, red drum, spotted seatrout, Southern flounder and Gulf menhaden. Wetlands act as nurseries to hundreds of non-commercial species that comprise a large part of the bay food web. Bird species, such as snowy egrets, great egrets, roseate spoonbills, tri-colored herons, black-crowned night herons and great blue herons use marsh as feeding habitat.

Unfortunately, historical subsidence in the Galveston Bay area has inundated thousands of acres of coastal marsh. Wetland loss in coastal Texas has been rated by the Environmental Protection Agency as severe (USEPA 1999) and is greater in the Galveston Bay system than other areas of the state. It is estimated that between 1953 and 1989, Galveston Bay experienced a net loss of approximately 35,100 acres of wetlands

(White et al. 1993). Subsidence in the Greater Houston area has slowed considerably since groundwater pumping was severely limited beginning in 1975 (Holzer 1989).

Pierce Marsh, a 2,346-acre area located on the north shore of West Galveston Bay, was once part of Basford Lake, a salt marsh crisscrossed with channels and rich with fish and wildlife. By the 1990s, it was completely inundated primarily by subsidence. In the 1990s, Pierce Marsh was acquired by the Galveston Bay Foundation (GBF) and The Nature Conservancy. With local subsidence largely abated, the GBF has spent the last 15+ years slowly restoring wetlands within Pierce Marsh. Since the late 1990s, GBF has restored 425 acres of emergent estuarine marsh at the site through five projects—a 53-acre terracing project in 1999, a 45-acre terracing project in 2001, a 25-acre terracing project in 2003, a 280-acre BUDM marsh restoration project in 2005-08, and a 22-acre terracing project in 2010.

This proposed project will involve planning, engineering, design, permitting, and budget development for a shovel-ready project to restore up to 150 acres of coastal wetlands within Pierce Marsh. Currently existing dredged material containment levees constructed for the 2005 BUDM project have sufficient capacity to support an additional 150 acres of BUDM-constructed intertidal marsh. The marsh design will maintain significant edge interface with shallow open water within the containment cells.

The area supports a large waterfowl population in the winter, as well as a variety of year-round bird species. Pierce Marsh is located near vital nesting islands in West Bay, including North Deer Island, and thus serves as an important feeding area during nesting season. Wading birds and shorebirds utilize the mudflats and shallow marsh ponds located throughout the area. Wintering waterfowl include gadwall, northern pintail, lesser scaup, American widgeon, greenwinged and blue-winged teal, and snow geese.

2. Implementation technology

This project will provide project design funding for preliminary activities, engineering, design, and permitting. Project proponents will engage the services of experienced surveyors, coastal planners and coastal engineering firms to conduct site assessments and analyses, design restoration plans and complete construction drawings, identify potential sources of dredge material, prepare lease and permit applications to the State of Texas General Land Office and USACE, and otherwise move the projects to a shovel-ready state.

3. Monitoring and adaptive management (if applicable)

Project proponents will work with representatives from federal and state agencies, local community representatives, nongovernmental organizations, and other interest groups during the planning phases. Meetings will be held between project proponents and the surveyors and engineers throughout the project period, as needed, to review progress and materials. Project proponents will work closely with the engineering firm(s) to oversee due diligence investigations at the project sites, including, but not limited to, surveys (bathymetric, etc.), analyses (geotechnical, etc.), and consultations (environmental, etc.). The project engineer(s) will use data from due diligence investigations to compile alternatives and cost analyses, which will be reviewed by the project proponents. The proponents will select a design alternative that best fits the project goal, objectives, and

budget, and the engineers will produce final design drawings. The project proponent and the engineers will work together to prepare, submit, and coordinate permit applications based upon the final designs. Monitoring and adaptive management plans for the marsh acreage to be created will be developed during this planning phase of the projects.

4. Measures of success for the proposed project or program

Specific measures of success for this project will include completion of an approved project design, submission of all required permit applications to the respective agencies, and identification of at least one source of dredge material for construction of the project. In other words, pending receipt of all necessary permits, the project should be made shovel ready by the end of the project period.

