Connecting Coastal Waters: Restoring Coastal Wetland Hydrology

A Proposal to the Gulf Coast Ecosystem Restoration Council

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Project Identification

Project Title: **Connecting Coastal Waters: Restoring Coastal Wetland Hydrology**	Project
State(s): **AL, FL, LA, MS, TX**	County/City/Region: Gulf Coastal Counties in all states

General Location: *Projects must be located within the Gulf Coast Region as defined in RESTORE Act. (attach map or photos, if applicable)* **Multiple Gulf Coastal Counties/Parishes- See Appendix A**

Project Description

RESTORE Goals: *Identify all RESTORE Act goals this project supports. Place a **P** for Primary Goal, and **S** for secondary goals.*

P Restore and Conserve Habitat
S Restore Water Quality
S Restore and Revitalize the Gulf Economy
S Replenish and Protect Living Coastal and Marine Resources
S Enhance Community Resilience

RESTORE Objectives: *Identify all RESTORE Act objectives this project supports. Place a **P** for Primary Objective, and **S** for secondary objectives.*

P **Restore, Enhance, and Protect Habitats**
S Restore, Improve, and Protect Water Resources
S Protect and Restore Living Coastal and Marine
S Resources Restore and Enhance Natural Processes and Processes Shorelines
S Promote Community Resilience
S Promote Natural Resource Stewardship and Environmental Education
S Improve Science-Based Decision-Making

RESTORE Priorities: *Identify all RESTORE Act priorities that this project supports.*

X Priority 1: Projects that are projected to make the greatest contribution
X Priority 2: Large-scale projects and programs that are projected to substantially contribute to restoring
X Priority 3: Projects contained in existing Gulf Coast State comprehensive plans for the restoration
X Priority 4: Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries

RESTORE Commitments: *Identify all RESTORE Comprehensive Plan commitments that this project supports.*

X Commitment to Science-based Decision Making
X Commitment to Regional Ecosystem-based Approach to Restoration
X Commitment to Engagement, Inclusion, and Transparency
X Commitment to Leverage Resources and Partnerships
X Commitment to Delivering Results and Measuring Impacts

RESTORE Proposal Type and Phases: *Please identify which type and phase best suits this proposal.*

X Project X Planning X Technical Assistance X Implementation ____Program

Project Cost and Duration

Project Cost Estimate: **Total**	**$** 17,888,563 (Optional phase funding approach included)	**Project Timing Estimate**: Date Anticipated to Start: 01/2015 (or upon award) Time to Completion: 36 months Anticipated Project Lifespan: 30+ years

Connecting Coastal Waters: Restoring Coastal Wetland Hydrology
Executive Summary

The Gulf of Mexico is a highly productive ecosystem where, in 2012 alone, Gulf ports took in over $760 billion worth of fish and shellfish and a multi-billion dollar recreational fishing industry was supported (NMFS 2014). In large part, this productivity is driven by the Gulf's 15.4 million acres of coastal wetlands, identified in the report, *Status and Trends of Wetlands* by NOAA and the U.S. Fish and Wildlife Service (Dahl and Stedman 2013). Coastal wetlands provide crucial marine fisheries habitat; by weight, 97% of fish and shellfish caught in the Gulf depend on wetlands during their life cycle (Lellis-Dibble et al. 2008). Coastal wetlands also support endangered species, improve water quality, and buffer communities against storms and flooding. However, from 2004 to 2009, 71% of the total loss of wetlands in the U.S. occurred in the Gulf of Mexico, a loss of over 257,000 acres (Dahl and Stedman 2013). Losses occurred in estuarine, intertidal, and freshwater wetlands, particularly forested wetlands. Gulf Coast wetlands were also damaged during the *Deepwater Horizon* oil spill. Preliminary Natural Resource Damage Assessment Trustee analysis suggests that tens of thousands of square miles of surface waters were affected by oiling, having significant adverse impacts on coastal and nearshore habitats and their biological communities (DWH NRDA Trustees 2014). Collectively, these impacts affect the health, sustainability, and extent of Gulf Coast wetlands. The restoration of these wetlands in many watersheds is limited by an altered regional hydrology (Dahl and Stedman 2013). For example, activities to ditch and drain wetlands and to impound, dredge, fill, or channelize estuaries were common in the mid-1900's. However, removing hydrological barriers or artificial drainage to enhance tidal and freshwater flows can restore large wetland areas and their vital ecosystem services using cost-effective techniques (NOAA 2010).

The *Connecting Coastal Waters* initiative will invest **$17,888,563 over 3 years** to 1) implement 11 proposed coastal wetland hydrology restoration projects in partnership with each Gulf State to restore coastal wetland types with the greatest regional losses (Figure 1); 2) leverage place-based collaborations to achieve measurable benefits for coastal wetlands; and 3) deliver science and tools, including an inventory of coastal wetland hydrology restoration projects. The proposal also provides an optional phase funding approach (Phase 1: $2,893,750; Phase 2: $14,994,813) described in *Section II: Implementation Methodology* to offer the Council the option to phase-in planning, design, and construction activities. NOAA will use a place-based approach to achieve the following objectives:

- Restore the extent, functionality, resiliency, and sustainability of the region's fresh, estuarine, and marine wetland habitats by restoring natural hydrology.
- Lay the foundation for large-scale ecosystem restoration by establishing hydrologic conditions for healthy coastal wetlands and the future restoration of these critical habitats.
- Restore and enhance ecosystem resilience, sustainability, and natural defenses by re-establishing natural hydrology and connectivity between freshwater and marine habitats.

NOAA will implement *Connecting Coastal Waters* in partnership with state and local agencies, non-governmental and academic organizations, and industry partners. NOAA will provide coordination, technical support, oversight, and reporting and, where appropriate, project design and management for the following activities:

- Restore coastal wetlands degraded by altered hydrology with partners in each Gulf State;
- Inventory coastal wetland hydrology restoration opportunities in each Gulf State to support the development of future coastal wetland hydrology restoration projects;
- Conduct community outreach and stewardship activities, including demonstration workshops and hands-on learning at restoration sites.

Measures of Success

Connecting Coastal Waters will achieve measurable, region-wide benefits for Gulf Coast wetlands and demonstrate the following measures of success:

- Restore hydrology to benefit and restore over **22,000 acres** of wetland and estuarine habitats.
- Engage local community organizations and provide opportunities for **250 participants** during community events held for restoration projects.
- Identify coastal wetland hydrology restoration projects within each of the Gulf's **37 estuarine drainage areas**.

Partnerships and Leveraging

The NOAA Restoration Center was established in 1991 to restore the nation's coastal, marine, and migratory fish habitat using place-based partnerships. NOAA proposes to build upon previous efforts that identified hydrological restoration projects through our community-based restoration grants program. Beginning in 2012, NOAA and the Gulf Sea Grant college programs worked with state and local partners to identify hydrology restoration projects, resulting in the Inventory of Potential Gulf of Mexico Hydrological Restoration. For this proposal, NOAA has worked with partners in each state to review projects submitted to the inventory, as well as additional hydrology restoration needs to identify projects that meet the goal of restoring coastal wetlands. Through the *Connecting Coastal Waters* initiative, NOAA will collaborate with the Gulf States and other partners to significantly improve the extent and sustainability of Gulf coast wetlands and the vital ecosystem services they provide to Gulf communities.

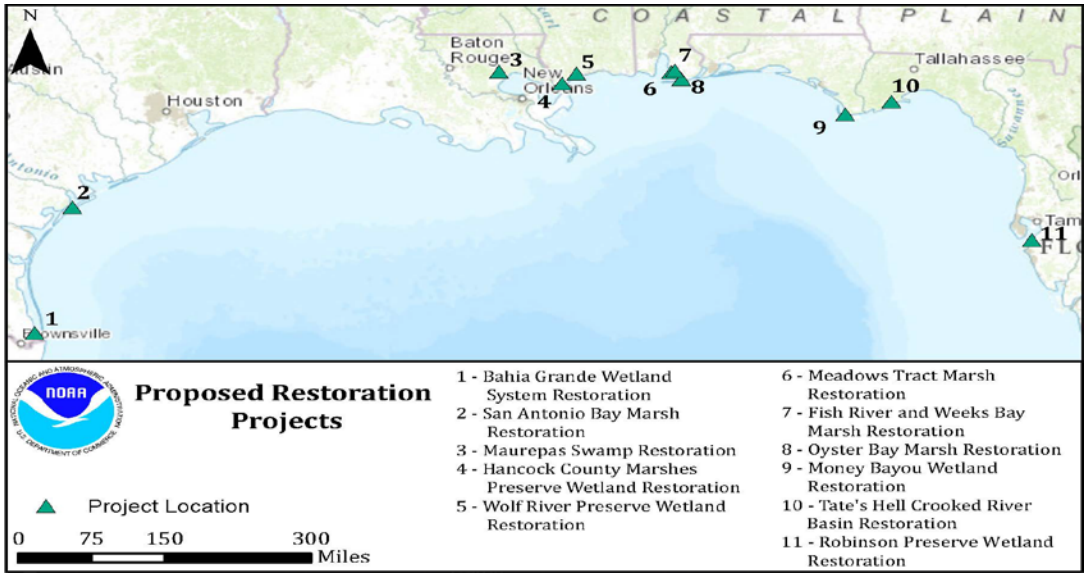

Figure 1: Regional map of coastal wetland hydrology restoration projects

Connecting Coastal Waters: Restoring Coastal Wetland Hydrology
Proposal Narrative

I. Proposal Introduction and Background

Introduction

The Gulf of Mexico ecosystem relies on a connected mosaic of aquatic systems to deliver fresh and tidal waters that drive the most diverse and productive coastal wetlands in the United States. Coastal wetlands include wetland habitat types immediately along the coast as well as those adjacent to the rivers and bays that drain into coastal waters (Watzin and Gosselink 1992). Coastal wetlands are organized and integrated by the water that flows through them. For example hydrology, the distribution, movement and quality of water, affects species composition and richness, productivity, and nutrient cycling in coastal ecosystems (Watzin and Gosselink 1992, Mitsch and Gosselink 1993). However, hydrological modifications, development, relative sea level rise, and unprecedented storms have degraded the health, connectivity, and sustainability of the Gulf's coastal wetlands. Between 2004 and 2009, the Gulf of Mexico region had the greatest loss of coastal wetlands in the U.S. (NOAA 2010, Dahl and Stedman 2013). The *Deepwater Horizon* oil spill further degraded the Gulf's already stressed ecosystem causing long-term damage to fragile habitats and the species that use those habitats (DWH NRDA Trustees 2014). Coastal wetlands play a pivotal role within the Gulf of Mexico ecosystem, connecting aquatic and terrestrial habitats and providing a vital link between the Gulf's coastal watersheds and its productive marine environment. Therefore, NOAA and our partners propose the initiative *Connecting Coastal Waters* to restore coastal wetlands and their critical role for the Gulf Coast.

Gulf Coast Wetlands

Gulf of Mexico coastal watersheds contain 15.6 million acres of a diverse array of tidal and non-tidal wetlands (Dahl and Stedman 2013) and abundant riparian habitats along its rivers and streams. Wetlands are defined by Cowardin et al. (1979) as transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water. Coastal wetlands include marshes (saltwater, brackish, and freshwater), mudflats, salt pannes, tidal flats, forested wetlands, pine savanna, riparian forests, mangroves, and swamps. Riparian habitats are vegetated, forested areas adjacent to streams, rivers, lakes, reservoirs, and other inland aquatic systems that affect or are affected by the presence of water (Fischer et al. 2000). They may also contain or adjoin riverine wetlands and share many functions including water storage, sediment retention, nutrient and contaminant removal, and maintenance of habitat for plants and animals. Continuous interactions occur between upland, riparian, aquatic, and marine ecosystems through exchanges of energy, nutrients, and species (NRC 1992).

Coastal wetlands are among the most productive ecosystems on Earth and support many species of fish and wildlife (Watzin and Gosselink 1992). A large number of bird species, including numerous rare and endangered birds, depend on the coastal wetlands (Twilley et al., 2001). For example, many bird species are dependent on marshes for foraging, roosting and nesting; marshes are also critical to both migratory and wintering waterfowl (Mitsch and Gosselink 1993). Wetlands also help improve surface water quality by filtering, storing, and detoxifying residential, agricultural, and urban wastes and improving overall water quality through the

removal and recycling of nutrients (Mitsch and Gosselink 1993; Turner 1977; Zimmerman et al. 1984). And wetlands can buffer coastal areas against flooding, storm and wave damage, and help stabilize shorelines, providing increasingly important functions in the face of climate change.

The Gulf's coastal wetlands are also critical for supporting a productive fishery. Commercial and recreational fishing are billion dollar industries for the Gulf Coast with an estimated $760 billion in 2012 commercial landings and almost $9.8 billion in recreational fishing expenditures in 2011 (NMFS 2014, Lovell et. al. 2013). About half of commercially harvested fish species depend on estuaries and nearby coastal waters at some stage in their life cycle (Mitsch and Gosselink 1993). This is especially true in the Gulf where 97 percent (by weight) of the fish and shellfish caught by fishermen in the Gulf of Mexico are dependent on wetlands at some point in their life cycle (Lellis-Dibble et al., 2008). Coastal wetlands also provide spawning grounds, nurseries, shelter, and food for finfish, shellfish, birds, and other wildlife. For example, the abundance and health of adult stocks of commercially harvested shrimp, blue crabs, oysters, and other species are directly related to the quality and quantity of wetlands (Daily et al. 1997, Minello and Webb 1997).

The Gulf States have suffered a high amount of coastal wetland loss, threatening the wildlife, economy, and resilience of the Gulf Coast. Using the remote sensing and mapping methodology of NOAA's Coastal Change Analysis Program, losses of wetlands in the Gulf's coastal watersheds from 1996 to 2006 were estimated at approximately 256,100 acres, or an annual average loss of approximately 25,610 acres (EPA, 2012). This method provides important information about the loss of coastal wetlands; however, it does not capture the full loss, such as a loss in function due to stressors that affect remaining wetlands in the region.

In addition to their loss and degradation due to environmental stressors, Gulf Coast wetlands were damaged during the *Deepwater Horizon* oil spill. Preliminary Natural Resource Damage Assessment Trustee analysis suggests that tens of thousands of square miles of surface waters were affected by oiling, having significant adverse impacts on coastal and nearshore habitats and their biological communities (DWH NRDA Trustees 2014). Declines in marsh vegetative health have been observed in oiled herbaceous mainland marshes relative to reference marshes. Impacts on animals that live in the marsh have also been demonstrated (DWH NRDA Trustees 2014). Collectively, these impacts affect the health, sustainability, and extent of Gulf Coast wetlands.

Coastal Wetland Hydrology

Hydrology is one of the main factors influencing both the location and function of coastal wetlands. The salinity, volume, exchange, temperature, and velocity of water; flooding frequency; and elevation all influence coastal wetland types and ecological functions (Turner and Lewis 1997). Natural hydrology for Gulf Coast wetlands is maintained by freshwater input from rainfall, rivers, and streams, and by tidal exchange. However, wetlands along the Gulf Coast have been experiencing significant shifts in hydrology as a result of changes in freshwater drainage patterns and restrictions of tidal flows (NOAA 2010, Dahl and Stedman 2013). Ditching and draining of coastal wetlands have increased the amount of fresh water flowing from these wetlands into nearby streams and compromised their flood control and storage functions. The quantity and rate of freshwater inputs from rivers are also altered by changes in rainfall and land cover; flood control practices; and water control structures such as locks, dams, and weirs.

These alterations in freshwater inputs to the Gulf of Mexico changes salinity regimes in nearshore areas. In addition, navigation channels, canals, and ditches lead to saltwater intrusion, which can destroy freshwater marshes (Ko and Day, 2004). Barriers to tidal flow such as levees, dikes, causeways, impoundments and other barriers can also result in the degradation of estuarine habitat, including reduced oxygen concentrations, increased nutrient loading, and can lead to a shift to a predominantly freshwater habitat, which changes the dynamics of an entire ecosystem (NOAA 2010). Artificial hydrologic modifications, such as levees, dams, and dikes, also affect the amount sediments delivered to coastal wetlands. These changes can limit the ability of wetlands to migrate inland in response to sea level rise (Day et al., 2000, 2007, Twilley et al. 2001).

Proposal Description

In response to these stressors, NOAA will implement the proposed *Connecting Coastal Waters* initiative to restore coastal wetlands using an ecosystem approach that addresses foundational conditions determining the extent, function, and diversity of Gulf Coast wetlands. Through place-based partnerships, NOAA will lead efforts to achieve the RESTORE Gulf of Mexico Ecosystem Restoration Council (Council) goal of restoring and conserving the health, diversity and resilience of coastal, estuarine and marine habitats by investing $17.9 million over three years to:

- Implement projects to restore the extent, functionality, resiliency, and sustainability of coastal wetland habitats by restoring natural hydrology;
- Leverage place-based collaborations to achieve measurable benefits for coastal wetlands; and
- Contribute to a regional approach to reverse the loss of coastal wetlands by providing a science-based inventory of coastal wetland hydrology restoration projects that make the greatest contribution to restoring and protecting the Gulf Coast ecosystem .

The proposal also provides an optional phase funding approach (Phase 1: $2,893,750; Phase 2: $14,994,813) described in *Section II: Implementation Methodology* to offer the Council the choice to phase-in planning, design, and construction activities. NOAA proposes to build upon previous efforts conducted through our community-based restoration grants program that identified hydrological restoration grant projects. Beginning in 2012, NOAA and the Gulf Sea Grant college programs worked with state and local partners to identify hydrology restoration projects. This effort resulted in the Inventory of Potential Gulf of Mexico Hydrological Restoration and identified 89 projects, demonstrating a great regional need for this type of restoration. For the *Connecting Coastal Waters* proposal, NOAA has worked with partners in each state to review projects submitted to the inventory, as well as additional hydrology restoration needs to identify projects that meet the goal of restoring coastal wetlands.

Connecting Coastal Waters will restore coastal wetlands using an ecosystem approach by addressing a critical limitation to restoration; an altered regional hydrology (Dahl and Stedman 2013, Mitsch and Gosselink 1993).This initiative will also achieve sustainable benefits because it focuses on restoring regional hydrologic processes that connect habitats (NOAA 2010). While the restoration of a specific wetland area depends on re-establishing the right conditions at that site, successful ecosystem restoration depends on reconnecting a healthy mosaic of wetland and

estuarine habitats (Sullivan et al. 2014). Therefore, *Connecting Coastal Waters* will not only use an ecosystem approach to restoration, but, by reconnecting habitats, it will establish the conditions necessary for coastal wetlands to better respond to sea level rise and sustain their critical ecosystem services. This resiliency is critical to the protection and long-term sustainability of the natural resources on which Gulf Coast communities and their economies have come to rely.

Compatibility with Existing Plans

In addition to meeting the goals of the Council, *Connecting Coastal Waters* implements a priority restoration strategy identified by several regional restoration plans, including the *Gulf of Mexico Regional Ecosystem Restoration Strategy* (2011). Recognizing the importance of restoring coastal wetlands, the Gulf Coast Ecosystem Restoration Task Force identified the restoration of natural hydrology as a priority need for immediate action. In addition, the Task Force identified coastal wetlands and hydrological restoration as a priority for ecosystem restoration that is shared by each Gulf State. This proposal is also compatible with the Task Force's recommendation that an inventory and tools to set priorities for restoration investments be developed as a critical step for a strategic, Gulf-wide approach.

II. Implementation Methodology

Under Goal 1 and section IV.1 of the *Initial Comprehensive Plan* developed by the Council, NOAA and our partners will implement projects that directly restore and enhance the extent, functionality, resiliency, and sustainability of Gulf Coast wetlands. *Connecting Coastal Waters* is a place-based partnership with Gulf States conducted through two strategies: Coastal Wetland Hydrology Restoration Projects and Inventory of Coastal Wetland Hydrology Restoration Opportunities.

Coastal Wetland Hydrology Restoration Projects

Budget: $16,698,563 million (Design and Permitting: $2,108,750; Construction: $12,922,805; Monitoring: $1,517,008; Outreach & Education: $150,000; Administration: $810,000)

NOAA reviewed projects in the 2012 NOAA-Sea Grant Inventory of Gulf of Mexico Hydrological Restoration, as well as other hydrology restoration needs, in consultation with partners to evaluate their compatibility with the goals of the *Connecting Coastal Waters* proposal. The proposed projects are described below and in *Appendix A: Location Information, Appendix B: Budget Narrative*, and in **Letters of Support** provided in *Appendix F: Other Information.* With additional resources more projects to restore coastal wetland hydrology could be done at additional locations in cooperation with NOAA's partners.

Implementation Approach

The proposed *Connecting Coastal Waters* projects will restore coastal wetland hydrology through actions that remove or modify anthropogenic barriers that restrict the volume, velocity, exchange, temperature, and salinity of coastal waters. Projects will apply a range of proven techniques based on either a passive or active design strategy to address restoration needs. Passive design strategies entail a one-time action resulting in a self-sustaining system with little

long-term intervention. Active design strategies entail more intensive construction activities and are typically characterized by the active operation of structures and long term maintenance needed to achieve project goals (NOAA 2010).

Project Descriptions:

The following section describes the proposed coastal wetland hydrology restoration projects developed with federal, state, and local agencies and non-governmental organizations.

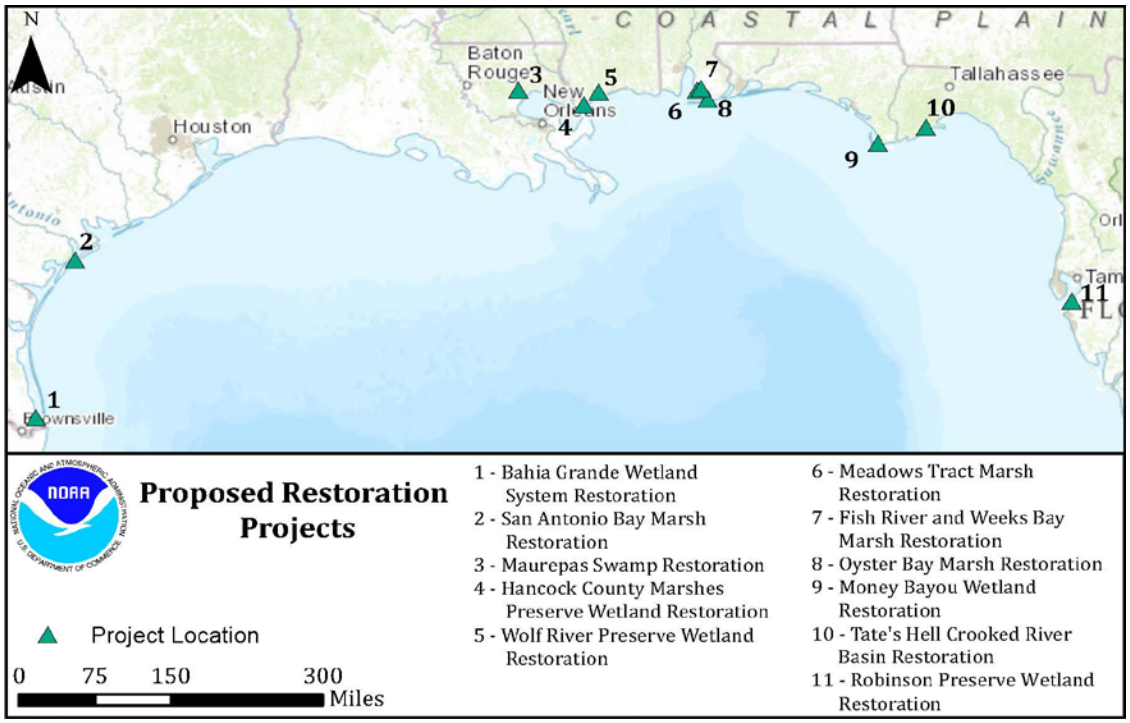

Figure 1: Regional map of coastal wetland hydrology restoration projects

Texas

1. **Bahia Grande Wetland System Restoration** (estimated budget- $1,140,000): Bahia Grande is a large coastal wetland ecosystem that has been greatly affected by hydrological modifications such as channelization, ditching, and road construction. This project will enhance **800 acres** of wetlands by restoring freshwater flow to the La Laguna Larga in the upper Bahia Grande System. The project will be implemented in cooperation with the Laguna Atascosa National Wildlife Refuge, the State, and other partners. Restoring a natural hydrology will be accomplished by either filling ditched areas or by installing a fixed crest weir to divert water into the Bahia Grande. Re-establishing freshwater flow into the La Laguna Larga will complement the tidal flow restoration completed in 2005 by NOAA and the Bahia Grande Restoration Partnership, a coalition of 65 partners. Outreach and educational activities will be conducted with partners including site tours for restoration practitioners and informational materials about the benefits of wetland hydrology restoration.
2. **San Antonio Bay Marsh Restoration** (estimated budget- $802,500): Matagorda Island is a 38-mile barrier island that supports 26,000 acres of salt marsh, tidal flats, and Gulf beaches as part of the Aransas National Wildlife Refuge. Hydrologic connectivity of these wetlands was altered by a network of roads, levees, and ditches built in the mid-1950s. This project

will be implemented in cooperation with the Refuge, the State, Coastal Bend Bays and Estuaries Program, and San Antonio Bay Foundation to restore hydrological connectivity to **170 acres** of South Matagorda Island tidal fan wetlands. The restoration strategy is to repair and replace dilapidated culverts to facilitate the flow and circulation of water within tidal wetlands. Improved connectivity will also allow marine and estuarine species to use restored habitats. Outreach, such as interpretive materials, will be developed for the project area to highlight the restoration effort and benefits of wetland hydrology restoration.

Louisiana

3. **Maurepas Swamp (West Joyce Wetlands) Restoration** (estimated budget- $3,495,000): This project is located on the northeast side of Lake Maurepas, adjacent to the Joyce Wildlife Management Area. The area supports characteristic Louisiana wetlands such as coastal swamp forests dominated by water tupelo and bald cypress. Once a vast wetland complex, the area is now bisected by highways, railroad tracts, and canals. This has created two hydrologically distinct wetland units, blocking water movement and impairing ecological sustainability. This project will restore natural hydrology to **15,000 acres** of cypress-tupelo swamp wetlands in cooperation with Tierra Resources LLC, Comite Resources, Inc., Wetland Resources, LCC, Ducks Unlimited, Climate Trust, and the Louisiana Division of Wildlife and Fisheries. Restoration strategies include the expansion of an existing wetland assimilation discharge area to increase freshwater inputs to the project area and construction of a salinity control structure on the I-55 canal to allow freshwater to pass south but inhibit salt water movement into the area's freshwater wetlands. Outreach activities will be conducted including site tours for restoration practitioners and presentations to local communities about the benefits of wetland hydrology restoration.

Mississippi

4. **Hancock County Marshes Coastal Preserve Wetlands Restoration** (estimated budget- $3,862,500): Hancock County Marshes Preserve contains the second largest contiguous marsh area in Mississippi. It supports a mosaic of habitat types including salt and brackish marsh, relic barrier islands, and forested riverine wetlands. In cooperation with the Mississippi Department of Marine Resources (DMR), this project will restore a natural hydrology to **450 acres** of marsh habitat impacted by extensive mosquito ditches constructed in the 1950s. The ditches disrupt natural sheet flow from the marsh system to Heron Bay, reducing the habitat value of both of these important systems. Restoration strategies for this project include backfilling ditches using sidecast material or clean fill, placing ditch blocks in strategic locations, and installing culverts. Restored areas will be planted with native vegetation to restore their habitat values. The Preserve has several existing programs that will be used to provide opportunities for community engagement and hands-on stewardship activities in cooperation with partners, such as the Mississippi Habitat Stewards Program.

5. **Wolf River Preserve Restoration** (estimated budget- $451,500): Wolf River Preserve is a 2,426-acre area protected by the DMR that contains expansive tidal freshwater and brackish marsh along the lower Wolf River, DeLisle Bayou, and Bayou Portage. DMR has identified the need to restore a natural hydrology to much of the Preserve, which is affected by unused logging roads and other barriers to natural sheet flow. This project will restore natural stream function and freshwater flow to **400 acres** of estuarine and freshwater wetlands impacted by now defunct logging roads, in cooperation with the DMR. Restoration strategies include installing culverts at appropriate elevations to restore natural stream flow, installing low

water crossings or removing unused logging roads to restore natural sheet flow across coastal plant communities, and replanting restored areas with native wetland vegetation. Stewardship activities will be developed with the DMR and the Mississippi Wildlife Federation to host volunteers from the Mississippi Habitat Stewards Program.

Alabama

6. **Fish River and Weeks Bay Marsh Restoration** (estimated budget- $1,520,000): Fish River flows into Weeks Bay within the Weeks Bay National Estuarine Research Reserve (NERR). Dead-end canals were previously dredged within this area, draining wetland habitat, degrading water quality, and attracting invasive plant species. In cooperation with the Alabama Department of Conservation and Natural Resources (ADCNR), this project will restore a natural hydrology to **70 acres** of estuarine marsh at the confluence of Fish River and Weeks Bay that were impacted by the excavation of more than 6 acres of canals. Marsh habitat will be restored by back-filling the dead-end canals to create both more natural tidal creeks and marsh habitat. Invasive plant species will also be removed and native wetland species planted within restored areas. Outreach will include a site tour and workshop for restoration practitioners. Outreach materials and other interpretive approaches will also be used to inform visitors about the importance of restoring coastal wetland hydrology.
7. **Oyster Bay Marsh Restoration** (estimated budget-$666,500): Oyster Bay is part of a system of smaller bays, rivers, and wetlands that make up Mobile Bay. Coastal wetlands once spanned the area between Bon Secour River, an estuarine river system that empties into Bon Secour Bay and Oyster Bay. The hydrology of Oyster Bay's forested wetlands and marshes was altered by construction of the Intracoastal Waterway and local roads and causeways. This resulted in the impoundment of freshwater, conversion of estuarine marsh habitat, and loss of fisheries habitat. In cooperation with ADCNR and the City of Gulf Shores, this project will restore a natural hydrology to **150 acres** of estuarine marsh by replacing undersized culverts, removing nuisance vegetation from channels, and planting native species in restored areas. This project is located near Gulf State Park and Bon Secour Wildlife Refuge, presenting opportunities to reach the public through educational materials. Site tours will also be conducted with restoration practitioners to share project results.
8. **Meadows Tract Marsh Restoration** (estimated budget- $522,000): The Meadows Tract is approximately 600 acres of forested wetlands adjacent to Mobile Bay. Construction of County Road 1, including the installation of undersized culverts, resulted in the loss of tidal exchange for adjacent marsh and forested wetlands. This project will restore tidal exchange to **250 acres** of marsh and forested wetlands by replacing undersized culverts in cooperation with ADCNR. A restoration site tour and workshop will be conducted with partners to share project information with restoration practitioners. Project interpretive materials will also be developed and displayed at the nearby Weeks Bay NERR Education and Interpretive Center.

Florida

9. **Money Bayou Wetlands Restoration** (estimated budget- $1,003,563): The Money Bayou basin includes over 1,800 acres of estuarine and freshwater marsh interspersed with forested wetlands. Money Bayou drains directly to the Gulf of Mexico between Cape San Blas and St. Vincent Island. Money Bayou basin is now protected within the St. Joseph Bay State Buffer Preserve; however, extensive ditching, road construction, and fire plow lines were constructed across the basin. These alterations disrupt the area's natural hydrology, resulting

in degraded wetlands, the loss of aquatic communities, and invasive plant species. This project will restore a natural hydrology to **1,000 acres** of wet prairie, basin swamp, and cypress done wetlands in cooperation with the St. Joseph Bay Buffer Preserve managed by the Florida Department of Environmental Protection. Restoration will include filling ditches, installing or repairing culverts, installing low-water crossings, removing invasive plant species, and prescribed burning in restored areas. Existing programs will be used to inform the public of the importance of coastal wetland hydrology restoration and host a workshop to share project results with restoration practitioners.

10. **Tate's Hell Crooked River Basin Restoration** (estimated budget- $1,450,000): The Crooked River basin is one of the largest watersheds in the Tate's Hell State Forest at over 40,000 acres. Crooked River is tidally influenced at both ends, lying between Ochlockonee and New Rivers. It converges with the New River and discharges to St. George Sound within the western portion of the basin. Large-scale silviculture operations, including ditching and road construction, have altered the hydrology of Crooked River Basin wetlands. The low-lying areas within the western basin include a mosaic of wetlands including basin swamps, shrub wetlands, cypress sloughs, and marsh. Several of the western basin's wetlands have not been converted to pine plantation, such as Pickett Bay, a large basin swamp and some areas have been replanted in native longleaf pine. This project will restore hydrology to **3,500 acres** of forested wetlands and marsh in cooperation with the Florida Forest Service. Outreach activities will include sharing project information with restoration practitioners and the public through workshops and presentations.
11. **Robinson Preserve Wetlands Restoration** (estimated budget- $1,785,000): Robinson Preserve is a 487-acre property located in northwestern Bradenton adjacent to the Palma Sola Bay and at the confluence of Tampa Bay and Sarasota Bay. The site contains a range of important coastal wetland habitats including mangrove, salt marsh, salt barren, coastal strand hammock and maritime hammock. In 2012, the Preserve was expanded by Manatee County's Natural Resources Department acquisition of a 150-acre parcel of former agricultural lands. This project will restore approximately **140 acres** of coastal upland, wetland, and subtidal habitat on the recently acquired parcel in cooperation with Manatee County and other project partners. To accomplish the project, a design plan, including any necessary hydrological modeling, will be developed to determine the most suitable locations for habitat restoration through regarding and earth moving activities, creation of tidal creeks and waterways, removal of invasive vegetation, and replanting native plant species.

Restoration Project Implementation Timeline

Connecting Coastal Waters restoration projects will be implemented in the following tasks:

	Y1 Q1	Y1 Q2	Y1 Q3	Y1 Q4	Y2 Q1	Y2 Q2	Y2 Q3	Y2 Q4	Y3 Q1	Y3 Q2	Y3 Q3	Y3 Q4
Task 1												
Task 2												
Task 3												
Task 4												
Task 5												
Task 6												

Figure 2: Coastal Wetland Hydrology Restoration Projects Timeline

Task 1: Planning and Local Involvement: a project team will be assembled to lead each restoration project, including setting project goals and measurable objectives that consider local knowledge and use a multi-disciplinary approach. This task will also evaluate proposed restoration strategies to address site specific requirements and coordination with state and federal regulatory agencies to incorporate their input at the earliest stages of project implementation.

Task 2: Engineering and Design: this task will evaluate restoration techniques capable of achieving the desired project outcomes. For each project, engineering studies, modeling, if necessary, and a final design will be completed and approved by a professional engineer. Design options will be continually evaluated against the project goals and objectives.

Task 3: Regulatory Compliance: early communication with regulatory agencies will be conducted to facilitate the overall permitting process and allow agencies the opportunity to identify concerns early in the process. Coordination could include site visits and meetings prior to and during the permitting process. NOAA will ensure that all local, state, and federal permits are obtained prior to initiating construction. NOAA will also ensure compliance with the National Environmental Protection Act (NEPA), as described in the section below.

Task 4: Construction: a project team will develop a budget estimate, statement of work, select a construction contractor, determine a schedule, and finalize construction plans. The construction task includes both the action of restoring the site and post-construction management including maintenance and monitoring of the construction. Monitoring will occur during and after construction to ensure work is progressing and completed as designed.

Task 5: Monitoring and Evaluation: a monitoring and evaluation plan that builds on identified goals and objectives will be developed for each project. The data collected before and after project construction will identify problems and document progress toward achieving restoration project goals and objectives. This information will also inform adaptive management decision-making. A more detailed description of monitoring is provided in the section below.

Task 6: Outreach and Education: the project team will develop a strategy to engage the public throughout project planning and implementation in cooperation with partners and existing community groups. Strategies may include site tours; presentations, interpretive outreach materials, videos, and other efforts to share project success.

Compliance and the NEPA Process

All restoration activities implemented by *Connecting Coastal Waters* will fully comply with all Federal statutory and regulatory procedures, including state and local permits, prior to construction. NOAA supports approximately 200 habitat restoration projects each year. All of these projects are assessed for environmental impacts in accordance with NEPA. To increase efficiency and reduce redundancy for future projects, NOAA developed a Programmatic Environmental Impact Assessment (PEIS) (NOAA 2014) that will be evaluated for applicability to projects proposed for this initiative. Project-specific impacts will be assessed for each proposed restoration project at the earliest possible time to ensure environmental issues are identified; that consultation among agencies and the public occurs; and to determine whether an Environmental Assessment (EA), Environmental Impact Statement (EIS), or a Categorical

Exclusion (CE) is the appropriate level of analysis. Some projects may require a detailed analysis; in other instances, tiering from an EA or another EIS will be the preferred approach. Projects that are small in scope and effect may fit the criteria for a CE determination.

NOAA Conservation Measures

In addition to NEPA procedures, NOAA has developed measures to mitigate possible impacts of restoration activities and protect Essential Fish Habitat (EFH) and endangered species. The following are examples of conservation measures for restoration projects normally required by NOAA:

- Use of Best management Practices (BMPs)- BMPs include but are not limited to:
  - Measures to protect water quality: use of turbidity curtains, hay bales, erosion mats.
  - Staging areas: will be planned in advance and kept to a minimum size.
  - Buffer areas: placed around sensitive resources, rare plants, archeological sites, etc.
- Invasive species - measures to ensure native vegetation or re-vegetation success.
- Avoidance of work during critical fish windows and use of Fishery Management Plan Conservation Measures.

Optional Phase Funding Approach

Phase 1: $2,893,750; **Phase 2:** $14,994,813

Proposed projects are each at differing points in the development process with varying levels of engineering and design work required to complete regulatory compliance and permitting. For example, projects such as the Maurepas Swamp Restoration project and Tate's Hell Crooked River Basin Restoration project have completed initial restoration plans and designs and are ready to move quickly into the regulatory compliance process. Other projects require additional engineering and design work for full development.

NOAA and our partners are confident that all the proposed projects can be fully developed to meet regulatory requirements. However, should the Council prefer to phase funding, the requested budget to complete engineering, design, and compliance for projects is $2,893,750 (including administrative costs, which are 4.5% of the total project cost). Following completion of compliance for all projects, a budget of $14,994,813 is requested to administer, construct, monitor, and conduct outreach for all of the proposed projects. NOAA will work with the Council to identify the most effective funding approach to meet Council priorities. Greater detail is provided in *Appendix A: Location Information* and *Appendix B: Budget Narrative*.

Inventory of Coastal Wetland Hydrology Restoration Opportunities

Budget: $380,000 (requested in Phase 1 if a phase funding approach is used)

NOAA will lead a collaborative, science-based inventory of coastal wetland hydrology restoration projects to meet the Council's goals for ecosystem restoration. *Connecting Coastal Waters* will expand the 2012 hydrology restoration inventory to be compatible with the goals of the Council and to focus on coastal wetland hydrology, a regionally significant need for ecosystem restoration. The inventory will be completed through the following tasks:

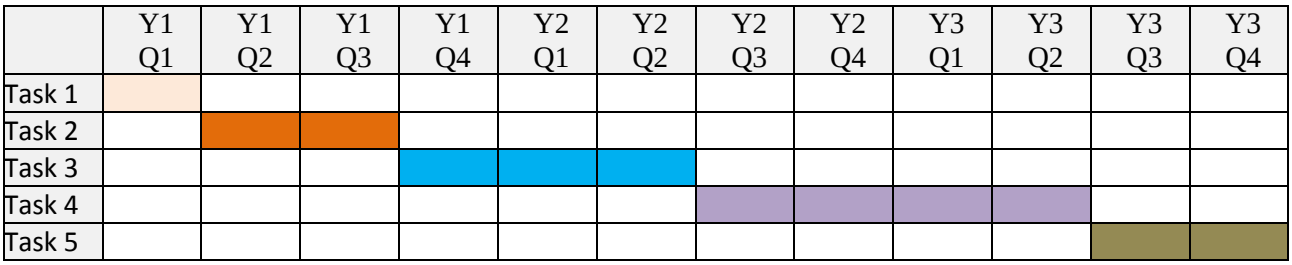

Figure 3: Inventory of Coastal Wetland Hydrology Restoration Projects Timeline

Task 1: Refine inventory objectives and set data standards: NOAA will form a technical advisory team consisting of restoration experts, resource managers, scientists, and target end-users of the inventory such as Council member agencies and the National Fish and Wildlife Foundation. The team will refine objectives to ensure the inventory meets restoration planning needs. The team will also set inventory data standards, data collection methods, and project screening criteria to ensure that the best available science is applied to the inventory.

Task 2: Prioritize wetland restoration focal landscapes: the technical advisory team will identify focal landscapes that target areas of greatest opportunity to address shared priorities; facilitate synergies among projects and across jurisdictions; and make the greatest contribution to restoring coastal wetlands, without regard to geographic location for the Gulf Coast. In addition to reviewing existing plans, the team will review coastal wetland restoration projects that have been submitted to state project portals to identify areas of high priority to the public.

Task 3: Conduct project identification workshops: NOAA will conduct local, interactive workshops to develop restoration projects within focal landscapes. Workshops will engage professionals and stakeholders with expertise and local area knowledge to identify coastal wetland restoration needs and projects. Participants will also evaluate factors such as cost-effectiveness, leveraging compatible activities, and opportunities for socio-economic benefits.

Task 4: Select projects for the inventory database: the technical advisory team will use screening criteria to evaluate projects identified in the workshops for inclusion in the inventory. Although all projects identified during workshops will be reported, the technical advisory team will conduct a technical screening of projects to identify future projects that can be tiered to substantially increase benefits. NOAA will conduct a data quality review, develop metadata, and enter project descriptions into the inventory database to produce an online map. The map will allow users to more easily locate projects and basic geographic information for the project area.

Task 5: Conduct outreach and share inventory: NOAA will develop an outreach strategy in coordination with the technical advisory team to ensure maximal exposure and use of the inventory. The strategy will include presentations at regional meetings, establishing links on compatible partner websites, and other opportunities to inform the public and restoration practitioners about the inventory and importance of restoring coastal wetland hydrology.

III. Monitoring and Adaptive Management

It is important to monitor and assess restoration projects to ensure that the money and time invested are being efficiently and effectively spent. Successful monitoring can prevent many problems by providing early warning signals, improving ongoing coordination, and enhancing planning to ensure that project goals are met. *Connecting Coastal Waters* will use standard monitoring protocols including *Science-Based Restoration Monitoring of Coastal Habitats* (Thayer et al. 2003, Thayer et al. 2005). Each project will develop a monitoring plan that details specific parameters, collection methods, and quality assurance and quality control procedures. For each parameter, the monitoring plan will indicate units and data collection methods; sampling sites, frequency, and duration; and reference site locations and sampling frequency and duration. Data collected under this proposal will undergo verification to ensure the quality, utility, and integrity of information collected. NOAA will report data once it has been through quality assurance and control procedures. Example parameters that will be considered in monitoring plans are listed below. Three types of monitoring will be conducted:

Pre-implementation monitoring—provides baseline information to compare with post-implementation data to determine whether the restoration is having the desired effect.
Implementation monitoring—ensures the project is being implemented as planned and identifies needed modifications.
Effectiveness monitoring—enables evaluation of whether a project has met its objectives.

Hydrology Parameters:

- Water depth, salinity
- Flow pattern, rate
- Flooding extent
- Tidal prism (volume)

Vegetation Parameters:

- Community composition
- Plant coverage, height, survival
- Plant reproduction

Soils Parameters:

- Soil salinity
- Soil texture, organic matter
- Sedimentation

Nekton Parameters:

- Species diversity and/or relative abundance
- Density or abundance
- Species survival, growth

Adaptive management

Adaptive management is a process of learning by doing, wherein flexibility is built into projects, and actions can be changed based on their progress toward a defined end-state. A key component is the use of a feedback mechanism to sequentially improve management actions so that management decisions are routinely adjusted to achieve program goals and objectives (GCERTF, 2011). Ecosystem monitoring is at the heart of adaptive management (Fischenich, et al. 2012). In adaptive management, the restored system is monitored, data assessed, and, if necessary, a remedy is prescribed. Comparing a project site to reference sites is also an effective monitoring strategy to understand the impacts of hydrology modification on many ecological indicators (Diefenderfer 2003). During project planning, adaptive management will be used to refine objectives and make changes as necessary. During construction, adaptive management will be used to evaluate the need for changes to original plans, e.g., number and types of plants, configuration of channels or grading, or amount of soil brought to the site. Using this approach, information gained through project monitoring will guide adaptive management.

IV. Measures of Success

NOAA and the Council share the principle of ensuring a science-based, transparent process to demonstrate results in achieving its goals. Therefore, NOAA has incorporated actions to set measurable objectives and measure success throughout planning, implementation, and reporting for *Connecting Coastal Waters*. NOAA will also dedicate a project manager to provide coordination and oversight across the projects to ensure the following metrics are achieved:

- **Metric 1:** restore natural hydrology to benefit and restore over **22,000 acres** of wetland and estuarine habitats.
- **Metric 2:** engage local community organizations and provide opportunities for **250 participants** during community events held for restoration projects.
- **Metric 3:** identify coastal wetland hydrology restoration projects within each of the Gulf's **37 estuarine drainage areas**.

Connecting Coastal Waters will measure progress through a robust planning, monitoring and evaluation approach using objective measures of success. Each proposed restoration project will set site-specific, science-based objectives with partners that will be assessed through an approved monitoring and adaptive management plan described in Section III. Examples of objective measures of success include achieving a target wetland hydroperiod or natural salinity regime, the presence of appropriate wetland vegetation, or increased use of the site by a target species. The development of an inventory of coastal wetland hydrology restoration opportunities will also use objective measures of success. In addition to the quantifiable metric of identifying projects within the Gulf's 37 estuarine drainage areas, criteria for the inclusion of projects in the final inventory will be set by the technical advisory team. By establishing these criteria, the quality of projects included in the inventory can be objectively evaluated.

V. Risks and uncertainties of the proposed activities

There are inherent risks to any project based in a dynamic coastal system including, but not limited to: sea level rise, storms, subsidence, and at times unpredictable changing environmental conditions. Environmental projects are often affected by upstream or watershed anthropogenic impacts that are beyond the ability of a single project to mitigate. These issues are common to any project; restoration techniques and designs need to consider first how not to increase harm, and secondly, how to optimize project benefits even in the face of such challenges.

The NOAA Restoration Center Programmatic Environmental Impact Statement (NOAA 2014) considers impacts of hydrologic restoration such as the projects listed within this proposal. Although the level of impacts will depend upon project specifics and location, the document states that hydrology restoration projects may cause direct and indirect, short-term minor or moderate impacts on geology and soils, water, living coastal and marine resources and Essential Fish Habitat, and threatened and endangered species during the construction phase of the project. The reasons for these impacts stem from the use of heavy machinery and construction equipment. Mitigation for potential impacts would focus on implementation of BMPs; however, restoration of priority habitats to natural states would enhance water quality, reduce sedimentation and erosion, and enhance habitat quality, mitigating short-term impacts. Example BMPs are listed in the Compliance discussion above (*Section II*). Other anticipated direct,

indirect, and cumulative impacts will be considered as project designs come to completion. In general, restoring hydrology will result in wetlands becoming healthier and more resilient to the effects of climate change and storm-induced stress. Improving freshwater and tidal exchange will also promote habitat growth, vertical accretion, and adaptation to sea level rise and subsidence.

Restoration projects implemented under NOAA programs have been, and will continue to be, sited where there is willing participation from landowners and little conflict between natural resource user groups. In the unlikely event that any of the proposed projects are not able to complete environmental and regulatory compliance, alternative projects will be identified in collaboration with the Council and our state partners. Our level of screening, however, and discussion with state partners gives us confidence that the identified projects can move forward to implementation. To instill further confidence from the Council, the implementation methodology describes a phased release of requested funds, to be distributed upon completion of all regulatory requirements. NOAA's experience, as shown in example projects within *Appendix F: Other Information* demonstrates that hydrologic restoration at this scale has been successful in meeting project objectives with few to no long-term negative impacts. Our thorough analysis as required under NEPA, coupled with NOAA's commitment to long-term monitoring and adaptive management, will optimize project performance and mitigate risk prior to implementation.

VI. Outreach and Education Opportunities

Connecting Coastal Waters will conduct outreach, education, stewardship, and training activities with proposed restoration projects and the inventory of coastal wetland hydrology projects. Each proposed restoration project will engage the local community in activities such as demonstration workshops, stewardship events, and restoration training with the conservation corps, extension, and other professional development organizations. The types and timing of outreach activities will be developed by each project team based on site specific conditions and opportunities for safe and meaningful involvement. Projects will leverage the many local organizations that engage communities in habitat restoration activities by forming partnerships during restoration project planning so that outreach activities can be incorporated in the full project life cycle. NOAA will also conduct public outreach across projects to communicate the importance of restoring coastal wetland hydrology. In addition, NOAA will conduct activities targeted to restoration planners and practitioners to share the inventory of coastal wetland hydrology projects and results of the *Connecting Coastal Waters* initiative. Outreach will be designed to increase regional capacity to identify and implement successful coastal wetland hydrology restoration projects.

VII. Leveraging of Resources and Partnerships

NOAA's mission is to understand our climate, weather, oceans, and coast, and apply that knowledge to the conservation and management of coastal and marine ecosystems. Our approach to this mission is based on the strength of partnerships. NOAA has embraced the importance of partnerships as part of its core operation, evidenced in each of its programs and initiatives. NOAA has also built long-standing programs that have contributed to the restoration and conservation of a variety of coastal and marine habitats using a science-based interdisciplinary approach. Through skilled teams including ecologists, oceanographers, engineers, and

professional project managers, NOAA has either directly implemented or partnered on many hundreds of projects focused on coastal restoration.

Our partners include state and local governments, non-governmental organizations, universities, and other organizations that we have worked with towards the specific objective of reconnecting coastal wetlands. NOAA has managed or partnered on dozens of hydrologic restoration projects along the Gulf Coast that have benefited over 20,000 acres of tidal wetlands. *Appendix F: Other Information* illustrates just a small sampling of projects that NOAA has led or partnered on that are similar in scope to the proposed projects. These projects were constructed under NOAA's core programs and each has included an emphasis on community involvement, volunteerism, education, and outreach as a means of instilling long-term stewardship of coastal habitats. The success of projects such as these has helped establish NOAA as a leader and a partner, in hydrologic restoration for a more resilient and sustainable coast.

VIII. Proposal Benefits

Connecting Coastal Waters will implement "a coordinated, Gulf Coast region-wide restoration effort in a way that restores, protects, and revitalizes the Gulf Coast", as called for in the Council's *Initial Comprehensive Plan*. Its projects and partnerships form the core steps to address the loss of Gulf Coast wetlands, a significant ecosystem issue. It also provides a science-based, collaborative process to identify future coastal wetland restoration projects that can be tiered to those included in this proposal and provide synergy across jurisdictional boundaries. *Connecting Coastal Waters* focuses on the restoration of coastal wetland hydrology using proven restoration strategies to achieve multiple benefits including the following:

Examples of ecological benefits:

- Creation/enhancement of fish and wildlife habitat;
- Improved habitat sustainability;
- Reduction of shoreline erosion;
- Storm surge attenuation and flood mitigation;
- Adaptation to sea level rise;
- Storm water management;
- Control of invasive species; and
- Improved water quality.

Examples of socio-economic benefits:

- Uses local work forces and businesses for planning and implementation;
- Enhances fisheries productivity for commercial/recreational harvest;
- Improves shoreline/infrastructure protection; and
- Increases surrounding property values.

The restoration of coastal wetland hydrology is also cost effective, sustainable, and foundational. Relatively small physical modifications and barriers to tidal or freshwater flow can negatively affect large areas of habitat. Consequently, the large-scale restoration of these habitats can be achieved with a relatively inexpensive (on a cost/acre basis) and small footprint of work (NOAA 2010). Wetland hydrology restoration also creates water quality and physical conditions (salinity, dissolved oxygen, nutrients) necessary for large-scale coastal wetland habitat restoration. Therefore, reconnecting a diverse mosaic of wetland and estuarine habitats restores the ability of these important systems to provide a range of ecosystem services for the fish, wildlife, and people of the Gulf Coast.

Connecting Coastal Waters: Restoring Coastal Wetland Hydrology Appendices

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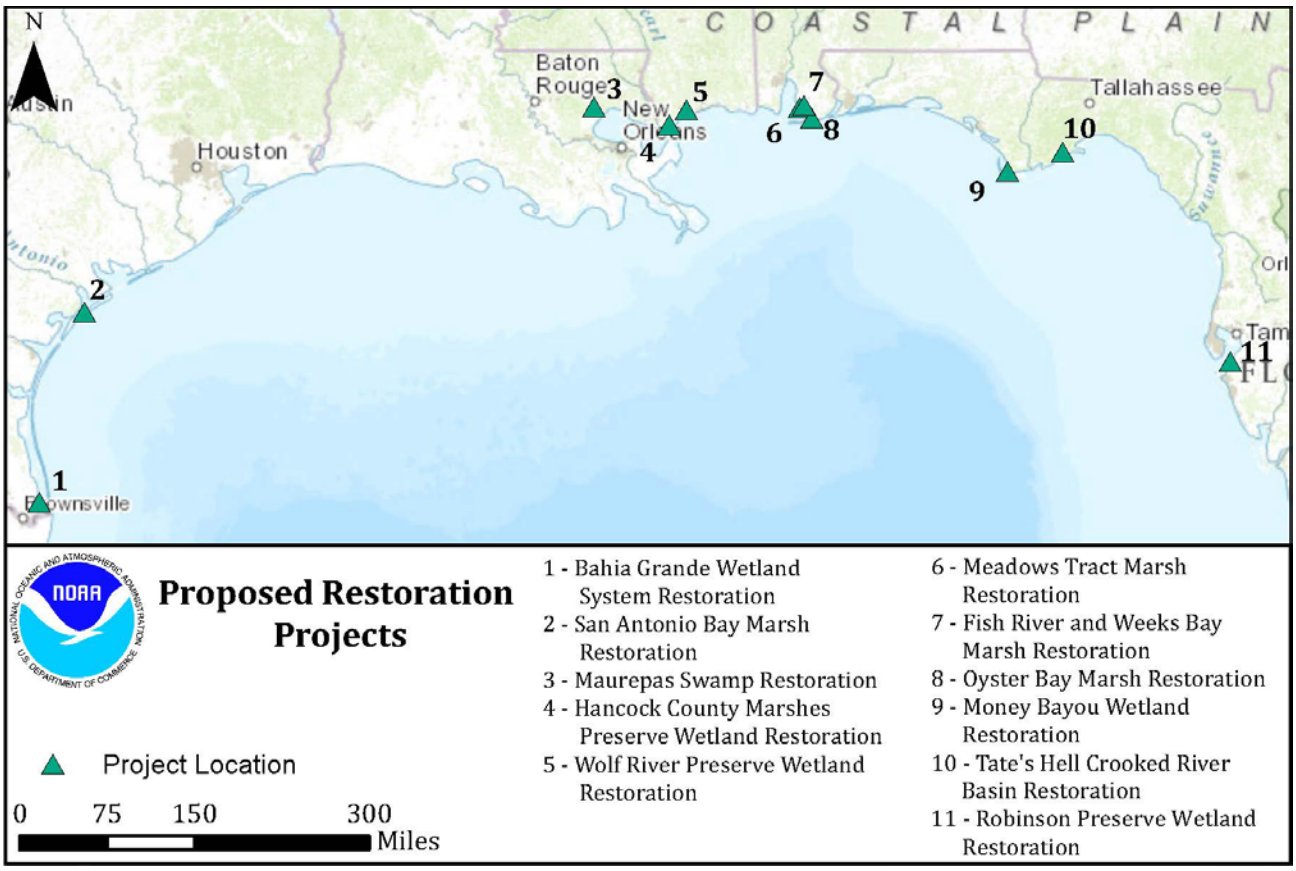
Appendix A: Location Information

Coastal Wetland Hydrology Restoration Projects



Project Title: Bahia Grande Wetland System Restoration
Location: Brownsville, Texas
Proposed Budget: $1,140,000

The Bahia Grande Wetland System Restoration project was developed in cooperation with staff from the Laguna Atascosa National Wildlife Refuge and the Texas Commission on Environmental Quality.

Project Area Description:
Bahia Grande is located in south Texas between Brownsville and Port Isabel (Figure 1a and 1b). Bahia Grande is a federally protected 20,000 acre coastal ecosystem that has been greatly affected by hydrological modifications. For more than seven decades, Bahia Grande and two smaller saltwater lagoons between Brownsville and Port Isabel have been cut off from the Laguna Madre Bay, landlocked behind spoil banks deposited during the dredging of the 17-mile-long Brownsville Ship Channel in the early 1930s. This isolation left the Bahia Grande a vast flat of dry sediment with little to no value as habitat for fish and wildlife.

Historically, watershed and rainfall drainage north of Highway 100 flowed into La Laguna Larga and upper basins of the Bahia Grande. The area has been the focus of several large-scale restoration projects to begin to restore this unique ecosystem. However, additional work is required to restore the Bahia Grande wetland system. A drainage ditch was dug on the north side of Highway 100 and now precipitation and overland flow go down the ditch and discharge into Laguna Madre just south of the City of Laguna Vista. The restoration of freshwater flow into the La Laguna Larga will complement the tidal flow restoration completed in 2005 by provide additional water inputs into the system and by moderating salinity levels in this 800 acres section of the Bahia Grande system.

Project Goals:
This project will restore natural hydrology to 800 acres of the Bahia Grande wetland system by restoring the flow of freshwater from north of Highway 100 to La Laguna Larga in the upper Bahia Grande System.

Implementation Strategy:
This project will be implemented by re-routing freshwater flow north of Highway 100 that currently drains into the Laguna Madre back into the Bahia Grande. This will be accomplished by either filling the ditch or by installing a fixed crest weir in the ditch that would divert the water under Highway 100 into the Bahia Grande. Land grading may be needed to ensure the desired water flow into the Bahia Grande.

Leveraging, Partnerships, and Likelihood of Success:
The Bahia Grande Restoration Partnership, a coalition of 65 partners including NOAA, was formed to work towards restoration of Bahia Grande, including a restoration project in 2005 that reconnected the Bahia Grande with tidal waters. This project builds on these efforts by implementing activities included in the Bahia Grande restoration master plan using proven restoration techniques with a high likelihood of success. Ducks Unlimited has also produced a conceptual design for the project and the U.S. Fish and Wildlife Service refuge staff has

coordinated with Texas Department of Transportation regarding the need to reroute the water from the roadside ditch and under Highway 100. Upon funding of the project, U.S. Fish and Wildlife Service engineering staff will begin to produce construction design plans.

Outreach and Education Strategy:
Outreach regarding the restoration can include on site interpretive materials and project tours to educate restoration practitioners and transportation professional about the benefits of restoring and maintaining wetland hydrology that has been or could be diverted by transportation projects.

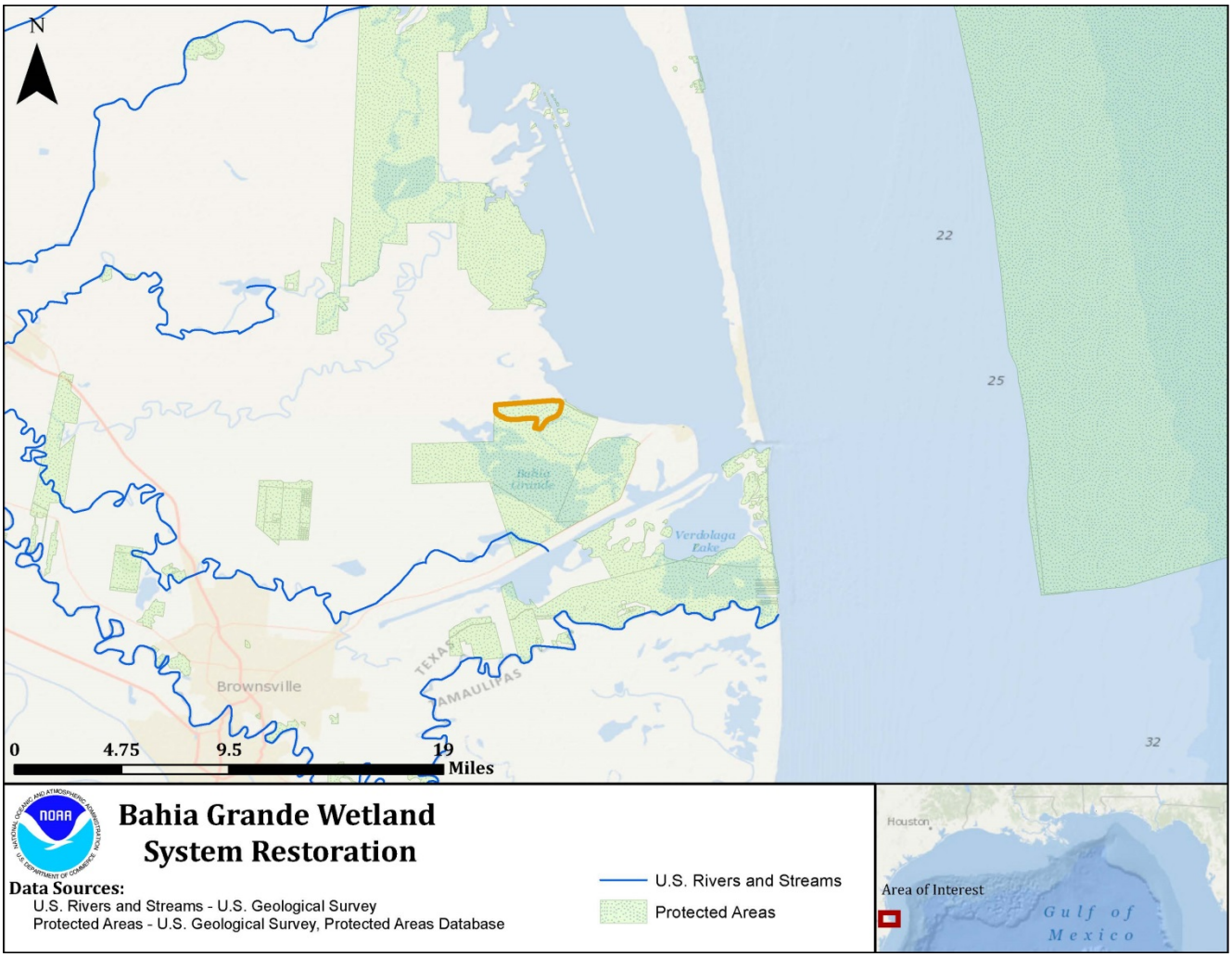


Figure 1a: Bahia Grande Wetland System Restoration Project Area

Figure 1b: Bahia Grande Wetland System Restoration Project Site

Project Title: San Antonio Bay Marsh Restoration
Location: Matagorda Island, Texas
Proposed Budget: $802,500

The San Antonio Bay Marsh Restoration project was developed in cooperation with staff from the Aransas National Wildlife Refuge and the Texas Commission on Environmental Quality.

Project Area Description:
In the mid-1950's, a network of roads, levees and ditches were built in on Matagorda Island (Figures 2a and 2b) with the intent of management for private and commercial use (dewatering for farmland, cattle grazing and oil and gas exploration). This work led to decrease in hydrological connectivity in several locations, as well as altered circulation and drainage patterns. These actions removed thousands of acres of fishery habitat from tidal flow decreasing the value of this habitat as a nursery for fishery species. Some corrective actions were taken after the state filed a lawsuit to reinstitute restricted water flow. Matagorda Island was eventually incorporated into the Aransas National Wildlife Refuge. Refuge staff is now continuing the restoration work with partners including the Coastal Bend Bays and Estuary Program.

Project Goals:
Restore hydrological connectivity to 170 acres of wetlands and tidal flats at Shell Reef by restoring hydrology by repairing and replacing dilapidated culverts. This will help to a) increase tidal exchange between the bay and marsh system, b) promote circulation and exchange between interior cells, c) reduce maintenance costs for existing system of control structures d) maintain access via critical levee roads for monitoring and law enforcement, e) restore fishery habitat at Shell Reef.

Implementation Strategy:
Tidal flows into this wetland system will be restored by replacing dilapidated culverts with culverts that are designed to optimize tidal flows into the degraded wetlands. Culverts will be designed to facilitate flows into and circulation within the wetland system and to allow ingress and egress of marine/estuarine organisms into the restore habitat. This project may also include breaching levees to facilitate tidal flow.

Leveraging, Partnerships, and Likelihood of Success:
This project is identified as a restoration priority (site 57) in *the Habitat Conservation and Coastal Public Access Plan for the San Antonio Bay System* prepared by the Coastal Bend Bays and Estuaries Program (CBBEP). The CBBEP has been working with U.S. Fish and Wildlife Service Staff from the Aransas National Wildlife Refuge to restore tidal flows into this wetland system. A variety of parameters is being measured through continuous monitoring at stations, including water level, salinity and dissolved oxygen. This project will build upon those partnership efforts and monitoring data by implementing restoration techniques with a high likelihood of success. Restoration efforts will also focus on the culverts and levees that have been identified as a priority for maximizing flows and circulation within the wetland system.

Outreach and Education Strategy:
Although this site is remote, it is utilized by the public for fishing and bird watching. The Aransas National Wildlife Refuge is the winter home of the only migrating flock of the endangered Whooping Crane. Interpretive materials will be developed highlighting the restoration effort and the benefits to fishery species and the Whooping Crane.

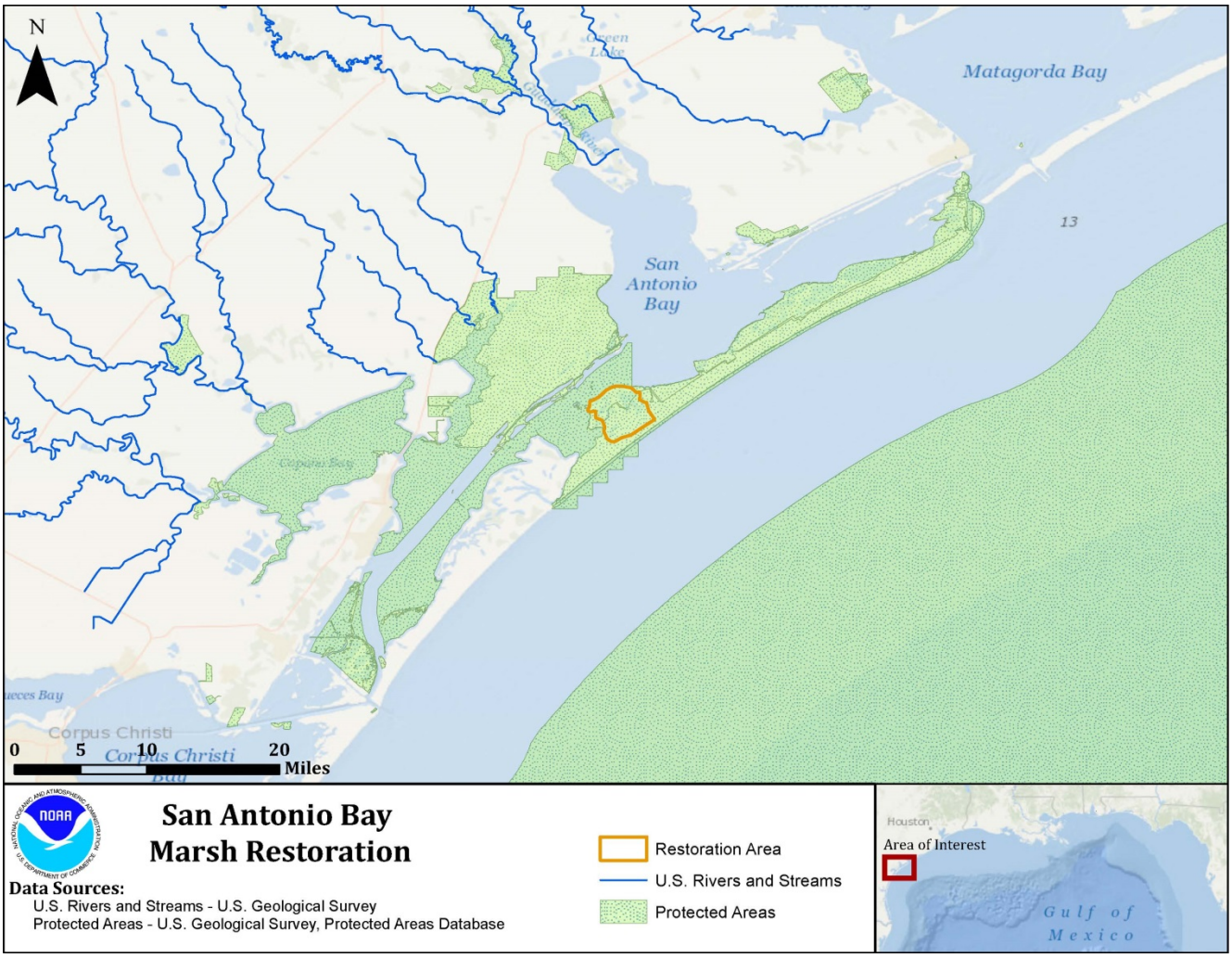


Figure 2a: San Antonio Bay Marsh Restoration Project Area

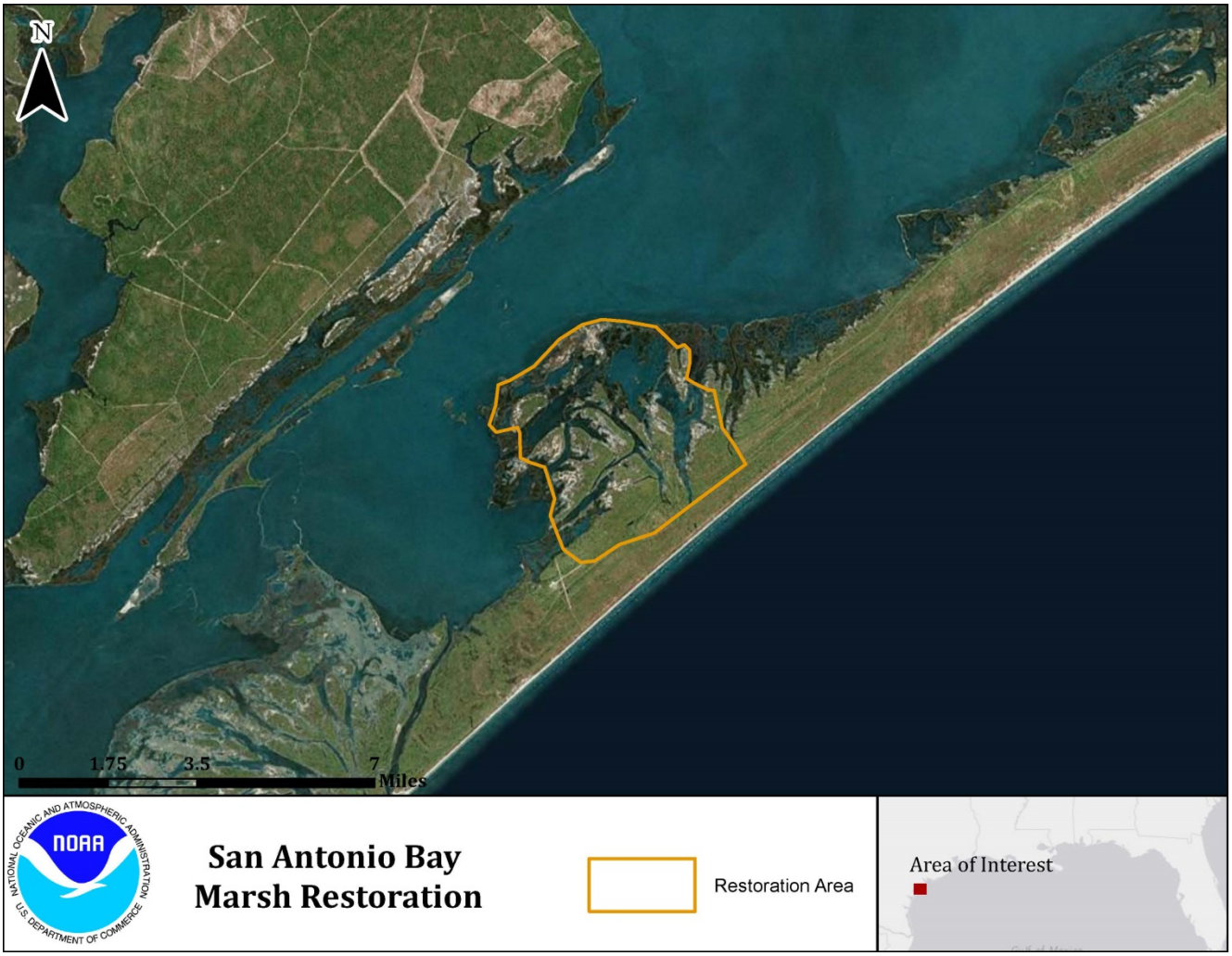


Figure 2b: San Antonio Bay Marsh Restoration Project Site

Project Title: Maurepas Swamp (West Joyce Wetlands) Restoration
Location: Ponchatoula, Tangipahoa Parish, Louisiana
Proposed Budget: $3,495,000

The Maurepas Swamp (West Joyce Wetlands) Restoration project was developed in cooperation with staff from Tierra Resources LLC, Comite Resources, Inc., Wetland Resources, LCC, Ducks Unlimited, Climate Trust, and the Joyce Wildlife Management Area, Louisiana Department of Wildlife and Fisheries (LDWF).

Project Area Description:
The project area is located on the northeast side of Lake Maurepas, adjacent to the Joyce Wildlife Management Area (WMA). The area supports characteristic Louisiana wetlands such as freshwater coastal swamp forest dominated by water tupelo and bald cypress (Figure 3a and 3b). The project area is owned by the LDWF, Williams Land Company, LLC, and Rathborne Land Company, all of whom have expressed interest in participating in this project. The project area was originally part of a contiguous West Joyce Wetlands complex. The wetlands are now bisected by Interstate-55/US-51and railroad tracks, essentially creating two hydrologically distinct wetland units. In the 1960's, Anderson Canal and South Slough were dredged. The spoil was placed on the south side of the canals, effectively blocking the flow and directing it to the canal running parallel to I-55. The canals created a conduit for saltwater movement into the system during northward wind driven surges. Since the construction of the Anderson, South Slough, and I-55 canals, saltwater intrusion has killed vast areas of cypress-tupelo swamp forests. Restoration of this large wetland complex will enhance habitat for a wide variety of plants and animals, improve water quality, and provide increased freshwater management for both the project area and the adjacent Joyce WMA.

Project Goals:
This project will enhance the ecological functionality of approximately 15,000 acres of cypress-tupelo swamp wetlands providing improved habitat longevity and sustainability.

Implementation Strategy:
The project will optimize freshwater inputs into the area to restore a complex of freshwater wetlands. The first component is the expansion of the City of Hammond wastewater assimilation area to distribute treated effluent onto LDWF property on the western portion of the project area. The existing wastewater distribution system, currently in operation on the Joyce Wildlife Management Area, would be expanded to run under I-55 and continue south across the Anderson Canal and along the canal's south spoil bank. Additional freshwater input to the area will stimulate wetland growth, reduce the risk of drought stress, and displace saltwater intrusion. This expansion will also overcome current hydrological barriers and allow water management across both the east and west sides of the wetland complex. The second component of the proposed project is construction of a salinity control structure on the I-55 canal. A salinity control structure will allow freshwater flows to pass south and provide fish access, but it will inhibit the ability of salt water to move north up the system where it negatively affects freshwater wetlands.

Leveraging, Partnerships, and Likelihood of Success:
This project has a high likelihood of success due to comprehensive partner planning and project area assessment. Tierra Resources with Ducks Unlimited, Comite Resources Inc., and the Climate Trust have assessed extensive baseline data for the proposed strategy. Shell Corporation also contributed $100,000 towards a 2014 feasibility study that included an assessment of conditions, water quality, and hydrology; as well as a permit analysis, conceptual design, and cost estimate. Meetings have been held with all landowners, who have expressed interest in the project. This project is complementary to several projects that are part of the State's coastal restoration plans including the West Maurepas Diversion project, Small Diversion at Convent/Blind River project, River Reintroduction into Maurepas Swamp project, and the Hydrologic Restoration of the Amite River Diversion Canal project. These projects, which are planned for other portions of the Lake Maurepas basin, share the goal of restoring wetlands by improving the region's hydrology.

Outreach and Education Strategy:
A restoration site tour will be conducted to share project information with restoration practitioners. Project interpretive materials will also be developed to inform the public about the importance of coastal wetlands and successful approaches for their restoration.

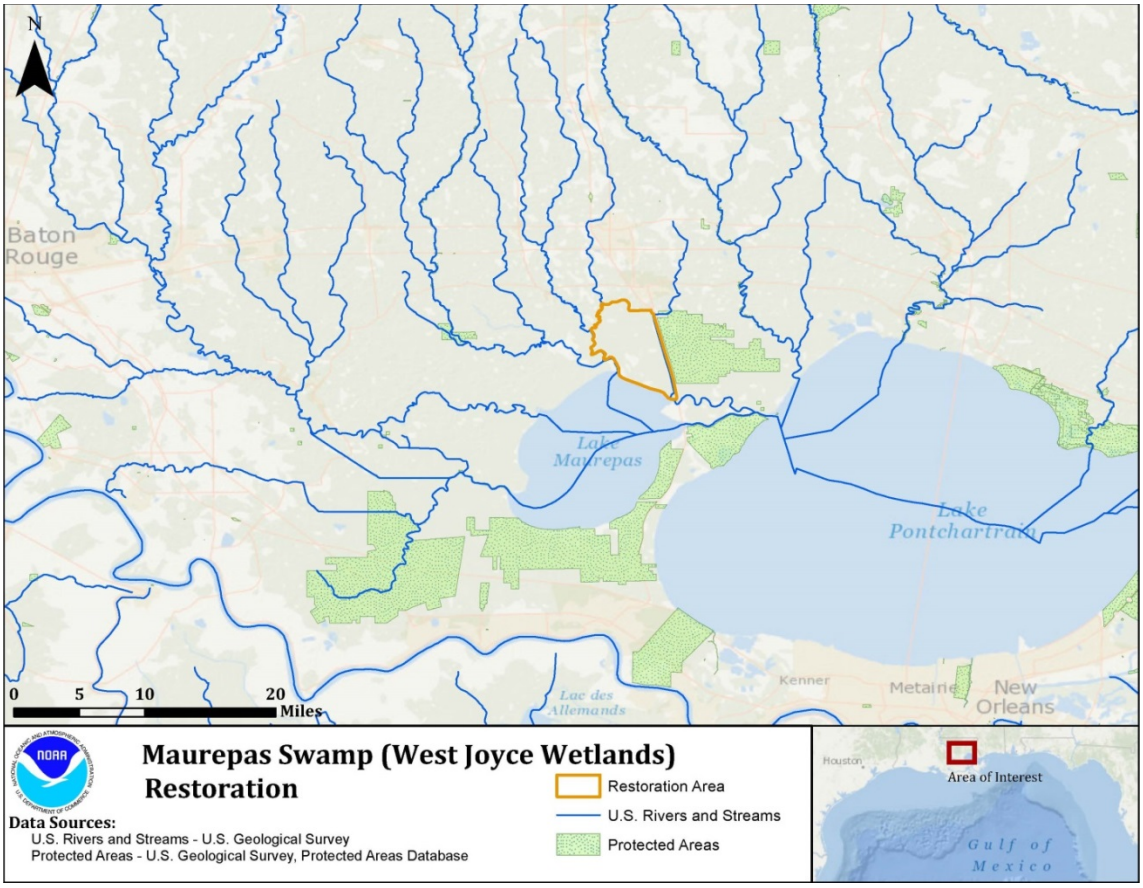


Figure 3a: Maurepas Swamp (West Joyce Wetlands) Restoration Project Area

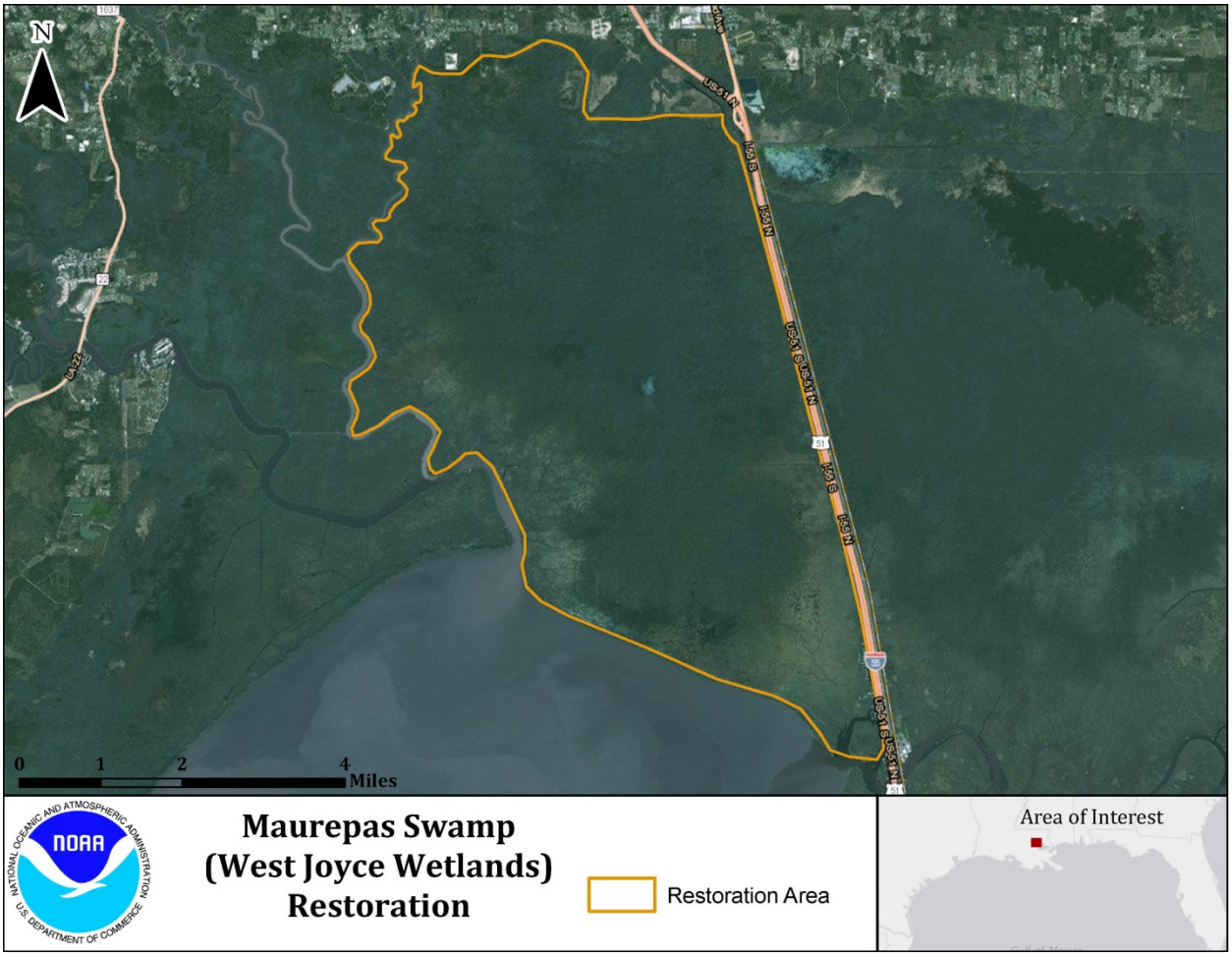


Figure 3b: Maurepas Swamp (West Joyce Wetlands) Restoration Project Site

Project Title: Hancock County Marshes Coastal Preserve Wetlands Restoration
Location: Ansley, Hancock County, Mississippi
Proposed Budget: $3,862,500

The Hancock County Marshes Coastal Preserve Wetlands Restoration project was developed in cooperation with staff from the Mississippi Department of Marine Resources (DMR).

Project Area Description:
Hancock County Marshes Coastal Preserve is located near the town of Ansley and contains the second largest continuous marsh area in Mississippi (Figure 4a and 4b). The Preserve protects 13,570 acres that are part of an estuarine system bordering Heron Bay and the Mississippi Sound. The areas includes a mosaic of habitat types including saline and brackish marsh, relic barrier islands, hummocks, forested dune and ridge systems, and riverine swamp. The wetlands within the Preserve are used by many bird species protected under the Endangered Species Act and Heron Bay is designated as critical habitat for the endangered Gulf sturgeon. However, the wetlands now protected within the Preserve were impacted by the construction of mosquito control ditches. Mosquito control activities such as ditching were prevalent in coastal Mississippi through the 1950's. The extensive, interconnected system of mosquito control ditches within the Preserve disrupt natural sheet flow to Heron Bay; degrade the adjacent marsh ecosystem function; and reduce the habitat utilization of these marshes by commercially and recreationally important juvenile finfish and birds. This project will restore marsh habitat impacted by mosquito control ditches located within the northern portion of the Preserve.

Project Goals:
This project will benefit over 450 acres of wetland habitat by restoring all or some of the approximately 26 acres of mosquito control ditches back to estuarine marsh connected by more natural tidal creeks.

Implementation Strategy:
A design and engineering plan will be developed along with modeling to determine the best restoration approach within the disturbed area that may include backfilling ditches from sidecast material or clean fill, placing ditch blocks in strategic locations, and/or installing culverts. Due to the orientation of the mosquito ditches and the limited access to the site, options for equipment access will be evaluated during the design phase to reduce unforeseen implementation risks. After the ditches are backfilled, they will be planted with appropriate, native vegetation and/or be allowed to re-vegetate naturally from the surrounding marsh.

Leveraging, Partnerships, and Likelihood of Success:
This project will implement restoration techniques that have a high likelihood of success in partnership with, and building upon the restoration efforts of, the DMR's Coastal Preserves Bureau. This project also compliments the Hancock County Marsh Living Shoreline Project proposed under Phase III of Early Restoration for the *Deepwater Horizon* Natural Resource Damage Assessment. The Hancock County Living Shoreline Project will restore salt marsh habitat, reduce shoreline erosion, and restore oyster reefs along and adjacent to Heron Bay. Restoration of wetland habitat within the Preserve proposed through this project will further benefit these important freshwater, estuarine, and marine habitats in Mississippi.

Outreach and Education Strategy:
There is an opportunity for community engagement and hands-on restoration training by working with volunteers from the Mississippi Habitat Stewards Program who will assist with re-vegetation efforts and ongoing maintenance and monitoring activities. Project interpretive materials will also be developed to inform the public about the importance of coastal wetlands and successful approaches for their restoration.

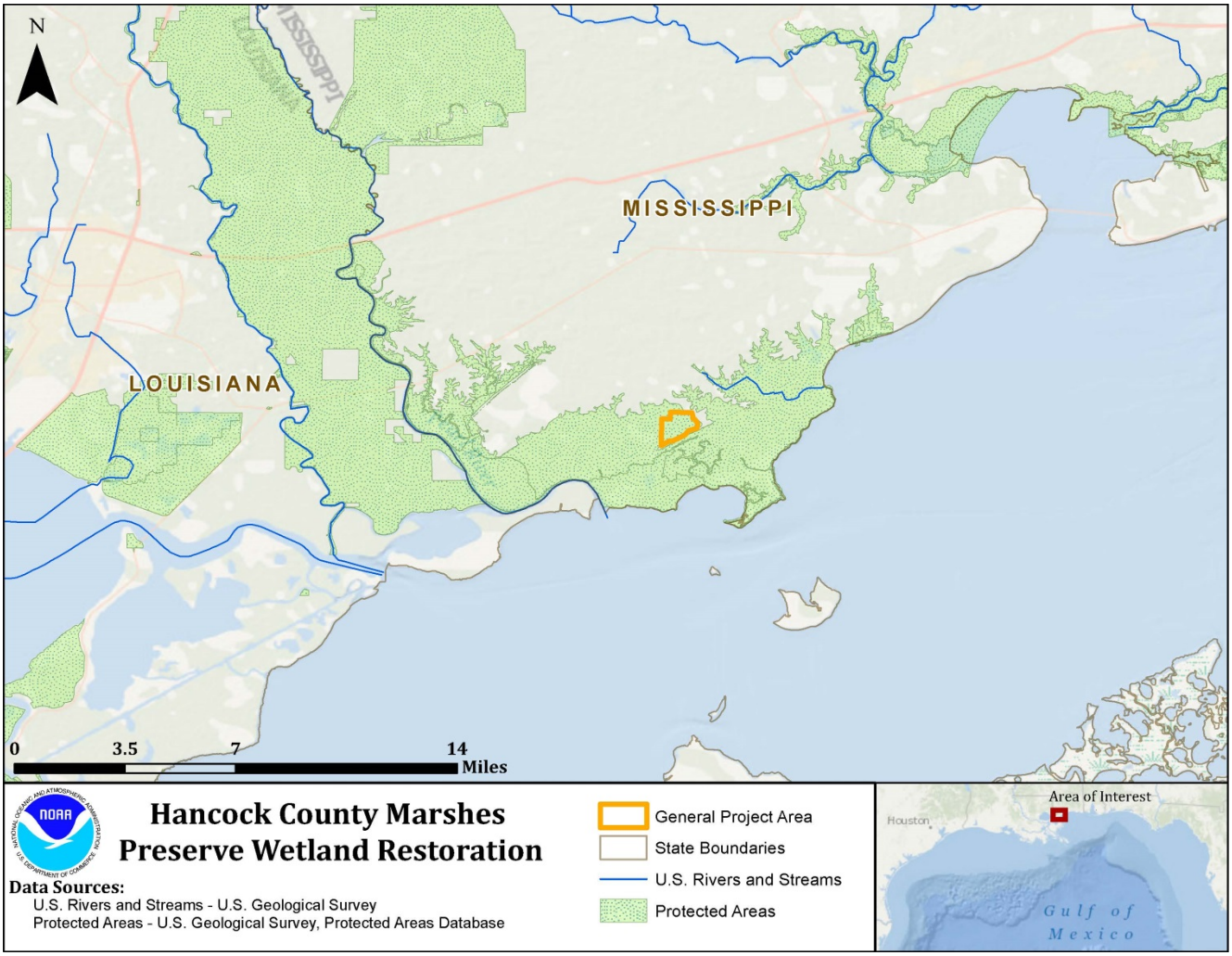


Figure 4a: Hancock County Marshes Preserve Wetlands Restoration Project Area

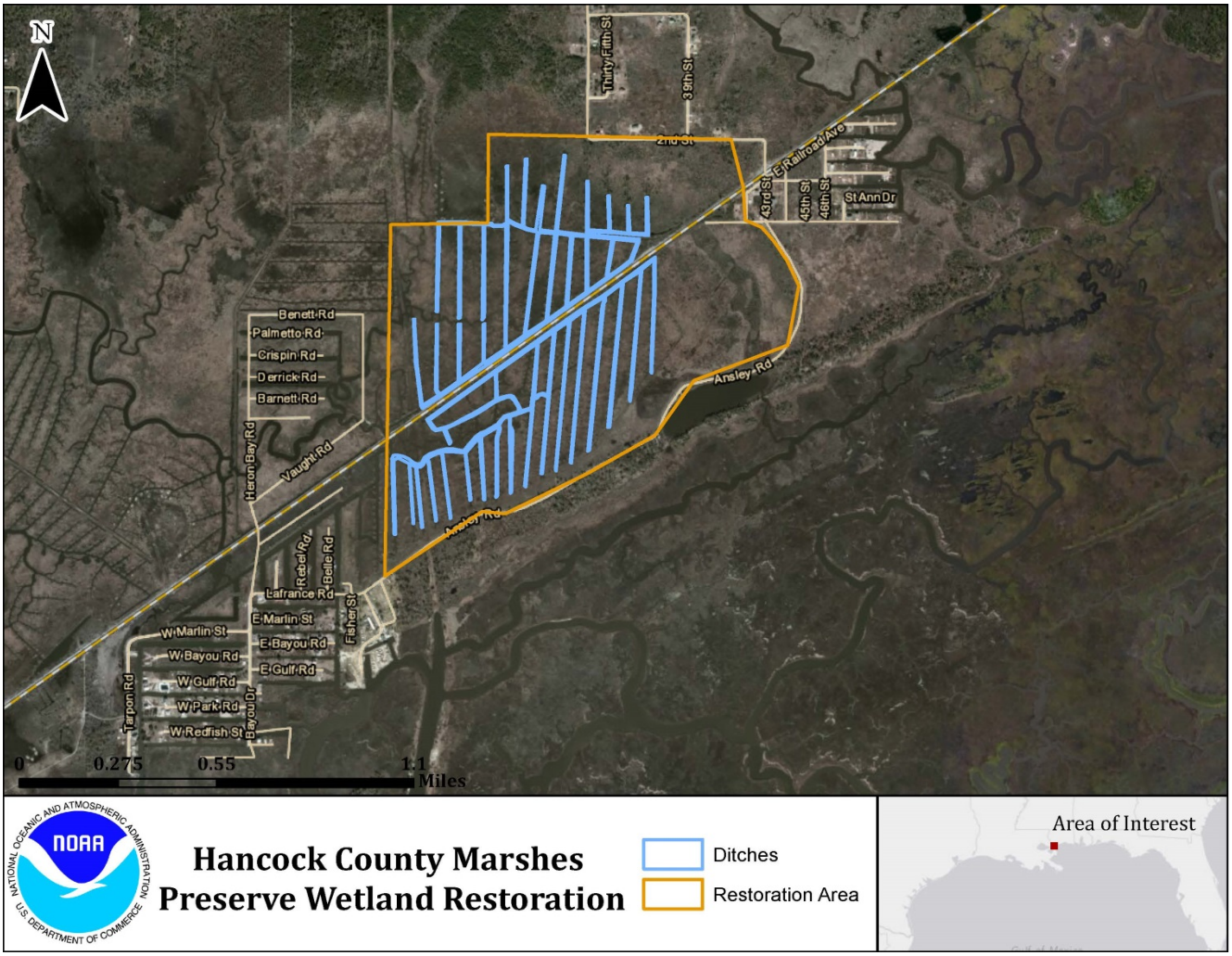


Figure 4b: Hancock County Marshes Preserve Wetlands Restoration Project Site

Project Title: Wolf River Preserve Restoration
Location: Wolf River Preserve
Proposed Budget: $451,500

The Wolf River Preserve Restoration project was developed in cooperation with staff from the Mississippi Department of Marine Resources (DMR)

Project Area Description:
The Wolf River Preserve Restoration project area is part of the Mississippi Coastal Preserve system, which provides recreational opportunities to the public while protecting, preserving, and restoring sensitive coastal habitats (Figure 5a and 5b). Wolf River Preserve is a 2,426-acre protected area that contains expansive tidal freshwater and brackish marsh along the lower Wolf River, DeLisle Bayou, and Bayou Portage. The Wolf River, a Mississippi Scenic Stewardship Stream, supports diverse forested wetland habitats such as cypress and tupelo swamps, as well as the bottomland hardwood forests that were once dominant habitats along southeastern rivers. This unique location provides excellent feeding, resting, and wintering habitat for numerous types of migratory bird species. The Preserve also provides essential fish habitat, habitat for endangered species such as the Alabama red-bellied turtle, and supports species of conservation concern such as the Diamondback terrapin. Silviculture was a prominent land use in Hancock County in the early 20th century, resulting in the construction of forest logging roads and other hydrological modifications to support forest operations. Former logging roads have affected natural drainage within the Wolf River Preserve, including limiting natural freshwater flow to brackish and salt marsh areas on the southern portion of the property and ultimately to Bay St. Louis.

Project Goals:
The goal of this project is to restore natural stream functions and areas affected by historical logging roads by installing culverts, low water crossings, and/or weirs in order to enhance approximately 400 acres of estuarine and freshwater wetlands.

Implementation Strategy:
This project will install culverts at appropriate elevations to restore natural stream flow beneath roadways; install low water crossings or remove unused logging roads to restore natural sheetflow across coastal plant communities; and replant restored areas with native, wetland vegetation.

Leveraging, Partnerships, and Likelihood of Success:
This project leverages work by the DMR Coastal Preserves Bureau to develop a restoration plan, completed in 2007, for this portion of the Preserve. A second plan was completed by Anchor QEA and Natural Capital Development in 2012 using field characterization and hydrological modeling. Both plans identify existing access roads and undersized culverts as hydrological impairments that should be addressed. The plans recommend low water crossings, undersized culvert replacement, and road bed stabilization. There is a high likelihood of success and minimal risk to undertake the restoration since reversing the effects of historical logging operations is a common restoration practice throughout the northern Gulf of Mexico.

Outreach and Education Strategy:
Stewardship activities will be developed with the DMR and the Mississippi Wildlife Federation. Events will be held to host volunteers from the Mississippi Habitat Stewards Program and conduct re-vegetation and ongoing maintenance activities (such as debris and sediment removal at culvert locations). Project interpretive materials will also be developed to inform the public about the importance of coastal wetlands and successful approaches for their restoration.

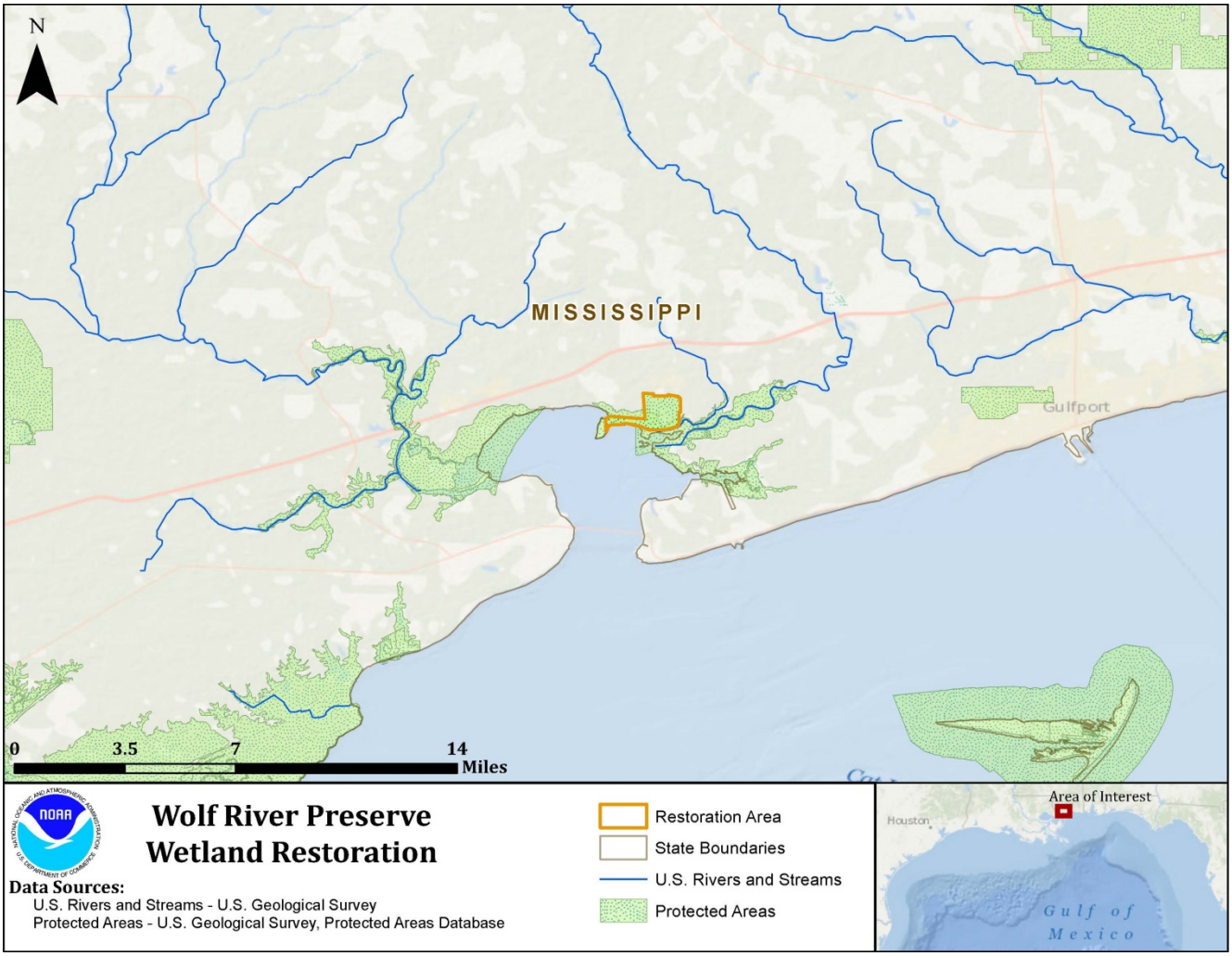


Figure 5a: Wolf River Preserve Wetland Restoration Project Area

Figure 5b: Wolf River Preserve Wetland Restoration Project Site

Project Title: Fish River and Weeks Bay Marsh Restoration
Location: Weeks Bay National Estuarine Research Reserve, Baldwin County, Alabama
Proposed Budget: $1,520,000

The Fish River and Weeks Bay Marsh Restoration project was developed in cooperation with staff from the Alabama Department of Conservation and Natural Resources (ADCNR).

Project Area Description:
The project site is located within Weeks Bay National Estuarine Research Reserve (NERR) boundaries north of Highway 98 in Baldwin County, Alabama (Figure 6a and 6b). Weeks Bay NERR encompasses more than 6,000 acres of tidal and forested wetlands, supporting many rare and endangered species, within the greater Mobile Bay estuarine system. The project site on the west side of the confluence of Fish River and Weeks Bay supports about 70 acres of estuarine tidal marsh. The marsh within this area was impacted during the excavation of more than 6 acres of canals within Fish River and Weeks Bay between 1965 and 1975. The canals range between 30 and 70 feet wide, and are approximately 6 feet deep, based on a preliminary bathymetric study conducted by the University of Southern Alabama in 2010. Berms created adjacent to the canals also prevent natural drainage through the marsh to the Fish River. The interior sections of the marsh maintain their ecological integrity; however, the fringes along the canals contain invasive species such as Chinese tallow and Cogon grass. The orientation and depth of these canals also contributes to poor water quality (high nutrients and low dissolved oxygen), which has resulted in several documented fish kills within the canals. Restoration of these canals will help restore the poor water quality and provide suitable habitat for juvenile finfish, birds, and benthic invertebrates such as blue crab.

Project Goals:
This project will restore 70 acres of estuarine tidal marsh, create tidal creeks, and improve water quality within the Weeks Bay NERR.

Implementation Strategy:
Wetlands will be restored by back-filling dead-end canals with approximately 40,000 cubic yards of upland-sourced sediment to create both more natural tidal creeks and salt marsh habitat. Following sediment placement, plant material from a donor site will be used to plant the filled areas at an appropriate density.

Leveraging, Partnerships, and Likelihood of Success:
There is a high likelihood of success for this project given the state owned management of lands surrounding the project; its use of proven techniques; and the state's ability to monitor and manage the site in the long-term. This project leverages site planning efforts conducted by the NERR and long-term data collected through the Reserve's system-wide monitoring program. In addition, the existing partnership between NOAA and ADCNR to implement training and educational programs through Weeks Bay NERR will be leveraged to engage the public in stewardship events and to incorporate project results in professional training workshops.

Outreach and Education Strategy:
A restoration site tour and workshop will be conducted with Weeks Bay NERR to share project information with restoration practitioners. Project interpretive materials will also be developed to inform the many visitors to Weeks Bay NERR about the importance of coastal wetlands and successful approaches for their restoration through hydrological restoration.

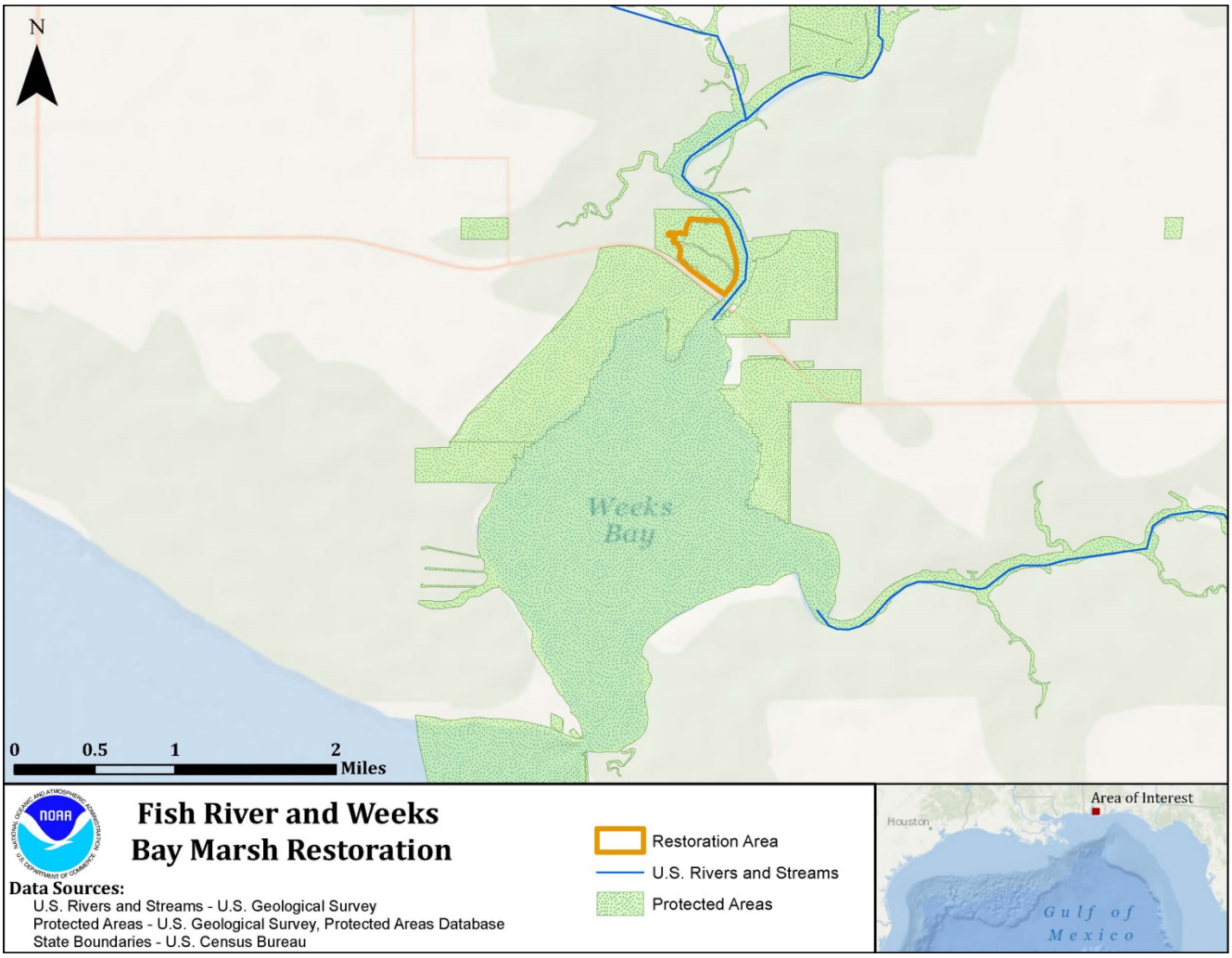


Figure 6a: Fish River and Weeks Bay Marsh Restoration Project Area

Figure 6b: Fish River and Weeks Bay Marsh Restoration Project Site

Project Title: Oyster Bay Marsh Restoration
Location: Gulf Shores, Baldwin County, Alabama
Proposed Budget: $666,500

The Oyster Bay Marsh Restoration project was developed in cooperation with staff from the Alabama Department of Conservation and Natural Resources (ADCNR) and the City of Gulf Shores.

Project Area Description:
The project site is located within the Oyster Bay watershed where County Road (CR) 4 (Oyster Bay Road) crosses Oyster Bay in Gulf Shores, Alabama (Figure 7a and 7b). Oyster Bay is a small embayment of Bon Secour Bay located at the mouth of the Bon Secour River. The area supports a diversity of migratory birds and wildlife and provides a range of recreational opportunities including the Bon Secour National Wildlife Refuge. The Sand Bayou unit of the Bon Secour National Wildlife Refuge is located adjacent to the eastern side of Oyster Bay and protects 1,132 acres of coastal wetlands. The Oyster Bay Marsh Restoration project site on the northeastern shore of Oyster Bay includes about 150 acres of estuarine tidal and brackish marsh that historically drained south through two tidal creeks into Oyster Bay and Bon Secour Bay. The region's historical flow pattern was altered by construction of the Intracoastal Waterway (1940s) and CR 4 (1960s). The construction of CR4 included a causeway across the southern portion of Oyster Bay, ditches on both sides of the road, and undersized culverts beneath the roadway. The culverts restrict water exchange across the road resulting in considerable impoundment of freshwater and conversion of wetland habitat. Due to the lack of water movement, the areas on the north and south sides of the culvert have trapped sediments resulting in colonization by giant reed (*Phragmites australis*). This nuisance plant species further reduces natural flow through the culverts. In addition to improving hydrology, the culvert replacement will allow finfish movement from the south side of the road to the north and provide more suitable habitat for birds and benthic invertebrates such as blue crabs. Further, this area provides habitat for the endangered Alabama red-bellied turtle.

Project Goals:
This project will restore the hydrology of approximately 150 acres of tidal and brackish marsh by replacing the existing culverts with appropriately sized culverts at the correct surface elevation.

Implementation Strategy:
To accomplish the project, a design plan, including hydrological modeling, will be developed to determine the most suitable locations for and sizes of the replacement culverts. After permits are obtained, sediments will be removed from channels to restore natural function and to remove nuisance vegetation and then culverts will be replaced. After the culverts are in place and the road surface is repaired, any remaining unvegetated areas will be replanted using plants from a suitable donor site.

Leveraging, Partnerships, and Likelihood of Success:
This project will be completed using proven restoration strategies within a relatively small construction footprint for a high likelihood of success. In addition, restoration will be

implemented in partnership with the City of Gulf Shores and ADCNR, the local and state agencies with management authority for the project site.

Outreach and Education Strategy:
The Oyster Bay Marsh Restoration Project is located near an urban center for Gulf Shores, presenting several opportunities to reach a broad public through educational materials and in cooperation with the nearby Gulf State Park and Bon Secour National Wildlife Refuge. In addition, site tours and technique demonstration workshops will be conducted with restoration practitioners.

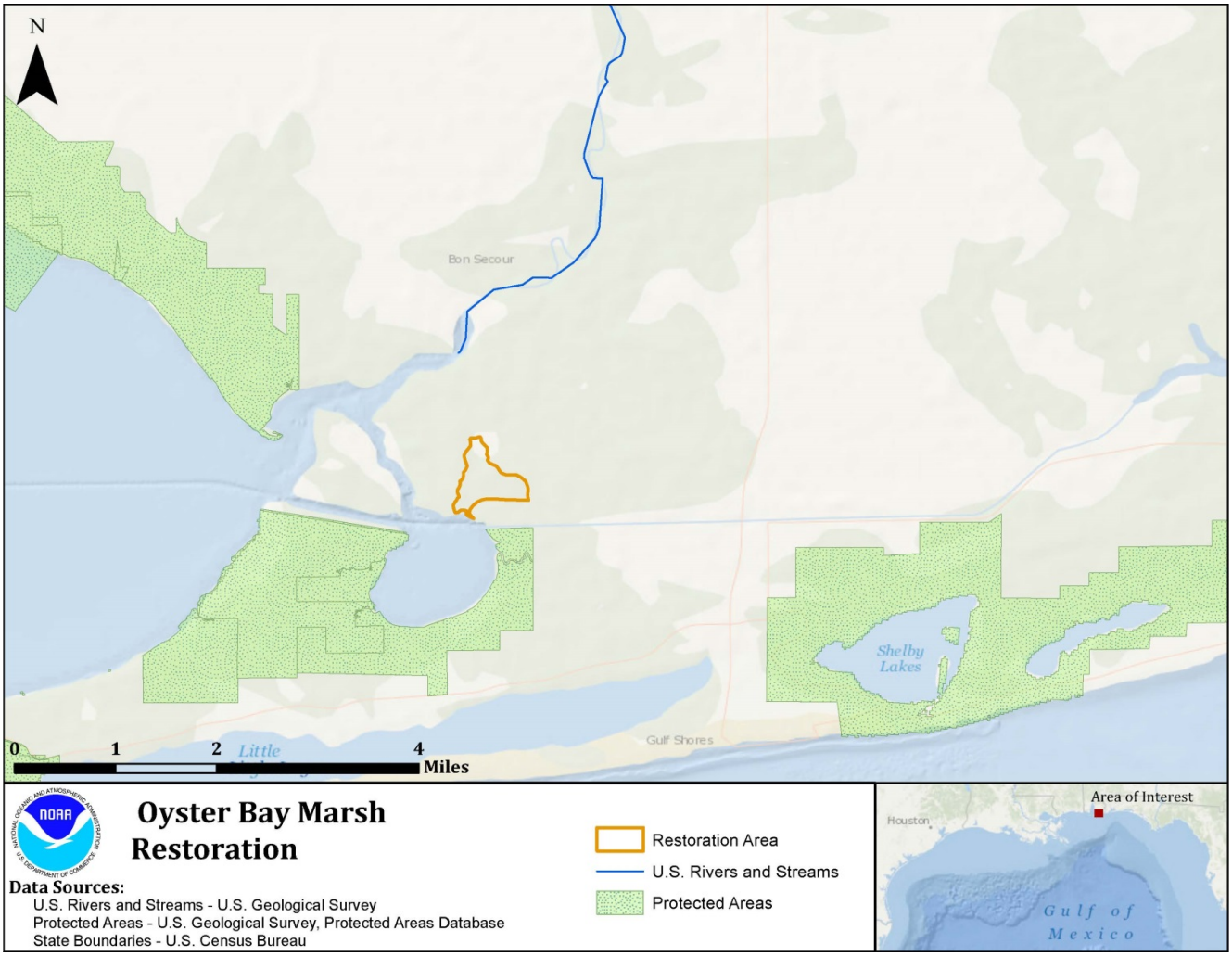


Figure 7a: Oyster Bay Marsh Restoration Project Area

Figure 7b: Oyster Bay Marsh Restoration Project Site

Project Title: Meadows Tract Marsh Restoration

Location: Fairhope, Baldwin County, Alabama
Proposed Budget: $522,000

The Meadows Tract Marsh Restoration project was developed in cooperation with staff from the Alabama Department of Conservation and Natural Resources (ADCNR).

Project Area Description:
The project site is located within the Mobile Bay watershed adjacent to County Road (CR) 1 and Weeks Bay (Figure 8a and 8b). The State of Alabama, Baldwin County, and Weeks Bay Foundation own approximately 600 acres on the east side of CR1 referred to as the Meadows Tract. These parcels and adjacent private parcels contain approximately 250 acres of freshwater and brackish marsh and forested wetlands that historically drained through several tidal creeks into Mobile Bay. The Meadows Tract area also provides additional protection to the Weeks Bay National Estuarine Research Reserve (NERR), which encompasses more than 6,000 acres of land and water habitats. Historical flow patterns were altered by CR1 construction, including the installation of undersized culverts that restrict tidal exchange and alter the composition of wetlands on the east side of the road. Replacing existing culverts and increasing tidal exchange from Bon Secour Bay into these wetlands will restore flow and fin fish movement during peak flow and high tides. The restored wetland area will also provide more suitable habitat for birds, invertebrates such as blue crabs, and the endangered Alabama red-bellied turtle.

Project Goals:
This project will restore the hydrology of 250 acres of tidal freshwater and brackish marsh by replacing the existing culverts with appropriately sized culverts at the correct surface elevation.

Implementation Strategy:
There are three locations where wetlands drain to Mobile Bay through undersized culverts and piping. Replacing the existing culverts with larger box culverts or bridges will improve hydrology of approximately 250 acres of brackish marsh and freshwater wetlands on the east side of Highway 98. To accomplish the project, a design plan, including hydrological modeling, will be developed to determine the most suitable location and size of replacement culverts or bridges. After the new structures are in place and the road surface is repaired, any remaining unvegetated areas will be replanted using plants from a suitable donor site.

Leveraging, Partnerships, and Likelihood of Success:
There is a high likelihood of success for this project, which uses proven restoration techniques. Additionally, implementation will be prioritized to begin construction within protected lands to demonstrate success and evaluate design strategies. By partnering with ADCNR and Baldwin County, this project will leverage existing plans for the restoration of this area and its management in coordination with the Weeks Bay NERR.

Outreach and Education Strategy:
A restoration site tour and workshop will be conducted with Weeks Bay NERR to share project information with restoration practitioners. Project interpretive materials will also be developed and displayed at the Weeks Bay NERR Education & Interpretive Center nearby this restoration site. Information will focus on informing the many visitors to Weeks Bay NERR about the importance of coastal wetlands and successful approaches for their restoration through hydrological restoration.

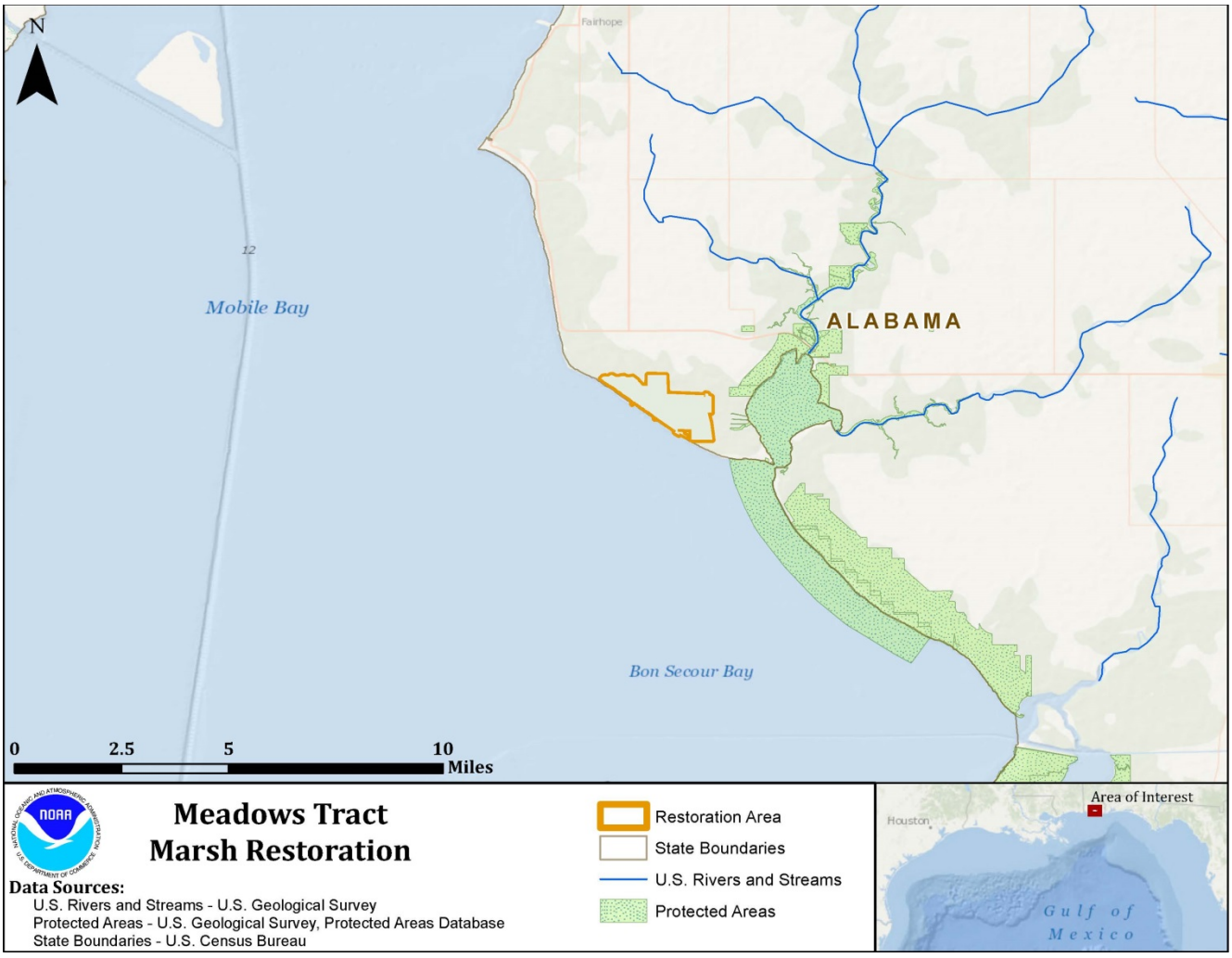


Figure 8a: Meadows Tract Marsh Restoration Project Area

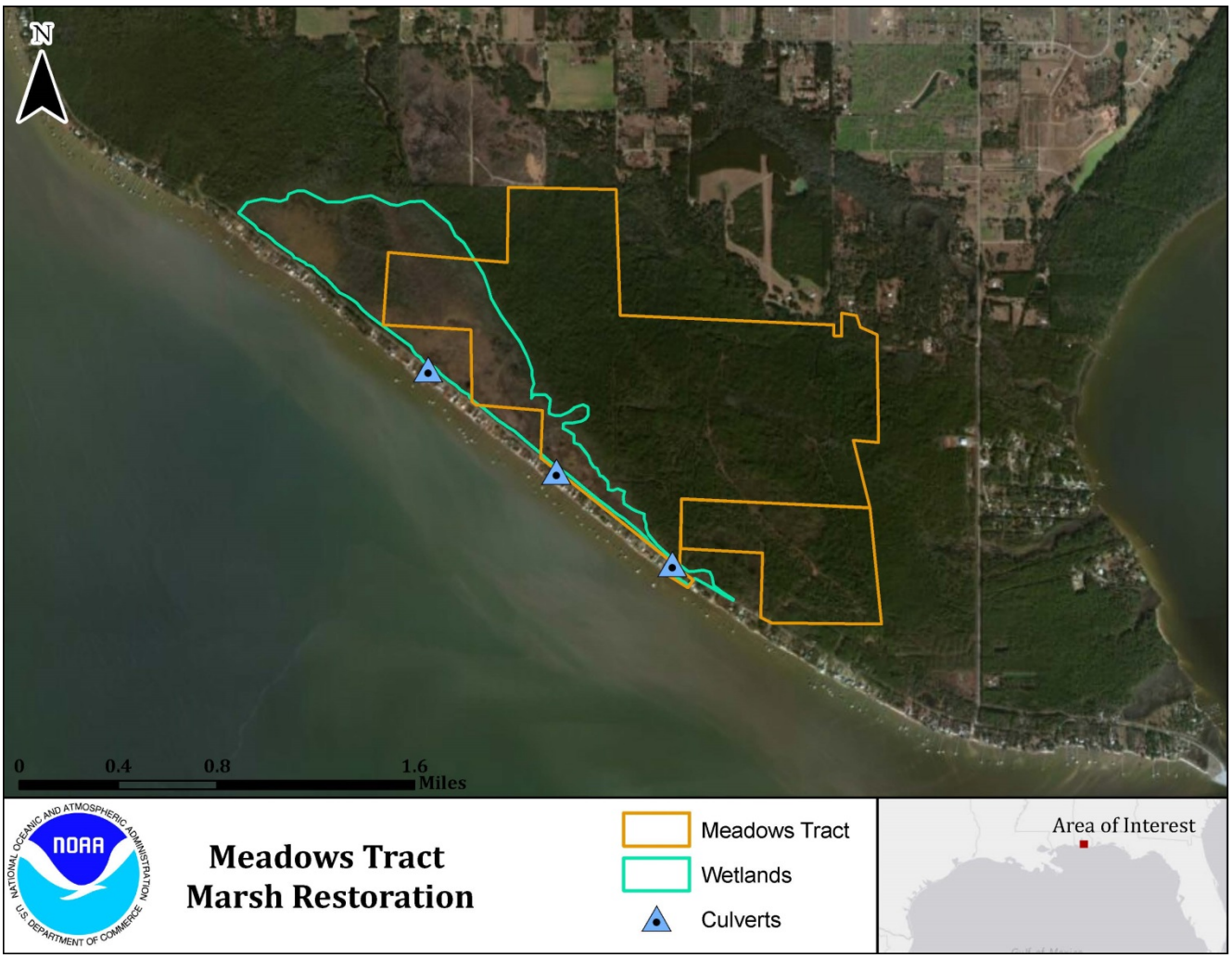


Figure 8b: Meadows Tract Marsh Restoration Project Site

Project Title: Money Bayou Wetlands Restoration
Location: St. Joseph Bay Buffer Preserve, Port St. Joe, Gulf County Florida.
Proposed Budget: $1,003,563

The Money Bayou Wetlands Restoration was developed in cooperation with staff from the Florida Department of Environmental Protection, St. Joseph Bay State Buffer Preserve.

Project Area Description:
The St. Joseph Bay State Buffer Preserve protects 5,019 acres in Gulf County, about five miles southeast of the town of Port St. Joe (Figure 9a and 9b). The St. Andrew Bay watershed, the Apalachicola River Basin, and the Money Bayou watershed all converge within the Preserve. The Money Bayou basin occupies over 1,800 acres within the Preserve including hundreds of acres of emergent estuarine and freshwater marsh that grade into wet prairie interspersed with cypress strands and islands of pine flatwoods in a complex mosaic of habitats.

Extensive hydrological disruption occurred on the Preserve in the past. Ditches were dug to hasten the flow of water off of the land and control mosquito populations. For example a major ditch was constructed to link Money Bayou with Indian Lagoon in an attempt to bring more freshwater into the lagoon. In addition, road construction along the boundaries of the Preserve have impacted freshwater flows and tidal exchange due to either the lack of or improperly designed culverts. Additional road construction occurred within the Preserve in the 1980s and 1990s including a large raised road with miles of ditches constructed across the Money Bayou portion of the Preserve in anticipation of a residential development. Additionally, many miles of bulldozer and fire plow lines were created within the Preserve in the attempt to suppress wildfire. These roads and plow lines affect surface water hydrology, alter the local vegetation composition, act as vectors for edge and exotic species, and are physical barriers to both small animal movement and prescribed fire. Impacted communities across the Preserve include wet prairie, seepage slope, floodplain marsh, strand swamp, basin swamp, and dome swamp.

Project Goals:
This project will restore 1,000 acres of wet prairie, basin swamp, cypress dome swamp, and other coastal wetland types within the Money Bayou basin to achieve the Preserve's goal of restoring hydrological functions related to the quality and quantity of water resources and the health of wetland and aquatic communities.

Implementation Strategy:
Restoration strategies will include activities to restore natural sheet-flow and hydrologic connectivity of wetlands by filling over 2.5 miles of ditches; filling, grading, and replanting over 4 miles of elevated, unpaved roads; restoring and replanting over 1.2 miles of former fire plow lines; installing or repairing 18 to 20 low-water road crossings; and installing or replacing 4 to 5 culverts. In addition, activities to restore wetland hydroperiod and habitat functions will be conducted including mechanical restoration of more than 700 acres by removing invasive and nuisance plant species, prescribed burning, and planting native species. A restoration design will be developed to identify specific locations for the proposed restoration activities and to achieve the greatest benefits across the extensive wetlands within the Money Bayou basin.

Leveraging, Partnerships, and Likelihood of Success:
This project leverages extensive baseline data and maps developed by the St. Joseph Bay Buffer Preserve as well as a collaborative management plan update that focused on hydrological restoration needs on the Preserve. The project has a high likelihood of success because of the use of proven restoration techniques, available baseline data, and Preserve staff experience.

Outreach and Education Strategy:
In partnership with existing volunteer and education programs, outreach and education activities will be conducted to inform the public of the importance of coastal wetlands and opportunities for hydrological restoration. The Buffer Preserve Center will also host a workshop and restoration site tour to share project results with restoration practitioners.

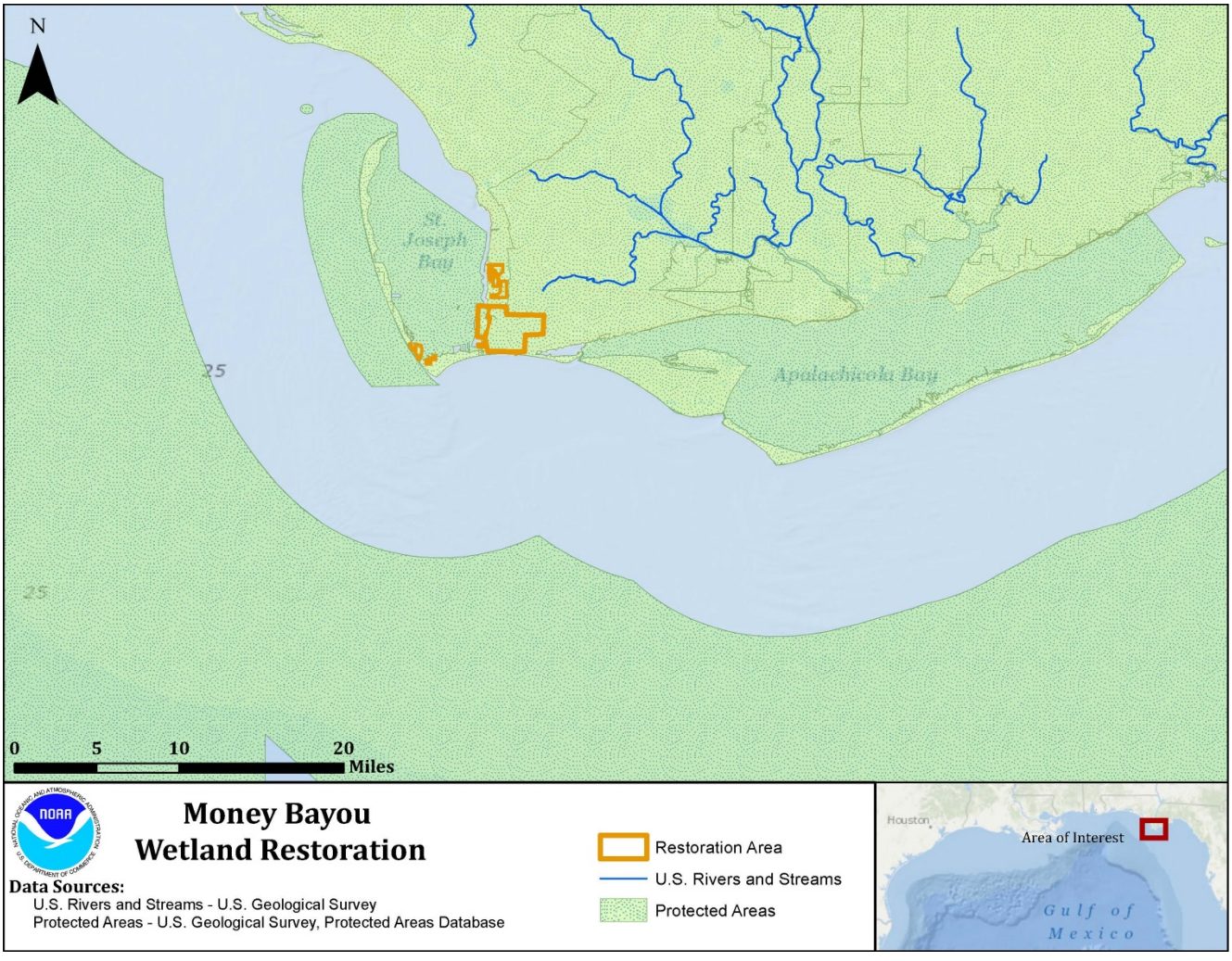


Figure 9a: Money Bayou Wetland Restoration Project Area

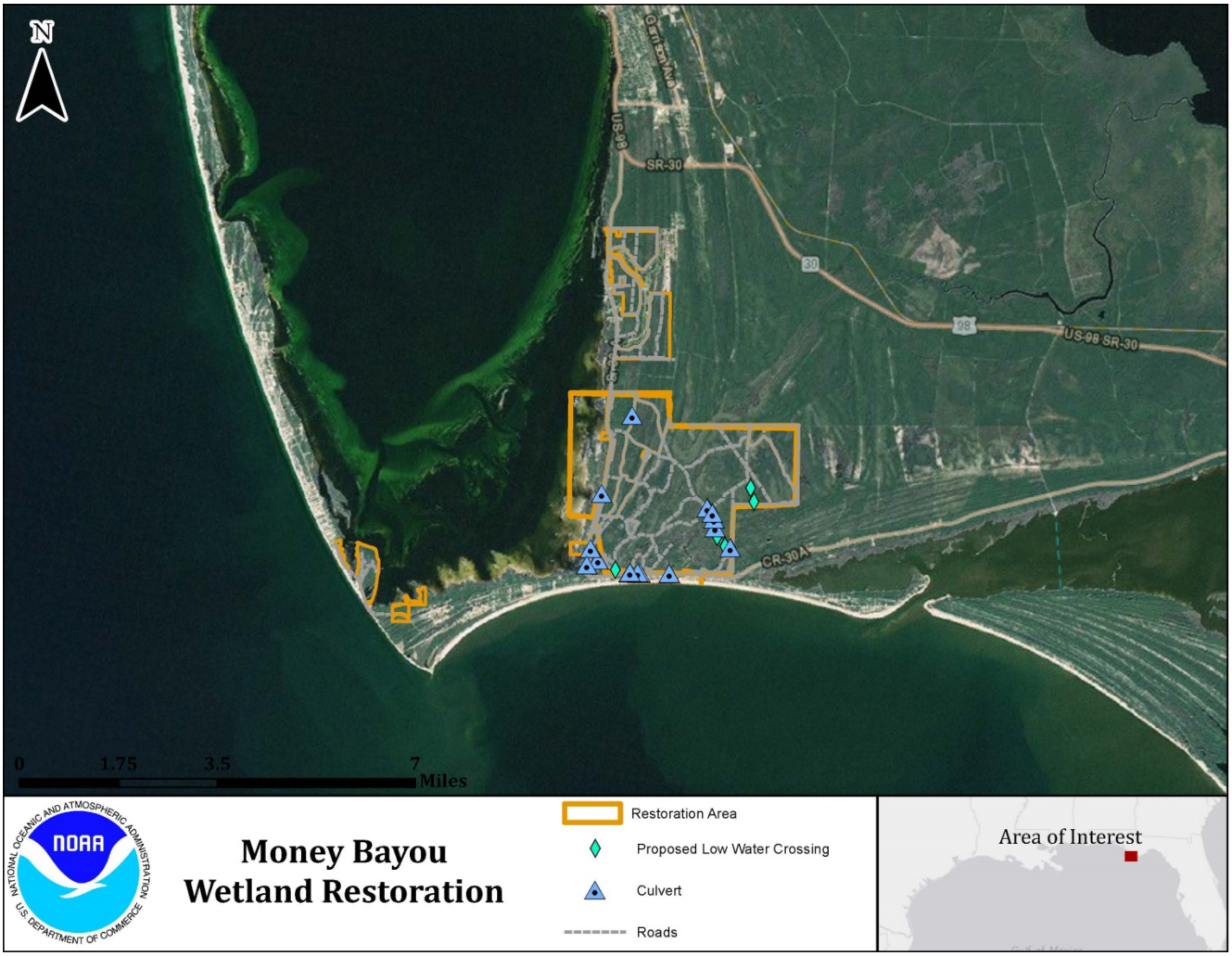


Figure 9b: Money Bayou Wetland Restoration Project Site

Project Title: Tate's Hell Crooked River Basin Restoration
Location: Tate's Hell State Forest, Franklin County, Florida
Proposed Budget: $1,450,000

The Tate's Hell Crooked River Basin Restoration project was developed in cooperation with staff from the Florida Forest Service.

Project Area Description:
Tate's Hell State Forest encompasses 202,400 acres within the Apalachicola River and Bay system, one of the most diverse, productive, and economically important estuaries in the United States. Tate's Hell State Forest was once a wetland-dominated landscape referred to as Tate's Hell Swamp. The Crooked River basin is one of the largest watersheds in Tate's Hell State Forest, at over 40,000 acres (Figure 10a and 10b). Tate's Hell State Forest has experienced a long history of silvicultural activities. Between 1950 and 1970, more than 800 miles of roads were constructed and drainage ditches were constructed along most roads to provide road fill and drain nearby wetlands. These large-scale habitat alterations significantly impacted historical ecological communities and altered the magnitude, timing, and quality of surface water runoff discharged to Apalachicola Bay, East Bay, and St. George Sound from the Crooked River basin. Crooked River is tidally influenced at both ends, lying between Ochlockonee River in the eastern portion of the basin and the New River on its western side. It converges with the New River and discharges to St. George Sound within the western portion of the basin. This low-lying area contains a mosaic of wetlands including basin swamps, shrub wetlands, cypress sloughs, and marshes. Some of the western Crooked River Basin's wetlands have not been converted to pine plantation, such as Pickett Bay, a large basin swamp, and many areas within the basin have been replanted in native longleaf pine as part of restoration being implemented across the Forest.

Project Goals:
This project will restore hydrology to **3,500 acres** of forested wetlands and marshes within the western Crooked River Basin of Tate's Hell State Forest in partnership with the Florida Forest Service.

Implementation Strategy:
Proposed hydrologic restoration activities will be conducted in the western Crooked River Basin to restore historical surface water flow patterns through wetlands, redirect surface water runoff towards tributary streams and reduce flow in roadside ditches. The implementation strategy is based on an extensive review of site data, historical and present-day aerial photography, LiDAR elevation data, road and culvert attributes, recreational facilities, and maps of historical ecological communities. Restoration activities will include hydrologic improvements such as low water crossings, ditch blocks and restoration, culvert removal, installation, or replacement, and other techniques to restore sheet flow and reconnect stream channels and wetlands. Habitat management actions such as planting native species, vegetation management, and prescribed burning will also be conducted in some restoration areas.

Leveraging, Partnerships, and Likelihood of Success:
This project will leverage the restoration planning and implementation conducted by the Florida Forest Service and Northwest Florida Water Management District to assess and prioritize

hydrologic restoration at 29 surface water drainage basins. Proposed restoration activities are based on the Tate's Hell Hydrologic Restoration Plan and successfully implemented techniques with a high likelihood of success. NOAA and the Florida Forest Service will also coordinate with Franklin County on restoration techniques on or near roads maintained by the County.

Outreach and Education Strategy:
A restoration site tour will be conducted to share project information with restoration practitioners. Presentation and other interpretive approaches will also be developed to inform the public about the importance of coastal wetlands and successful approaches for their restoration.

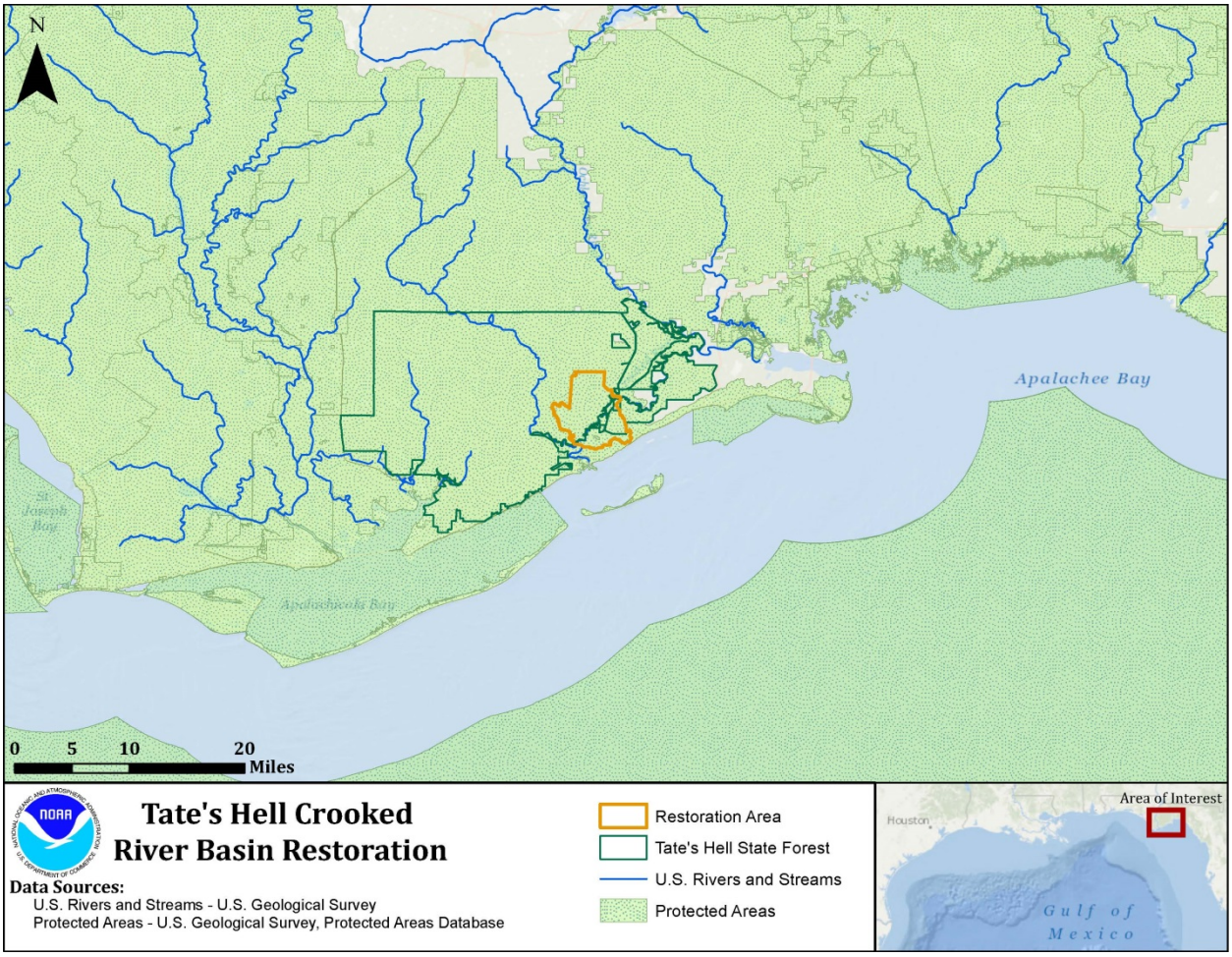


Figure 10a: Tate's Hell Crooked River Basin Restoration Project Area

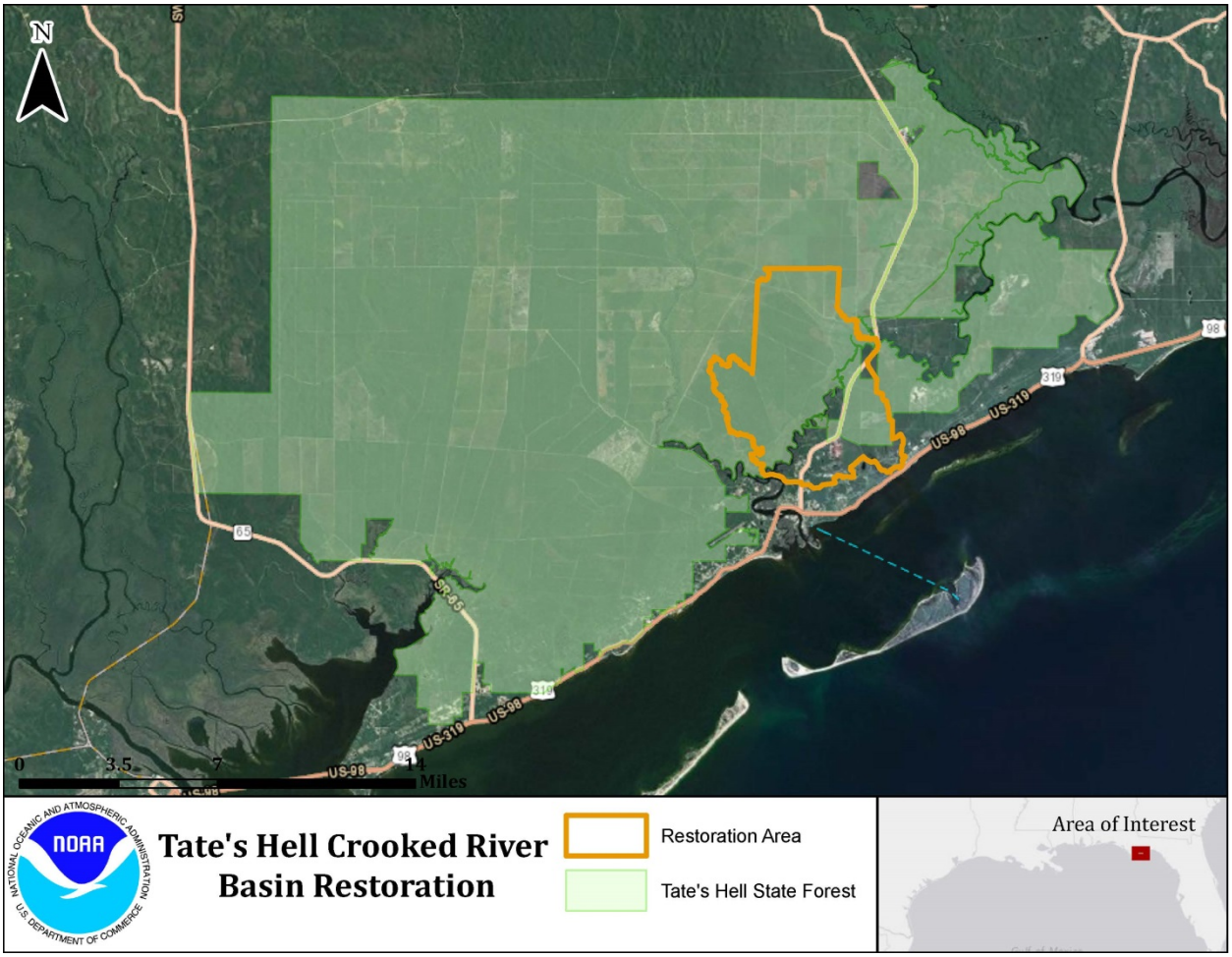


Figure 10b: Tate's Hell Crooked River Basin Restoration Project Site

Project Title: Robinson Preserve Wetlands Restoration
Location: Bradenton, Manatee County
Proposed Budget: $1,785,000

The Robinson Preserve Wetlands Restoration project was developed in cooperation with staff from the Florida Department of Environmental Protection (FDEP) and Southwest Florida Water Management District.

Project Area Description:
Tampa Bay is the largest open-water estuary in Florida at nearly 400 square miles. It borders three counties Hillsborough, Manatee, and Pinellas and, at 2,200 square miles, its watershed is more than five times larger than the bay itself. Robinson Preserve is a 487-acre property located in northwestern Bradenton adjacent to the Palma Sola Bay and at the confluence of Tampa Bay and Sarasota Bay. The site contains a range of important coastal wetland habitats including mangrove, salt marsh, salt barren, coastal strand hammock and maritime hammock. In 2012, the Preserve was expanded with the acquisition of a 150-acre parcel of former agricultural lands. Robinson Preserve has undergone extensive restoration from disturbed farmland to coastal and wetland habitats, including the restoration of tidal flow within the property. This project will continue these restoration efforts to convert the 150-acre expansion of Robinson Preserve from mostly disturbed land to native wetland and upland habitats by re-contouring the land, followed by planting with native vegetation. The 150-acre expansion area was in agricultural production for at least five decades and has lay fallow for the past ten years. Fill was piled over large portions of the site for a golf course community before acquisition. Historical uses have allowed nuisance and exotic vegetation to overrun the majority of the site, severely limiting ecological functions. While the overall project planned by local partners involves enhancements for public access, all RESTORE funds received will be used for ecological restoration.

Project Goals:
This project will restore approximately **140 acres** of coastal upland, wetland, and subtidal habitat on the recently acquired parcel in cooperation with Manatee County, FDEP, and other project partners. Specific goals include 1) Creation of coastal upland and wetland habitats and tidal creeks that will be designed to incorporate projected near-term sea level rise; 2) creation of high quality estuarine subtidal habitats; and 3) restoration of a natural hydrology linking the coastal upland, wetland, and estuarine areas within the Preserve. When completed, the project will provide about 85 acres of upland habitats and 55 acres of created wetland and sub-tidal habitats, for a total of 140 acres of productive habitat from former low quality agricultural land. The remaining 10 acres will be dedicated to an environmental education center and other recreational facilities that will be constructed and managed by Manatee County.

Implementation Strategy:
To accomplish the goals of this project, a design plan, including any necessary hydrological modeling, will be developed to determine the most suitable locations and strategies to restore native habitats. Restoration activities will include re-grading and earth moving activities, creation of tidal creeks and waterways, removal of invasive vegetation, and replanting native plant species.

Leveraging, Partnerships, and Likelihood of Success:
This project will leverage the many partnerships and studies conducted for this high priority project by Manatee County, Florida DEP, Tampa Bay Estuary Program and Sarasota Bay Estuary Program. Outreach and education project activities will also leverage the successful education and volunteer programming at Robinson Preserve that are managed by full time staff in the Manatee County Parks and Natural Resources Department. In addition, habitat restoration will also be conducted in coordination with planned construction of the Mosaic Center for Nature, Exploration, Science, and Technology (NEST) interpretive classroom/nature center on the property. In addition to the protection of the Preserve, this project will leverage the experience and information gained by Manatee County and its partners through past efforts that have restored over 1,500 acres of coastal lands since 1990. This project has a high likelihood of success by building on this extensive experience and the use of proven restoration techniques.

Outreach and Education Strategy:
In partnership with existing volunteer and education programs, outreach and education activities will be conducted to inform the public of the importance of coastal wetlands and opportunities for hydrological restoration. Project partners will also host a workshop and restoration site tour to share project results with restoration practitioners.

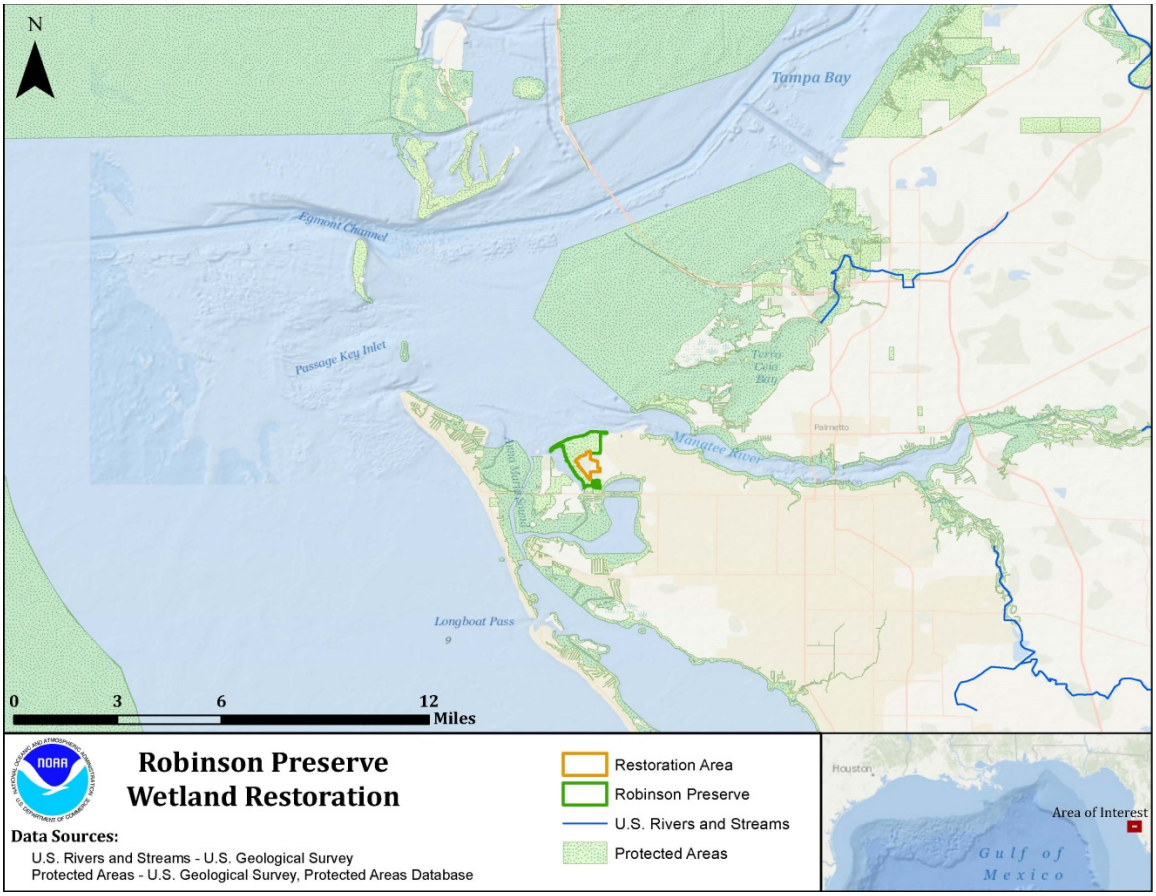


Figure 11a: Robinson Preserve Wetland Restoration Project Area

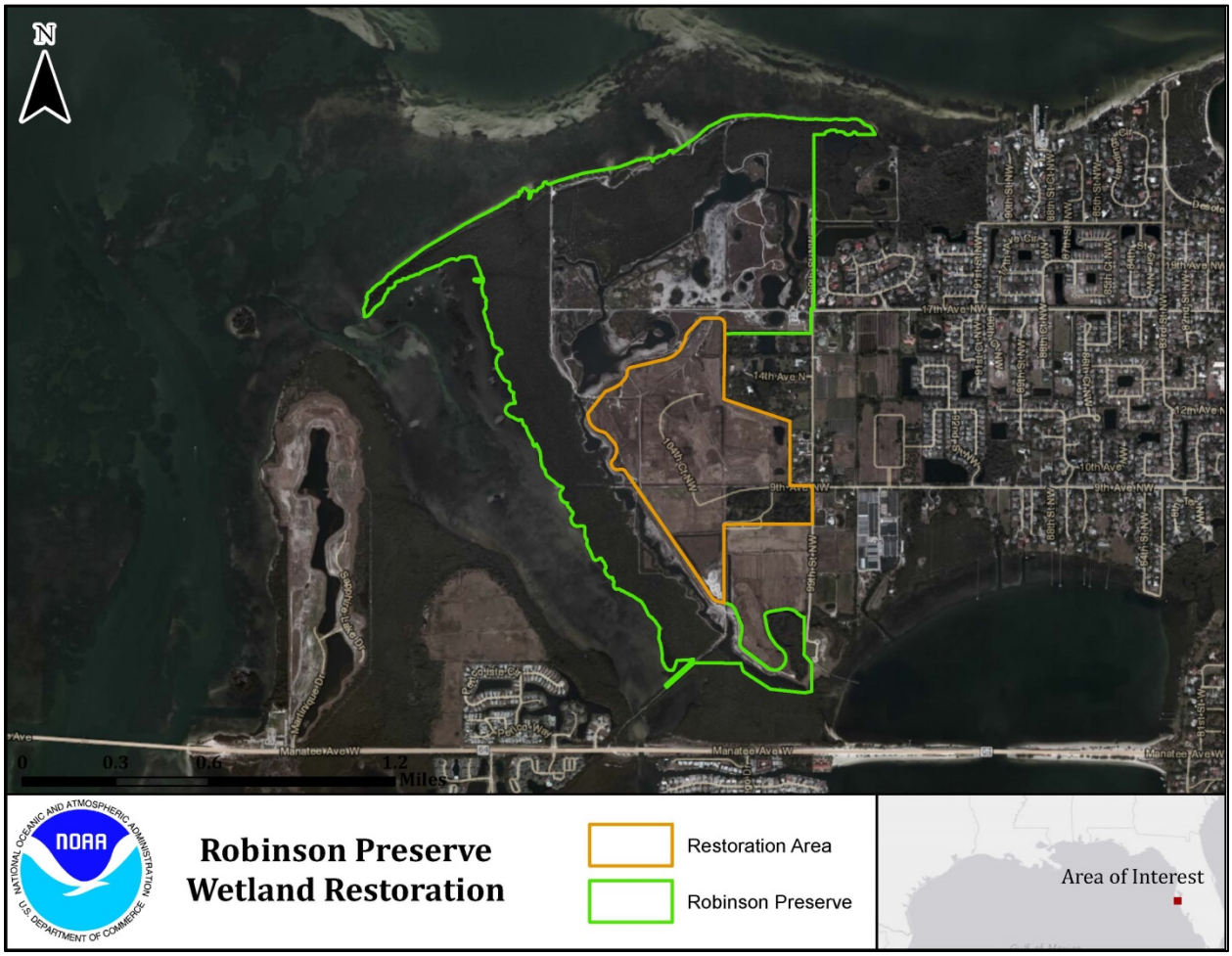


Figure 11b: Robinson Preserve Wetland Restoration Project Site

Appendix B: Budget Narrative

Budget Table

Requested Budget	Year 1	Year 2	Year 3	Subtotal
Labor- Program oversight				
Program Manager (1 FTE)	100,000	100,000	100,000	300,000
Project Coordinators (0.5 FTE)	80,000	80,000	80,000	240,000
Fringe and Indirect	90,000	90,000	90,000	270,000
Subtotal				***810,000***
Restoration Project Costs				
Alabama projects (3)				
Planning, E&D	525,000			525,000
Construction		1,853,500		1,853,500
Monitoring	60,000	120,000	120,000	300,000
Education and Outreach	10,000	10,000	10,000	30,000
Subtotal				*2,708,500*
Florida projects (3)				
Planning, E&D	640,000			640,000
Construction		3,092,805		3,092,805
Monitoring	118,940	118,940	237,878	475,758
Education and Outreach	10,000	10,000	10,000	30,000
Subtotal				*4,238,563*
Louisiana projects (1)				
Planning, E&D	100,000			100,000
Construction		3,065,000		3,065,000
Monitoring	100,000	100,000	100,000	300,000
Education and Outreach	10,000	10,000	10,000	30,000
Subtotal				*3,495,000*
Mississippi projects (2)				
Planning, E&D	525,000			525,000
Construction		3,509,000		3,509,000
Monitoring	50,000	100,000	100,000	250,000
Education and Outreach	10,000	10,000	10,000	30,000
Subtotal				*4,314,000*

Requested Budget	Year 1	Year 2	Year 3	Subtotal
Texas projects (2)				
Planning, E&D	318,750			318,750
Construction		1,402,500		1,402,500
Monitoring	47,812	47,813	95,625	191,250
Education and Outreach	10,000	10,000	10,000	30,000
Subtotal				*1,942,500*
Subtotal				***16,698,563***
Inventory				
Contractual labor	100,000	100,000	100,000	300,000
Regional workshops	12,000	48,000		60,000
Database development	20,000			20,000
Subtotal				***380,000***
Total Proposal Budget:				**$17,888,563**

Budget Table for Optional Phase Funding

Optional Phase 1 Budget	Year 1	Year 2	Year 3	Subtotal
Labor- Program oversight				
Program Manager	50,000	50,000	50,000	150,000
Project Coordinators	40,000	40,000	40,000	120,000
Fringe and Indirect	45,000	45,000	45,000	135,000
Subtotal				***405,000***
Restoration Project Costs				
Alabama projects (3)				
Planning, E&D	525,000			525,000
Subtotal				*525,000*
Florida projects (3)				
Planning, E&D	640,000			640,000
Construction				
Monitoring				
Education and Outreach				
Subtotal				*640,000*
Louisiana projects (1)				
Planning, E&D	100,000			100,000
Subtotal				*100,000*
Mississippi projects (2)				
Planning, E&D	525,000			525,000
Subtotal				*525,000*
Texas projects (2)				
Planning, E&D	318,750			318,750
Subtotal				*318,750*
Subtotal				***$2,108,750***

Inventory

Contractual labor	100,000	100,000	100,000	300,000
Regional workshops	12,000	48,000		60,000
Database development	20,000			20,000
Subtotal				***380,000***

Total Phase 1 Budget: $2,893,750

Optional Phase 2 Budget	Year 1	Year 2	Year 3	Subtotal
Labor- Program oversight				
Program Manager		75,000	75,000	150,000
Project Coordinators		60,000	60,000	120,000
Fringe and Indirect		67,500	67,500	135,000
Subtotal				***405,000***
Restoration Project Costs				
Alabama projects (3)				
Construction		1,853,500		1,853,500
Monitoring		180,000	120,000	300,000
Education and Outreach		20,000	10,000	30,000
Subtotal				*2,183,500*
Florida projects (3)				
Construction		3,092,805		3,092,805
Monitoring		237,879	237,879	475,758
Education and Outreach		15,000	15,000	30,000
Subtotal				*3,598,563*
Louisiana projects (1)				
Construction		3,065,000		3,065,000
Monitoring		150,000	150,000	300,000
Education and Outreach		15,000	15,000	30,000
Subtotal				*3,395,000*

Optional Phase 2 Budget	Year 1	Year 2	Year 3	Subtotal
Mississippi projects (2)				
Construction		3,509,000		3,509,000
Monitoring		125,000	125,000	250,000
Education and Outreach		15,000	15,000	30,000
Subtotal				*3,789,000*
Texas projects (2)				
Construction		1,402,500		1,402,500
Monitoring		95,625	95,625	191,250
Education and Outreach		15,000	15,000	30,000
Subtotal				*1,623,750*

Total Phase 2 Budget:	$14,994,813

Budget Narrative

Category	Requested Amount	Description
Labor-	**$810,000**	
Program Manager (PM)	$450,000	This will be held by one full-time NOAA employee, who will serve as the general manager for the program. Their role will be full-time at 2,080 hours per year, and will include the primary duties of: contract management, contractor oversight for construction and implementation, grant and reporting management with the Council, and partnership development and communications. The shown rate includes salary, fringe, and indirect costs. If the Council chooses to phase funding as described in the project narrative, the initial requested amount is $225,000 with the remaining $225,000 requested in subsequent phases.
Project Coordinators	$360,000	This will be held by 4 NOAA technical representatives, located in the Gulf region, who will contribute up to 20% of their time towards project implementation in their assigned state. Their primary duties include: assisting the PM with project coordination, organizing site visits, data collection, and construction inspections, and coordination with local partners. If the Council chooses to phase funding as described in the project narrative, the initial requested amount is $180,000 with the remaining $180,000 requested in subsequent phases.
Construction & Implementation-	**$16,698,563**	
Planning, E&D	$ 2,108,750	This line item includes the costs of project development, data collection, engineering and design, and completion of landrights, permitting and compliance requirements. The priority projects listed within this proposal have had at least preliminary engineering and feasibility completed, in some cases more, as described within the proposal narrative. The budget request considers the level of project development completed for each state's proposed projects. If the Council chooses to phase funding as described in the project narrative, the full amount is requested for planning and E&D.
Construction	$12,922,805	Construction funds are requested to implement projects that successfully complete the planning phase. If

Category	Requested Amount	Description
		preferred, the Council can distribute construction funds to NOAA in a 'just-in-time' manner upon completion of necessary compliance and regulatory documentation for each project. The costs shown include a construction contingency budget. If the Council chooses to phase funding as described in the project narrative, the full amount requested in phase 2.
Monitoring	$1,517,008	These funds will cover the monitoring costs described within the narrative for each project. Both NOAA personnel and contractors will complete the monitoring activities, to be determined by the unique needs and locations of the projects. If the Council chooses to phase funding as described in the project narrative, the full amount is requested in phase 2.
Education and Outreach	$ 150,000	This line item includes the costs of hosting site visits, workshops, creating educational kiosks and signage, and photography for websites and outreach materials. If the Council chooses to phase funding as described in the project narrative, the full amount is requested in phase 2.
Inventory	**$380,000**	
Contractual Labor	$300,000	These funds will be contracted to conduct the inventory. A regional inventory coordinator(s) will centralize the effort across the gulf, as well as conduct the workshops in partnership with NOAA and state partners. The coordinators will also provide guidance to local partners and staff, and compile the inventory as it is expanded. If the Council chooses to phase-in funding as described in the project narrative, the full amount is requested to complete this task.
Regional workshops	$60,000	This line item will include costs needed to conduct the regional workshops as discussed in the narrative. Costs may include travel, site visits, conference space, outreach, and printing costs. There will be a minimum of 4 workshops conducted across the gulf coast. If the Council chooses to phase funding as described in the project narrative, the full amount is requested to complete this task.
Database development	$20,000	As discussed within the narrative, a database and

Category	Requested Amount	Description
		interactive web-based application will be developed to store, organize, and publicly display information and updates for the projects that are incorporated into the inventory. Costs shown are for IT contractors to build the database and provide three years of web maintenance and administration. Existing NOAA infrastructure will be maximized to leverage costs for this application. If the Council chooses to phase funding as described in the project narrative, the full amount is requested to complete this task.

Appendix C: Environmental Compliance Checklists

Bahia Grande Wetland System Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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				X
NEPA – Environmental Assessment	X			
NEPA – Environmental Impact Statement				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				X

San Antonio Bay Marsh Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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				X
NEPA – Environmental Assessment	X			
NEPA – Environmental Impact Statement				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				X

Maurepas Swamp (West Joyce Wetlands) Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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				X
NEPA – Environmental Assessment	X			
NEPA – Environmental Impact Statement				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	X			

Hancock County Marshes Coastal Preserve Wetlands Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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				X
NEPA – Environmental Assessment	X			
NEPA – Environmental Impact Statement				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				
MDMR – Coastal Wetlands Variance	X			
MDEQ – Water Quality Certification	X			

Wolfe River Preserve Restoration

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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	X			
NEPA – Environmental Assessment				X
NEPA – Environmental Impact Statement				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	X			

Fish River and Weeks Bay Marsh Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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	X			
NEPA – Environmental Assessment				X
NEPA – Environmental Impact Statement				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	X			

Oyster Bay Marsh Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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	X			
NEPA – Environmental Assessment				X
NEPA – Environmental Impact Statement				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	X			

Meadows Tract Marsh Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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	X			
NEPA – Environmental Assessment				X
NEPA – Environmental Impact Statement				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	X			

Money Bayou Wetlands Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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	X			
NEPA – Environmental Assessment				X
NEPA – Environmental Impact Statement				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	X			

Tate's Hell Crooked River Basin Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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	X			
NEPA – Environmental Assessment				X
NEPA – Environmental Impact Statement				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	X			

Robinson Preserve Wetlands Restoration Project

Environmental Compliance Checklist

Please check all federal and state environmental compliance and permit requirements as appropriate to the proposed project/program

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	X			
NEPA – Environmental Assessment				X
NEPA – Environmental Impact Statement				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: FDEP Environmental Resource Permit	X			

Appendix D: Data and Information Sharing Plan

The NOAA Directive on Data Management guides the agency's data management activities. The directive states that environmental data will be visible, accessible and independently understandable to users, except where limited by law, regulation, policy (such as personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. Environmental data includes observations and measurements of physical, chemical, biological, geological, and geophysical properties and conditions of the environment, as well as correlative data, such as socioeconomic data, related documentation, and metadata. Media, including voice recordings and photographs, may be included. The *Connecting Coastal Waters* program will manage and share data collected through two primary activities: individual hydrological restoration projects and the development of an inventory of hydrological restoration projects in the Gulf of Mexico region.

Environmental data and information created during the course of the project
Each hydrological restoration project will develop a data sharing plan and a project monitoring plan, approved by NOAA, which details specific environmental data parameters, the collection method that will be used, and quality assurance/quality control procedures. Examples of commonly collected parameters that will be considered for inclusion in project monitoring plans based on project goals and site specific characteristics are provided below.

Hydrology Parameters:
- Water depth, salinity
- Flow pattern, rate
- Flooding extent
- Tidal prism (volume)

Vegetation Parameters:
- Community composition
- Plant coverage, height, survival
- Reproduction- percent of dominant plants flowering/seeding

Soils Parameters:
- Soil salinity
- Soil texture, organic matter
- Sedimentation

Nekton Parameters:
- Species diversity &/or relative abundance
- Density or abundance
- Species survival, growth

In addition, NOAA will collect geospatial data during activities to create an inventory of hydrological restoration opportunities. The type of geospatial data collected for the inventory will include the following:

- Restoration project boundaries;
- Potential area of restoration benefit;
- Hydrological barriers; or
- Other site specific information required to characterize restoration needs and depicted as points, lines, or polygons.

Data collected under this proposal will undergo verification by NOAA to ensure the quality, utility, and integrity of the information collected. Once data has been through the approved QA/QC procedures, NOAA will share approved data through appropriate websites.

Standards to be used for data/metadata format and content;
NOAA's directive for metadata establishes ISO 19115 Parts 1 and 2 and a recommended representation standard (Extensible Markup Language (XML) formatted per the ISO 19139 schema) for documenting NOAA's environmental data and information. Geospatial data will be documented using the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata. There are different profiles of the FGDC Content Standard that will be applied based as appropriate for each project: Shoreline data, Classification of Wetlands and Deep Water Habitats, Digital Orthoimagery, Soils, and Vegetation. As required by the NOAA Data Access Procedural Directive, environmental data will be made accessible via the Internet, except in limited circumstances, using open-standard, interoperable, non-proprietary web services (for example, OPeNDAP, or Open Geospatial Consortium (OGC) web services) where feasible.

Policies addressing data stewardship and preservation
NOAA Administrative Order (NAO) 212-15 establishes environmental data management policy for NOAA and provides high-level guidance for procedures, decisions and actions regarding environmental data management and establishes the policy directives that would guide data stewardship and preservation efforts under this proposal.

Procedures for providing access, sharing, and security
Management of NOAA environmental data will be based upon an end-to-end data management lifecycle that includes:

- Determining what data are required to be preserved and how;
- Developing and maintaining metadata that comply with standards;
- Obtaining user requirements and feedback;
- Developing and following data management plans with the appropriate NOAA archive;
- Conducting data stewardship to address data content, access, and user understanding;
- Providing for delivery to the archive and secure storage; and
- Enabling integration and/or interoperability with other information and products.

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Appendix F: Other Information

NOAA Restoration Center Example Projects

Hopedale Hydrologic Restoration

Location: Yscloskey, Louisiana

Construction begins on the water control structures.

Controlled flap-gates help optimize water levels and salinity.

Partners

LA Coastal Protection and Restoration Authority

St. Bernard Parish

Description

In the 1950s, a water control structure was placed in a canal leading from the project area to Bayou la Loutre, LA, near two major navigation channels. As time passed, the structures collapsed and fell into disrepair, thus adversely impacting wetlands through the loss of drainage capability. Increased water elevations from high tides and rainfall ponding on the marsh surface reduced plant health and led to accelerated marsh loss.

Working with state partners, NOAA replaced the collapsed culverts with new 10' x 10' box culverts. These larger culverts restored the tidal flow of water in the marsh, improving drainage and fisheries access to critical habitat. Controlled flap-gates were installed to optimize water levels and salinity, and reduce storm surge and salt water intrusion into fresher wetlands. This project reestablished optimal hydrology and drainage necessary to promote healthy wetland growth and sustainability throughout the 3,800-acre project area.

Project Breakdown

Funded through	NOAA Contribution	Other Contribution	Total Cost	Total Acres Restored
Coastal Wetlands Planning, Protection, and Restoration Act	$1,939,093	$342,193	$2,281,286	3,800

Bahia Grande – Pilot Channel

Location: **Brownsville, Texas**

The Bahia Grande before tidal flow reconnection.

The Bahia Grande after tidal flow reconnection.

Partners

Natural Resources Conservation Service

U.S .Fish and Wildlife Service

Ocean Trust

Description

The Bahia Grande is an 11,000 acre complex of three estuarine basins in south Texas that was once a highly productive shallow water system. It became a massive, salty sand flat in the 1930s when the Port of Brownsville dredged the Brownsville ship channel, and the water supply for this tidal system was cut off. The Bahia Grande dried up, and its drifting sands became the source of numerous health and industrial problems in the Brownsville area.

In 2005, NOAA worked with our partners to re-establish tidal flow. The project cut multiple channels to reintroduce water to the area, and native plant nurseries provided plants for re-vegetation efforts once tidal flow was restored to the system. The implementation successfully reconnected more than 10,000 acres to tidal influence, the area has been relieved of blowing dust, and the ecosystem is once again abundant with plants and aquatic life.

Project Breakdown

Funded through	NOAA Contribution	Other Contribution	Total Cost	Total Acres Restored
National Fisheries Institute/Ocean Trust	$367,354	$496,514	$863,854	10,110

Ft. DeSoto Tidal Flow Restoration

Location: Tierra Verde, Florida

A causeway dike was replaced with a 40-foot span bridge.

Non-toxic dye was used to monitor water flow between the bays.

Partners

Tampa Bay Estuary Program Gulf of Mexico Program

Florida Department of Community Affairs

Environmental Protection Agency

Southwest Florida Water Management District

Description

Tidal flow between bays in the Fort DeSoto Park Aquatic Habitat Management Area in Pinellas County was severed during the dredging and filling activities that occurred in the late 1950s. Summertime temperatures became extremely elevated in these areas, leading to very low dissolved oxygen levels as well as severe seagrass stress.

With funding from the NOAA Restoration Center, with the U.S. Fish and Wildlife Foundation and other partners, a bridge was constructed in place of what was once a solid dike to restore circulation to the back bays of Mullet Key in Ft. DeSoto Park, Florida. Restored circulation has resulted in healthier wetlands and seagrasses, and has improved water quality within the bays. Additionally, fish and crabs migrated into the area within a few days of restoring tidal flow.

Project Breakdown

Funded through	NOAA Contribution	Other Contribution	Total Cost	Total Acres Restored
National Fish and Wildlife Foundation	$75,000	$250,000	$325,000	1,140

Backyard Bayou: Marsh Creation and Stream Bank Restoration

Location: **Biloxi, Mississippi**

Post excavation of entire area, and bayou enhancement prior to installing wetland vegetation.

Partners

Gulf Coast Community Design Studio
Biloxi Housing Authority
City of Biloxi

Description

This project removed a bulkhead and created tidal marsh habitat in a mixed-income housing development along the partially filled and culverted Bayou Auguste in Biloxi, Mississippi. The project's objectives were to: 1) improve the health and circulation of the bayou for fish and other wildlife, 2) enhance the area's visual appeal and provide a natural amenity for local residents, and 3) promote stewardship of the bayou and other urban waterways. This project had many volunteers plant and help on the construction site and is a small part of a much larger vision for Bayou Auguste.

The project, completed in 2011, rehabilitated 9.5 acres of bayou and the parcel of land was put under conservation easement for protection. It also benefited commercially important species like blue crab, Gulf menhaden, and spotted seatrout.

Project Breakdown

Funded through	NOAA Contribution	Other Contribution	Total Cost	Total Acres Restored
FishAmerica Foundation	$35,563	$95,298	$130,861	9.5

Mon Luis Island Marsh Restoration

Location: Belle Fontaine, Alabama

Tidal channels were reestablished, invasive plants were removed, and the fill was re-graded.

The newly graded and restored wetland, ready for planting.

Partners

University of South Alabama
Mobile County Commission
Alabama Department of Conservation and Natural Resources
Barry A. Vittor and Associates

Description:

For the past thirty years, excess spoil from the dredging of the Fowl River was deposited on a once productive salt marsh at the river's mouth. The fill material drastically altered the elevation of the marsh and changed it from a productive salt marsh covered with native species to a marsh covered with an invasive common reed.

In 2004, the Alabama Coastal Foundation and its partners worked to restore the marsh by:

- Removing excess fill and invasive plants to restore five acres of salt marsh.
- Constructing a tidal channel through the new marsh to feed the wetland vegetation and provide nursery habitat for commercially and recreationally important fisheries species
- Engaging nearly 20 volunteers to plant the site and remove invasive plants.

Project Breakdown

Funded through	NOAA Contribution	Other Contribution	Total Cost	Total Acres Restored
Gulf of Mexico Foundation	$42,000	$62,088	$103,088	5

Letters of Support

Mayor of the City of Hammond

The Climate Trust

Comite Resources, Inc.

Ducks Unlimited, Southern Regional Office

Florida Department of Environmental Protection, Apalachicola National Estuarine Research Reserve and St. Joseph Bay Buffer Preserve

Greater New Orleans, Inc.

Mississippi Department of Marine Resources, Coastal Preserves Bureau

Mississippi-Alabama Sea Grant Consortium

Texas Sea Grant

Tierra Resources, LLC

Wetland Resources, LLC

Williams Land Company, LLC

Mayson H. Foster
Mayor

October 23, 2014

Chris Doley, Chief,
Restoration Center, NOAA Fisheries,
Office of Habitat Conservation
1315 East-West Highway SSMC314th Floor F/HC3
Silver Spring, Maryland 20910

Dear Mr. Doley:

I am writing to express my support of the Connecting Coastal Waters proposal. Specifically, the City of Hammond is interested in partnering to implement the Maurepas Swamp Restoration project to restore the hydrology, ecological functionality and sustainability of 15,000 acres of cypress-tupelo swamps that provide critical habitat to the region. The project will optimize freshwater inputs into the area to restore severely degraded wetlands. A salinity control structure will maximize freshwater, but inhibit the ability of saltwater to move into the system.

The Maurepas Swamp Restoration project leverages existing partnerships, research, monitoring, and feasibility funding. The City of Hammond established a wetland assimilation system in 2006 and has spent over $2,000,000 in capital funding to develop a wetlands rehabilitation program using treated wastewater, and provides over $50,000 per year in monitoring this project. Shell contributed $100,000 towards a feasibility study to expand the current wetland assimilation system to the additional 15,000 acres associated with the Maurepas Swamp Restoration project. The feasibility study that includes an assessment of conditions, water quality, and hydrology; as well as a permit analysis, conceptual design, and cost estimates will conclude in 2014. The project will be ready for implementation beginning in 2015. The existing partners on the project include state and local governments, non-governmental organizations, universities, private landowners, and other organizations. Landowners have contributed historical monitoring data in order to have a complete baseline of the project.

The City of Hammond looks forward to working with project partners to implement this project. Please give all due consideration of the proposal.

Sincerely,

Mayson H. Foster
Mayor

The ClimateTrust®

October 28, 2014

Chris Doley, Chief,
Restoration Center, NOAA Fisheries,
Office of Habitat Conservation
1315 East-West Highway SSMC314th Floor F/HC3
Silver Spring, Maryland 20910

Dear Mr. Chris Doley,

I am writing to express my support of the Connecting Coastal Waters proposal. Specifically, The Climate Trust is interested in partnering to implement the Maurepas Swamp Restoration project to restore the hydrology, ecological functionality and sustainability of 15,000 acres of cypress-tupelo swamps that provide critical habitat to the region. The project will optimize freshwater inputs into the area to restore severely degraded wetlands. A salinity control structure will maximize freshwater, but inhibit the ability of saltwater to move into the system.

The Maurepas Swamp Restoration project leverages existing partnerships, research, monitoring, and feasibility funding. The Climate Trust has been working the past three years with Tierra Resources to support Gulf Coast restoration through the development of innovative funding mechanisms. These funding mechanisms are being developed to fund long-term monitoring and maintenance of restoration projects that are usually not included in Federal, State, or parish level restoration programs. The feasibility study will conclude in 2014 and will include potential funding mechanisms to pay for the ongoing monitoring and maintenance of the project that are not included in the proposal cost estimates.

Please give this proposal all possible due consideration.

Sincerely,

Sean C Penrith

Executive Director

65 SW Yamhill Street, Suite 400
Portland, OR 97204

phone: 503.238.1915
fax: 503.238.1953

info@climatetrust.org
www.climatetrust.org

Comite Resources, Inc
11831 Pride Port Hudson Rd.
Zachary, LA 70791
225-654-8847

COMITE RESOURCES

October 29, 2014

Mr. Chris Doley, Chief
Restoration Center, NOAA Fisheries
Office of Habitat Conservation
1315 East-West Highway SSMC314 FLOOR F/HC3
Silver Spring, MD 20901

Dear Mr. Doley:

I am writing to express my support of the Connecting Coastal Waters proposal. Specifically, Comite Resources is interested in partnering to implement the Maurepas Swamp Restoration project to restore the hydrology, ecological functionality and sustainability of up to 15,000 acres of cypress-tupelo swamps that provide critical habitat to the region. The project will optimize freshwater inputs into the area to restore severely degraded wetlands. A salinity control structure will maximize freshwater, but inhibit the ability of saltwater to move into the system.

Scientists at Comite Resources have carried out measurements in the area for over ten years. These measurements were taken as part of a wetland assimilation system operated by the City of Hammond in freshwater marshes and swamps on the east side of I-55. The proposed project would not only benefit the wetlands to the west of I-55 but also allow for better management of the assimilation wetlands. The assimilation project has resulted in higher productivity, substantial water quality improvement, and control of salinity intrusion. But at present, water levels are often too high in the assimilation. Therefore, the proposed project would allow for better water level management to the east of I-55 as well as control of salinity and habitat improvement in the project area.

The measurements carried out by Comite Resrouces will be available as background information for the proposed project. The existing partners on the project include state and local governments, non-governmental organizations, universities, private landowners, and other organizations. Landowners have contributed historical monitoring data in order to have a complete baseline of the project.

Please give all due consideration of the proposal.

Sincerely,

John W. Day, Jr., PhD
Senior Scientist.

DUCKS UNLIMITED

SOUTHERN REGIONAL OFFICE
193 Business Park Drive, Suite E
Ridgeland, MS 39157-6026
(601) 956-1936 Fax (601) 956-7814
www.ducks.org

October 21, 2014

Chris Doley, Chief,
Restoration Center, NOAA Fisheries,
Office of Habitat Conservation
1315 East-West Highway SSMC314th Floor F/HC3
Silver Spring, Maryland 20910

Dear Mr. Doley,

I am writing to express Ducks Unlimited's support of the Connecting Coastal Waters proposal to:

- construct 11 proposed coastal wetland hydrology restoration projects;
- leverage place-based collaborations to achieve measurable benefits for marine fisheries habitat; and
- deliver an inventory of coastal wetland hydrology restoration projects.

The Connecting Coastal Waters proposal represents a suite of projects that collectively will make a significant contribution towards waterfowl and wetland habitat across the Northern Gulf of Mexico.

Ducks Unlimited biologists and engineers have been actively involved with the development of the proposed restoration plans for the proposed Bahia Grande Wetland System Restoration in Texas and the proposed Maurepas Swamp Restoration in Louisiana. Ducks Unlimited stands ready to assist NOAA Restoration Center staff and other partners with the implementation of both of these projects similar to our current efforts at Cow Trap Lake in Texas and Carencro Bayou in Louisiana.

Sincerely,

Jerry Holden
Director of Conservation Programs
Southern Region, Ducks Unlimited

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
Apalachicola National Estuarine Research Reserve
108 Island Dr. Eastpoint, FL 32328
850-670-7700

RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANTERA
LT. GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

November 4, 2014

Chris Doley, Chief
Restoration Center, NOAA Fisheries
Office of Habitat Conservation
1315 East-West Highway SSMC3, 14th Floor F/HC3
Silver Spring, Maryland 20910

Dear Mr. Doley,

The Apalachicola National Estuarine Research Reserve and the St. Joseph Bay Buffer Preserve appreciates the opportunity to partner with the National Oceanic and Atmospheric Administration (NOAA) on its "Connecting Coastal Waters" proposal to be submitted to the Gulf Coast Ecosystem Restoration Council (the Council), for funding under the Council Selected Component of the RESTORE Act.

Reserve staff would be willing and active participants for implementing the NOAA proposal should it be selected by the Council for inclusion in their Funded Priorities List.

Should you have any questions, please feel free to contact me at 850-670-7716 or Jennifer.harper@dep.state.fl.us.

Sincerely,

Jennifer Harper
Regional Administrator, Florida Coastal Office
Manager, Apalachicola National Estuarine Research Reserve

GREATER NEW ORLEANS INC
REGIONAL ECONOMIC DEVELOPMENT

10 PARISHES
Jefferson
Orleans
Plaquemines
St. Bernard
St. Charles
St. James
St. John the Baptist
St. Tammany
Tangipahoa
Washington

November 3, 2014

Chris Doley
Chief, Restoration Center, NOAA Fisheries,
Office of Habitat Conservation
1315 East-West Highway SSMC314th Floor F/HC3
Silver Spring, Maryland 20910

Dear Mr. Doley,

As President and CEO of Greater New Orleans, Inc. (GNO, Inc.) I am writing to express my support of the Connecting Coastal Waters proposal. This proposed project will optimize freshwater inputs into the Maurepas Swamp Restoration area to restore the hydrology, ecological functionality and sustainability of 15,000 acres of cypress-tupelo swamps and degraded wetlands that provide critical habitat to the region.

As the economic development organizations for the 10-parish greater New Orleans region, GNO, Inc. recognizes the extraordinary economic potential in the region's water management and coastal restoration sectors: our commitment to this industry is reflected in the adoption of Emerging Environmental as a key focus area for our economic development efforts. Emerging Environmental is defined as an industry sector which creates jobs and community wealth by providing products and services that help companies or governments address environmental challenges. To grow and sustain this sector, fostering innovation is critical—and the project proposed herein is an excellent example of local expertise being cultivated in the region and in this industry.

By leveraging existing partnerships, research, monitoring, and feasibility funding, the Maurepas Swamp Project will provide an exceptional model of multi-agency collaboration from both the public, private and non-profit sectors. Through an assessment of conditions underway, water quality, and hydrology—as well as a permit analysis, conceptual design, and cost estimates—is currently being established.

In light of the inter-disciplinary and multi-agency approach to this proposal, GNO, Inc. is pleased to lend our support to this application. We appreciate your consideration of this proposal.

Sincerely,

Michael Hecht
President and CEO

365 Canal Street, Suite 2300, New Orleans, LA 70130
Phone: 504.527.6900 Fax: 504.527.6970 www.gnoinc.org

MISSISSIPPI
DEPARTMENT OF MARINE RESOURCES

4 November 2014

Chris Doley, Restoration Center, Chief
NOAA Fisheries, Office of Habitat Restoration
1315 East-West Highway SSMC3, 14th Floor F/HC3
Silver Spring, Maryland 20910

Dear Mr. Doley:

I am writing this letter in support of the Connecting Coastal Waters proposal submitted by the NOAA Restoration Center to restore hydrology on two Mississippi Coastal Preserve Program (MCPP) areas: Hancock County Marshes Coastal Preserve and Wolf River Coastal Preserve. These two projects are priorities for the Preserves Program.

Both sites had previous manipulations which drastically changed the landscape. Large-scale ditching activity in the Hancock County Marshes Preserve impaired the natural tidal regime and fragmented estuarine marsh habitat. Historic timber harvesting and the associated logging roads and culverts impacted the natural sheet flow on the Wolf River Coastal Preserve. These impairments should be corrected to fit within the conservation mission of the program. The restoration of the Hancock County Marshes site will restore natural tidal flow, increase connectivity of tidal marsh, and replenish lost acreage. The restoration of the Wolf River site will restore natural sheet flow, allow access for monitoring and management activities, and increase opportunity for public access which have all been limited due to current conditions.

The MCPP is dedicated to preserving, restoring, and managing state-owned coastal wetlands to perpetuate their natural features and ecological integrity, as well as their social and economic values for the benefit of present and future generations. The program currently manages over 39,000 acres within its boundary, including management activities adjacent to these areas. We fully support the efforts of this proposal which directly align with our mission.

If you have any questions, you may contact me via phone at 228-523-4105 or by email at ali.leggett@dmr.ms.gov.

Sincerely,

Ali Leggett

Ali Leggett
Coastal Preserves Bureau, Director
Mississippi Department of Marine Resources

Mississippi-Alabama Sea Grant Consortium
Science Serving America's Coasts

October 31, 2014

Chris Doley
Chief, Restoration Center
NOAA Fisheries, Office of Habitat Conservation
1315 East-West Highway SSMC3
14th Floor F/HC3
Silver Spring, Maryland 20910

RE: Support for "Connecting Coastal Waters: Restoring Coastal Wetland Hydrology"

Dear Chris:

The proposal entitled, "Connecting Coastal Waters: Restoring Coastal Wetland Hydrology" (Connecting Coastal Waters) addresses priority restoration needs in the Gulf of Mexico and will directly result in on-the-ground restoration. During the past four years the four Sea Grant College Programs in the Gulf of Mexico have partnered with the NOAA Restoration Center to implement a community-based restoration partnership. This partnership was formed, in part, to:

1. assess hydrology restoration needs in the region;
2. identify hydrology restoration projects throughout the five Gulf of Mexico states; and
3. fund a few, small-scale on-the-ground restoration projects.

The NOAA Restoration Center/Sea Grant partnership worked with state agencies, NGO's, communities, university researchers and others and identified a total of 89 restoration sites. Many of these sites remain unfunded; the Connecting Coastal Waters project will provide the resources to implement many of these restoration projects.

This proposal outlines a strategy that is appropriate to successfully implement a restoration program. The proposed on-the-ground restoration projects have been identified and vetted with key partners to successfully execute the project. The inventory expansion effort is based on using the best available science via a highly qualified technical team to identify additional restoration sites and determine if adequate information is available to properly assess the success the restoration of those sites.

The Mississippi-Alabama Sea Grant Consortium supports this project. It is a natural evolution of a community-based partnership among the four Gulf Sea Grant College Programs and the NOAA Restoration Center and demonstrates that NOAA, the Department of Commerce and the RESTORE Council are responsive to the local, state and regional restoration needs identified by the constituents we all serve.

Please contact us with any questions or if additional clarification is needed.

Sincerely,

LaDon Swann, Director

Stephen Sempier
Mississippi-Alabama Sea Grant Consortium, Deputy Director

Sea Grant
Texas
AT TEXAS A&M UNIVERSITY
TexasSeaGrant.org

October 28, 2014

Chris Doley
Chief, Restoration Center
NOAA Fisheries, Office of Habitat Conservation
1315 East-West Highway SSMC3
14th Floor F/HC3
Silver Spring, Maryland 20910

RE: Support for "Connecting Coastal Waters: Restoring Coastal Wetland Hydrology"

Dear Chris:

This letter is to indicate Texas Sea Grant's support of the project entitled, "Connecting Coastal Waters: Restoring Coastal Wetland Hydrology." The activities outlined in this proposal will provide funding for hydrologic restoration activities that have been previously identified by the NOAA Restoration Center, Texas Sea Grant and the three other Sea Grant programs located in the Gulf of Mexico. Funding these restoration activities will benefit coastal communities and ecosystems in Texas, as well as several other areas in the Gulf of Mexico.

Restoration projects like the ones described in this proposal are as equally important as the research that was done to identify these areas, and the research that monitors and evaluates the success of such restoration activities. Further, these projects were identified through community-engagement activities, so there is bottom-up local support for these projects.

Thank you for your consideration. Please contact me if you have any questions.

Sincerely,

Pamela Plotkin

Pamela T. Plotkin, Ph.D.
Director

Texas A&M University, MS 4115 • College Station, Texas 77843-4115
(979) 845-3854 • FAX (979) 845-7525 • http://TexasSeaGrant.org

October 29, 2014

Mr. Chris Doley, Chief
Restoration Center, NOAA Fisheries
Office of Habitat Conservation
1315 East-West Highway SSMC314 FLOOR F/HC3
Silver Spring, MD 20901

Dear Mr. Doley:

I am writing to express my support of the Connecting Coastal Waters proposal. Specifically, Tierra Resources is interested in partnering to implement the Maurepas Swamp Restoration project to restore the hydrology, ecological functionality and sustainability of up to 15,000 acres of cypress-tupelo swamps that provide critical habitat to the region. The project will optimize freshwater inputs into the area to restore severely degraded wetlands. A salinity control structure will maximize freshwater, but inhibit the ability of saltwater to move into the system.

Tierra Resources has been working on the development of this project since 2013 when we identified this project as being one of the most cost-efficient restoration projects in the region. This project will enhance and conserve critical habitat that provides essential hurricane protection to surrounding communities at a cost of less than $300/acre. Tierra Resources has convened the landowners, the City of Hammond, and an excellent implementation team that includes Ducks Unlimited, Comite Resources, and the Climate Trust. Tierra Resources has directed the feasibility study process and secured $100,000 through Shell to fund the feasibility study. In addition, Tierra Resources has provided approximately $30,000 of in-kind services as well as leveraging data from other Tierra projects. Lastly, Tierra Resources works closely with Louisiana State University, Tulane University, and South Eastern Louisiana University to provide opportunities for students to receive practical job experience. This project is currently ready for implementation and only lacking capital.

Tierra Resources looks forward to working with NOAA and other project partners should this project be selected. Please give all due consideration of the proposal.

Sincerely,

Sarah K. Mack, MSPH, PhD, CFM
President and CEO
Tierra Resources LLC

October 24, 2014

Chris Doley, Chief,
Restoration Center, NOAA Fisheries,
Office of Habitat Conservation
1315 East-West Highway SSMC314th Floor F/HC3
Silver Spring, Maryland 20910

Dear Mr. Chris Doley,

I am writing to express my strong support of the Connecting Coastal Waters proposal. My team has been involved with the Hammond Assimilation Wetland located directly east of I-55 and the Maurepas Swamp Restoration project since 2006 (Shaffer et al. in review, Ecological Engineering). The existing Hammond Assimilation Wetland contains only a single outfall system, causing the area to be permanently flooded in some areas with about 30 cm of water. What is needed is an independent outfall system to the west of I-55, located in the Maurepas Swamp Restoration project,which is the heart of the Connecting Coastal Waters proposal. This new outfall system will enable establishment of a pulsing hydrology that allows for periods of drawdown in both outfall areas.

The project will not merely alleviate the flooding in the Hammond Assimilation Wetland, greatly enhancing its functionality, but also restore 15,000 acres of highly degraded marsh and shrub-scrub to healthy baldcypress – water tupelo swamp. My team will partner on this project by helping to grow, plant, and protect the cypress and tupelo seedlings and monitor rates of survival and growth. We will also assist in monitoring environmental variables such as salinity, soil strength, hydrology, and redox potential.

Of all of the wetland restoration projects proposed for the Manchac/Maurepas region (I am CWPRA's Academic Advisor for the Pontchartrain Basin), this project has the highest probability of success and will serve as a demonstration project on how to engineer and construct optimal assimilation wetlands in coastal Louisiana and around the world.

Sincerely,

Gary P. Shaffer
Chief Scientist
Wetland Resources, LLC

WILLIAMS LAND COMPANY, L.L.C.
P. O. Box 460
Patterson, LA 70392

October 24, 2014

Mr. Christopher Doley, Chief
Restoration Center, NOAA Fisheries
Office of Habitat Conservation
1315 East-West Highway
SSMC314th Floor F/HC3
Silver Spring, Maryland 20910

RE: Connecting Coastal Waters Proposal - Maurepas Swamp Restoration Project

Dear Mr. Doley:

I am writing to express my support of the Connecting Coastal Waters proposal. Subject to final review and approval of the project, Williams Land Company, L.L.C., is interested in partnering to implement the Maurepas Swamp Restoration project to restore the hydrology, ecological functionality and sustainability of 15,000 acres of cypress-tupelo swamps that provide critical habitat to the region. As currently designed, the project will optimize freshwater inputs into the area to restore severely degraded wetlands. A salinity control structure will also maximize the retention of much needed freshwater into the area, while greatly reducing saltwater movement into the system.

The Maurepas Swamp Restoration project leverages existing partnerships, research, monitoring, and feasibility funding. Shell Oil Company contributed $100,000 towards a 2014 feasibility study that included an assessment of conditions, water quality, and hydrology, as well as a permit analysis, conceptual design, and cost estimates. This feasibility study will conclude in 2014 and the project will be ready for implementation beginning in 2015. The existing partners on the project include state and local governments, non-governmental organizations, universities, private landowners, and other organizations. Williams Land Company, L.L.C. has contributed historical monitoring data in order to have a complete baseline of the project.

Please give all due consideration of the Maurepas Swamp Restoration project.

With kindest regards, we remain

Sincerely,

WILLIAMS LAND COMPANY, L.L.C.

Rudy C. Sparks
Vice President

RCS/dh

107 McGee Drive, Patterson, LA 70392
Phone: (985) 395-9576 Fax: (985) 395-9578

Cc: Office file

ELIGIBILITY REVIEW

Bucket 2 – Council Selected Restoration Component

PROPOSAL TITLE

Connecting Coastal Waters: Restoring Coastal Wetland Hydrology

PROPOSAL NUMBER

DOC-1

LOCATION

Multiple Gulf Coastal Counties/Parishes

SPONSOR(S)

Department of Commerce

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

Planning, Technical Assistance, Implementation

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:

Restore hydrology to benefit and restore over 22,000 acres of wetland and estuarine habits.

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	☑	F. Environmental compliance checklist	☑
B. Executive summary	☑	G. Data/Information sharing plan	☑
C. Proposal narrative	☑	H. Reference list	☑
D. Location information	☑	I. Other	☑
E. High level budget narrative	☑		

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: