ALABAMA STATE EXPENDITURE PLAN (SEP)

Project #26: Little Lagoon Restoration Project

Project Description/Summary

a) This project consists of planning, design and implementation to: 1) construct 1,000 feet of living shorelines; to improve hydrologic connectivity of the existing canal system; 2) convert approximately 200 individual septic systems to city sewer; 3) create shellfish restoration programs; 4) restore marsh and seagrass; 5) create fish habitat structures; and 6) conduct baseline surveys, hydrodynamic modeling, ecological research, and long-term monitoring. It is anticipated the proposed activities will restore and improve approximately 2,500 acres of habitat in the watershed of Little Lagoon in Gulf Shores, Alabama, and will result in the restoration and protection of water quality of the Gulf Coast Region's fresh, estuarine, and marine water resources.

Little Lagoon is an 8-mile-long, ¾-mile-wide brackish coastal lake hydrologically connected to the Gulf of Mexico. It is part of a system of coastal dune lakes in south Baldwin County including Lake Shelby (678 ac), Middle Lake (250 ac), Little Lake (45 ac), and Gator Lake (45 ac) which are essentially fresh, tannin rich, lakes that receive salt water only during abnormally high (tropical) tides. The Little Lagoon watershed is bounded on the west by the Bon Secour National Wildlife Refuge and to the east by Gulf State Park. The unique hydrology of Little Lagoon creates an environment that is rich in diversity and functions both as a coastal dune lake and as a tidal estuary.

Little Lagoon is home to more than 64 species of fish, 13 species of crab, 7 species of shrimp, and 11 species of mollusks. Over 370 species of migratory and resident birds have been documented within the western most 1/3 of the watershed, and the area is habitat for many endangered and threatened species, including the Alabama beach mouse, eastern indigo snake, gopher tortoise, loggerhead sea turtle, green sea turtle, and the Kemp's Ridley sea turtle.

Activities also include the comprehensive administration of this grant, including, but not limited to, project development and oversight, contracting, and sub-recipient monitoring.

   a. **Need**: The Lagoon was directly and significantly impacted by the Deepwater Horizon Oil Spill in 2010. Implementation of this project will restore and protect habitats, as well as improve and enhance water quality, ensuring increased ecological productivity and improved coastal resiliency.

   Purpose: The purpose of this project is to improve water quality, increase and enhance habitat area, and increase ecological productivity. The project will have secondary beneficial impacts to the region including improved and more resilient infrastructure and increased recreational and ecotourism opportunities.

   Objective: The primary objective of this project is:

- Construct 1,000 feet of living shorelines;
- Improve hydrologic connectivity of the existing canal system;
- Convert approximately 200 individual septic systems to city sewer;
- Create shellfish restoration programs;
- Restore marsh and seagrass;
- Create fish habitat structures; and
- Conduct baseline surveys, hydrodynamic modeling, ecological research, and long-term monitoring.

   b. This project is located in the Gulf Coast region and will be implemented in the City of Gulf Shores in Baldwin County, Alabama.

   c. This project anticipated to begin on 7/1/19 and end on 6/30/24 (5 years).

   d. The proposed project will be implemented by the City of Gulf Shores.

b) This project will improve water quality in Little Lagoon which flows directly into the Gulf of Mexico. Improved water quality leads to enhanced ecosystem health and recreational opportunities resulting in the restoration of the Gulf economy.

Eligibility and Statutory Requirements

This activity is located in the Gulf Coast Region and is eligible for Spill Impact Component funding under Category #1 – Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast region (primary). Secondary activities include Category #3 - Implementation of a federally approved marine, coastal, or comprehensive conservation management plan, including fisheries monitoring; and Category #10 - Promotion of tourism in the Gulf Coast Region, including recreational fishing.

Comprehensive Plan Goals and Objectives

This project is consistent with the following Comprehensive Plan goals:

- Goal 1: Restore and Conserve Habitat – Restore and conserve the health, diversity, and resilience of key coastal, estuarine, and marine habitats;
- Goal 2: Restore Water Quality and Quantity – Restore and protect water quality of the Gulf Coast region's fresh, estuarine, and marine water;
- Goal 3: Replenish and Protect Living Coastal and Marine Resources – Restore and protect healthy, diverse, and sustainable living coastal and marine resources;
- Goal 5: Restore and Revitalize the Gulf Economy – Enhance the sustainability and resiliency of the Gulf economy.

This project supports the following Comprehensive Plan objectives:

- Objective 1: Restore, Enhance, and Protect Habitats – Restore, enhance, and protect the extent, functionality, resiliency, and sustainability of coastal, freshwater, estuarine, wildlife, and marine habitats;

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- Objective 2: Restore, Improve, and Protect Water Resources – Restore, improve, and protect the Gulf Coast region's fresh, estuarine, and marine water resources by reducing or treating nutrient and pollutant loading; and improving the management of freshwater flows, discharges to and withdrawals from critical systems;
- Objective 3: Protect and Restore Living Coastal and Marine Resources – Restore and protect healthy, diverse, and sustainable living coastal and marine resources including finfish, shellfish, birds, mammals, reptiles, coral, and deep benthic communities;
- Objective 4: Restore and Enhance Natural Processes and Shorelines – Restore and enhance ecosystem resilience, sustainability, and natural defenses through the restoration of natural coastal, estuarine, and riverine processes, and/or the restoration of natural shorelines; and
- Objective 6: Promote Natural Resource Stewardship and Environmental Education – Promote and enhance natural resource stewardship efforts that include formal and informal educational opportunities, professional development and training, communication, and actions for all ages.
- Objective 7: Improve Science-Based Decision-Making Processes – Improve science-based decision-making processes used by the Council.

Major Milestones

a) Milestone 1: Procure professional services

b) Milestone 2: Develop scope, management plan

c) Milestone 3: Conduct engineering and design

d) Milestone 4: Obtain permits

e) Milestone 6: Implementation

f) Milestone 7: Conduct monitoring

Success Criteria/Metrics/Outcomes

The anticipated outcome of Little Lagoon Restoration Project will be:

- 2500 acres of restored and enhanced habitat in Little Lagoon

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Table 27. Proposed Projects Success Criteria/Metrics/Outcomes

Activity	Anticipated Project Success Criteria/Metrics	Short-term outcome	Long-term outcome
Restore Little Lagoon with the creation of living shorelines, removal of septic tanks, restoration of marsh and seagrasses, and the creation of shellfish restoration programs	Develop one management plan Create 1,000 linear feet of living shoreline Remove 200 septic systems Restore/create ~20 acres marsh/seagrass Create shellfish program Develop monitoring plan to assess water quality improvements and ecological benefits	Pollutant source repaired Increased oyster habitat Enhanced shoreline	Restoration and protection of water quality Increased resiliency

Additional success criteria capturing the ecological benefits of this project will be selected at the grant application stage.

Monitoring and Evaluation

a) Submission of final management plan to ADCNR for review and approval

b) Submission of final E&D to ADCNR for review and approval

c) Provide evidence to ADCNR that all required permits were obtained (including SHPO)

d) Submit results of bid process to ADCNR prior to awarding contracts

e) ADCNR will conduct periodic onsite reviews

f) Submission of quarterly and final reports

g) Post construction monitoring as required

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Best Available Science

The restoration methods proposed as part of this project are standard methods that have been successful in other areas. Shellfish restoration, living shorelines, seagrass restoration, marsh restoration, and the elimination of septic tanks within a coastal system have all shown to be effective ways to improve water quality and habitat. This project will not attempt to 'reinvent the wheel' but will use tried and true techniques that have proven to be effective for many projects, including RESTORE projects in other areas. The specific components of the project will be analyzed and refined during the initial data gathering and watershed management plan development process.

This project is consistent with the values and recommendations set forth in the MBNEP's Comprehensive Conservation and Management Plan 2013-2018, available on the MBNEP [website](#).

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Sharma, S, et. al. 2016. Do restored oyster reefs benefit seagrasses? An experimental study in the Northern Gulf of Mexico. Restoration Ecology 24(3), 306-313.

Walters, K., et al 2010. Local-scale characteristics of high-marsh communities next to developed and undeveloped shorelines in an ocean-dominated estuary, Murrells Inlet, SC. Aquatic Sciences 7, 309-324.

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Peterson, CH et. al 2003. Estimated enhancement of fish production resulting from restoring oyster reef habitat: quantitative valuation. Marine Ecology Progress Series 264, 249-264.

Brumbaugh RD et. al., 2000. Making a case for community-based oyster restoration: An example from Hampton Roads, Virginia, USA. Journal of Shellfish Research 19(1), 467-472.

Budget/Funding

a) Estimated cost of the project and amount to be requested from Spill Impact Component Funds: $6,175,557 (10-20% - Planning, 90-80% - Implementation). While it is noted that funding available under a grant award cannot exceed the amount described in the SEP for this project, the percentages listed in this section are estimated and will be more clearly cultivated in the grant application.

b) No other funding sources are anticipated at this time.

Partnerships/Collaboration (if applicable)

Not applicable at this time.

Leveraged Resources (if applicable)

Not applicable at this time.

Funds Used As Non-Federal Match (if applicable)

Not applicable at this time.

Other

Not applicable at this time.

Figure 26. The Little Lagoon Restoration Project will be implemented in the City of Gulf Shores, Alabama.