5. Risks and uncertainties of the proposed activities

Project design uncertainties are closely akin to project construction uncertainties. Planners must account for the risk of unknown future events that may affect the feasibility and efficacy of the marsh construction itself. There are always uncertainties in the using dredged materials to support habitats because of potential variations in salinity. The length of time it takes for the sediment to become suitable for a particular marsh application is sometimes hard to predict. Tropical weather events can also adversely affect the completion of a BUDM project. The planners for these individual projects will need to take these uncertainties into account in preparing the required plans and obtaining the necessary permits.

6. Outreach & education opportunities

The Texas natural resource agencies TPWD, TCEQ and the GLO will publicize and feature the project design funding on www.restorethetexascoast.org. It will be hailed as a significant first step in implementing the RESTORE Act in Texas, and thus the agencies will make extra efforts to inform the public about the project and the environmental benefits that will flow from them.

TPWD will conduct one or more public information meetings during the permitting process for the Nelda Stark and Salt Bayou Unit projects to inform the general public of the project goals and objectives, and expected benefits to fish and wildlife resources. TPWD will be available to speak with focus groups, such as the Coastal Conservation Association local chapters upon request. TPWD will invite local industries that have the potential to beneficially use dredge material to discuss how their needs can be incorporated into the long term restoration plan for the Nelda Stark and Salt Bayou Units. GBF will create a webpage to showcase the Pierce Marsh project design phase on its website, www.galvbay.org (average of 4,600 visitors monthly), and include articles in its quarterly hard-copy newsletter (3,500 recipients) and/or monthly e-newsletter (average of 7,986 recipients monthly). It is anticipated that the later construction phases, when funded, will provide many more outreach and education opportunities.

7. Leveraging of resources and partnerships

No additional funding is anticipated for these projects for engineering and design beyond that requested with this proposal. However, the process of engineering and design will rely upon participation by a host of project partners. These may include natural resource

agency personnel (including representatives from USFWS, TCEQ, TPWD, NRCS, etc.), NGOs, and potential future construction phase funding partners.

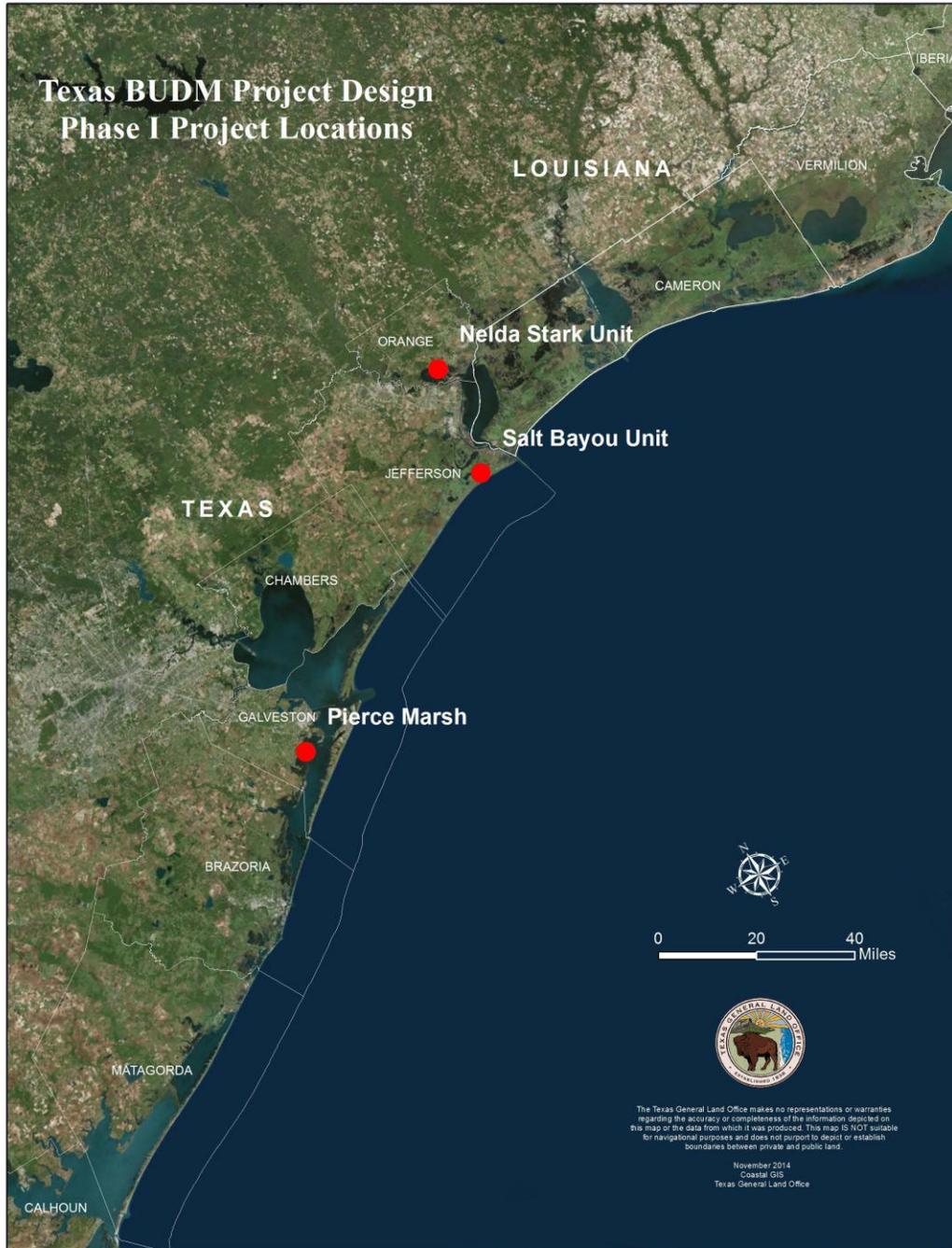
8. Proposal project / program benefits

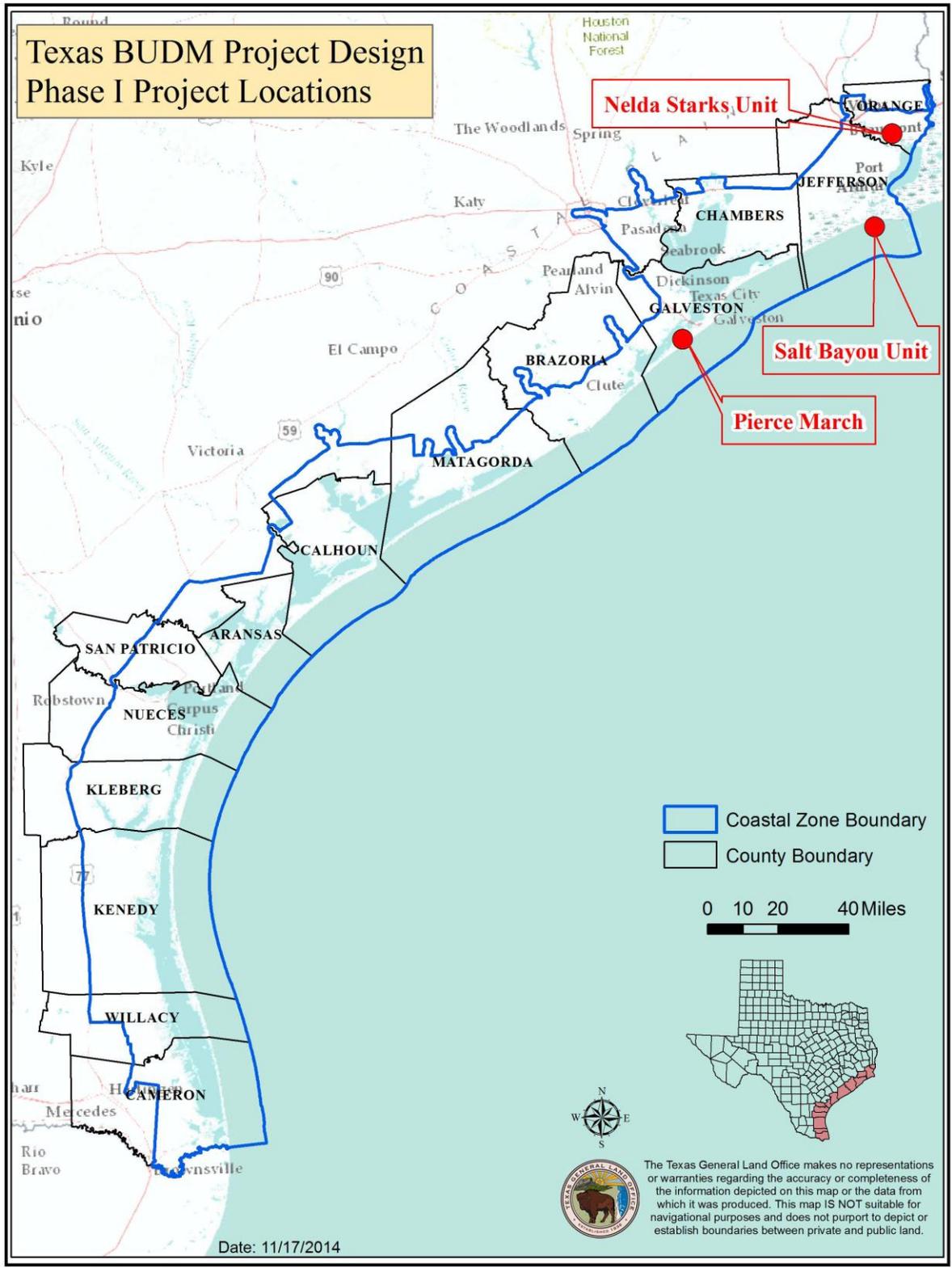
The project design fund lays the foundation for the restoration of thousands of acres of estuarine emergent marsh through BUDM. The habitats restored through this project are important to the life cycles, and therefore the sustainability, of many ecologically and economically significant marine species. The contributions of such natural resources on the ecology and economy of Texas are, in a major way, dependent upon the Sabine-Neches Watershed, the Salt Bayou Watershed, and Galveston Bay having habitats suitable to their development. Restoration of estuarine habitats is especially important not only to maintain essential habitat for commercially and recreationally important marine species, but also for their prey species, as so many of the prey species are also estuarine dependent. The marsh edge, in particular, serves as a critical transition between the emergent marsh vegetation and open water by providing a gateway for the movement of organisms and nutrients between intertidal and subtidal estuarine environments.

Each of the three BUDM projects addresses the serious issues of Wetland/Habitat Loss, Impact to Fish and Wildlife, and Water Quality and Quantity for Region 1 in *The Texas Coast: Shoring Up Our Future*, a publication of the Texas Coastal Management Program (GLO 2014). The successful completion of the projects at the WMAs will facilitate many additional acres of BUDM marsh from dredge projects that would have been too small to afford the engineering and design costs. This project will take advantage of the economies of scale and enable building more marsh where it is sorely needed.

(3) LOCATION INFORMATION

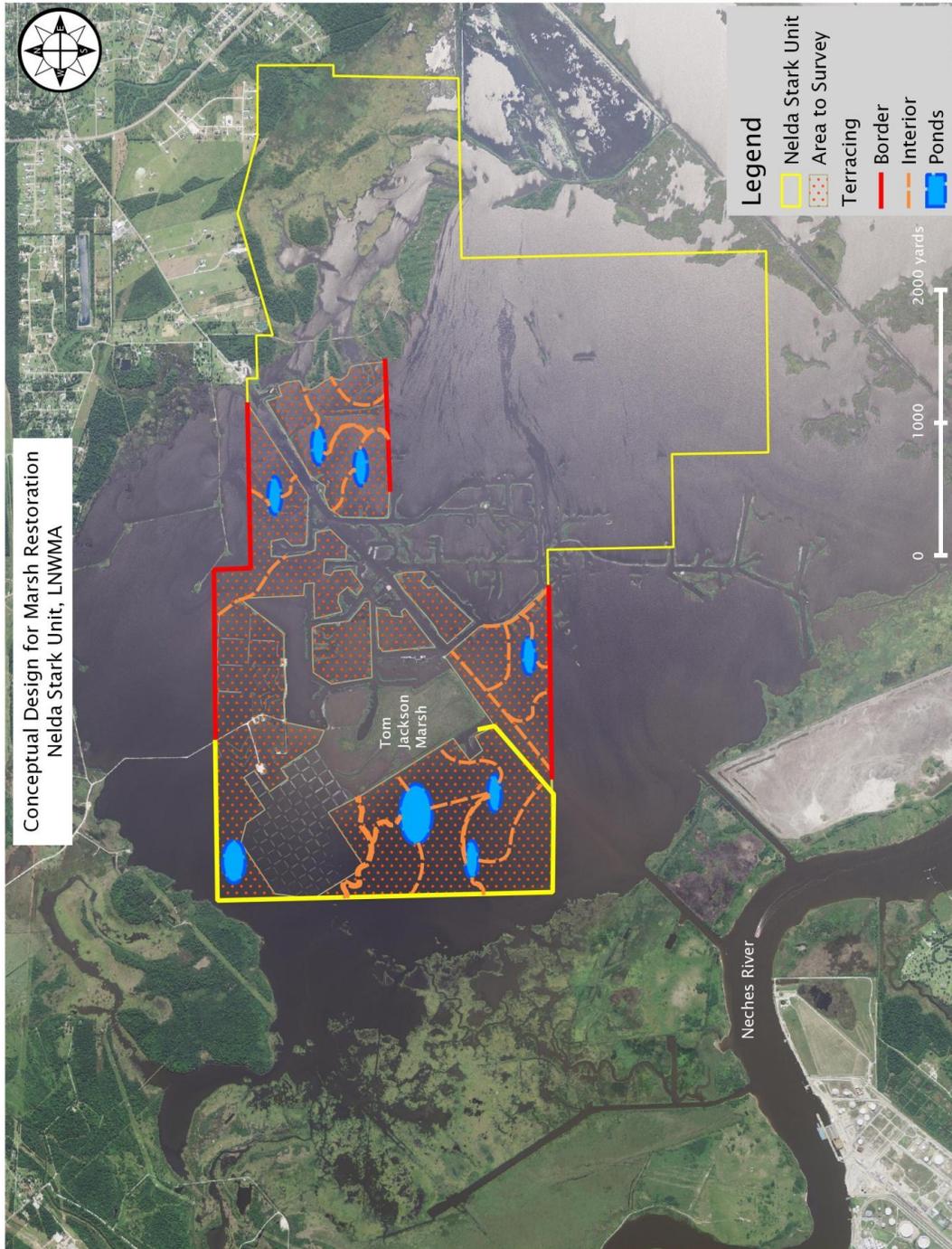
All three BUDM projects are within the Texas Coastal Management Program Coastal Zone Boundary. Thus, each is within the area where projects may be eligible for RESTORE Act funding. Any design or engineering work performed outside the geographical limits is eligible for RESTORE funding because those services contribute directly to projects that will significantly improve the ecosystems of the Gulf coast.





Bessie Heights, Nelda Stark Unit, Lower Neches WMA

The project is centered at N 30.036915°, W 93.937451°.



Salt Bayou Unit, J.D. Murphree WMA

The project is centered at N 29.759757°, W 94.000462°.



Pierce Marsh, West Galveston Bay

The project is centered at N 29.317516°, W 94.963548°.



(5) COST ESTIMATES

An estimate of the cost of project design for each project is set forth in the following table. Estimates are based on experience with prior BUDM projects, knowledge of current cost for similar activities, and the details of each particular project. Surveying costs vary between the projects because of the differing acreage and needs of each project. Similarly, design and engineering estimates vary by the complexity of the planned construction project.

Bessie Heights/Nelda Stark Unit Marsh Project Design	Preliminary Surveying	\$80,000.00
	Design & Engineering	\$66,000.00
	Permitting	\$25,000.00
	TOTAL	\$171,000.00
Salt Bayou Unit Marsh Project Design	Preliminary Surveying	\$257,000.00
	Design & Engineering	\$70,000.00
	Permitting	\$25,000.00
	TOTAL	\$352,000.00
Pierce Marsh Project Design	Preliminary Surveying	\$90,000.00
	Design & Engineering	\$310,000.00
	Permitting	\$45,000.00
	TOTAL	\$445,000.00
TOTAL PROJECT COST		\$ 968,000.00

(6) ENVIRONMENTAL COMPLIANCE CHECKLIST (APPENDIX B)

Environmental Compliance Type	Yes	No	Applied For	N/A
Federal				
National Marine Sanctuaries Act (NMSA)				x
Coastal Zone Management Act (CZMA)	x			
Fish and Wildlife Coordination Act				x
Farmland Protection Policy Act (FPPA)				x
NEPA – Categorical Exclusion	TO BE DETERMINED	x	x	
NEPA – Environmental Assessment	TO BE DETERMINED	x	x	
NEPA – Environmental Impact Statement	TO BE DETERMINED	x	x	
Clean Water Act – 404 – Individual Permit (USACOE)	x			
Clean Water Act – 404 – General Permit(USACOE)	x			
Clean Water Act – 404 – Letters of Permission (USACOE)	x			
Clean Water Act – 401 – WQ certification	x			
Clean Water Act – 402 – NPDES				x
Rivers and Harbors Act – Section 10 (USACOE)				x
Endangered Species Act – Section 7 – Informal and Formal Consultation (NMFS, USFWS)	x			
Endangered Species Act – Section 7 – Biological Assessment (BOEM,USACOE)				x
Endangered Species Act – Section 7 – Biological Opinion (NMFS, USFWS)				x
Endangered Species Act – Section 7 – Permit for Take (NMFS, USFWS)				x
Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) – Consultation (NMFS)	x			
Marine Mammal Protection Act – Incidental Take Permit (106) (NMFS, USFWS)				x
Migratory Bird Treaty Act (USFWS)				x
Bald and Golden Eagle Protection Act – Consultation and Planning (USFWS)				x
Marine Protection, Research and Sanctuaries Act – Section 103 permit (NMFS)				x
BOEM Outer Continental Shelf Lands Act – Section 8 OCS Lands Sand permit				x
NHPA Section 106 – Consultation and Planning ACHP, SHPO(s), and/or THPO(s)	x			
NHPA Section 106 – Memorandum of Agreement/Programmatic Agreement		x		
Tribal Consultation (Government to Government)		x		
Coastal Barriers Resource Act – CBRS (Consultation)		x		
State				
As Applicable per State				

(7) DATA / INFORMATION SHARING PLAN

Data to be collected during these projects includes geophysical survey information of the proposed restoration sites, and locations of potential obstacles to restoration. Additional data to be generated are sources and location of dredged materials, estimates of volumes of dredge materials that can be placed for beneficial use. Where appropriate, information about core sampling and dredged material placement will be made available to the GLO for inclusion in the USACE’s Texas Coastal Sediments Geodatabase.

<http://gisweb.glo.texas.gov/txsed/index.html?config=config-Corp.xml>. These data will be available to the public. TPWD and GBF will work cooperatively with federal and state agencies and entities that aggregate and publicize sediment locations and transport, as well as other coastal and marine spatial planning data.

(8) REFERENCE LIST OF LITERATURE CITED

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(9) LETTERS OF SUPPORT

Jefferson County Courthouse
P.O. Box 4025
Beaumont, Texas 77704



Beaumont (409) 835-8466
Pt. Arthur (409) 727-2191 Ext. 8466
Facsimile (409) 839-2311

JEFF R. BRANICK
County Judge

November 13, 2014

Commissioner Toby Baker
Texas Commission on Environmental Quality
P.O. Box 13087, MC 100
Austin, TX 78711-3087

Re: Jefferson County support for Texas Beneficial Use of Dredged Material Project Design Fund Phase I

Dear Commissioner Baker,

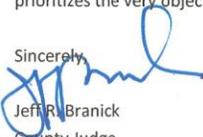
On behalf of Jefferson County Commissioners Court I am pleased to strongly endorse the State's "Texas Beneficial Use of Dredged Material Project Design Fund Phase I" proposal that you are submitting to the Gulf Coast Ecosystem Restoration (GCER) Council.

Jefferson County is eager to participate in the implementation of the RESTORE Act and we fully endorse your project application's description of the ecosystem threats, troubling long term trends in Texas' coastal deterioration and marsh loss, as well as the proven and feasible opportunities to address and correct them through the beneficial use of dredge material. We agreed with Congress's intent when it passed the RESTORE Act and pledged the support of the nation to investing in the ecology and economy of a region that has produced 90% of the America's off-shore energy resources and is home to critically important natural resources that were badly damaged by the *Deepwater Horizon* oil spill.

No natural resource was more damaged by *Deepwater Horizon* than water, and no location was harmed more than the Gulf's coastal marsh ecosystems. Your GCER Council application directly addresses those realities in a location where vitally important restoration objectives of the RESTORE Act can be met.

Jefferson County is dedicated to partnering with the State of Texas and the GCER Council to meet those important goals just as we have done through investment of our time, energy and financial resources in the development of the Salt Bayou Watershed Restoration Plan that resulted from intensive stakeholder partnering and which clearly prioritizes the very objectives of Texas' application to the GCER Council.

Sincerely,


Jeff R. Branick
County Judge



November 14, 2014

Commissioner Toby Baker
Texas Commission on Environmental Quality
P.O. Box 13087, MC 100
Austin, TX 78711-3087

Re: Letter of Support for the Texas Beneficial Use of Dredged Material (BUDM) Project Design Fund Phase I.

Dear Commissioner Baker:

Please accept this letter of support from the Texas General Land Office for the Texas BUDM Project Design Fund Phase I RESTORE proposal. Establishment of this program will help to realize the true intention of Regional Sediment Management and will directly address the Gulf Coast Ecosystem Restoration Council's August 2013 *Initial Comprehensive Plan* - Objective #4: "to restore and enhance natural process and shorelines" that includes improved sediment management.

Providing dredged material to the Nel da Stark Unit, the Salt Bayou Unit, and Pierce Marsh would help to address the declining state of wetlands on the Texas coast and provide valuable habitat for many of the species that were adversely affected by the Deepwater Horizon Oil Spill.

If you have any questions or concerns, please contact me at (512) 463-5058 or at Sheri.Land@glo.texas.gov

Sincerely,

A handwritten signature in cursive script that reads 'Sheri Land'.

Sheri Land
Director of Grant Programs and Support
Coastal Resources
Texas General Land Office

Stephen F. Austin Building • 1700 North Congress Avenue • Austin, Texas 78701-1495
Post Office Box 12873 • Austin, Texas 78711-2873
512-463-5001 • 800-998-4GLO
www.glo.state.tx.us

November 17, 2014

Commissioner Toby Baker
Texas Commission on Environmental Quality
P.O. Box 13087, MC 100
Austin, TX 78711-3087

Re: Ducks Unlimited support for Texas Beneficial Use of Dredged Material Project Design Fund Phase I

Dear Commissioner Baker,

On behalf of the Southern Regional Office of Ducks Unlimited I am pleased to endorse the State's "Texas Beneficial Use of Dredged Material Project Design Fund Phase I" proposal you are submitting to the Gulf Coast Ecosystem Restoration (GCER) Council.

Ducks Unlimited has had a long term focus on the Upper Texas coastal wetlands and DU is a planning partner and signatory to the Salt Bayou Watershed Restoration Plan that began as a stakeholder project in 2000 and had its recommendations adopted by the group in 2013.

With that prior organizational commitment in mind, we fully endorse Texas' GCER project application's description of the ecosystem threats, long term trends in Texas' coastal deterioration and marsh loss, as well as the proven and feasible opportunities to address and correct them through the beneficial use of dredge material as your GCER proposal would accomplish if funded. Ducks Unlimited remains dedicated to partnering with the State of Texas and the GCER Council to meet those goals.

Coastal Texas is part one of the most important wintering areas for waterfowl on the continent. It is critical that we seize any opportunity to restore and enhance these habitats. Such actions represent ecological wins, but they also help the local communities that are intrinsically tied to the resource through their economies.

Thank you for your leadership in seeking the beneficial use of dredge material as part of *Deepwater Horizon* restoration of the Gulf of Mexico ecosystem.

Sincerely,



Jerry Holden, Jr.
Director of Conservation Programs
Southwest Conservation Unit, Ducks Unlimited, Inc.



ELIGIBILITY REVIEW

Bucket 2 – Council Selected Restoration Component

PROPOSAL TITLE

Texas Beneficial Use of Dredged Material Project Design Fund Phase 1

PROPOSAL NUMBER

TX-4

LOCATION

Within the Texas Coastal Management Program Coastal Zone boundary

SPONSOR(S)

Texas

TYPE OF FUNDING REQUESTED (Planning, Technical Assistance, Implementation)

Planning

REVIEWED BY:

Bethany Carl Kraft/ Ben Scaggs

DATE:

11-18-14

1. Does the project aim to restore and/or protect natural resources, ecosystems, fisheries, marine and wildlife habitat, beaches, coastal wetlands and economy of the Gulf Coast Region?

YES NO

Notes:

This proposal seeks to perform planning for three proposed beneficial use of dredged material projects.

2. Is the proposal a project?

YES NO

If yes, is the proposed activity a discrete project or group of projects where the full scope of the restoration or protection activity has been defined?

YES NO

Notes:

3. Is the proposal a program?

YES NO

If yes, does the proposed activity establish a program where the program manager will solicit, evaluate, select, and carry out discrete projects that best meet the program's restoration objectives and evaluation criteria?

YES NO

Notes:

4. Is the project within the Gulf Coast Region of the respective Gulf States?

YES NO

If no, do project benefits accrue in the Gulf Coast Region?

YES NO

Notes:



Eligibility Determination

ELIGIBLE

Additional Information

Proposal Submission Requirements

1. Is the project submission overall layout complete? *Check if included and formatted correctly.*

- | | | | |
|--------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|
| A. Summary sheet | <input checked="" type="checkbox"/> | F. Environmental compliance checklist | <input checked="" type="checkbox"/> |
| B. Executive summary | <input checked="" type="checkbox"/> | G. Data/Information sharing plan | <input checked="" type="checkbox"/> |
| C. Proposal narrative | <input checked="" type="checkbox"/> | H. Reference list | <input checked="" type="checkbox"/> |
| D. Location information | <input checked="" type="checkbox"/> | I. Other | <input checked="" type="checkbox"/> |
| E. High level budget narrative | <input checked="" type="checkbox"/> | | |

If any items are NOT included - please list and provide details

2. Are all proposal components presented within the specified page limits (if applicable)?

YES NO

Notes: