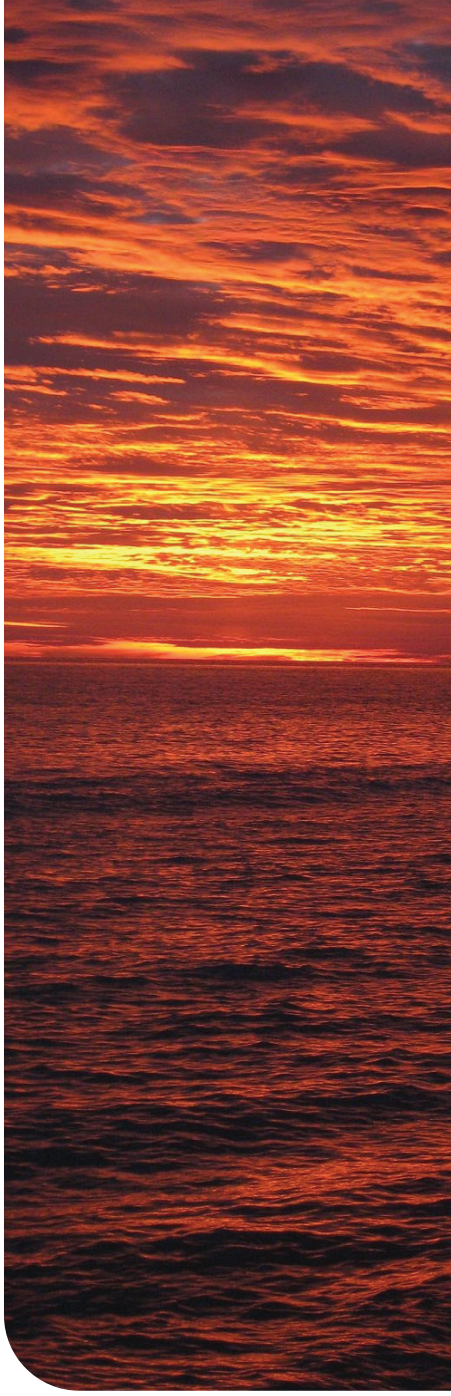

Gulf Coast Ecosystem Restoration Council
2026 Funded Priorities List

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Gulf Coast Ecosystem Restoration Council Members

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Executive Summary

On June 10, 2026, Gulf Coast Ecosystem Restoration Council (RESTORE Council or Council) voted to commit approximately $403,654,000 in new funding for water quality improvement, habitat conservation and restoration, and other ecosystem projects and programs across the Gulf Coast, pursuant to the *Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies Act of the Gulf Coast States of 2012* (33 U.S.C. § 1321(t) and *note*) (RESTORE Act). This 2026 Funded Priorities List (FPL) includes 19 ecosystem restoration projects and programs which build upon over $685 million in restoration activities previously identified by the Council. With these additional funds, the RESTORE Council has committed over $1 billion for restoration activities across the Gulf Coast under the Council-Selected Restoration Component of the RESTORE Act. In addition, the RESTORE Council is reallocating $9,605,860 in savings from previously approved projects and programs to further support activities in this FPL. This 2026 FPL also includes an update to the RESTORE 2022 Comprehensive Plan.

The RESTORE Act is a federal law that dedicated a portion of a civil settlement with parties responsible for the *Deepwater Horizon* disaster to the RESTORE Council to fund environmental and economic restoration across the Gulf Coast. Under the 2016 *Deepwater Horizon* consent decree among the United States, the five Gulf States, and BP Exploration & Production, Inc. (BP), BP makes payments into the Gulf Coast Restoration Trust Fund over a 15-year period ending in 2031. As funds become available, the RESTORE Council works collaboratively with input from stakeholders across the Gulf to develop FPLs, which designate ecosystem projects and programs for funding. This funding comes from the RESTORE Act allocation known as the Council-Selected Restoration Component. FPL funding decisions are guided by criteria set forth in the RESTORE Act, the Council's Comprehensive Plan, the Council's Planning Framework and other policies.

In the 2026 FPL, the RESTORE Council is funding ten new activities as well as amendments to increase funding for nine activities approved in prior FPLs. This FPL adheres to the FPL development process committed to by the RESTORE Council, including the application of best available science (BAS), public engagement and transparency, and the Planning Framework. Each activity included for new or increased funding is described as well as summaries of the BAS reviews of the proposals. The potential benefits of this funding include:

- Ecosystem restoration in important ecoregions and watersheds, including the Texas Gulf Region, Lower Mississippi/Lake Pontchartrain watershed in Louisiana, Mississippi Sound in Mississippi and Alabama, the Mobile Bay and Mobile/Tensaw Delta Watershed in Alabama, and Pensacola Bay and other coastal Florida watersheds.
- Large-scale restoration of the Chandeleur Islands, which provide valuable habitat for a wide range of fish and wildlife species, while also serving as a first line of storm defense for communities in Louisiana.
- Leveraging funding from multiple sources, including previous FPLs, within a specific geographic area to maximize ecosystem restoration outcomes.
- Restoration of a former barrier headland in a cross-state border project led by Mississippi and Alabama.
- Large-scale programs to address water quality and quantity, habitat restoration, coastal resilience, and other ecosystem restoration needs in the Gulf Coast region.
- Continuation of funding to enhance the environmental vitality of the region's natural resources while also providing environmental job training for youth from Federally recognized tribes.
- Private land conservation and ecological restoration on agricultural lands across the Gulf; and
- Scientific efforts to help build the knowledge needed to advance Gulf restoration.

The activities described in this document will continue to strategically leverage investments with other restoration efforts and build upon successes of existing and past FPL activities in accordance with the Council's Comprehensive Plan.

Our Vision

A healthy and productive Gulf ecosystem achieved through collaboration on strategic restoration projects and programs

I. Introduction

A. The RESTORE Act and Gulf Coast Ecosystem Restoration Council

The RESTORE Council was established in 2012 by the *Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012* (33 U.S.C. § 1321(t) and *note*) (RESTORE Act), a federal law enacted in response to the *Deepwater Horizon* oil spill disaster. Members of the RESTORE Council include the Governors of the States of Alabama, Florida, Louisiana, Mississippi, and Texas; the Secretaries of the U.S. Departments of the Interior, the Army, Commerce, Agriculture, and Homeland Security; and the Administrator of the U.S. Environmental Protection Agency (EPA). The Administrator of the EPA currently serves as the RESTORE Council Chairperson.

Pursuant to the RESTORE Act, the RESTORE Council is responsible for administering a portion of the funds associated with settlement of civil penalties against parties responsible for the *Deepwater Horizon* spill. Specifically, the RESTORE Council is responsible for administering two RESTORE Act funding allocations, the Council-Selected Restoration Component and the Spill Impact Component, each of which receives 30% of the funds allocated under the RESTORE Act. Figure 1 shows the funding allocations and amounts under the RESTORE Act and associated settlements of civil penalties.

Under the 2016 *Deepwater Horizon* consent decree among the United States, BP Exploration & Production, Inc. (BP), and the five Gulf States, BP makes payments into the Gulf Coast Restoration Trust Fund (Trust Fund) over a 15-year period ending in 2031. As funds become available, the RESTORE Council works collaboratively with input from stakeholders across the Gulf to develop Funded Priorities Lists (FPLs), which designate ecosystem projects and programs for funding. FPL funding decisions are guided by criteria set forth in the RESTORE Act, the Council's Comprehensive Plan, the Council's Planning Framework and other policies.

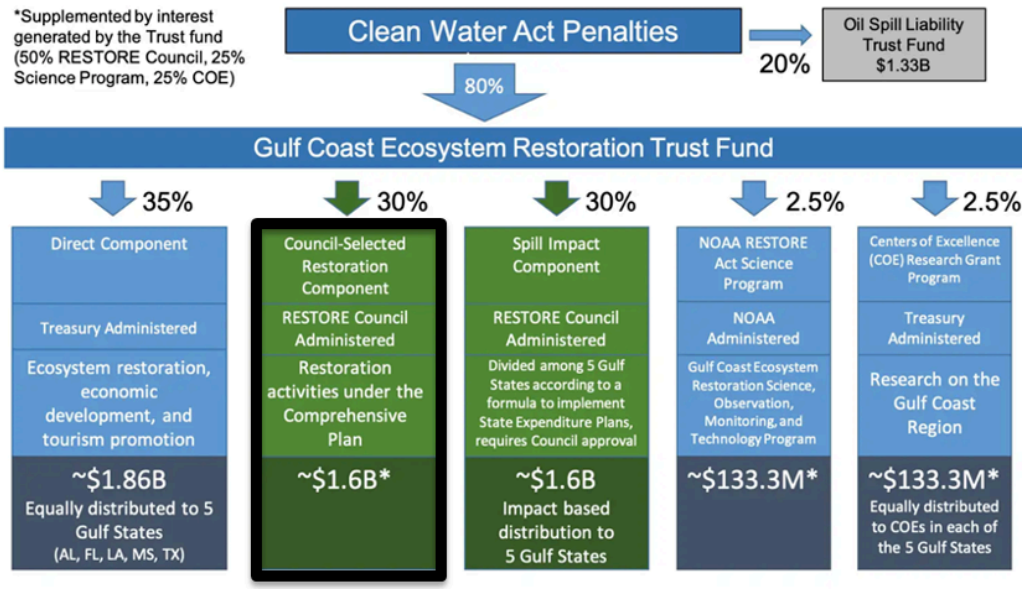


Figure 1. Allocation of the Gulf Coast Restoration Trust Fund based on settlements with BP, Transocean and Anadarko; RESTORE Council oversight components are highlighted in green.

B. RESTORE Act Priority Criteria

In selecting projects and programs, the RESTORE Act requires that the RESTORE Council give the highest priority to projects and programs that address one or more of the following criteria:

1. Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.
2. Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.
3. Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.
4. Projects that restore long-term resilience of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the *Deepwater Horizon* oil spill.

The RESTORE Council's strategy for achieving a healthy Gulf is founded on goals and objectives set forth in the Council's Comprehensive Plan. Additionally, the RESTORE Council committed to an overarching framework for an integrated and coordinated approach to region-wide Gulf Coast restoration and to help guide the collective actions at the local, state, tribal, and federal levels.

The RESTORE Council's goals are:

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 the water quality and quantity of the Gulf Coast region's fresh, estuarine, and marine waters.**
Goal 3	**Replenish and Protect Living Coastal and Marine Resources - Restore and protect healthy, diverse, and sustainable living coastal and marine resources.**
Goal 4	**Enhance Community Resilience - Build upon and sustain communities with the capacity to adapt to short and long-term changes.**
Goal 5*	**Restore and Revitalize the Gulf Economy - Enhance the sustainability and resilience of the Gulf economy.**

*Goal 5: Restore and Revitalize the Gulf Economy" focuses on reviving and supporting a sustainable Gulf economy. While a healthy ecosystem does benefit the economy, this goal does not apply directly to the Council-Selected Restoration Component. This goal directly pertains to expenditures by the Gulf Coast States authorized in the RESTORE Act under the Spill Impact Component (administered by the RESTORE Council) and ensures that these investments can be considered in the context of comprehensive restoration.

Figure 2: Restore Council's Goals as defined in the Comprehensive Plan.

Consistent with these goals, the RESTORE Council's objectives are:

1. Restore, Enhance and Protect Habitats;
2. Restore, Improve and Protect Water Resources;
3. Protect and Restore Living Coastal and Marine Resources;
4. Restore and Enhance Natural Processes and Shorelines;
5. Promote Community Resilience;
6. Promote Natural Resource Stewardship and Environmental Education; and
7. Improve Science-Based Decision-Making Processes.

The RESTORE Council approves Council-Selected Restoration Component funding for projects and programs through the development of FPLs. Projects and programs funded through this component must be in furtherance of the goals and objectives of the Comprehensive Plan and meet at least one of the above-mentioned criteria identified in the RESTORE Act.

The RESTORE Council developed a Planning Framework to provide guidance to help ensure that funds are used as effectively as possible and to serve as a "bridge" between the Council's Comprehensive Plan goals and objectives and the specific restoration activities to be approved in future FPLs. The Planning Framework lists priority restoration approaches and techniques (Figure 3), their relationship to the Comprehensive Plan goals and objectives, and associated geographic areas. The purpose of this document is to provide the public and potential funding partners with an indication of the kinds of projects and programs that are anticipated to be developed for FPL funding consideration.

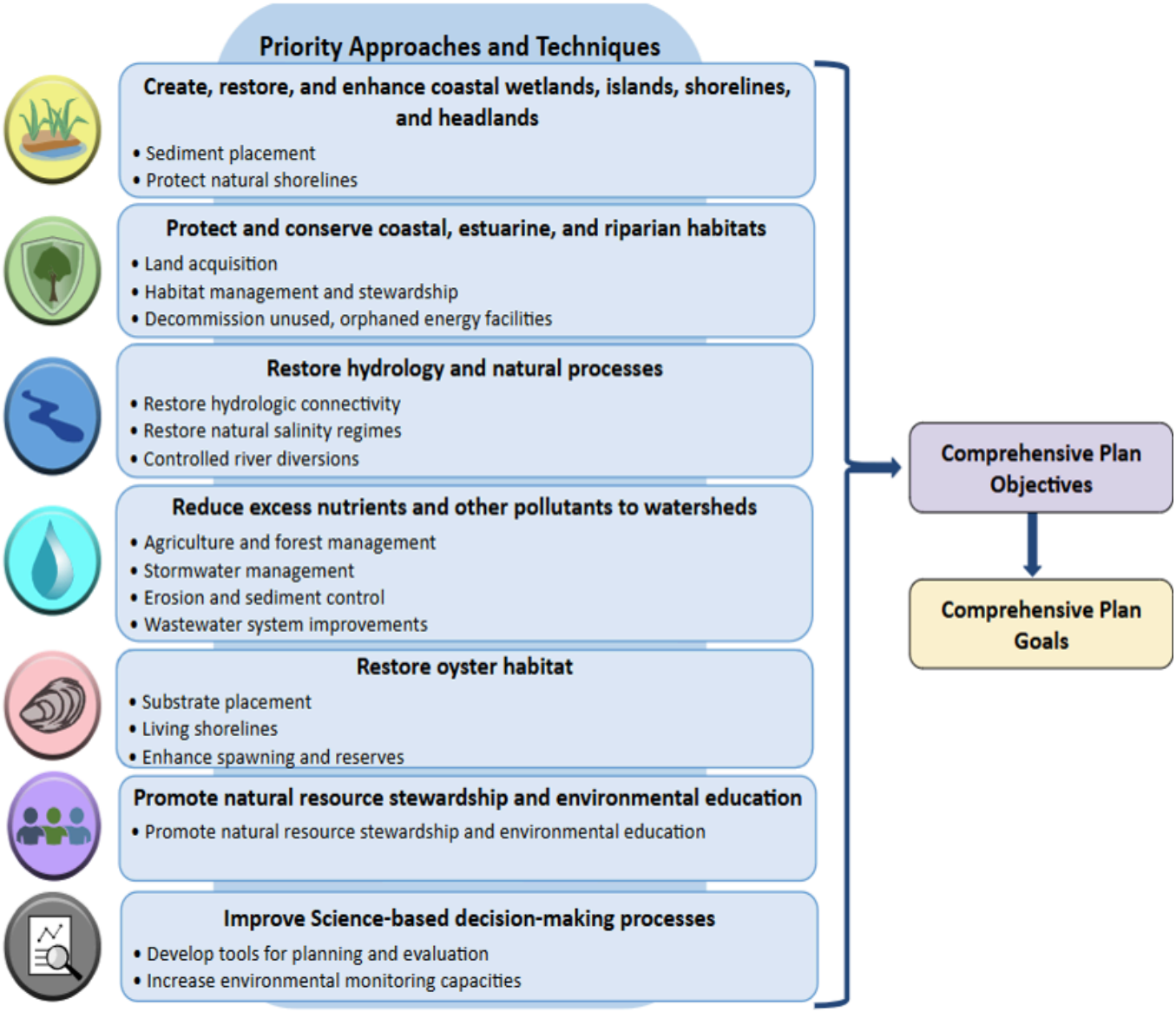


Figure 3: The Planning Framework priority approaches and techniques can be applied to support the Comprehensive Plan objectives and goals.

C. Restoration Investments in Prior FPLs

Over its lifetime, the Council will invest over $1.6 Billion in Gulf Coast ecosystem restoration activities through the Council-Selected Restoration Component. Prior to the 2026 FPL, the Council approved three major Funded Priorities Lists: the Initial FPL in 2015; the Comprehensive Plan Commitment and Planning Support FPL approved in 2018 and amended in 2024; and FPL 3, approved in two phases in 2020 and 2021. Through these prior FPLs, the RESTORE Council has committed over $685.5 Million for ecosystem restoration projects and programs across the Gulf Coast. Information on the projects and programs contained in past FPLs can be found on the Council's website and RESTORE Project Map. With the addition of the funds in this newly approved FPL, the Council has committed over $1 Billion in Council-Selected Restoration Funding.

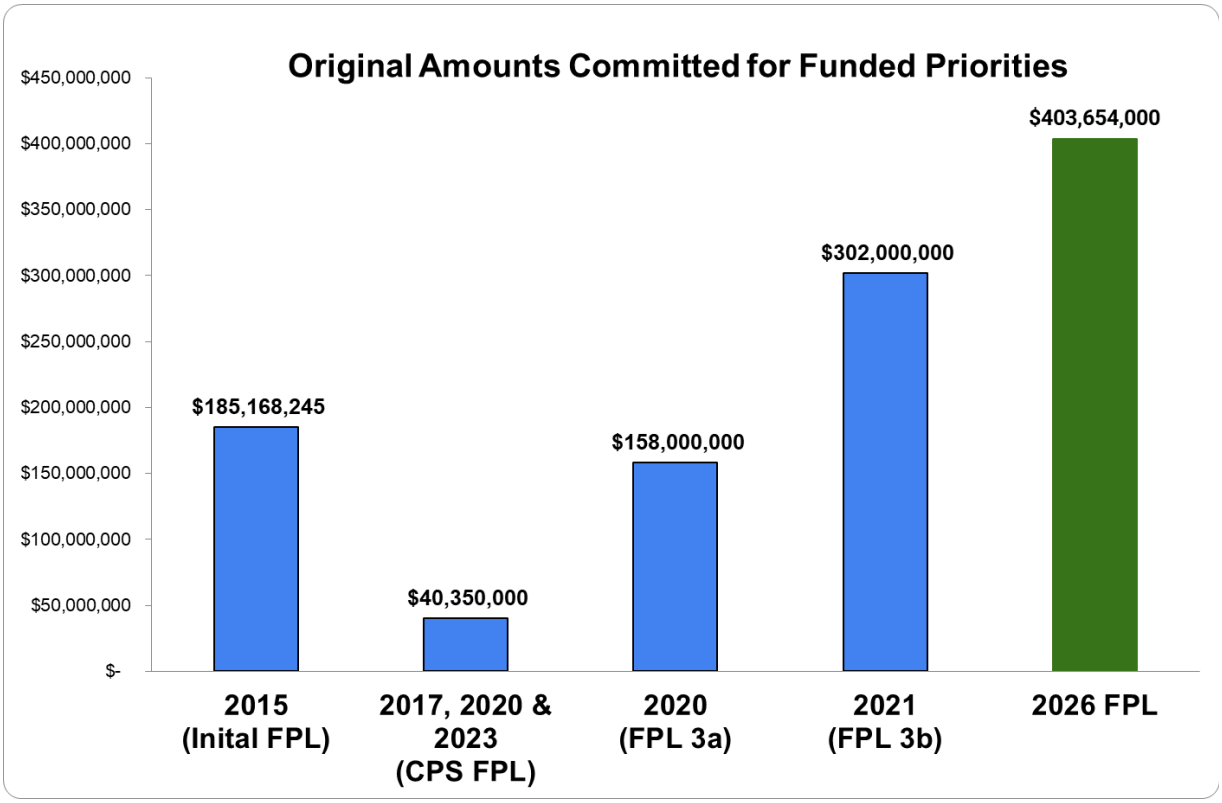


Figure 4: Funding amounts on this chart reflect the original amounts committed by the Council for Funded Priorities in both Category 1 and Category 2. These values reflect the March 2020 Council amendment to reallocate $2 million from the 2017 CPS FPL to the 2015 Initial FPL for the Gulf Coast Conservation Corps Program. Savings achieved from activities in prior FPL projects that have been applied towards other FPL activities, including those in this 2026 FPL decision, are not shown on this chart. See Table 2 and 3 for more details on savings and reallocations applied to the 2026 FPL.

II. Council Collaboration in FPL Development

The Council develops FPLs through a collaborative and iterative process among its members. In the early stages of collaboration for the 2026 FPL, members identified and discussed potential priorities that ranged from broad programmatic goals to specific project concepts, as well as the continuation of previously approved activities. Throughout this process, project and program concepts were reviewed and discussed by all members, further refined, and in some cases, dropped from further consideration based on feedback and other factors (e.g., availability of alternative funding sources). These discussions helped members further shape their respective project and program concepts as they developed the 2026 FPL proposals.

Figure 5: Steps in developing a Funding Priorities List

A. FPL Proposal Submission Guidelines and Review Process

In 2023, the RESTORE Council developed updated guidance for its members on the content and review process for funding proposals. The Proposal Submission Guidelines primary purpose is to help Council members develop effective proposals for potential funding in FPLs. Council members are the only entities eligible to submit proposals for potential funding under the Council-Selected Restoration Component. Federally recognized tribes may submit proposals via a federal Council member sponsor. The members were asked to submit potential project proposals for review and consideration for the 2026 FPL. The Council then reviewed all proposals for compliance with the RESTORE Act, consistency with the Comprehensive Plan and Planning Framework, and compliance with all applicable environmental laws.

The RESTORE Act requires the Council to "undertake projects and programs, using the best available science that would restore and protect the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, coastal wetlands, and economy of the Gulf Coast." To meet the intent of the RESTORE Act, and to support the Council's Comprehensive Plan commitment to science-based decision-making, all FPL proposals underwent a BAS review process that included three anonymous external science reviews (including reviews by experts from within and outside the Gulf Coast region) and an Internal BAS Review Panel. The purpose of this internal panel was to use Council member-agency technical expertise to consider external reviews, identify ways to further strengthen the scientific basis of each proposal and, as applicable, identify potential synergies between proposals not identified prior to their submission.

For the existing projects or programs in the 2026 FPL requesting additional funding, the proposals were evaluated for consistency with the previous BAS reviews to ensure:

- the previous BAS review was deemed applicable; and
- there was no new information or changing environmental or other circumstances that was relevant to the previous BAS review.

After all proposal reviews were completed, members responded to review comments pertaining to their respective proposals. This included revising their proposals if warranted. The revised proposals and the proposal "packages" containing the reviews and responses can be found in the appendices. As the collaborative process among the members continued, some proposals were modified, and others were eliminated from further consideration.

B. FPL Categories

FPLs include activities in two categories:

- **Category 1** activities are approved for the Council-Selected Restoration Component funding. Such approval requires a Council vote as set forth in the RESTORE Act. To be approved in Category 1, a project or program must have documentation demonstrating that all applicable environmental laws have been addressed. For example, a construction project would need documentation demonstrating compliance with the National Environmental Policy Act and other applicable laws.

- **Category 2** activities are Council priorities for potential future funding but are not approved for funding. These are projects and/or programs that are not yet able to be approved by the RESTORE Council, but which warrant potential future funding. A Council vote to amend the FPL is required to move an activity from Category 2 to Category 1. The RESTORE Council will provide a minimum of 15 days public notice before voting on whether to approve funding for an activity in Category 2, thereby moving it to Category 1. These notifications will be provided to Council Announcement subscribers, referred to in the "Public Comment Process for the 2026 FPL" section of this document. These notifications also will be posted to the RESTORE Council's website.

More information regarding FPL Category 1 and Category 2 can be found in the Proposal Submission Guidelines.

C. FPL Activities Alignment with the Comprehensive Plan

The Council defined goals and objectives and six foundational commitments in the Comprehensive Plan to guide its ecosystem restoration funding decisions. The Council selects and funds projects and programs that restore the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region, that support meeting its vision of a "healthy and productive Gulf ecosystem achieved through collaboration on strategic restoration projects and programs."

The Council's six commitments are:

1. Taking a regional ecosystem-based approach to restoration;
2. Leveraging resources and partnerships;
3. Maintaining and enhancing public engagement, inclusion and transparency;
4. Providing efficient, effective and transparent environmental compliance;
5. Applying science-based decision-making; and
6. Delivering results and measuring impacts.

These activities build on or expand previously funded projects and programs consistent with the Council's commitment to a watershed/estuary-based approach to restoration found in the Comprehensive Plan and Planning Framework. An example of this is the *Restoration of Grand Batture Island* project in the Mississippi Sound. This project, co-sponsored by Mississippi and Alabama, supports the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region by creating, restoring and enhancing coastal habitats through the restoration of Grand Batture Island.

New regional ecosystem-based activities that support the Council's objective to restore, enhance, and protect habitats include the Louisiana-sponsored *Chandeleur Islands Restoration* project, the Texas-sponsored *Protecting and Restoring Waterbird Rookery Habitat* program, and the Department of the Interior-sponsored *Colonial Waterbird Rookery Island Restoration* project. These activities will restore and enhance critical nesting habitats for wildlife. The *Chandeleur Islands Restoration* project will benefit sea turtles such as Loggerhead, Green and the endangered Kemp's Ridley, as well as several bird species, including colonial nesting waterbirds and foraging birds. The *Protecting and Restoring Waterbird Rookery Habitat* program and *Colonial Waterbird Rookery Island Restoration* project leverage each other to help restore coastal bird populations through restoring key nesting habitats along the Texas coast by supporting restoration techniques that include sediment placement, protecting natural shorelines, and habitat management and stewardship. Additionally, Gulf-wide projects such as the EPA-sponsored *Trash Free Waters Program Benefiting Communities in the Gulf Coast* will benefit coastal communities across all five Gulf Coast states by developing competitive funding opportunities to prevent, remove and/or recycle/upcycle trash from waters that drain to the Gulf Coast.

The Council recognizes the benefit in continuing to invest in activities previously approved for funding. Expanding these critical efforts ensures that the large-scale restoration efforts the Council has already identified and invested in continue to progress. For example, the Council continues to support the USDA-sponsored *Gulf Coast Conservation Reserve* program in order to build upon the restoration and conservation progress made through previous FPL funding. This program will implement conservation practices and restoration activities on private lands which benefit water quality in Coastal Texas, the Mississippi Sound and the Mobile Bay and Perdido Bay watersheds.

In addition to continuing to support the *Gulf Coast Conservation Reserve* Program, the Council recognizes the benefit in continuing to invest in two FPL3b large-scale water quality programs, the *Coastal Alabama Regional Water Quality* program and the *Florida Water Quality Improvement* program. These programs build on planning and ongoing efforts to improve water quality and quantity specific to the geographic areas and watersheds by leveraging local and regional expertise, and other funding. All the projects and programs, whether new activities or amendments to previously funded activities, align with the Council's commitments in the Comprehensive Plan. More information on the six commitments can be found in the Council's Comprehensive Plan. Table 1 below shows a crosswalk of how all the 2026 FPL activities align with the Comprehensive Plan Goals and Objectives.

Table 1: Alignment of the 2026 FPL Activities with the Council's Goals and Objectives

		Comprehensive Plan Objectives						
Geographic Area	Project/Program	Restore, enhance, and protect habitats	Protect and restore living coastal and marine resources	Restore and enhance natural processes and shorelines	Restore, improve, and protect water resources	Promote community resilience	Natural resource stewardship and env. education	Improve science-based decision-making processes
Coastal Texas	Managing Wetlands Migration Corridors and Natural Floodways Program	✓			✓			
	Oyster Reef Restoration Program	✓	✓					
	Protecting and Restoring Waterbird Rookery Habitat Program	✓	✓					
	Colonial Waterbird Rookery Island Restoration	✓						
	Wind-Tidal Flat Restoration Pilot, Phase 2							✓
	Development of Indicators and Identification of Thresholds to Support Reef Restoration	✓						✓
Pontchartrain Basin, Louisiana	Chandeleur Islands Restoration Project	✓	✓	✓				
Mississippi Sound, Mississippi and Alabama	Restoration of Grand Batture Island	✓	✓	✓				
	Coastal Nearshore Habitat Restoration and Development Program	✓	✓	✓				
Mobile Bay and Mobile-Tensaw Delta, Perdido Bay and River, Alabama	Coastal Alabama Regional Water Quality Program				✓	✓		
	Upper Mobile Bay Beneficial Use Wetland Creation Site	✓	✓					
	West End Dauphin Island, Alabama Renourishment and Resilience			✓		✓		
Coastal Florida	Florida Gulf Coast Resilience Program					✓		
	Florida Gulf Coast Tributaries Hydrologic Restoration Program				✓			
	Florida Water Quality Improvement Program				✓			
	Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County		✓	✓				
Gulf-wide	Trash Free Waters Program Benefiting Communities in the Gulf Coast				✓		✓	
	Gulf Coast Conservation Reserve Program	✓			✓			
	Tribal Youth Conservation Corps					✓	✓	
		Restore and conserve habitat	Living coastal / marine resources	All	Restore water quality and quantity	Enhance community resilience	All	
		Comprehensive Plan Goals						

III. FPL Activities

A. FPL Activities Overview

The projects and programs (collectively referred to as activities) included in Table 2 and Table 3 below will address ecosystem needs across the Gulf Coast. In 2026, the Council has approved new funding of approximately $136,573,000 for Category 1 activities and allocated $267,081,000 in funds for Category 2 activities for a total of $403,654,000 in new funding for Gulf Coast restoration. The Council is also reprogramming $9,605,860 in unspent funds from previous FPLs to support projects and programs contained in the 2026 FPL.

B. Reprogrammed Savings from Previous FPLs

To maximize on-the-ground restoration, the RESTORE Council incentivizes savings and efficiency under the Council-Selected Restoration Component. Under the Council's "Savings Policy," if an FPL project or program is completed under budget or other savings are achieved, the sponsoring member may seek approval to reprogram the remaining unspent funds on another FPL activity sponsored by that same member. The use of unspent funds is subject to a Council vote after an opportunity for public comment and in accordance with the RESTORE Act and all other applicable laws.

Council members are using this savings policy to reallocate unspent funds from several previously approved activities in the 2026 FPL:

- The State of Alabama has completed work on an Initial FPL project, *Enhancing Opportunities for Beneficial Use of Dredge Sediments*, and has a total of $1,950,000 in unspent funds. The Council is reallocating those funds to the 2026 FPL joint Mississippi-Alabama *Restoration of Grand Batture Island* project.
- The State of Louisiana has completed work on three Initial FPL projects (*West Grand Terre Beach Nourishment & Stabilization, Golden Triangle Marsh Creation*, and *Biloxi Marsh Living Shoreline*) and has a total of $5,872,250 in unspent funds. The Council is reallocating those funds to the 2026 FPL *Chandeleur Islands Restoration* project.
- EPA has completed work on the Initial FPL *Tampa Bay Estuary* program. The Council is reallocating $283,610 in unspent funds from this program to the 2026 FPL activity entitled *Trash Free Waters Program Benefiting Communities in the Gulf Coast*.

These reallocations of unspent funds are shown in the table below under the "Savings Applied" column. In addition to the savings-based reallocations discussed above, the Council is reallocating the $1,500,000 approved in FPL3b for the State of Alabama's *Perdido Watershed Water Quality Improvements and Restoration Assessment* program funds into the *Coastal Alabama Regional Water Quality* program.

C. 2026 FPL New Activities

The new activities included in the 2026 FPL are listed below in Table 2, along with the savings mentioned above, their location and the total funding amount(s). The environmental compliance documentation for implementation activities in FPL Category 1 can be found on the Council's website.

Table 2: 2026 FPL New Activities Funding

Geographic Area	New Activities for 2026 FPL	Savings Applied*	2026 FPL Funds: Category 1	2026 FPL Funds: Category 2	Total New Funds for 2026 FPL	Total 2026 FPL Funds with Savings
Coastal Texas	Development of Indicators and Identification of Thresholds to Support Reef Restoration		$1,200,000	$0	$1,200,000	$1,200,000
	Colonial Waterbird Rookery Island Restoration		$600,000	$1,400,000	$2,000,000	$2,000,000
	Managing Wetlands Migration Corridors and Natural Floodways Program		$8,424,000	$38,376,000	$46,800,000	$46,800,000
	Oyster Reef Restoration Program		$2,304,000	$10,496,000	$12,800,000	$12,800,000
	Protecting and Restoring Waterbird Rookery Habitat Program		$2,304,000	$10,496,000	$12,800,000	$12,800,000
Pontchartrain Basin, Louisiana	Chandeleur Islands Restoration Project	$5,872,250	$0	$84,900,000	$84,900,000	$90,772,250
Mississippi Sound Mississippi and Alabama	Restoration of Grand Batture Island	$1,950,000	$13,750,000	$41,250,000	$55,000,000	56,950,000
Mobile Bay and Mobile-Tensaw Delta, Alabama	West End Dauphin Island, Alabama Renourishment and Resilience		$38,000,000		$38,000,000	$38,000,000
Coastal Florida	Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County		$900,000	$0	$900,000	$900,000
Gulfwide (All five states)	Trash Free Waters Program Benefiting Communities in the Gulf Coast	$283,610	$1,000,000	$8,000,000	$9,000,000	$9,283,610
	Subtotals	$8,105,860	$68,482,000	$194,918,000	**$263,400,000**	**$271,505,860**

*Savings Applied represents funds from previous FPLs. All savings will be in Category 2.

D. Expanding on Existing Projects

Nine of the nineteen 2026 FPL activities provide additional funding for existing projects and programs approved in prior FPLs. These are listed in Table 3 below.

Table 3: Amendments to Approved Activities for Additional Funding.

Geographic Area	Additional Funding for Existing Activities	Previous FPL	Savings Applied*	New Funds in 2026 FPL: Category 1	New Funds in 2026 FPL: Category 2	Total New Funds in 2026 FPL	Total 2026 FPL Funds with Savings
Coastal Texas	Wind-Tidal Flat Restoration Pilot, Phase 2	FPL 3b		$1,200,000	$0	$1,200,000	$1,200,000
Mississippi Sound, Mississippi	Coastal Nearshore Habitat Restoration and Development Program in Mississippi	FPL 3b		$5,000,000	$20,000,000	$25,000,000	$25,000,000
Mobile Bay and Mobile-Tensaw Delta, Perdido Bay and River, AL-FL	Coastal Alabama Regional Water Quality Program	FPL 3b	$1,500,000	$2,400,000	$5,600,000	$8,000,000	$9,500,000
	Upper Mobile Bay Beneficial Use Wetland Creation Site	Initial FPL		$24,000,000	$0	$24,000,000	$24,000,000
Coastal Florida	Florida Gulf Coast Resilience Program	FPL 3b		$8,000,000	$12,000,000	$20,000,000	$20,000,000
	Florida Gulf Coast Tributaries Hydrologic Restoration Program	FPL 3b		$5,042,000	$7,563,000	$12,605,000	$12,605,000
	Florida Water Quality Improvement Program	FPL 3b		$18,000,000	$27,000,000	$45,000,000	$45,000,000
Gulfwide (TX & AL)	Gulf Coast Conservation Reserve Program	Initial FPL & FPL 3b		$3,000,000	$0	$3,000,000	$3,000,000
Gulfwide (TX, LA, MS, AL & FL)	Tribal Youth Conservation Corps	Initial FPL & FPL 3b		$1,449,000	$0	$1,449,000	$1,449,000
	Subtotals		$1,500,000	$68,091,000	$72,163,000	**$140,254,000**	**$141,754,000**

*Savings Applied represents funds from previous FPLs. All savings will be in Category 2.

2026 FPL Total for New Activities & Amendments to Existing Activities $263,400,000 + $140,254,000 = **$403,654,000**
2026 FPL Total with Savings $271,505,860 + $141,754,000 = **$413,259,860**

IV. Activities by Geographic Area

Summary descriptions of each approved activity are presented below according to the geographic area in which they will occur. More details regarding each activity description can be found in the proposal package in the appendices. The proposal "package" contains the proposal, a summary of the best available science review and responses, and the review forms.

A. Coastal Texas

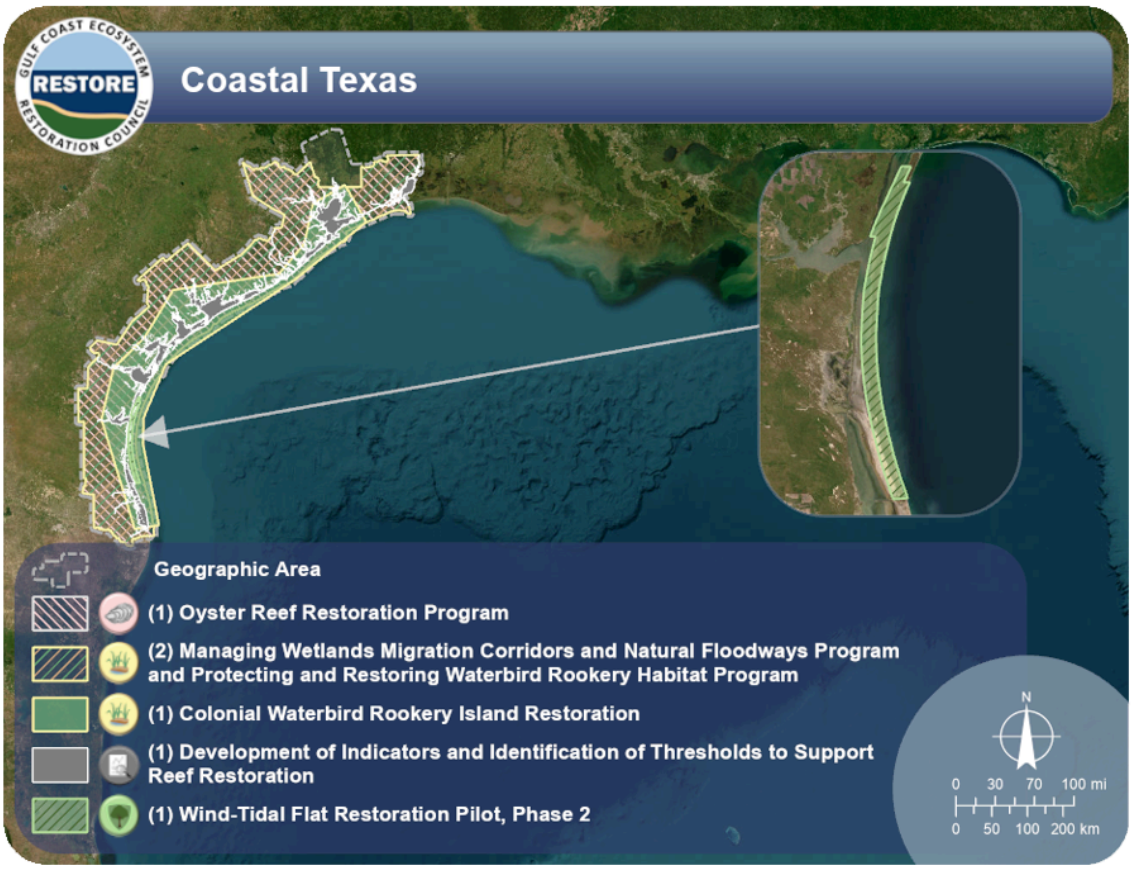


Figure 6: Coastal Texas activities in the 2026 FPL

A.1 Managing Wetlands Migration Corridors and Natural Floodways Program (New Program)

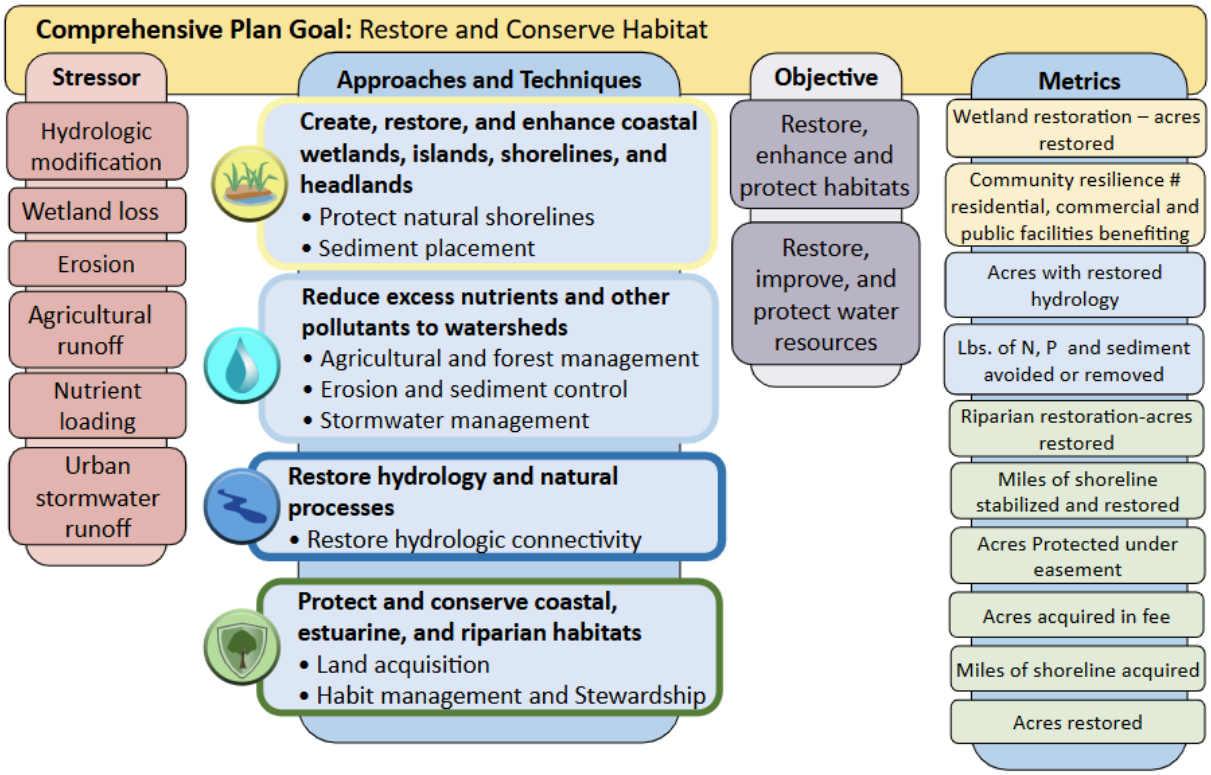


Figure 7: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The *Managing Wetlands Migration Corridors and Natural Floodways* program aims to combat the loss of estuarine wetlands by protecting pathways for wetlands to shift inland. With a budget of $46.8 million, the program will fund project activities such as land acquisition, habitat management, hydrologic restoration, agricultural and forest management, stormwater management, erosion control, sediment placement and shoreline protection. It will also fund planning, implementation and monitoring to measure success. Coastal wetlands are vital for supporting wildlife, recreational activities, commercial fisheries, flood control and water quality. In Texas, coastal habitats and communities face risks from storm surges, especially when combined with heavy rainfall. Periodic and long-term inundation of estuarine habitats can profoundly alter the hydrology of these systems, undermining their resilience and ability to support diverse wildlife and ecosystem functions. This program supports the RESTORE Council's primary goal of habitat restoration and conservation, with secondary benefits including improved water quality and quantity, and community resilience.

Priority will be given to well-developed, scalable projects that offer lasting benefits such as habitat conservation, improved flood protection, enhanced wildlife habitat and water quality improvement. The program's duration is 7 years.

A.2 Oyster Reef Restoration Program (New Program)

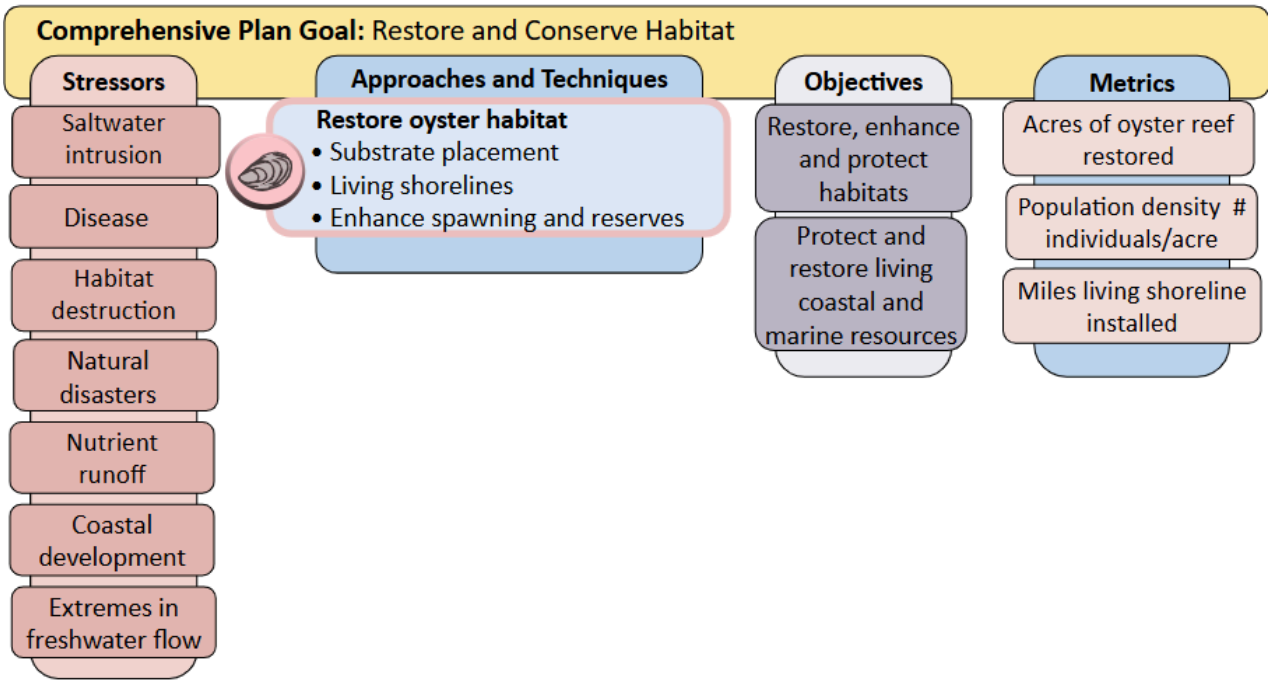


Figure 8: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The Texas *Oyster Reef Restoration* program seeks to restore and conserve habitat and replenish and protect living coastal and marine resources by restoring non-commercial oyster reef habitats in Texas estuarine waters. Over time, oyster reefs across Texas bays and estuaries have declined significantly. Oysters play a critical role in both the environment and the economy by providing essential habitat for many marine species and offering valuable ecosystem services such as filtering water, protecting shorelines, and supporting recreational and commercial fishing.

With a budget of $12.8 million, the program will use restoration methods such as placing new substrate, building living shorelines and enhancing areas where oysters can spawn. Additional program activities will include planning, implementation and monitoring to ensure success. Priority will be given to projects that have undergone prior review and align with key criteria, such as project readiness, scalability and potential effectiveness. The overall goal of this program is to enhance the habitat and productivity of Texas's oyster resources. The program's duration is 7 years.

A.3 Development of Indicators and Identification of Thresholds to Support Reef Restoration (New Project)

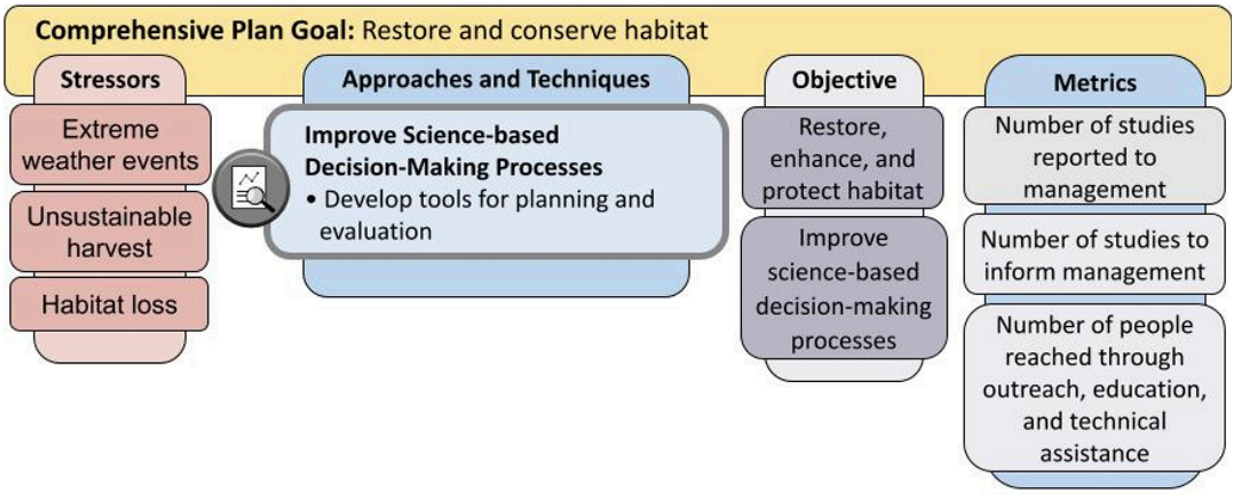


Figure 9: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

With the *Development of Indicators and Identification of Thresholds to Support Reef Restoration* project, the Council has approved $1.2 million for the Department of the Interior to build on recent work that has already identified priority restoration sites and calculated restoration and aquaculture suitability indices. This project will expand on this work by studying oysters at the reef level, focusing on population characteristics and how these link to restoration activities, environmental conditions and different management approaches. Across the northern Gulf, restoration and management goals include ensuring resilience and sustainability of oysters, the reefs they create and the services the reefs and oysters provide. This project supports the primary Comprehensive Plan goal of restoring and conserving habitat.

In Texas, managers aim to balance oyster reef restoration and sustainable fisheries through the use of passive (i.e., harvest management), and active (i.e., material in the water) methods. This project will provide critical data to inform management decisions by providing outcome indices based on proposed restoration management and environmental conditions related to oyster reef structure, population dynamics and biodiversity and food web support. The project duration is 4 years.

A.4 Protecting and Restoring Waterbird Rookery Habitat Program (New Program)

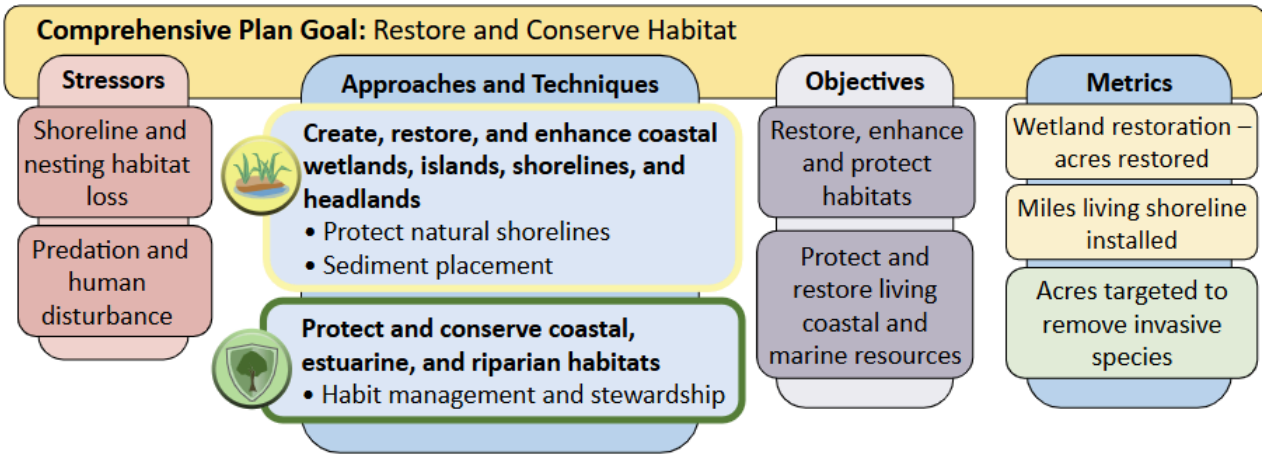


Figure 10: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The *Protecting and Restoring Waterbird Rookery Habitat* program in Texas is focused on preserving and improving essential nesting sites for waterbirds. Across the state, many nesting bird colonies are located on islands formed from dredged materials. These important nesting areas are increasingly at risk due to problems like the loss of vegetation, human disturbance, and predators, all of which contribute to declining bird populations.

This program aligns with the Council's Comprehensive Plan goal to restore and conserve habitats by focusing on the protection and enhancement of rookery islands. With a budget of $12.8 million, the program will support restoration techniques that include placing sediment to stabilize islands, protecting natural shorelines and managing habitat to support healthy bird colonies. It will also include planning, implementation and monitoring activities to ensure success. Priority will be given to projects that have undergone prior review and align with key criteria, such as project readiness, scalability and potential effectiveness. The overall goal is to improve the resilience and sustainability of waterbird populations in Texas. The program's duration is 7 years.

A.5 Colonial Waterbird Rookery Island Restoration (New Project)

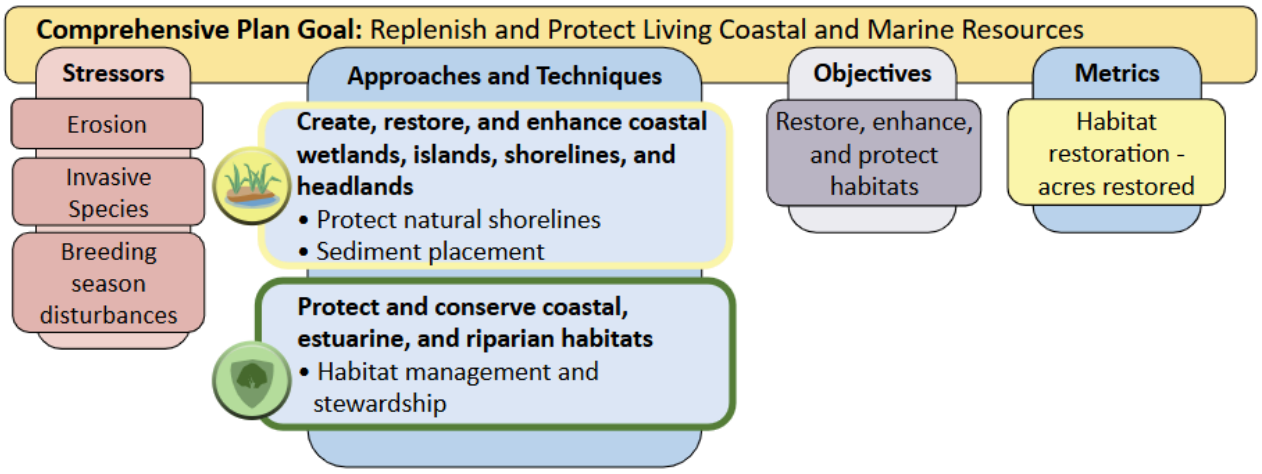


Figure 11: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The Council is allocating $2 million in funding for the Department of the Interior (DOI) to implement the *Colonial Waterbird Rookery Island Restoration* project which will support restoration actions to slow and reverse declines in waterbirds on islands in coastal Texas. Actions could include restoration through sediment placement, erosion protection, vegetation manipulation, invasive species control, and/or disturbance abatement. DOI will work with Texas Parks and Wildlife Department, Texas General Land Office and other partners to implement the projects in support of waterbird rookery island restoration actions. The project supports the Council's Comprehensive Plan goal of replenishing and protecting living coastal and marine resources.

This project leverages NOAA RESTORE Science Program funding for the development of a tool to prioritize rookery island restoration based on bird biology, nesting productivity and food resources, named "Colony Island Network Design and Implementation" (CINDI). This tool is designed to help managers prioritize a network of colony islands where rehabilitation and management are cost effective and the potential for enhancing waterbird populations is high. Funding from this project will be used to implement actions using the CINDI tool as a guide. The project's duration is 5 years.

This DOI-led project will support the *Protecting and Restoring Waterbird Rookery Habitat* program to be implemented by the State of Texas by leveraging a science-based prioritization tool to guide restoration efforts to high-impact sites. Together, these two projects create a coordinated, data-driven approach to improve habitats, boost nesting success and sustain healthy waterbird populations across Texas.

A.6 Wind-Tidal Flat Restoration Pilot, Phase 2 (Amending Existing Project)

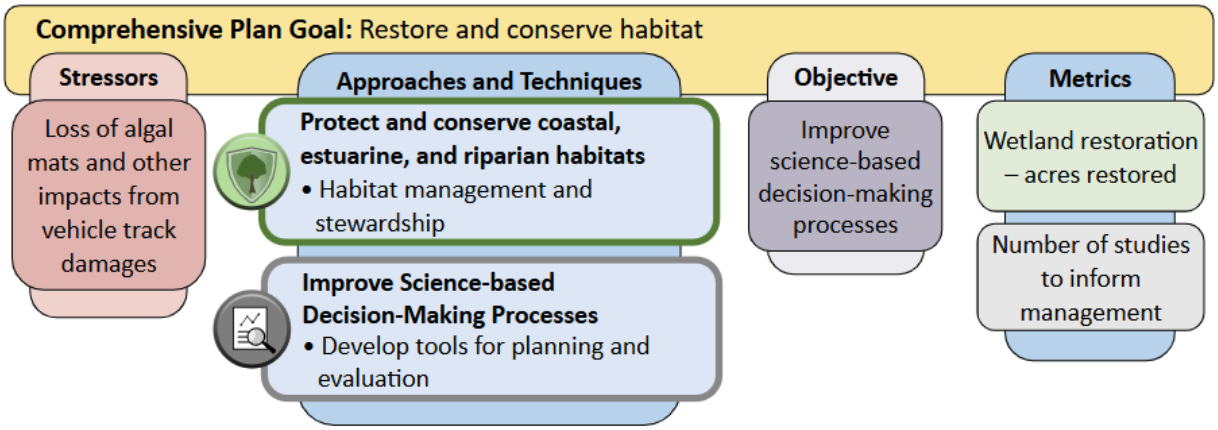


Figure 12: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The *Wind-Tidal Flat Restoration Pilot* project led by the U.S. Department of the Interior, National Park Service was approved by the RESTORE Council in the FPL 3b in 2021. In the 2026 FPL, the Council has approved an additional $1.2 million to build on this pilot, which focuses on restoring wind-tidal flat habitats at Padre Island National Seashore.

In this expanded effort, the DOI will build upon the pilot to map and assess the overall distribution and conditions of wind tidal flat habitats at Padre Island National Seashore and conduct on-the-ground restoration targeting areas that have sustained damage over time. A cost-benefit analysis will be conducted to estimate costs of using the selected restoration approach over a large scale.

The wind-tidal flat areas at Padre Island National Seashore are significant in that they protect portions of the largest freshwater wetland in Texas, conserve protected species and provide wintering habitat for millions of migratory birds. These important habitats have been impaired over time. This project aims to both scale up and redefine the methods tested in the pilot by using drones with advanced multispectral imaging technology to improve the accuracy of wind-tidal flat mapping and by applying field-tested “best practices” for restoration identified in the pilot.

A document of lessons-learned will be created to share with resource managers across the Gulf and to inform future management decisions regarding conservation and restoration of wind-tidal flat habitats. The project supports the RESTORE Council’s goal of restoring and conserving habitat. The project’s duration is 3 years.

Additional information about the projects and programs within the coastal Texas geographic area can be found in Appendix A (Texas sponsored) or Appendix H (DOI sponsored).

B. Pontchartrain Basin in Louisiana

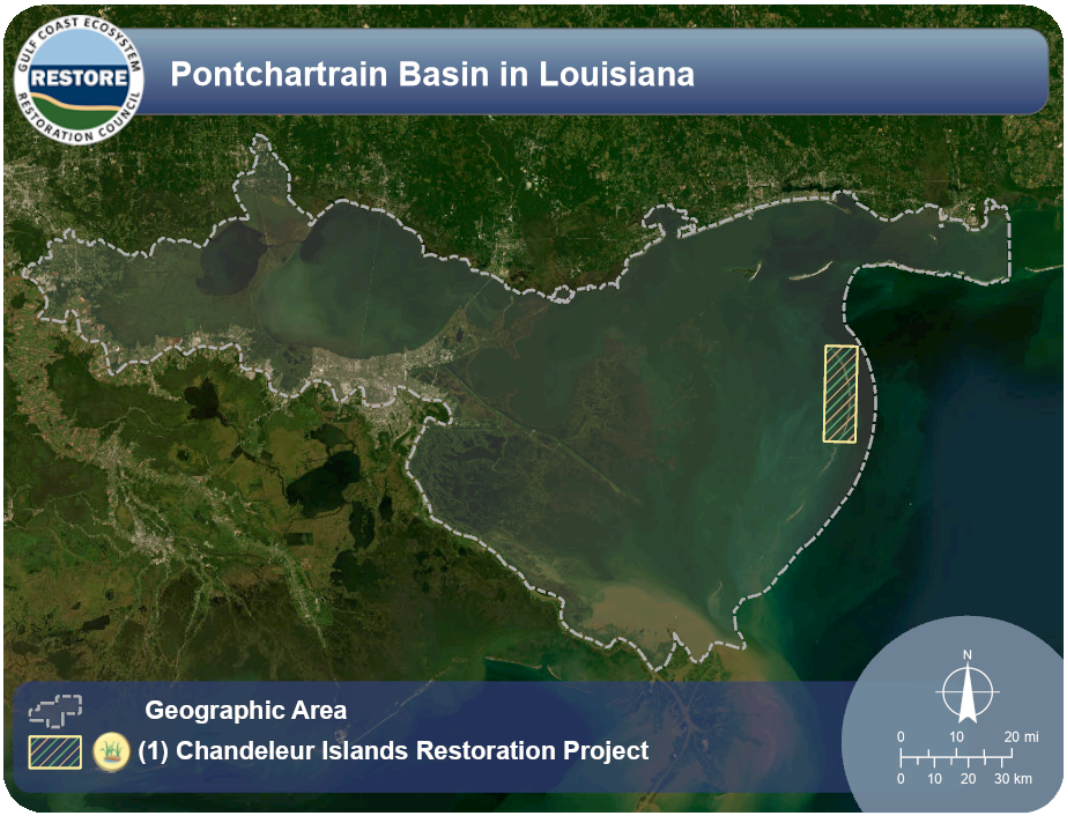


Figure 13: Pontchartrain Basin activity in the 2026 FPL

B.1 Chandeleur Islands Restoration Project (New Project)

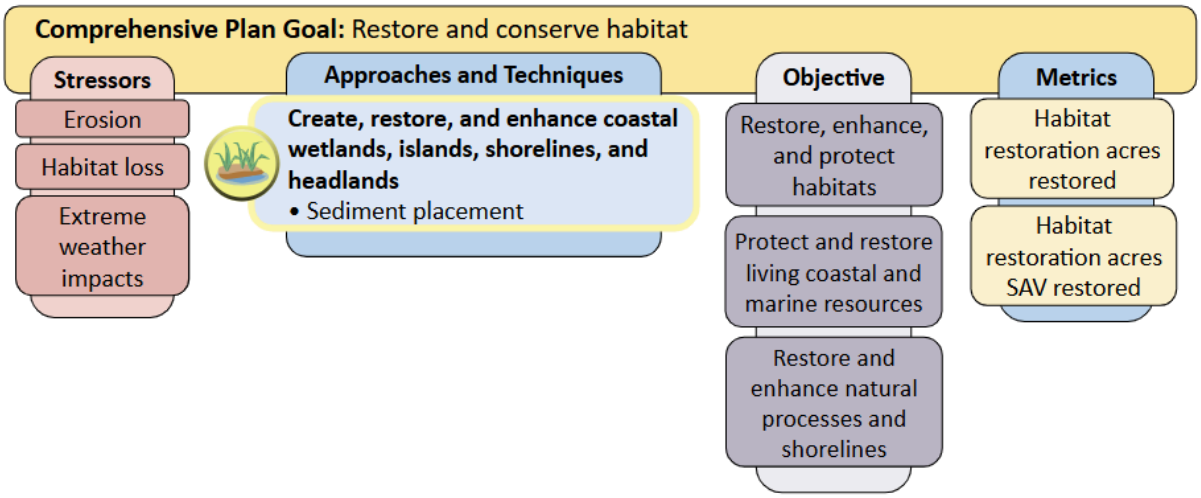


Figure 14: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The Council has allocated $84.9 million in funding for the *Chandeleur Islands Restoration* project sponsored by the State of Louisiana. In addition, the RESTORE Council is reallocating $5,872,250 in savings from previously approved projects to further support this activity. This is an entire ecosystem restoration project that will restore wildlife and fish habitats for several species in addition to preserving and enhancing 5,200 acres of the island's marine seagrass meadows. The project is located on a remote barrier island complex in southeast Louisiana, more than 20 miles offshore and managed as part of Breton National Wildlife Refuge. This project includes restoration activities on both North Chandeleur and New Harbor Islands in St. Bernard Parish. The restoration strategy is designed to reverse decades of erosional wetland loss and provide direct benefits to a wide range of wildlife and fish species that were impacted by the 2010 *Deepwater Horizon* oil spill. This includes sea turtles such as Loggerhead, Green and the endangered Kemp's Ridley. Several bird species will benefit, including colonial nesting waterbirds and foraging birds. A wide variety of fish species including reef fish, sharks and game fish will benefit. Additionally, eighty species designated as "Species of Greatest Conservation Need" will benefit from this project.

Restoration of the Chandeleur Islands will rebuild an important barrier island that serves as a first line of defense for many communities in St. Bernard Parish. The island is rapidly eroding, and its restoration is featured in St. Bernard's 2022 Coastal Strategy document to mitigate against storm surges from tropical storms and hurricanes. This project is being implemented by the Louisiana Coastal Protection and Restoration Authority and the United States Fish and Wildlife Service. This project supports the Council's primary goal of restoring and conserving habitats. The project's duration is 3 years.

Additional information about the project in the Louisiana (Pontchartrain Basin) geographic area can be found in Appendix B.

C. Mississippi Sound in Mississippi and Alabama

Figure 15: Mississippi Sound activities in the 2026 FPL

C.1 Restoration of Grand Batture Island (New Project)

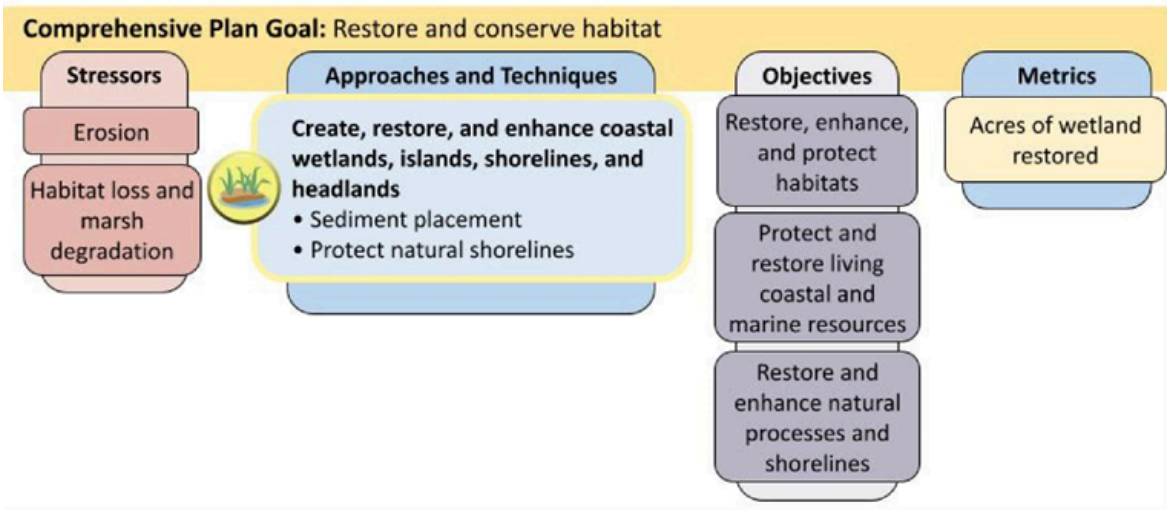
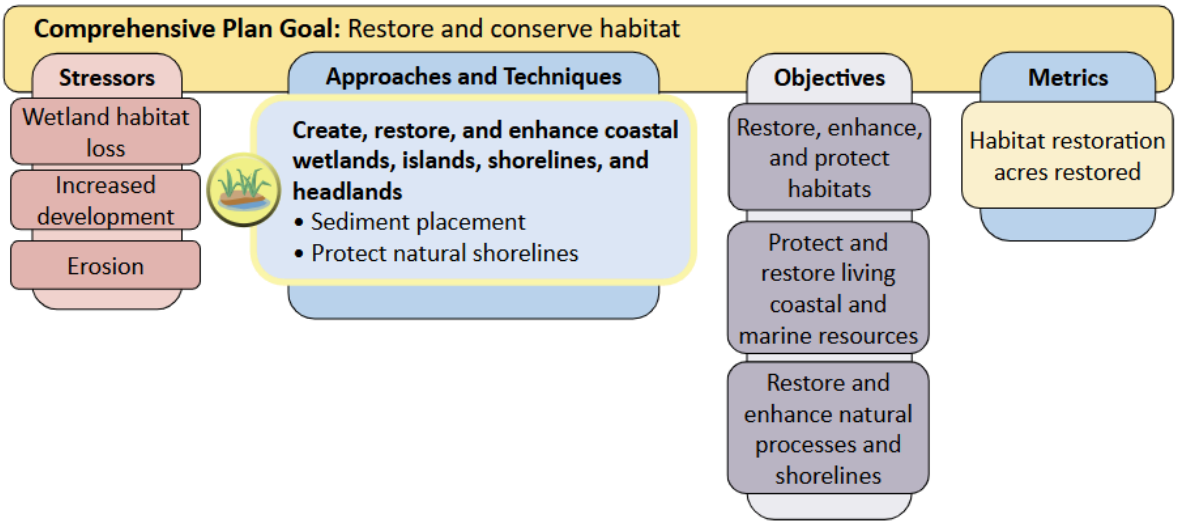


Figure 16: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The Council has allocated $55 million in funding for the cross-border *Restoration of the Grand Batture Island* project, sponsored by the States of Mississippi and Alabama. In addition, the RESTORE Council is reallocating $1,950,000 in savings from a previously approved project to further support this activity. This project will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region by creating, restoring and enhancing coastal habitats through the restoration of Grand Batture Island in Jackson County, Mississippi and Mobile County, Alabama.

The remnants of Grand Batture Island are characterized by natural sandy beaches, dunes and back barrier marsh. In the past, the island played a crucial role by protecting extensive intertidal marshes and supporting thriving oyster and submerged aquatic vegetation beds within Point aux Chenes Bay, Middle Bay and Grand Bay. Restoration actions will reduce erosion rates, protect essential coastal marsh and create crucial habitat for many species including shorebirds and the diamondback terrapin. This project supports the Council's primary goal of restoring and conserving habitats. The project duration is 10 years.

C.2 Coastal Nearshore Habitat Restoration and Development Program (Amending Existing Program)



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The Council has allocated an additional $25 million in funding for the *Coastal Nearshore Habitat Restoration and Development* program sponsored by the State of Mississippi. The Program builds-on work funded by the Initial FPL, FPL 3b and projects supported by the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund.

Coastal nearshore habitats provide many important ecosystem services including acting as natural buffers to protect shorelines from erosion, storm surge protection, fisheries production and water quality benefits through sediment and nutrient reduction. The creation of new coastal nearshore habitats and the restoration of these habitats will continue to support and increase these ecosystem services to coastal systems in Mississippi. This project supports the Council's primary goal of restoring and conserving habitats. The program's duration is 10 years.

Additional information about the project and program in Mississippi can be found in Appendix C.

D. Mobile Bay and Tensaw Delta, Perdido Bay & River in Alabama

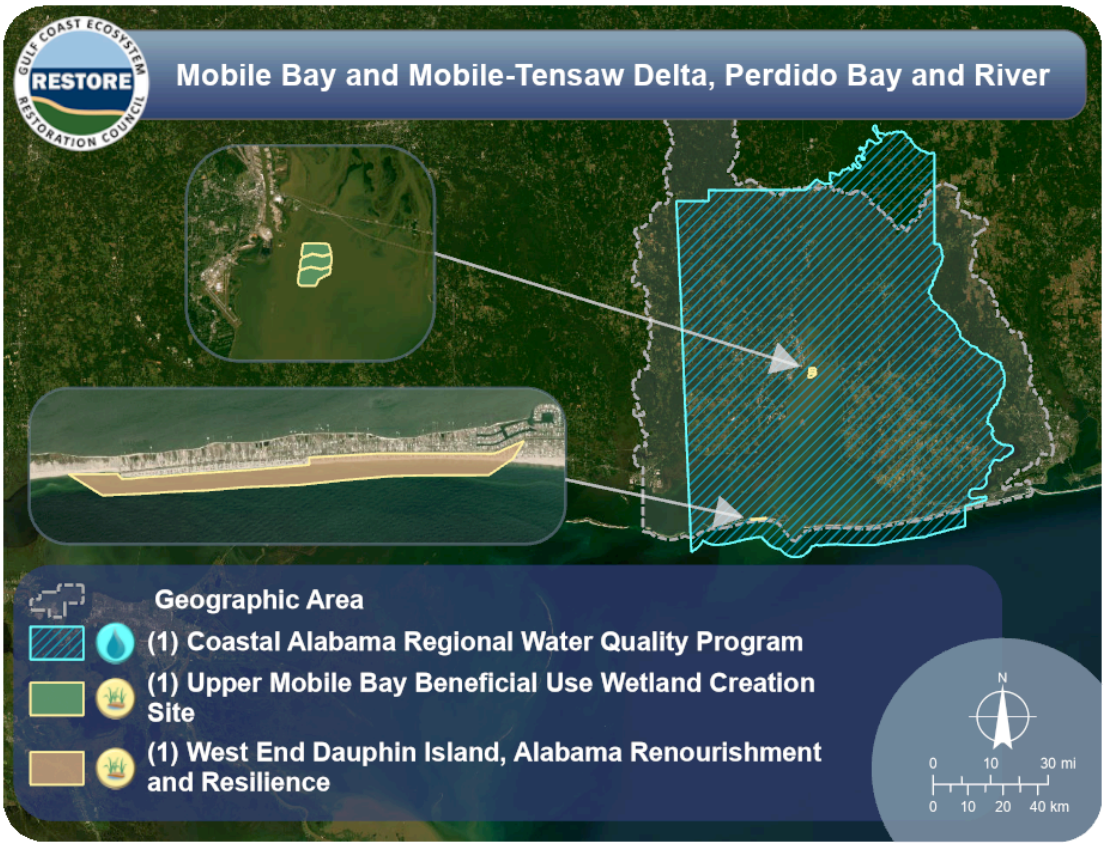


Figure 18: Coastal Alabama activities in the 2026 FPL

D.1 Coastal Alabama Regional Water Quality Program (Amending Existing Program)

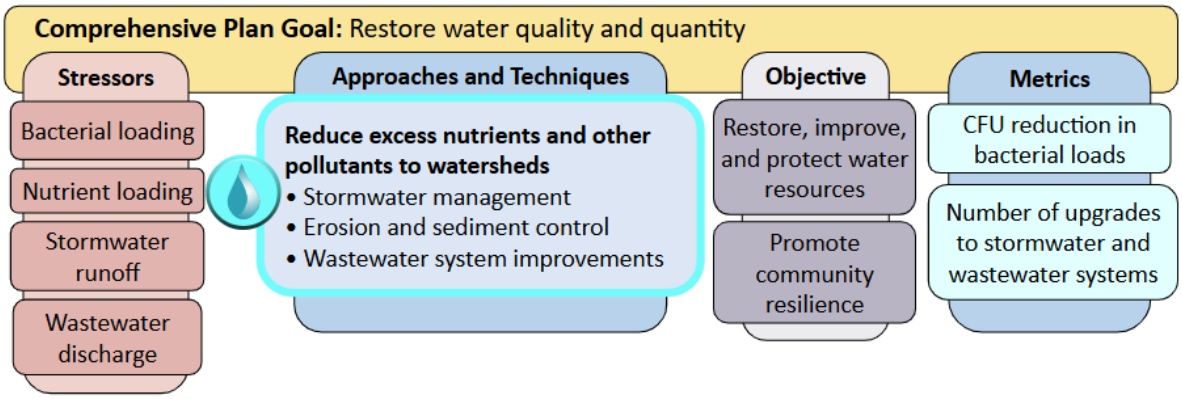


Figure 19: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The *Coastal Alabama Regional Water Quality* program was approved by the Council in FPL 3b in 2021. The Council has allocated an additional $8 million in funding to continue the *Coastal Alabama Regional Water Quality* program sponsored by the State of Alabama. In addition, the RESTORE Council is reallocating $1,500,000 in unspent funds from a previously approved program to further this activity. The program will support the primary Comprehensive Plan goal of restoring water quality and quantity. The program includes planning-related work as well as implementation activities which could include construction of or upgrades to stormwater and wastewater management systems, low impact development, green infrastructure activities and septic to sewer conversions. Alabama works in partnership with local entities implementing water quality improvement projects as stakeholders continue to prioritize water quality improvement as a basis for restoring the environment and economy of coastal Alabama. The program's duration is 10 years.

D.2 Upper Mobile Bay Beneficial Use Wetland Creation Site (Amending Existing Project)

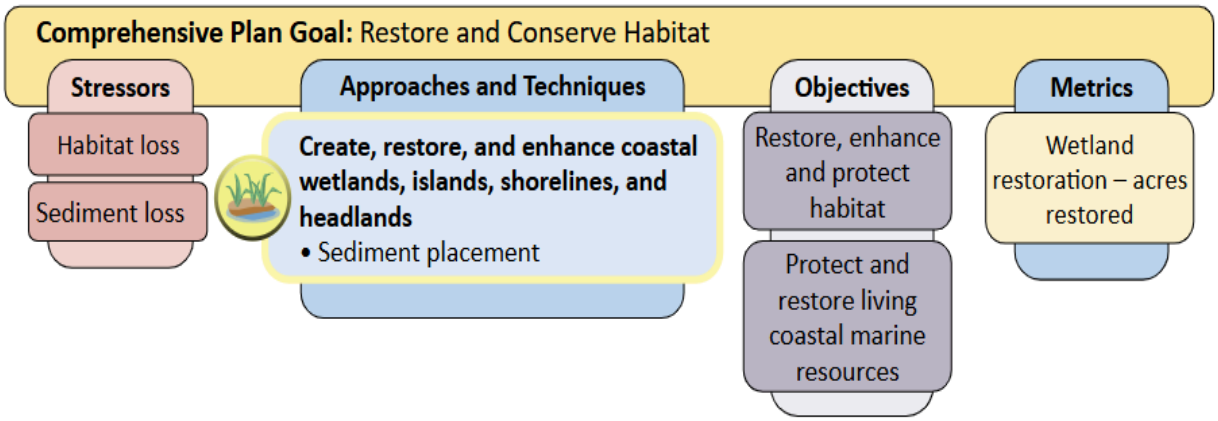


Figure 20: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The *Upper Mobile Bay Beneficial Use Wetland Creation Site* project was approved by the Council in the Initial FPL in 2015. This project funded design and environmental compliance of a wetland restoration project in upper Mobile Bay. In the 2026 FPL, the Council has approved an additional $24 million in funding to construct a 100-acre wetland restoration cell in Upper Mobile Bay as the first phase of 1,200 acres of tidal wetlands.

The project, sponsored by the State of Alabama, will enhance utilization of navigation channel maintenance sediment and contribute to maximizing use of dredge material for effective and sustainable coastal restoration. The project will support the primary Comprehensive Plan goal to restore and conserve habitat by restoring the estuarine marsh through the construction of a semi-submerged containment area and placement of dredge material. Additional benefits include providing habitat for living coastal and marine resources, enhancing community resilience by providing a buffer to a main thoroughfare between Mobile and Baldwin Counties, and enhancing the economy of the region by providing cost effective disposal options for the many navigation-related industries located along the Mobile River. The project's duration is 3 years.

D.3 West End Dauphin Island, Alabama Renourishment and Resilience (New Project)

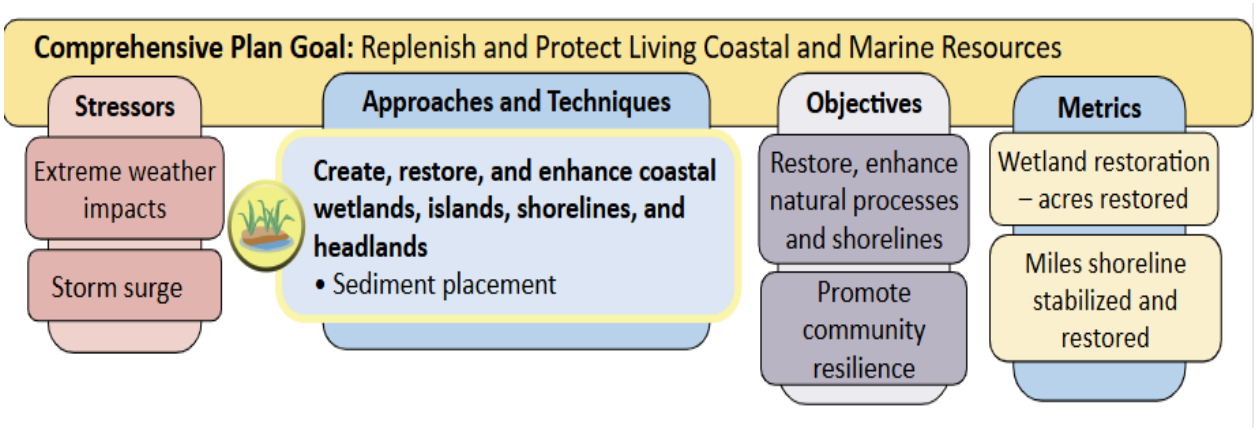


Figure 21: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The Council has approved $38 million in funding for the *West End Dauphin Island, Alabama Renourishment and Resilience* project sponsored by the State of Alabama to restore approximately 200 acres of critical barrier island habitat. This includes rebuilding 3.5 miles of linear dune, 40 acres of sandy water bottoms and 160 acres of beach and dune habitat. Restoring this area will help protect valuable estuarine habitats in the Mississippi Sound such as seagrasses, oyster beds and salt marshes. It will also protect 30,000 acres of mainland conservation land and nearby coastal communities that are vulnerable to storms and flooding. This project supports the primary Comprehensive Plan goal of replenishing and protecting living coastal and marine resources. This habitat restoration project will also provide for the enhancement of community resilience. The project's duration is 5 years.

Additional information about the projects and programs in Alabama can be found in Appendix D.

E. Coastal Florida

Figure 22: Coastal Florida activities in the 2026 FPL

E.1 Florida Gulf Coast Resilience Program (Amending Existing Program)

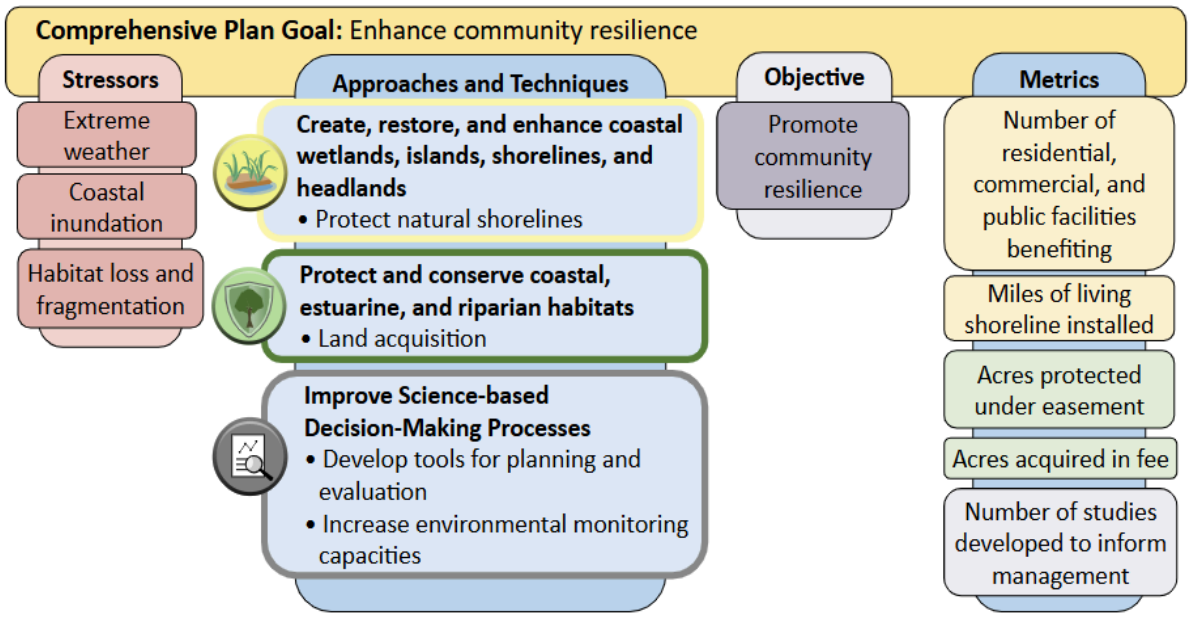


Figure 23: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

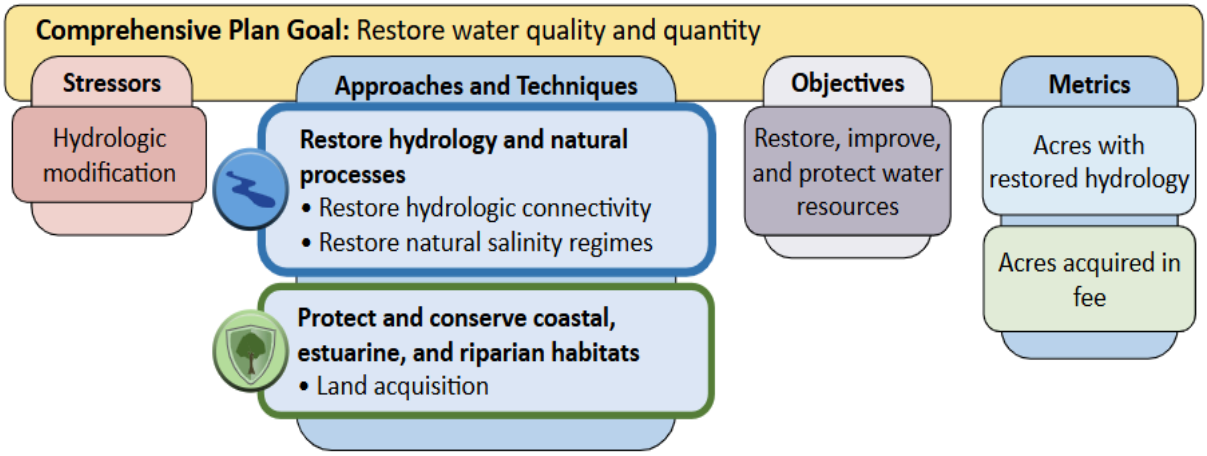
The *Florida Gulf Coast Resilience* program (FGCRP) was approved by the RESTORE Council in FPL 3b in 2021. In the 2026 FPL, the Council has allocated an additional $20 million in funding to continue this program. The FGCRP, sponsored by the State of Florida, supports the primary RESTORE Comprehensive Plan goal of enhancing community resilience through activities that implement sustainable solutions to improve coastal resilience.

Program activities include:

- planning and implementation of adaptation and mitigation strategies to address the impacts of flooding;
- living shorelines to protect against erosion and reduce wave energy; and
- land management and land acquisition activities to protect submerged lands and coastal ecosystems that enhance resilience.

Developing strategies to address resilience is critical to Florida's ability to adapt to a changing coastline. FGCRP results include resilience improvements such as reducing repetitive loss of critical habitats and infrastructure, protecting against wave energy, erosion and storm surge, enhancing habitat protection (e.g., marshes, mangroves, seagrass, coral, and oyster reef restoration), enhancing sustainable healthy wildlife populations and fisheries, enhancing water quality benefits and improving recreation and tourism opportunities. The program's duration is 7 years.

E.2 Florida Gulf Coast Tributaries Hydrologic Restoration Program (Amending Existing Program)



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The *Florida Gulf Coast Tributaries Hydrologic Restoration* program (THRP) was approved by the Council for funding in FPL 3b in 2021. In the 2026 FPL, the Council has allocated $12.6 million in additional funding for the THRP. This program, sponsored by the State of Florida, supports the primary RESTORE Comprehensive Plan goal of restoring water quality and quantity throughout the Florida Gulf Coast by underwriting a comprehensive suite of linked, high-priority hydrologic improvement projects. Examples include canal plugging, restoring natural dimensions of tidal passes/inlets, restoring/reconnecting wetlands and installing erosion control or water control structures. Planning and implementation projects proposed in Florida watersheds that drain to the Gulf of America will be considered under this program.

The THRP improves flow regime dynamics, nutrient cycling, salinity gradients, wildlife habitat and biodiversity and recreational experiences, and may help reduce algal blooms and fish kills. The program framework allows for administration of project funding that targets projects that provide cumulative benefits to the Gulf and link environmental benefits between selected projects and other restoration projects in a watershed or region. The program's duration is 7 years.

E.3 Florida Water Quality Improvement Program (Amending Existing Program)

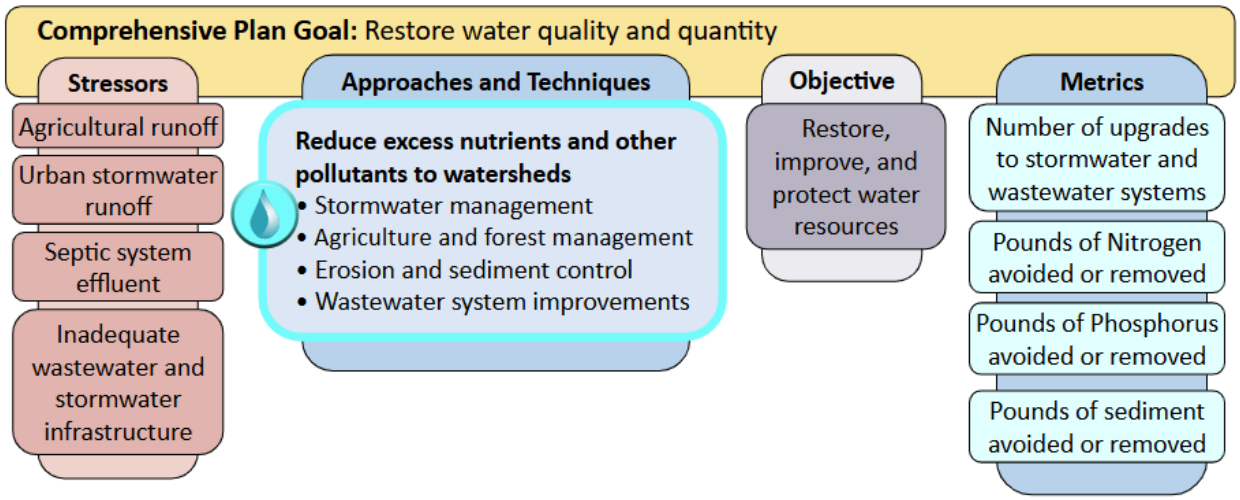

Figure 25: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The *Florida Water Quality Improvement* program (WQIP) was approved by the Council in FPL 3b. The Council has allocated $45 million in additional funding to continue this program. The WQIP, sponsored by the State of Florida, supports the primary RESTORE Comprehensive Plan goal of restoring water quality and quantity throughout the Florida Gulf Coast by underwriting a suite of linked, high-priority water quality improvement projects. Projects may include stormwater treatment, wastewater treatment enhancements, sediment reduction and land acquisition. Planning and implementation projects will be located in Florida watersheds that drain to the Gulf of America.

Program activities are intended to result in water quality restoration with anticipated environmental benefits that include fewer algal blooms, fish kills, beach closures, fish and shellfish consumption restrictions, as well as healthier seagrass and other submerged aquatic vegetation and wildlife habitat and improved recreational opportunities/experiences. The WQIP framework allows for administration of project funding to target projects that deliver cumulative benefits to the Gulf of America and link environmental benefits between WQIP projects and other restoration projects in a watershed or region. The program's duration is 7 years.

E.4 Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County (New Project)

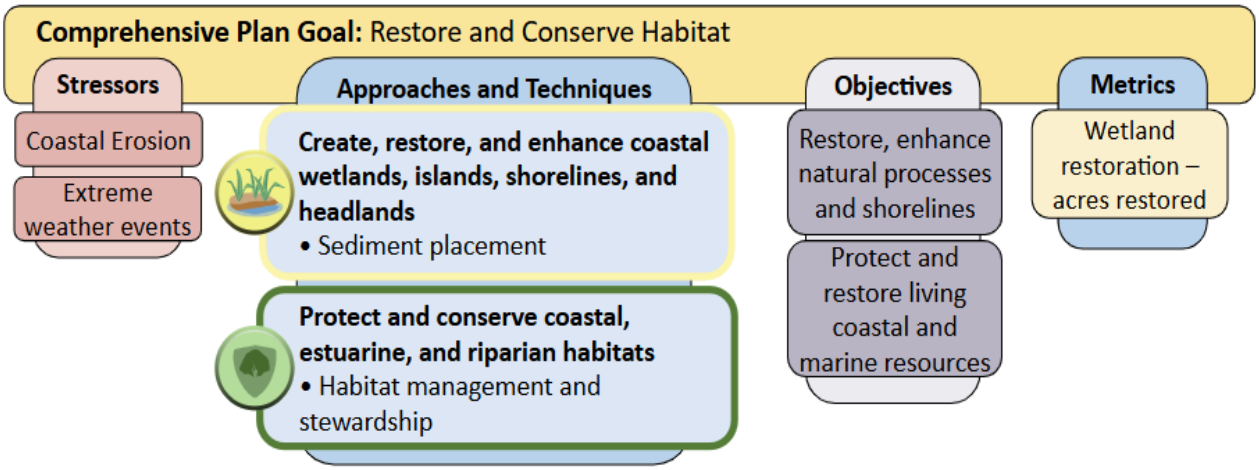

Figure 26: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The Council has approved $900 thousand in funding for the *Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County* project sponsored by the U.S. Department of the Interior. This project will cover planning and compliance work needed to extend local beach restoration efforts into the Gulf Islands National Seashore (GUIS). Extending these beach nourishment efforts onto federal land will enhance infrastructure protection and combat coastal erosion.

While this project does not include funding for sediment placement, it will prepare the way for future beach nourishment and immediately support dune stabilization by planting vegetation. This project includes two years of planning and three years of planting and monitoring. Plants grown from existing species in the GUIS will help stabilize dunes, protect infrastructure, reduce erosion and improve storm resilience. It will also help maintain wildlife corridors for species like beach mice and expand nesting habitat for shorebirds and sea turtles, whose breeding areas have been reduced by coastal development. Enhancing barrier island resilience through this effort will not only improve habitat but also support local communities by protecting critical evacuation routes and promoting tourism in the area, particularly following recent hurricane impacts. The primary goal of this project is to restore and conserve habitat. The project duration is 5 years.

Additional information about the programs in Florida can be found in Appendix E (Florida sponsored) or Appendix H (DOI sponsored).

F. Gulfwide

Figure 27: Gulf-wide activities in the 2026 FPL

F.1 Trash Free Waters Program Benefiting Communities in the Gulf Coast (New Program)

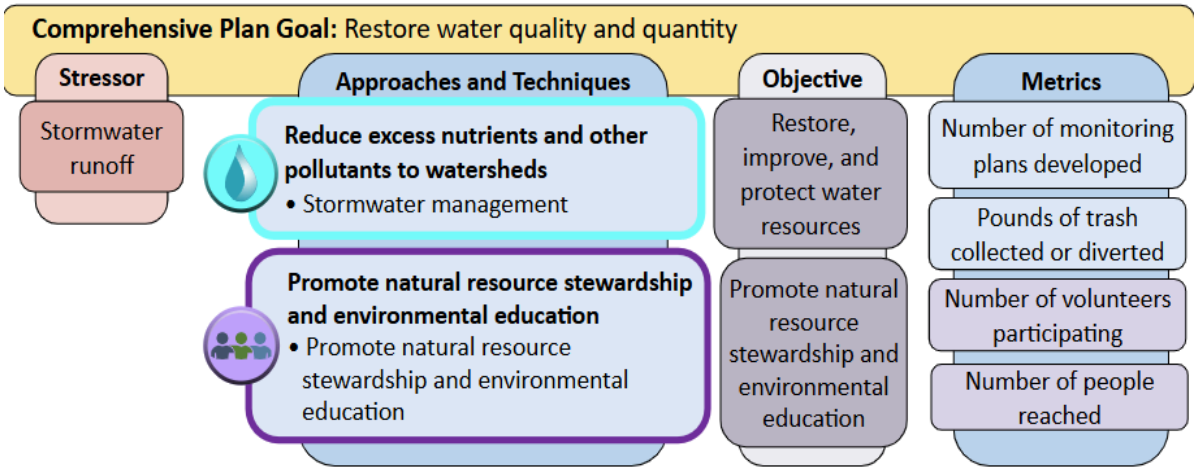

Figure 28: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The Council has allocated $9 million for a *Trash Free Waters (TFW)* program sponsored by the U.S. Environmental Protection Agency that will benefit coastal communities across the five Gulf Coast states. In addition, the RESTORE Council is reallocating $283,610 in savings from a previously approved program to further support this activity. Working together with all five Gulf state partners, EPA will develop competitive funding opportunities to prevent, remove and/or recycle/upcycle trash from waters that drain to the Gulf Coast. Eligible projects will include prevention activities (sustainable replacement products, waste lifecycle, environmental stewardship), removal activities (in-situ trash capture devices, cleanup events, incentivized disposal) and/or circularity and life cycle activities or planning in order to provide positive outcomes at larger scale (generation to disposal). This program supports the Council's Comprehensive Plan goal of restoring water quality and quantity.

EPA will award grants in each Gulf state with estimated project periods of up to 3 years. Estimated benefits are reducing pollutants such as trash from water bodies that flow to the Gulf of America, thereby improving water quality and positively impacting ecosystems and local economies. TFW projects have proven records of diverting or recycling tens of thousands of pounds of trash, preventing future litter by education and outreach, and educating future stewards of the environment. The program duration is 7 years.

Additional information about the program for EPA can be found in Appendix F.

F.2 Gulf Coast Conservation Reserve Program (Amending Existing Program)

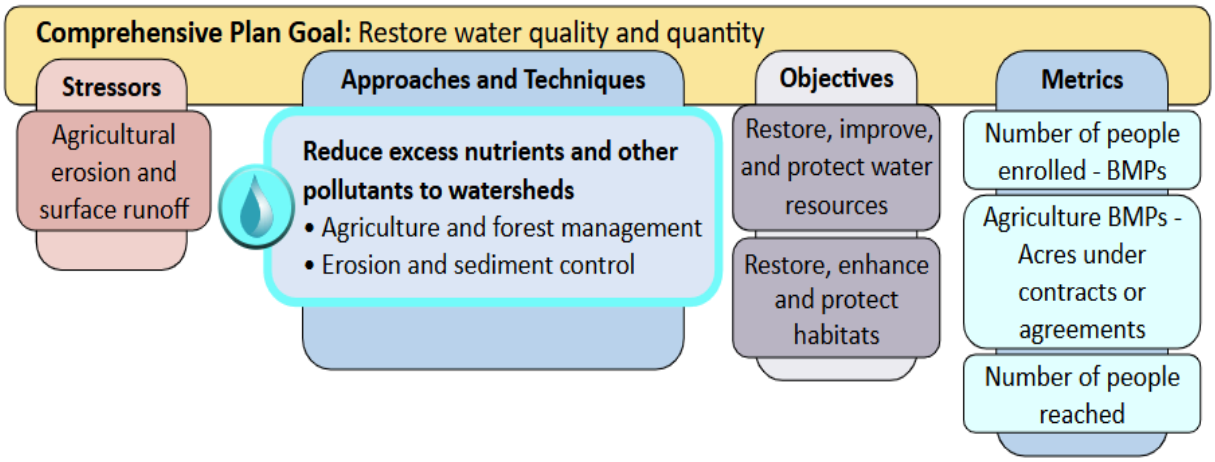

Figure 29: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The U.S. Department of Agriculture-sponsored *Gulf Coast Conservation Reserve* program (GCCRP) was established through the Council's 2015 Initial FPL and continued in FPL3b for the purpose of protecting and restoring critical wildlife habitat and improving water quality through the development of conservation and restoration plans. This amendment will add $3 million in funding for additional activities in Texas and Alabama.

The GCCRP activities will allow for conservation planning on private lands including but not limited to ecosystem restoration by conducting soil and water conservation for the benefit of water quality to priority bays and estuaries. This program will serve to assist willing private landowners with implementing conservation measures that improve water and wildlife habitat conditions. This program will build upon the restoration and conservation progress made through the previous FPL funding and will support the primary Comprehensive Plan goal to restore water quality and quantity. The program's duration is 4 years.

Additional information about the program for USDA can be found in Appendix G.

F.3 Tribal Youth Conservation Corps (Amending Existing Program)

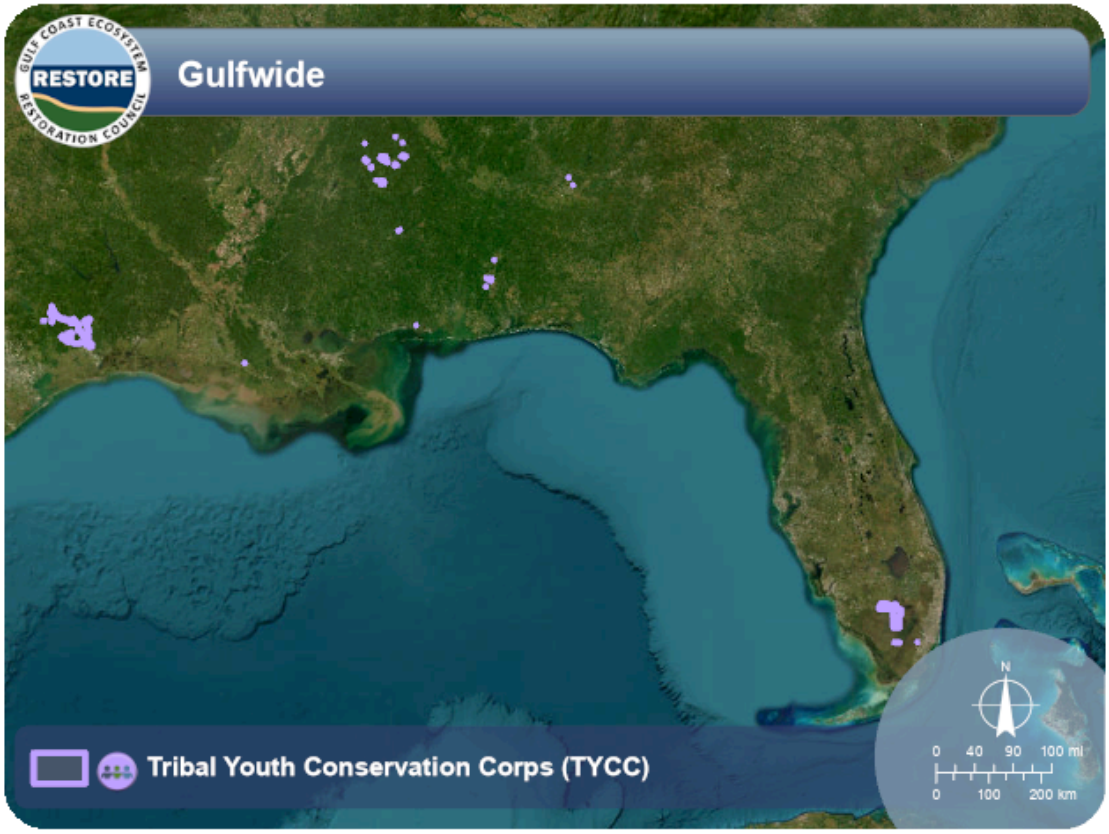

Figure 30: Tribal Youth Conservation Corps Program in the 2026 FPL

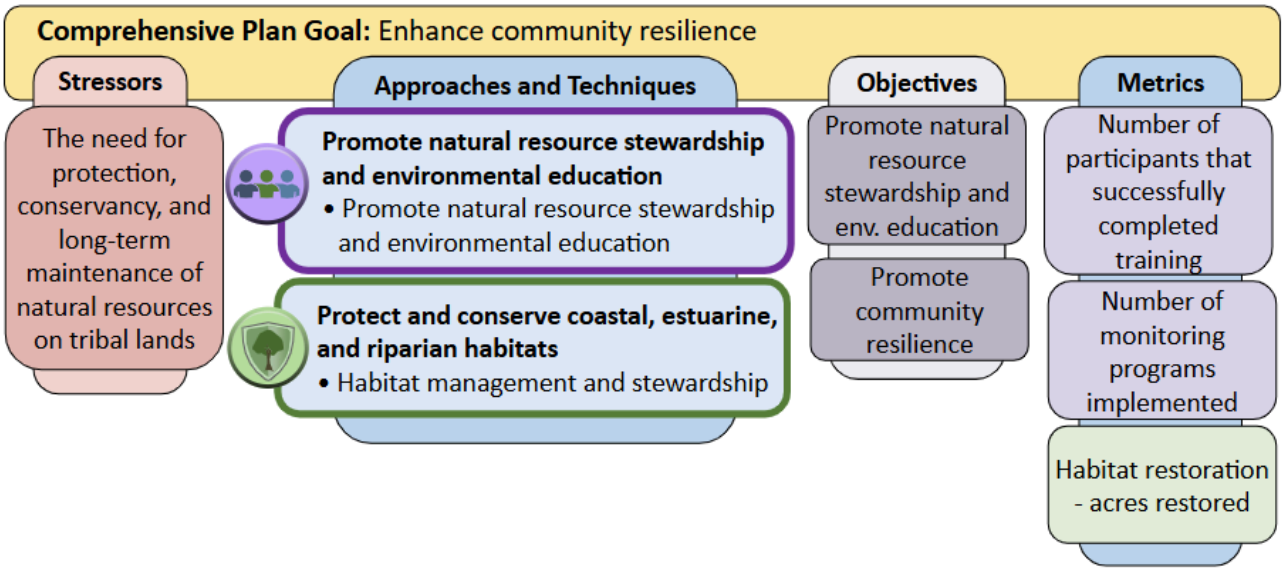

Figure 31: This figure shows the Comprehensive Plan goal of this activity (top row), how the Planning Framework approaches and techniques employed by this activity (second column) will address stressors (first column) to support Comprehensive Plan objectives (third column), and the corresponding metrics that may be used to track program or implemented project success (fourth column). As this program is implemented, metrics may be added, removed, or replaced, as appropriate, as specific projects under the program are identified.

The Tribal Youth Conservation Corps (TYCC) is an ongoing program funded by the Council in both the Initial FPL in 2015 and FPL 3b in 2021. This program is active in six federally recognized Tribes: the Seminole, Miccosukee, Poarch Band of Creek Indians, Mississippi Band of Choctaw, Chitimacha and Alabama-Coushatta. Each Tribe has developed and conducted restoration and educational activities in a manner that best benefits their Tribal community's unique needs. This amendment will add $1,449,000 in funding for this program.

The goal of TYCC is to educate and train Tribal youth through direct participation in restoration projects that reflect each Tribe's unique cultural and environmental priorities. These projects have already helped restore up to 2,000 acres, addressing coastal erosion, invasive species removal, habitat restoration, and cultural preservation. The program helps Tribes to restore the Gulf while providing meaningful job opportunities for youth, creating powerful connections to nature and helping prepare the next generation of environmental stewards. This program supports the primary Comprehensive Plan goal of enhancing community resilience. The program's duration is 3 years.

Additional information about the program for the Tribal Youth Program can be found in Appendix H.

V. Change to the 2022 Comprehensive Plan

In addition to identifying projects and programs for funding, this 2026 FPL includes an update to the Comprehensive Plan. The Council approved the *2022 Comprehensive Plan Update: Restoring the Gulf Coast's Ecosystem and Economy*, providing the public with updates to the strategic guidance the Council established to effectively administer its roles and responsibilities. In addition, it provided a summary of Council progress on its goals, objectives, and commitments, and the effectiveness of the Council's use of general planning funds to meet those commitments.

A key part of the update is the Council's continued focus on delivering results and measuring impacts. In this update the Council is clarifying that only projects or programs that collect environmental data must include an Observational Data Plan (ODP). The ODP contains information on how monitoring data will be collected, managed, and made publicly available. Environmental data is defined as information collected directly from measurements of physical, chemical, biological, geological, and geophysical properties and conditions; or produced from models. This update reaffirms the Council's commitment to demonstrate the benefits of the Council investments and measuring the overall success of restoration.

VI. Public Comment Process for 2026 FPL

The draft 2026 FPL was made available for a 43-day public review and comment period. During the public comment period, the Council provided an overview of the proposed 2026 FPL via 5 live public webinars and 3 in-person meetings. Notice of these meetings was posted on the Council's website and distributed via the Council's email distribution list. Recordings of these meetings were posted to the Council's website to allow access for those members of the public unable to attend the live events. The public was able to provide feedback during the public comment period, both verbally and in writing during the public meetings, by email, and via the online Planning, Environment and Public Comment (PEPC) site.

The Council reviewed all comments received before the deadline, developed a written response to comments, and considered those comments as it proceeded to finalize the 2026 FPL. The Council decided to proceed to a vote to approve the 2026 FPL and notified the public in advance of this vote. All associated information including fact sheets and original proposal packages is also available on the Council's website.

The Council appreciates those stakeholders who are not only interested in Gulf restoration but also participated in the Council's restoration activities by offering comments during the public comment period. If you are interested in receiving notifications of upcoming webinars, public meetings, or public comment periods, please subscribe to receive the Council's automatic email updates at https://www.restorethegulf.gov/. Locate the "Stay in Touch" box and click "Subscribe" to select the "Public Meetings and Public Comment Periods" category, in addition to other categories of interest to you.

Appendices

Appendix A: State of Texas Proposal Package

Appendix B: State of Louisiana Proposal Package

Appendix C: State of Mississippi Proposal Package

Appendix D: State of Alabama Proposal Package

Appendix E: State of Florida Proposal Package

Appendix F: The Environmental Protection Agency Proposal Package

Appendix G: The United States Department of Agriculture Proposal Package

Appendix H: The Department of the Interior Proposal Package

Appendix A: Coastal Texas Proposal Packets

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Managing Wetlands Migration Corridors and Natural Floodways Program

RESTORE Council Proposal Document

General Information

Title:
Managing Wetlands Migration Corridors and Natural Floodways Program

Project Abstract:
The Managing Wetlands Migration Corridors and Natural Floodways Program seeks to address estuarine wetland loss by preserving corridors for wetland migration and restoring wetlands that will have a path to migrate as sea level rises. Coastal wetlands are vital for supporting wildlife, recreational activities, commercial fisheries, flood control, and water quality. This program supports the RESTORE Council's primary goal of habitat restoration and conservation, with secondary benefits including improved water quality, quantity, and community resilience. In Texas, coastal habitats and communities are increasingly vulnerable to storm surge damage, especially when combined with heavy precipitation. Periodic and long-term inundation of estuarine habitats can profoundly alter the hydrology of these systems, undermining their resilience and ability to support diverse wildlife and ecosystem functions. With a proposed budget of $46.8M, the program will fund project activities such as land acquisition, habitat management, hydrologic restoration, agricultural and forest management, stormwater management, erosion control, sediment placement and shoreline protection. It will also fund planning, implementation, and monitoring to measure success. Priority will be given to projects that are well-vetted and scalable to achieve significant long-term benefits such as habitat protection, wildlife habitat enhancement, flood storage, and water quality improvement.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: N/A

Co-sponsoring Agency(ies):
TX

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.
(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

Priority Criteria Justification:
This is a large-scale program that aims to conserve the future quantity, quality, and diversity of Texas wetlands under changing environmental conditions. Projects will provide long-term benefits to wetland functions and values, such as flood storage, wildlife habitat, and water quality improvement. In Texas, nearly $96.8 M has been invested to improve our understanding of how coastal wetlands function and to restore and protect them (DWH project tracker). Additional work is needed, however, to continue addressing the status and future trends of these critical environments.

Coastal wetlands, which include estuarine marsh, freshwater marsh, and tidal flats, are a valuable resource and are the focus of place-based, regional, state, and Gulf-wide plans. The needs for wetland conservation and restoration occur in a variety of physical and ecological settings in coastal Texas. This program aims to support a variety of wetland projects that demonstrate the greatest need and effectiveness for bolstering present day and future wetlands. Wetland initiatives in Texas can be found in the following documents:

- The Texas Coastal Resiliency Master Plan (Texas General Land Office, 2023)
  Deepwater Horizon Oil Spill Natural Resource Damage Assessment Texas Trustee Implementation Group Draft Restoration Plan/Environmental Assessment #2: Restoration of Wetlands, Coastal, and Nearshore Habitats; Nutrient Reduction; Oysters; Sea Turtles; and Birds (Texas Trustee Implementation Group 2022) .
- Texas Coastal Management Program: Section 309 Assessment and Strategies Report 2021-2025 (Texas General Land Office 2020)
- Carancahua Bay and Cedar Bayou Watershed protection plans
- Arroyo Colorado Habitat Restoration Plan (Flores et al. 2017)
- Two Gulf Coast Join Ventures Conservation Plans (little blue heron & mottled duck) (GCJV 2024).
- Laguna Atascosa National Wildlife Refuge Comprehensive Restoration Plan (USFWS, 2010)
- Proposal for Expanding Conservation for Aransas National Wildlife Refuge (USFWS 2022)
- Texas Coastal Prairie Initiative (Coastal Prairie Conservancy 2025)

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Goals:
Restore Water Quality and Quantity
Enhance Community Resilience

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Protect natural shorelines
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement
Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship
Protect and conserve coastal, estuarine, and riparian habitats: Land acquisition
Reduce excess nutrients and other pollutants to watersheds: Agriculture and forest management
Reduce excess nutrients and other pollutants to watersheds: Erosion and sediment control
Reduce excess nutrients and other pollutants to watersheds: Stormwater management
Restore hydrology and natural processes: Restore hydrologic connectivity

Location

Location:
The location of this program activity is within the Texas Coastal Zone, in areas with high potential for coastal wetland protection (Figure 1). This includes coastal and estuarine areas within Texas' RESTORE eligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris, Jackson, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Orange, Refugio, San Patricio, Victoria, and Willacy (Figure 1).

HUC8 Watershed(s):
Texas-Gulf Region(Neches) - Neches(Lower Neches)

Texas-Gulf Region(Neches) - Neches(Pine Island Bayou)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(West Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Spring)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(East Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Buffalo-San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(North Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(West Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Austin-Oyster)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Lower Brazos)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Lower Colorado(Lower Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(San Bernard)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Navidad)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(Lower Guadalupe)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Lower San Antonio)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Mission)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Lower Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Palo Blanco)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Laguna Madre)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Sabine Lake)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Lavaca)
Texas-Gulf Region(Sabine) - Sabine(Lower Sabine)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(San Fernando)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Baffin

Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central Laguna Madre)

State(s):
Texas

County/Parish(es):
TX - Aransas
TX - Brazoria
TX - Calhoun
TX - Cameron
TX - Chambers
TX - Galveston
TX - Harris
TX - Jackson
TX - Jefferson
TX - Kenedy
TX - Kleberg
TX - Matagorda
TX - Nueces
TX - Orange
TX - Refugio
TX - San Patricio
TX - Victoria
TX - Willacy

Congressional District(s):
TX - 18
TX - 22
TX - 27
TX - 14
TX - 36
TX - 34
TX - 7
TX - 9
TX - 8
TX - 38

Narratives

Introduction and Overview:
The Managing Wetlands Migration Corridors and Natural Floodways Program aims to address

estuarine wetland loss by preserving corridors for wetland migration and restoring wetlands that will have a path to migrate as sea level rises. The program primarily supports the RESTORE Council's goal of restoring and conserving habitat, and secondary benefits of this program address the Council's goals of restoring water quality and enhancing community resilience. The program will be managed by the Texas Commission on Environmental Quality and will provide funds to support projects that meet program priorities. The program's priority framework focuses on the following: creating, restoring, and enhancing coastal wetlands, islands, shorelines, and headlands; protecting and conserving coastal, estuarine, and riparian habitats; restoring hydrology and natural processes; and reducing excess nutrients and other pollutants from entering coastal waters. Techniques that will be considered for this program include the following: land acquisition; habitat management and stewardship; restoring hydrologic connectivity; restoring natural salinity regimes; agricultural and forest management; stormwater management; and erosion and sediment control.

Around the Gulf, climate-related disasters can have lasting ecological, social, and economic effects (Cahoon 2006; Geaghan 2011; Hamel et al. 2018). In Texas, coastal habitats and communities are increasingly vulnerable to storm surge damage, especially when combined with heavy precipitation (Maymandi, Hummel, and Zhang, 2022; Valle-Levinson, Olabarrieta, and Heilman, 2020). Periodic and long-term inundation of estuarine habitats can profoundly alter the hydrology of these systems. Historical sea level rise trends along Texas bays, as documented by NOAA's Tides and Currents website, vary by location. In Cameron County, Port Isabel exhibits a rate of 4.32 mm/year, while Port Mansfield records 3.69 mm/year. The central coast, represented by Rockport, experiences a higher rate of 5.66 mm/year, and the upper coast at Eagle Point shows the most pronounced trend at 12.93 mm/year (NOAA Center for Operational Oceanographic Products and Services, 2025). This shift in water levels is altering the dynamics of wetland habitats, affecting their hydrology, which is critical for maintaining the ecological functions of these environments (Passeri et al., 2016). The anticipated changes will challenge the ability of wetlands to sustain their current biodiversity, flood control capacity, and water quality improvement functions (Tomscha et al., 2019; Mitsch, Bernal, and Hernandez 2015; de Groot, Brander, and Max Finlayson, 2018).

Coastal wetlands are crucial habitats that support diverse wildlife, recreational activities, and commercial fisheries, while also providing flood control and improving water quality. Although emergent estuarine wetlands constitute less than 5% of total wetlands in the U.S. (Dahl, T.E., 2000), they are experiencing some of the most significant declines in areal extent compared to other wetland types (Dahl, 2000; Stedman and Dahl, 2008). The primary causes of estuarine emergent wetland loss include land conversion, erosion, and environmental changes, with the majority of losses attributed to conversion to open water (Dahl and Stedman, 2013).

In Texas, coastal areas contain approximately 435.4 sq. mi. of estuarine emergent wetlands and 857.97 sq. mi. of palustrine emergent wetlands. A total of 58.27 sq. mi. of coastal wetlands were lost between 1996 and 2010 (Texas General Land Office, 2020). A landscape change analysis performed for the Texas Coastal Resiliency Master Plan (TCRMP) utilized the SLAMM wetland model to project the future of wetlands in coastal Texas (AECOM, 2023). The output is shown in the map and graphs in Figure 2. The map illustrates wetland change caused by an intermediate sea level rise scenario and highlights current salt and brackish wetlands, as well as future conditions

(assuming wetland migration corridors are preserved). Additionally, the map identifies key areas for land conservation that will support future estuarine wetland habitats (Texas General Land Office, 2023). Some of these zones of potential wetland conservation intersect with current coastal prairies. Coastal prairies are open expanses of coastal uplands with continuous grassy vegetation located immediately inland of coastal marshes along the Gulf of Mexico shoreline. Historically, the land surrounding the bays and estuaries of the Texas coast was predominantly coastal prairie, characterized by relatively flat terrain. Coastal prairies once covered over 6.5 million acres (2.63 million hectares) of Texas land, but they now occupy only 65,000 acres (26,300 hectares), less than one percent of the original extent. Protecting coastal prairies not only conserves current habitats but also ensures that estuarine habitats can migrate and adapt in the future (Texas General Land Office, 2020). Another assessment by the Bureau of Economic Geology found that shoreline movement in Texas bays is predominantly erosional, with long-term average retreat rates ranging from -0.49 m/yr in San Antonio Bay to -1.05 m/yr in the Galveston Bay system (Paine, Caudle, and Andrews, 2016; Caudle and Paine, 2024). Shoreline types such as deltaic marshes, back-barrier marshes, and tidal flats are particularly vulnerable to sea level rise and wave action, contributing to significant land-loss rates across the region.

To support the Texas Restore FLP 4 planning process, a content analysis of 119 planning and restoration documents, including those from local, state, and federal entities as well as NGOs, was performed by the Harte Research Institute. These documents included various area management plans, state environmental program plans, conservation plans for different species, and restoration project documents either funded or in need of funding. This analysis identified altered, degraded, or lost habitat as a primary issue of concern. Further, wetlands, in particular saline or estuarine wetlands, were identified as habitats of high concern. This information, in addition to other habitat trend information, was used to create an initial list of potential programs for Texas. On July 2023, the programs were presented for discussion to two Texas working groups, comprising government agencies and NGOs, that advise the Texas RESTORE process. Following the presentation, a survey was administered to the working group. The survey responses for the wetland programs acknowledged wetlands as a high priority due to their importance for wildlife and commercial fisheries. It was recommended that the program include active wetland restoration and the protection of future wetland migration areas, as acquisition alone may not sufficiently counter threats such as ditching, draining, and filling. The inclusion of upland coastal prairie and forested habitats was advised as they can improve water quality through natural vegetation communities. Additionally, leveraging opportunities with NRDA, the Army Corps of Engineers, and other agencies for wetland restoration, including the beneficial use of dredge material, was suggested. Further suggestions included wind tidal flats restoration and support for Natural and Nature Based Features for filtering and conveying floodwaters.

This program is designed to conserve and protect current and future wetland habitat under changing environmental conditions The program targets fresh and saltwater wetlands including tidal flats, coastal prairie habitat, and adjacent buffer areas that may serve as wetland migration corridors. Considerations will be extended to wetlands that support the natural conveyance, storage and filtering of flood water, with the potential to protect or enhance water quality. An additional benefit of this program will be to reduce flood risk in neighboring communities and increase the use

of green infrastructure to improve resilience and ecological benefits. The program will utilize funds to support projects that meet the program goals with techniques such as land acquisition, habitat management and stewardship, restoring hydrologic connection, agriculture and forest management, stormwater management, erosion and sediment control, sediment placement, and protection of natural shorelines.

Example projects for consideration are outlined in current planning documents such as the Texas Coastal Resiliency Master Plan (TCRMP) (Texas General Land Office 2022). The TCRMP proposes an estimated $1.87 billion in 121 proposed Tier 1 coastal resiliency projects, spanning 10 priority statewide actions. These projects reflect careful consideration of the complex characteristics of the Texas coastal zone by the Texas General Land Office (TGLO) and the Plan's Technical Advisory Committee (TAC), which includes coastal planners, community leaders, scientists, engineers, and other stakeholders. The potential project budgets for wetlands vary from $250K to $60M (Table 1). Further, previous DWH funding for Texas (DWH Project Tracker) has supported projects in Mad Island, Dollar Bay, Bahia Grande, Swan Lake, JD Murphee WMA, Matagorda Bay, Nueces Delta, Brazoria NWR, and Galveston Island (among a few others). This program will consider the outcomes of those prior projects and the potential to fund additional phases where applicable. Considerations will be taken to leverage ongoing work and opportunities to make the most impact on coastal wetland restoration. Table 1 is a list of TCRMP Tier 1 projects that potentially meet this program's goals. While these examples provide evidence of funding needs in Texas, funding for this program will be open to proposals and is not limited to those listed. Fundable projects must demonstrate rigorous planning, feasibility, and support by the public and conservation community, as well as the applicant's experience and demonstrated ability to conduct and manage these types of projects.

Proposed Methods :

This program will implement a project selection process that evaluates the need for the project, its potential to benefit wetland habitat, the feasibility of the design and location, and the applicant's (and team's) demonstrated ability to implement and successfully construct the project. In addition, project applicants will be required to submit project success metrics, example of which are presented in this program section titled "Metrics and Measures of Success".

This program aims to preserve current and future estuarine habitat, by developing a framework to prioritize the selection of projects that support the program's goals. It is encouraged that projects utilize available analysis and initiatives to support the need for their project. A variety of resources are available to support the planning of wetland conservation and restoration projects, highlighting the need to address vulnerable areas and prioritize action. Tools like the "Shoreline Change Map" (Bureau of Economic Geology, 2024) and the NOAA Sea Level Rise Viewer (NOAA Office for Coastal Management, 2024) provide valuable data on shoreline movement, flood risks, wetland migration, and areas susceptible to inundation. The NERRS Landscape-Scale Study of Marsh Resilience (Stevens et al., 2023) offers GIS-based analyses of marsh vulnerability and adaptive capacity at the watershed scale, while the Coastal Resilience Master Plan (TGLO, 2023) models wetland changes, flood hazards, and potential wetland loss to guide strategic conservation efforts.

Implementation methods are described below.

Land acquisition involves purchasing land from willing sellers or obtaining conservation easements from landowners to secure the long-term preservation of natural habitats. Purchased lands are permanently owned by a government agency, conservation organization, or land trust, while conservation easements allow the owner to retain property ownership with voluntary restrictions for conservation (RESTORE Council 2023). Both approaches help preserve native biodiversity and ecosystem functions. Land acquisition projects must show alignment with the program goals. Once an area has been targeted for acquisition the following general steps will be required: (1) Complete due diligence including appraisal, environmental assessment, survey, and title search to ensure that the purchase costs are consistent with market values, that the property is not contaminated, property boundaries are known, and that the tracts' titles are free and clear of objectionable encumbrances; (2) Secure the land or easement with a purchase contract; and (3) Convey the property for long-term management. It may also be necessary to engage specialists such as surveyors and environmental engineers to address any complexities during the transaction (Land Trust Alliance 2024).

Habitat management and stewardship can be carried out on public lands, newly acquired properties, or private lands through voluntary agreements. These efforts involve collaborating with landowners, including agricultural and forest producers, to enhance and preserve the ecological value of their land. Stewardship focuses on the responsible use and protection of natural resources through sustainable practices (RESTORE Council, 2023). Examples of habitat management and stewardship activities that apply to this program include controlling invasive species, planting native vegetation, managing forests and coastal prairies, conserving riparian buffers, removing debris, restoring hydrology, controlling erosion, and developing habitat management plans.

Restoration of wetland functions may require restoring hydrologic connection. Restoring natural hydrology involves re-establishing or mimicking disrupted hydrologic connections, often obstructed by infrastructure like roads and levees that block essential surface flows. Solutions include installing or enlarging culverts and gates to restore flow, degrading spoil banks to allow water movement, and addressing disruptions caused by logging roads and drainage ditches (RESTORE Council, 2023).

Projects may incorporate sediment placement and natural shoreline protection where appropriate. Sediment placement aids in wetland restoration by depositing sediment into shallow water habitats to elevate them to levels that support native vegetation or re-establish the natural shoreline. This approach may utilize the beneficial use of dredged material. The beneficial use of dredged material involves repurposing sediment that would otherwise be disposed of and placing it in a manner that benefits society and the natural environment, such as for habitat restoration and development (US EPA 2007). Project planning activities may involve an assessment of the feasibility of using dredged material, obtaining the appropriate permits, and creating construction designs. Project implementation would involve coordination and construction of the designed project. Shoreline protection techniques reduce wave energy and currents, promoting sediment deposition, and providing shelter for wetland plants and shoreline habitats. Examples of shoreline protection include the construction of offshore or nearshore breakwaters, reefs, or living shorelines to reduce erosion.

Lastly, this program would support activity that enhances secondary benefits of a wetland protection and conservation project leading to the reduction of excess nutrients and other pollutants in the watershed. These include agriculture and forest management, stormwater management, and erosion and sediment control. Riparian and wetland vegetation buffers, along with farmland-to-wetland conversion, can reduce excess nutrients, sediment, and pollutants in runoff, improving water quality and ecosystem health. Forest management activities, such as reforestation and invasive species removal, further enhance water storage, filtration, and habitat for native species while reducing flood risks. Stormwater management approaches address domestic and municipal stormwater. This program will focus on techniques that incorporate stormwater wetlands to protect water quality and enhance community resilience. Lastly, erosion and sediment control protect water quality by limiting the transport and deposition of sediments that transport pollutants such as pesticides, nutrients, metals, and other contaminants. This program will consider the use of vegetation buffers for water quality improvement.

Monitoring and metrics of success will be tailored to the project being implemented. Metrics will be selected on a project-by-project basis to ensure they align with the unique objectives and desired outcomes of each initiative, providing a customized framework for evaluating success. Potential metrics considered are listed below and feature metrics related to habitat restoration, land acquisition, shoreline protection, water quality and community resilience.

Environmental Benefits:

The program will fund projects with the highest potential for long-term benefits to wetland functions and values, such as flood storage, wildlife habitat, water quality improvements, support fisheries, and carbon sequestration (Barbier et al. 2011; Engle 2011; Yoskowitz et al. 2017). The program has the potential for significant environmental benefits by protecting, conserving, and restoring diverse coastal wetland habitats, including estuarine wetlands and adjacent upland areas. These habitats are essential for supporting numerous species, including shorebirds, waterfowl, waterbirds, finfish, shrimp, blue crabs, and sea turtles. Additionally, maintaining these complex ecosystems is crucial for ensuring their resilience and longevity in the face of rising sea levels, thereby safeguarding biodiversity and the overall health of coastal environments. Lastly, wetlands and other natural coastal features play a crucial role in protecting communities from flooding and coastal storms and can be important for enhancing community resilience (Arkema et al., 2013; Spalding et al., 2014; Sutton-Grier et al., 2015).

Metrics:

Metric Title: HR013 : Wetland restoration - Acres restored

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: as the number of acres restored, cubic volume or mass of sediment deposited, and the number of vegetation plugs.

Metric Title: RES003 : Community Resilience - # of residential, commercial, and public facilities benefiting

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: residential, commercial, and public facilities benefiting from the project once the community resilience project is implemented. These are considered additional benefits of habitat restoration and conservation.

Metric Title: HR009 : Restoring hydrology - Acres with restored hydrology

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: number of acres with restored hydrology. This can include wetlands and upland buffer/transition habitats.

Metric Title: HM001 : Nutrient reduction - Lbs. N avoided or removed

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: nitrogen removed from the system (in lbs) or prevented from entering the system (in lbs/year). These are considered additional benefits of habitat restoration and conservation.

Metric Title: HM003 : Nutrient reduction - Lbs. P avoided or removed

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: Enter the total amount of phosphorus removed from the system (in lbs) or prevented from entering the system (in lbs/year). These are considered additional benefits of habitat restoration and conservation.

Metric Title: HM004 : Sediment reduction - Lbs. sediment avoided or removed

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: number of acres restored. Habitat included in this metric has been restored to original (or target) habitat and ecosystem function.

Metric Title: HR010 : Riparian restoration - Acres restored

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: number of acres of riparian habitat restored to improve water quality.

Metric Title: PRM011: Planning - Number of E&D plans developed

Target: 0.99

Narrative: Number of E&D plans developed

Metric Title: HR014 : Habitat restoration - Acres of coastal habitat prevented from eroding

Target: 0.99

Narrative: Land change rate (acres/year) at the conclusion of monitoring, i.e., the ratio of (land to water)/time.

Metric Title: HR002 : Shoreline restoration - Miles of shoreline stabilized and restored

Target: 0.99

Narrative: Miles of shoreline protection installed. This should be selected and reported for coastal habitat shoreline restoration projects that protect against erosion.

Metric Title: HC001 : Conservation easements - Acres protected under easement

Target: 0.99

Narrative: Number of acres protected under long-term easement (permanent or >30- yr). Acres protected under easement should always be brought under improved management.

Metric Title: HC002 : Conservation easements - Miles of shoreline under long-term easement

Target: 0.99

Narrative: Miles under long-term easement (permanent or >30yr). This includes miles of shoreline in coastal streams or open coast (i.e., beaches). Miles protected under easement should always be brought under improved management

Metric Title: HC003 : Land acquisition - Acres acquired in fee

Target: 0.99

Narrative: Number of acres acquired in fee. Acres acquired in fee should always be brought under improved management.

Metric Title: HC004 : Land acquisition - Miles of shoreline acquired

Target: 0.99

Narrative: In miles acquired. This includes miles of shoreline in coastal streams or open coast (i.e., beaches). Miles acquired in fee should always be brought under improved management.

Metric Title: HR004 : Habitat restoration - Acres restored

Target: 0.99

Narrative: Number of acres restored. Habitat included in this metric has been restored to original (or target) habitat and ecosystem function. This metric should be used for habitats that span outside (or occur beyond) habitats captured by other metrics, such as upland forests.

Metric Title: OEB001 : Other Environmental Benefits - # metric tons of greenhouse gas emissions reduced

Target: 0.99

Narrative: Other environmental benefits - Number of metric tons of greenhouse gas emissions reduced

Risk and Uncertainties:

Wetland restoration faces several challenges and risks that could hinder its success. One significant factor is sediment availability, which is critical for the long-term sustainability of coastal wetlands (Liu et al., 2007). Additionally, wetlands are vulnerable to various pressures, including drainage, nutrient enrichment, invasive species, and urban and agricultural encroachment, which have led to significant global wetland losses (Familkhalili et al. 2023). Climatic events, such as

hurricanes, extreme storms, and prolonged droughts, also pose significant risks to restoration activities. These events can lead to increased erosion, sediment displacement, and habitat destruction, directly impacting the construction, effectiveness, and longevity of restoration projects (Zabin et al., 2022). Other environmental changes further complicate restoration efforts by altering hydrological regimes, impacting water availability, and necessitating habitat-specific management strategies to address regionally variable stressors (Erwin, 2009). Particularly, periodic and long-term inundation of estuarine habitats can profoundly alter the hydrology of these systems, (Hayhoe et al., 2018; Sweet et al., 2022) undermining their resilience and ability to support diverse wildlife and ecosystem functions. Historical sea level rise trends along Texas bays vary by location, with rates ranging from 3.69 mm/year in Port Mansfield to 12.93 mm/year at Eagle Point (NOAA CO-OPS, 2025).These trends contribute to potential effects on coastal areas including submergence and erosion, saltwater intrusion, and a decline/change in coastal wetlands (Gornitz, 1991; Nicholls and Cazenave, 2010; Mitchell, Herman, and Hershner, 2020). These challenges emphasize the need for project planning, prioritization, and adaptive management to ensure the effectiveness of wetland restoration in sustaining ecosystem services and supporting biodiversity. Monitoring for each project will be based on project goals and potential for uncertainty depending on location, project activity, and timeline.

For projects involving land acquisition, a primary risk and uncertainty involves finding willing sellers of land that meet program objectives. Land prices are uncertain as well and may cause the program to find other properties if environmental objectives are not achievable with smaller purchases. For projects that use beneficial use of dredge material, potential risks include the availability, source, and timing of materials present is one of the largest uncertainties in implementing the program. Many ports and channels have maintenance dredging permits specifying the amount of material to be dredged to maintain access. However, the implementation and timing of maintenance dredging depends on various factors, such as budget availability. Another potential delay to the implementation of a project can result from the planning, engineering, and permitting process for a beneficial use project often taking between three to six years (Parson and Swafford, 2012).

Monitoring and Adaptive Management:

Given the uncertainties in restoration, the principles of adaptive management are potentially useful in both planning and managing restoration projects to increase the probability of success. Adaptive management is a method to systematically assess and improve the performance of restored systems and contribute to restoration technology (Thom, 2000). In essence, adaptive management involves synthesizing existing knowledge, exploring alternative actions, making explicit predictions of their outcomes, implementing actions, monitoring to determine whether outcomes match those predicted, and using these results to adjust future plans (Murray and Marmorek, 2003).

In implementing adaptive management, this program will use a goal-oriented approach by engaging established working groups in the development of criteria to select priority projects and utilize monitoring to assess needs and performance. Adaptive management is important considering the risks and uncertainties mentioned above, in particular those that may lessen the effectiveness, delay, or prevent project implementation (e.g., storms, drought, permitting issues).

Due to these and other potential challenges, the program allocates 10% of the total budget for contingencies, providing a buffer for adaptive management.

Data Management:

Data management for this program is designed to promote transparency in the project selection process. Information used in decision-making, such as supporting plans, program budgets, and past project performance reports, will also be accessible to guide potential project decisions. Once projects are selected, geotechnical and engineering data, along with construction specifications, will be made available. Furthermore, data related to post-project implementation will be collected and shared publicly. This includes information on project performance, such as potential metrics previously mentioned.

The Texas Commission on Environmental Quality (TCEQ) and the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC) will collaborate with data producers to ensure data is shared after key activities conclude. GRIIDC, a multidisciplinary repository, tracks, curates, and archives diverse datasets, making them publicly discoverable through digital object identifiers and detailed ISO 19115-2 metadata. This publicly accessible repository will facilitate data access for performance monitoring and adaptive management and ensure data interoperability and reuse.

Collaboration:

Two Texas workgroups were established to provide input on coastal priorities: State & Federal Representatives and Non-Governmental Organizations. Moving forward, continued engagement in the FPL 4 process will integrate with ongoing coastal restoration planning processes such as TGLO's Coastal Resiliency Master Plan. The program will leverage state and federal efforts including the DOI wind-tidal flat restoration and USDA Gulf Coast Conservation Reserve (FPL4 proposed). Work will also continue with Texas representatives and working groups during the project selection process, at that time potential leveraging opportunities (co-funding, adjoining or building on other work) will be considered.

Public Engagement, Outreach, and Education:

The engagement process for FPL 4 is ongoing and involves multiple steps to ensure comprehensive input and alignment with restoration priorities. A content analysis of 119 planning and restoration documents, including those from entities participating in our federal/state and NGO working groups, was conducted to identify key concerns, past restoration projects and programs, and current restoration needs. This analysis, combined with other environmental data, guided the development of potential FPL 4 programs. These programs were presented to the working groups in the summer of 2023 and followed by a survey to gather feedback on the level of support and to request suggestions for changes.

The working groups were also given the opportunity to submit additional programs for consideration. After edits and budget adjustments, the proposed programs were opened for public comment in March of 2024. Based on the feedback received and the availability of funding, the programs were then refined, combined, and revised to better meet the needs and priorities identified throughout the process.

Moving forward, the selection process for FPL 4 grant subrecipients will require that projects are vetted through the Texas FPL 4 process or other public process, such as the TGLO's Coastal Resiliency Master Plan, NRDA, or NFWF. Criteria for selecting projects will include but are not limited to, the following factors: alignment with issues outlined in the program activity description, availability of funds for the program, project readiness, leveraging opportunities, scalability, risk/benefit ratio, and distribution of funds across the Texas coast. This comprehensive process, which includes both completed and forthcoming steps during program planning and implementation, will ensure that the final project selections align with the RESTORE Planning Framework document and reflect the input of workgroups, elected officials, the public, and the Office of the Governor.

Leveraging:
N/A

Environmental Compliance:
The planning of this program's activity is covered by the Council's NEPA Categorical Exclusion for planning and related activities (Section 4(d)(3) of the Council's NEPA Procedures). Permitting will be necessary in the implementation of restoration activity that involves placement and modification of sediment within Texas waters and includes USACE permits, permits for Beneficial Use of Dredge Material, Coastal Zone Management Consistency Certification (TGLO), Surface Lease (TGLO), 401 Water Quality (TCEQ), and consultation with appropriate agency as it related to Essential Fish Habitat, Endangered Species Act, Migratory Bird Treaty and Marine Mammal Protection Act. All specific environmental compliance needs will be identified during project identification and development activities.

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Yoskowitz, David, Cristina Carollo, Jennifer Beseres Pollack, Carlota Santos, and Kathleen Welder. “Integrated Ecosystem Services Assessment: Valuation of Changes Due to Sea Level Rise in Galveston Bay, Texas, USA: Changes in Ecosystem Service Values Due to Sea Level Rise.” Integrated Environmental Assessment and Management 13, no. 2 (2017): 431–43. https://doi.org/10.1002/ieam.1798.

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Grosholz, and Katharyn E Boyer. 2022. “Increasing the Resilience of Ecological Restoration to Extreme Climatic Events.” Frontiers in Ecology and the Environment 20 (5): 310–18. https://doi.org/10.1002/fee.2471.

Budget

Project Budget Narrative:
A total budget of $46,800,000 is proposed for FPL 4 activities associated with this program. These funds are intended for planning, implementation and monitoring of activity related to the protection and restoration of waterbird rookery habitat. An estimated 3% will be used for project planning, which includes activities such as project selection and development. An additional estimated 5% will be allocated for monitoring and data management activities which include project activity monitoring and collection of data to support metrics for evaluation of success.

Total FPL Project/Program Budget Request:
$ 46,800,000.00

Estimated Percent Monitoring and Adaptive Management: 5 %

Estimated Percent Planning: 3 %

Estimated Percent Implementation: 82 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: 10 %

Is the Project Scalable?:
Yes

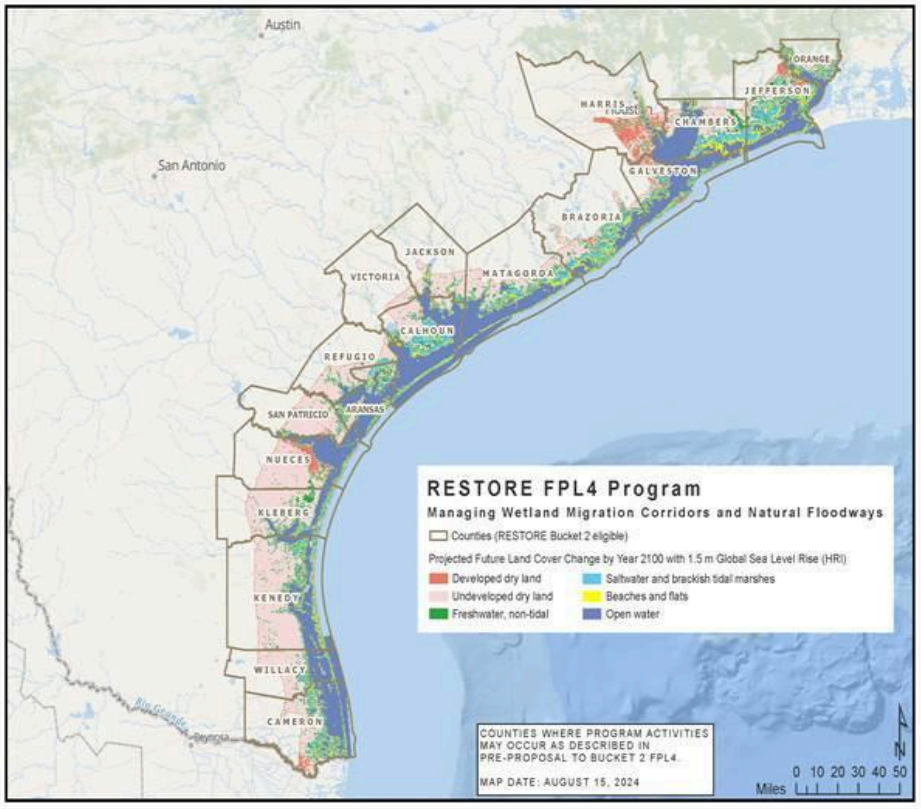
If yes, provide a short description regarding scalability.:
Given the program's budget of $46.8 Million and Texas's estimated need of nearly $300 million (Table 1), this program will prioritize and scale projects to maximize impact. The program will consist of several independent projects, which can be scaled down or reduced in number based on available funding.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	N/A	Note not provided.
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.

Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Managing Wetlands Migration Corridors and Natural Floodways Program

Other Uploads

Main Uploads_0:
Tx-Wetlands-Fig1-TCRMP_Model.docx

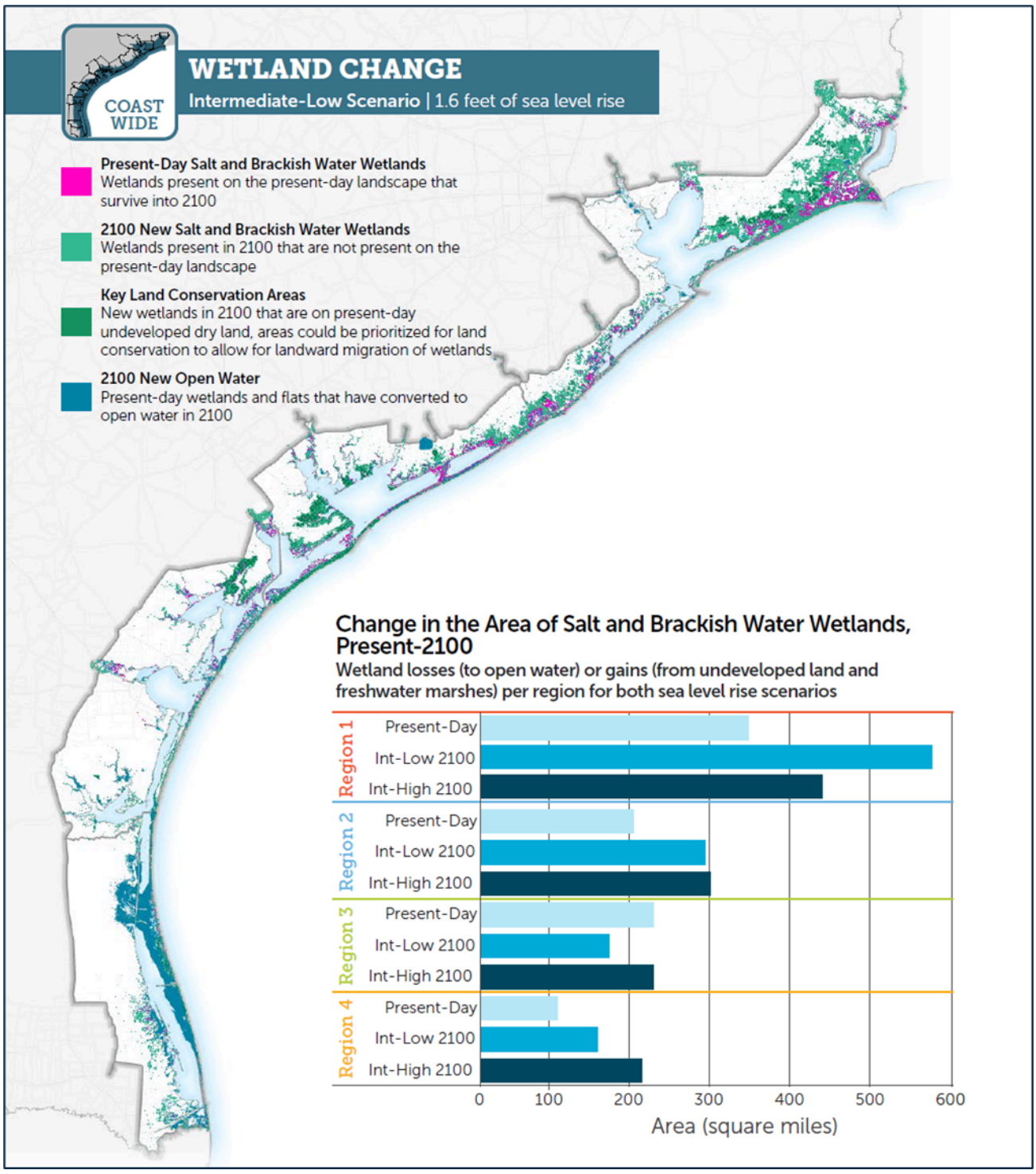


Figure 1. Map and graph for projected estuarine change along the Texas coast. The map highlights the importance of wetland migration corridors and key conservation areas needed to preserve estuarine wetlands in the future. Image credit: Texas General Land Office, Texas Coastal Resilience Master Plan, 2023.

Main Uploads_1:

Tx-Wetlands-Table1.docx

Table 1. Select wetland projects from TCRMP that involve habitat creation, land acquisition & hydrologic connectivity. This table highlights the diverse need for addressing the conservation and restoration of coastal wetlands in Texas.

Project Type and Title	Project ID	Project Estimated Cost
Habitat Creation and Restoration* (excludes rookery and oyster projects)		**$51,000,000**
Anahuac NWR East Unit Beneficial Use	1390	$16,000,000
Bessie Heights Wetland Restoration	9025	$7,700,000
Highland Bayou Shoreline and Marsh Restoration Project	9248	$1,700,000
Lower Neches WMA Lake Street Drive Beneficial Use	1387	$6,000,000
McFaddin NWR Willow Lake Marsh Beneficial Use	1389	$8,600,000
San Bernard NWR Sargent Unit Beneficial Use	1391	$11,000,000
Habitat Creation and Restoration; Land Acquisition		**$56,200,000**
East and West Galveston Bay Watershed, Wetland, and Habitat Conservation	9108	$31,200,000
South Padre Island Coastal Beach Protection	9051	$25,000,000
Habitat Creation and Restoration; Shoreline Stabilization; Land Acquisition		**$9,700,000**
Dollar Bay Wetland Protection, Restoration, and Acquisition	9066	$9,700,000
Habitat Creation and Restoration; Studies, Policies, and Programs; Hydrologic Connectivity		**$24,300,000**
Farming Out Pollutants in Petronila Creek	9209	$20,000,000
Hydrologic Restoration of Welder Flats	1342	$4,300,000

Hydrologic Connectivity		**$6,000,000**
Texas Bayou Water Control Structure	1356	$6,000,000
Hydrologic Connectivity; Studies, Policies, and Programs		**$250,000**
Matagorda Bay Regional Inflow Study	9070	$250,000
Land Acquisition		**$46,600,000**
Coastal Heritage Preserve	240	$24,000,000
Follet's Island Conservation Initiative	9046	$7,600,000
Bastrop Bayou Marsh Acquisition	1262	$10,000,000
Shell Point Ranch Wetlands Protection	9003	$5,000,000
Land Acquisition; Habitat Creation and Restoration		**$92,700,000**
Anahuac NWR Conservation and Restoration	10000	$25,000,000
Columbia Bottomlands Ecosystem Preservation	1284	$4,700,000
Lake Austin Coastal Prairie Conservation	9224	$60,000,000
Middle Armand Bayou Protection Project	9150	$3,000,000
Land Acquisition; Habitat Creation and Restoration; Shoreline Stabilization		**$10,000,000**
Moody NWR Conservation and Restoration	9082	$10,000,000
Grand Total		**$296,750,000**

Main Uploads_2:
Tx-Wetlands-Fig2-Map.docx

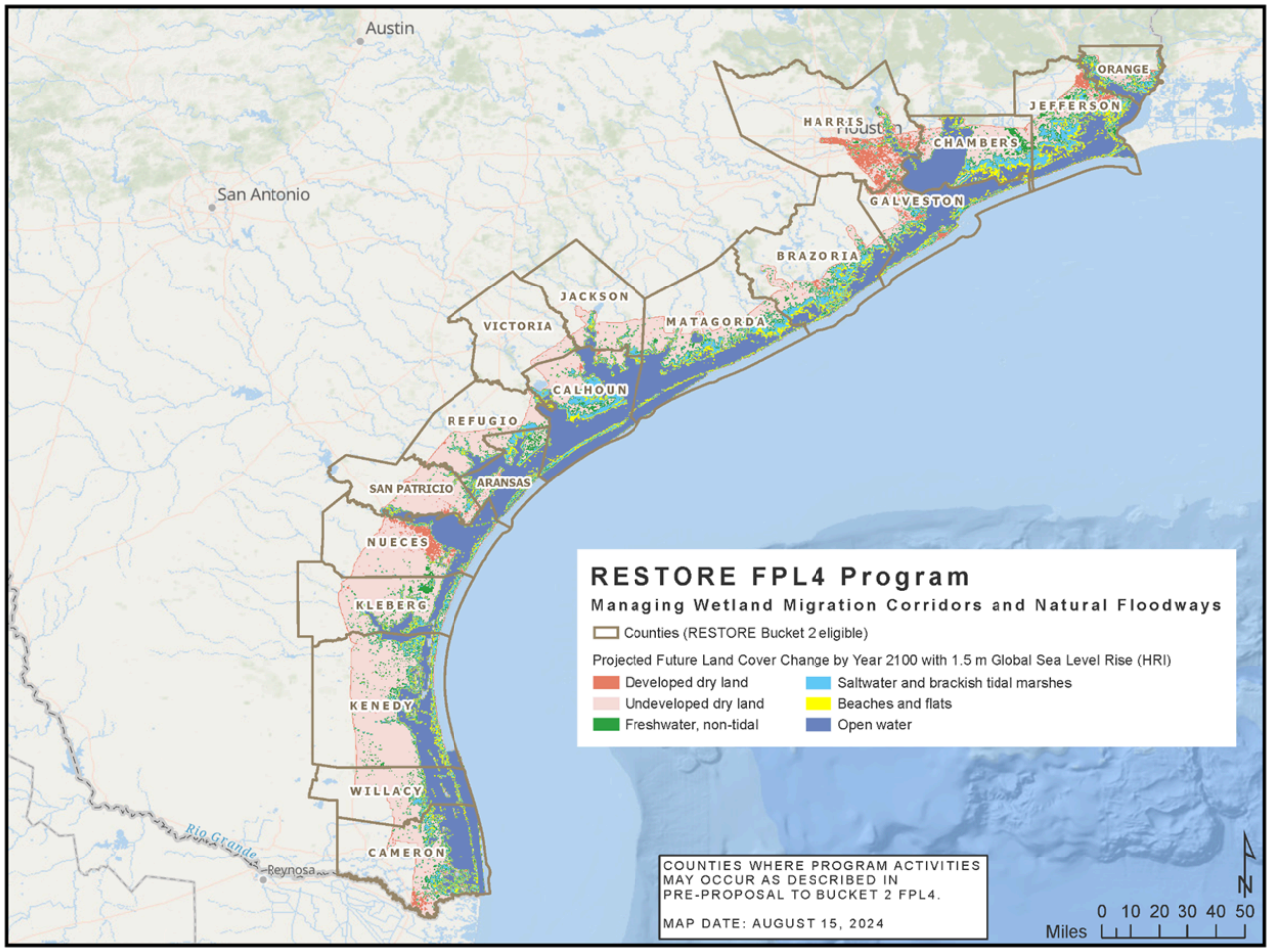


Figure 2. Map of RESTORE eligible counties and program activity.

GIS Data_4:
TX_FPL3b_WQ.zip

Council Staff Review: Managing Wetlands Migration Corridors and Natural Floodways Program

Note: All comments indicated below have been addressed in this revised proposal.

FPL Internal Staff Review

Project/Program	Managing Wetlands Migration Corridors and Natural Floodways Program		
Primary Reviewer	Heather Young	Sponsor	Texas
EC Reviewer	John Ettinger	Co-Sponsor	N/A

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	More information needed
Notes	Location states all activity will be within TX Coastal Zone within Texas RESTORE eligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris, Jefferson, Matagorda, and Refugio. However, 18 counties were selected in PIPER and featured on map. Needs clarification. Response: TX added the 8 other eligible counties: Orange, Jackson, Victoria, San Patricio, Nueces, Kleberg, Kenedy, Willacy

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	More information needed

Notes	The FPL 4 proposal provides the total funding amount requested for the activity, along with the percentage breakdown between FPL Categories 1 and 2. By applying the percentages to the total for the activity the requested amount in FPL Category 1 is $8,424,000 and Category 2 is $38,376,000. Need to verify numbers are correct. This comment has been addressed.

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	More information needed
Notes	Recommend adding PRM011 : Restoration planning/design/permitting - # E&D plans developed. Omission was likely a typo since Narrative description of PRM013 EC states "Number of E&D plans developed". This comment has been addressed.

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	The implementation component is in FPL Category 2.

Summary of Best Available Science Review: Managing Wetlands Migration Corridors and Natural Floodways Program

Reviewers provided a range of feedback on the Texas wetlands proposal, recognizing strengths in its alignment with regional planning and its use of peer-reviewed or publicly available sources, while also highlighting areas needing improvement. The objectives and methods were generally justified, particularly through references to the Texas Coastal Resiliency Master Plan and relevant literature, though some citations were outdated, inaccessible, or incomplete. All reviewers agreed the proposal was geographically appropriate for the Gulf Coast region. However, there were concerns over inadequate citation of supporting science in parts of the document, especially regarding secondary benefits like sediment and nutrient reduction.
While short-term risks related to project implementation, such as land acquisition and dredge material sourcing, were briefly addressed, long-term risks like sea level rise and climate change impacts were insufficiently discussed. Adaptive management was mentioned as a strategy, with a contingency budget included, but reviewers noted the lack of detail on how this approach would be operationalized or linked to performance metrics. The proposal does mention measures of success aligned with RESTORE Act goals, yet some metrics—particularly for land acquisition, community resilience, and hydrologic restoration—were deemed vague or incomplete.

Reviewers had mixed opinions on whether the program demonstrated experience. In-state reviewers were confident in the agencies' expertise, but out-of-state reviewers found the proposal unclear about the lead entity and partners. While the goals and methods were generally well-defined, one reviewer noted a mismatch between some proposed activities and the primary wetland restoration goal. Environmental benefits were well-articulated in relation to climate and land use stressors, though the proposal lacked an evaluation of past project successes and failures. Finally, while a data management and monitoring plan was included, reviewers called for more specific details, particularly regarding long-term monitoring and how adaptive management would respond to ecological performance over time.

Additional suggestions included incorporating nutrient and pest management plans, requiring long-term ecological monitoring, and offering clearer definitions of performance targets across project types. Overall, the proposal was seen as grounded in regional science and planning but would benefit from stronger documentation, risk analysis, and implementation strategies.

Summary of Texas’ Response to BAS Comments: Managing Wetlands Migration Corridors and Natural Floodways Program

In response to the BAS comments, the state strengthened the proposal by updating and properly citing references (added 34 additional references), ensuring key documents are either linked or summarized within the proposal, and including maps and tables where necessary. They explicitly addressed long-term climatic risks, including sea level rise, by incorporating relevant study results and improving the connection between adaptive management strategies and future environmental

changes. The state also acknowledged the need for clearer metrics, adding additional metrics, specific to land acquisition and community resilience. Also, in response to a comment they clarifed the role of TCEQ in the RESTORE Bucket 2 process. More details were provided to address comments regarding project types, expected distribution, added success stories from past efforts, and made clarifications on the integration between monitoring and adaptive management. Some issues, such as concerns about risk and uncertainty,were addressed indirectly through these broader improvements in the narrative, additional citations, and enhancement to the “Risk and Uncertainties” Section.

Best Available Science Review Forms: Managing Wetlands Migration Corridors and Natural Floodways Program

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Managing Wetland Migration Corridors and Natural Floodways Program
Location (If Applicable): The location of this program activity is within the Texas Coastal Zone, in areas ofhigh potential for coastal wetland protection. This includes coastal and estuarine areas within TexasRESTORE eligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston,Harris, Jefferson, Matagorda, and Refugio.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: In state
Date of Review: 9/30/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	

The proposal does provide peer-reviewed justification for the objectives and methods decribed; however, some of the references, particularly the data on land-use changes and wetland loss, is over a decade old. Using more recent data would make the justification more compelling.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
This proposal pertains specifically to the Texas Gulf Coast.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Citations are correct and properly presented.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
The proposal includes a brief mention of the effects of Extreme Climatic Events on the success of restoration projects. It does not address the risk posed by increasing rates of sea level rise, which also threaten the success of such projects. Other risks, including challenges faced by land acquisition and beneficial use projects, are more thoroughly addressed.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A

Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Click here to enter text.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
I see no evidence here of any sort of bias in the choice of supporting science.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
The proposal incorporates references that sufficiently discuss risks and uncertainties associated with the types of projects likely to take place under the proposed program.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
The proposing agencies have long-standing reputations in implementation of these sorts of project.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Click here to enter text.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
While specific methods are not proposed, this is a programmatic proposal under which many different types of projects can be proposed and funded. The program incorporates review methods which should ensure that methods used in the funded projects are both scientifically sound and cost-effective.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The proposal does an excellent job in this area.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
The program describes the metrics which will be applied to programs it funds. These metrics are quantitative and do align with the Comp Plan goals/objectives.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
The proposal includes only a brief mention of the effects of Extreme Climatic Events on the success of the kinds of restoration projects it anticipates funding. It does not address the risk posed by increasing rates of sea level rise, which also threaten the success of such projects. Other risks, including challenges faced by land acquisition and beneficial use projects, are more thoroughly addressed.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The proposal includes an effective strategy for implementing adaptive management through the use of longitudinal working groups who will engage with proposed projects thoughout project life. These groups will be empowered to address issues that may arise from scientific uncertainties. It also includes a 10% contingency budget to account for unexpected challenges.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Click here to enter text.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No
Comments:	
The proposal does not discuss past successes and failures other than in a general way; however, the agencies involved have extensive experience overseeing these types of projects. I would expect them, as well as the individual project PIs, to have immense knowledge of these types of efforts and be well-versed in the best practices needed to give individual projects the greatest chance of success.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	

The performance criteria included (metrics) can inform adaptive management so long as they are collected longitudinally over an adequate time period. Metrics such as acres restored are largely meaningless in terms of ecological impacts if they are collected at the end of the construction phase of project. Individual projects must be monitored over the long term (25 years) to demonstrate ecological stability and resilience to external stressors.

Please summarize any additional information needed below:

I would like this proposal to include nutrient management plans and Integrated Pest Management as additional strategies for working with agricultural landowners to improve water quality.

I would also like to see a requirement that individual projects account for the potential long-term threat of accelerated sea level rise and the short-term threat of extreme climatic events. Otherwise, a lot of this money will be thrown away.

Lastly, I would like to see a commitment by the proposers to requiring long-term monitoring of success criteria such as ecological and hydrologic function and increase in biodiversity in projects that involve habitat restoration.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Managing Wetland Migration Corridors and Natural Floodways Program
Location (If Applicable): The location of this program activity is within the Texas Coastal Zone, in areas of high potential for coastal wetland protection. This includes coastal and estuarine areas within TexasRESTORE eligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston,Harris, Jefferson, Matagorda, and Refugio.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of State
Date of Review: 10/14/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	
The proposed objectives and justufications can benefit from more references. There are references to reports, management plans, DWH projects/programs etc. However, some of them are either not accessible or no specifics are given to trace them.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The information supporting the proposal pertain to the Gulf Coast.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information
Comments:	
This is similar to #1. In many places there is not citation to support to the claims. It might be argued that they are common knowledge, and I cannot disagree with that as someone familiar with the science. However, I still want to see evidence. For example, as a secondary benefit, they talk about nutrient and sediment reduction, but provide no evidence that there is excess nutrient and sediment. Nutients and sediments are not all bad.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	
They address uncertainties and risk under in a paragraph, but it is limited to land acquisition, use of dredge material and a general statement about potential delays. They could have done a much better job.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes

Comments:
Many of the scientific claims of the applicant are likely true even if they do not provide citation or supporting data. However, there are parts where they did not provide justification. For example, is there sediment problem that requires sediment reduction? Coastal wetlands can benefit from sediment.

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	No
Comments:	
I don't think the applicant explained well whether their proposal relies on high-quality, objective, and reliable scientific data. There was very little statistical data.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
I tend to say yes here as they addressed the two big ones.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
Frankly, I could not figure out who the applicant is. I know it is some entity in Texas. There is a reference to content analysis by Heart Research Institute to identify key need. Another one refers to Texas Coastal Resiliency Master Plan where 121 peojects are proposed at estimated $1.87B. There is also reference to previous Restore projects in Texas. I could not tell who they are and if they managed such large projects.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	

The goals and objectives are clearly defined.

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The methods are clear for most but not all. However, I understand where they come from as they can only explain some. Land acquisition, stewardship, restoring hydrologic connectivity, and use of dredge material are explained relatively well. However, the part related to the activities supporting the secondary benefits are not described well.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Although they do identify several key benefits, I feel like they rushed this part. They could have done better by being more specific, yet it is sufficient.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information
Comments:	
They list several measures of success, but I find some of the vague. For example, the metric related to community resilience will use number of residential, commercial and public facilities benefiting. How would they measure if a facilility is benefiting from the project? Another one is retoring hydrology. They list “acres with restored hydrology”as the metric. Is this area of watershed? N, P, TSS avoided or removed is another one. I assume they will use models for this as measuring those is nearly impossible.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	No

Comments:
The only relevant information is the brief geneal statement about climate events, like hurricanes, extreme droughts, etc. potentially impacting project implementation, borrowed from Zabin et al. (2022)

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
There is some discussion on risks related to land acquisition and finding dredge material. I have not seen mitigation plans. However, the section on Adaptive Management somewhat touches this.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Need more information
Comments:	
This is question is not very clear to me. I don't want to misguide you.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No
Comments:	
I did not see it in the proposal.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	

They will use help of Texas Commission on Environmental Quality (RCEQ) and Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC) for data sharing. Data will be archived a GRIIDC. I did not see anything about quality control of data.

Please summarize any additional information needed below:
Click here to enter text.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Managing Wetland Migration Corridors and Natural Floodways Program
Location (If Applicable): The location of this program activity is within the Texas Coastal Zone, in areas of high potential for coastal wetland protection. This includes coastal and estuarine areas within TexasRESTORE eligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston,Harris, Jefferson, Matagorda, and Refugio.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of Gulf
Date of Review: 15Sep2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	

The objectives and methods were reasonably informed by peer reviewed, publicly available information and ongoing coastal restoration planning processes. For example, a landscape change analysis performed for the Texa Coastal Resiliency Master Plan (TCRMP) was used to inform key areas for land conservation that will support future wetland habitats. A study by the Hart Research Institute that analyzed the content of 119 planning and restoration documents was used to justify the need and process for the proposed program, including identification of priority sites. However, that document was not cited and could not be reviewed.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
Information used was heavily drawn from materials that pertain directly to the Gulf Coast Region. In the instances where sources refer to other geographies, those concepts are adaptable or applicable to the Gulf Coast region. For example, literature related to Adaptive management approaches which is a method that can be readily applied in any geography.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information
Comments:	
In a few instances, sources were not completely cited. Notably, the Harte Research Institute study was not completely cited and Table 1 and other figures were not accessible. However, overall the sources were represented in a fair and unbiased manner.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	No
Comments:	
Recognizing the challenges of evaluating uncertainties and risks for projects that have yet to be identified, the proposal described several over-arching uncertainties for the implementation of select project types and indicated that adaptive management will be used to minimize uncertainty. Inclusion of dedicated funds in the budget to allow for the implementation of adaptive management is notable and suggests a higher likelihood of overall program success, if it is applied effectively. However, long-term uncertainties and risks were not evaluated in this proposal. Likewise, the planned application of adaptive management approaches was not fully explained nor linked to performance metrics.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The applicant based the proposed program on information from multiple planning and restoration documents for the region, such as the TCRMP which is underpinned by peer-reviewed information.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The proposed methods to develop a framework to prioritize the selection of projects is based on previous scientific analysis and initiatives, such as SCA tool and TCRMP.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	
The applicant outlined risks and uncertainties for select project types on the basis of scientific understanding and logistical considerations. As projects are identified, a project specific risk assessment should be conducted within the framework of adapative management methods. Lacking from the proposal was specific details about how adapative management approaches would be applied. See related comments below on the weaknesses of risk and uncertainty discussions and the adaptive management/monitoring proposed approaches.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information

Comments:
Unclear who the program sponsor and partners are.

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The goals are clearly stated as addressing estuarine wetland loss by preserving corridors for wetland mirgration and restoring wetlands that will have a path to migrate as sea level rises, although there appears to be a typo under the project budget narrative that lists the goal as “project planning, and restoration of waterbird rookery habitat”. One concern is that the types of project activities that may be funded under this program are quite broad and some are not directly related to the stated goal. While the secondary activities may support wetlands indirectly (e.g., stormwater management), without strategic targeting of projects the RESTORE program goal to achieve long-term benefits to wetland functions and values may not be optimally met.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The proposal clearly describes methods for site selection which rely heavily on previously vetted projects, and indicates that priority will be given to projects that are scalable and equitably funded.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The ecological, social and economic importance of coastal and estuarine wetland habitats are described in relation to climate change and habitat conversion stressors that are identified in the literature and multiple regional plans.	

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:

The program includes example metrics that would be used for particular project types that align with Comprehensive Plan goals. For example, wetland acres restored, hydrologic restoration acres restored, lbs Nitrogen avoided or removed. However, not all potential project activities are captured in the metrics. Land acquisition is an identified activity without a corresponding metric. One possible metric could be Future marsh protected (acres).

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	No

Comments:

The proposal generally discusses short-term risks that may hinder project implementation, but long-term risks from climate change and changing land are not discussed.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	No

Comments:

Other applicable short-term implementation risks and scientific uncertainties are not discussed. Only risk or uncertainties that may prevent or delay the initial project implementation are discussed.

Question H

Does the project/program consider recent and/or relevant information in discussing the elements above?	No

Comments:

The elements directly above (long-term risks and short-term implementation risks) were not discussed in the proposal.

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
The program has not explicitly evaluated past successes and failures within the proposal. A Restore Council 2023 document was referred to (without an included citation) within the proposed methods section that may indicate consideration for prior successes and failures, but this is not clearly stated.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information
Comments:	
The program has identified a general monitoring and data management strategy as well as the use of an adaptive management strategy. Generally, projects will be monitored to assess needs and performance and as implementation issues arise ("in particular those that may set back, delay, or prevent the implementation of a project"), a contingency budget will be in place to address those issues. However, beyond initial implementation it is unclear how adaptive management/monitoring will inform or be informed by the performance criteria. Data management for the program is described to promote transparency, including making information publicly available from planning data, program budgets and performance reports. Likewise the TCEQ and GRIIDC will collaborate with data users to ensure data is accessible.	

Please summarize any additional information needed below:
Additional information on the expected relative distribution and number of different project activity types (in funding and geography) would help to inform the likelihood of program success to meet RESTORE program goals. Similarly, performance targets were not quantitatively described (e.g., wetland restoration -acres restored), with more information of the weights given to particular activities (e.g., land acquisition, wetland restoration, shoreline protection), a better sense of the performance target to be achieved could be estimated.

Oyster Reef Restoration Program

RESTORE Council Proposal Document

General Information

Title:
Oyster Reef Restoration Program

Project Abstract:
The Oyster Reef Restoration Program for Texas seeks to restore and conserve habitat and replenish and protect living coastal and marine resources by restoring non-commercial oyster reef habitats in Texas estuarine waters. Oyster reefs, found in both intertidal and subtidal zones across Texas bays and estuaries, have suffered significant declines. However, oysters play a critical role in ecological and economic systems, providing essential habitat, supporting secondary and tertiary production, and contributing to ecosystem services such as nutrient regulation, shoreline protection, wave attenuation, potential oyster harvest, and recreational fishing opportunities. With a proposed budget of $12.8 million, the Oyster Reef Restoration Program will employ restoration techniques including substrate placement, construction of living shorelines, and enhancement of spawning reserves. Additional program activities will include planning, implementation, and monitoring to ensure success. Priority will be given to projects that have undergone prior vetting and align with key criteria, such as project readiness, scalability, and potential effectiveness. The overall goal of this program is to enhance the habitat and productivity of Texas's oyster resources.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: N/A

Co-sponsoring Agency(ies):
TX

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

Priority Criteria Justification:
This is a large-scale program aiming to restore coastal resources and habitats with the goal of achieving and enhancing the habitat and productivity of Texas oyster resources. Oyster reef restoration is identified as an important issue of Gulf-wide importance. In Texas, nearly $15.1 million have been invested to enhance the understanding and implementation of oyster reef restoration projects (DWH project tracker), yet additional work is needed to continue to address this large-scale concern.

Oyster reefs are a key resource addressed in various regional, state, and Gulf-wide Plans including:

- The Texas Coastal Resiliency Master Plan (GLO, 2023)
- Deepwater Horizon Oil Spill Natural Resource Damage Assessment Texas Trustee Implementation Group Draft Restoration Plan/Environmental Assessment #2: Restoration of Wetlands, Coastal, and Nearshore Habitats; Nutrient Reduction; Oysters; Sea Turtles; and Birds (2022).
- Oyster Restoration in the Gulf of Mexico: Proposals from the Nature Conservation (2018)

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Restore , Enhance, and Protect Habitats
Protect and Restore Living Coastal and Marine Resources

Secondary Comprehensive Plan Goals:
Restore and Conserve Habitat
Replenish and Protect Living Coastal and Marine Resources

PF Restoration Technique(s):
Restore oyster habitat: Substrate placement
Restore oyster habitat: Living shorelines
Restore oyster habitat: Enhance spawning and reserves

Location

Location:
Texas Coastal Zone, particularly in areas with current and historical oyster reefs; including areas within the following Texas RESTORE eligible counties: Cameron, Willacy, Kenedy, Kleberg, Nueces, San Patricio, Aransas, Refugio, Victoria, Jackson, Calhoun, Matagorda, Brazoria, Harris, Galveston, Chambers, Jefferson, Orange Counties (Figure 1).

HUC8 Watershed(s):
Texas-Gulf Region(Neches) - Neches(Lower Neches)
Texas-Gulf Region(Neches) - Neches(Pine Island Bayou)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(West Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Spring)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(East Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Buffalo-San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(North Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(West Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Austin-Oyster)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Lower Brazos)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Lower Colorado(Lower Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(San Bernard)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Navidad)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(Lower Guadalupe)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Lower San Antonio)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Mission)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Lower Nueces)

Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Palo Blanco)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Laguna Madre)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Sabine Lake)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Lavaca)
Texas-Gulf Region(Sabine) - Sabine(Lower Sabine)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(San Fernando)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Baffin Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central Laguna Madre)

State(s):
Texas

County/Parish(es):
TX - Aransas
TX - Brazoria
TX - Calhoun
TX - Cameron
TX - Chambers
TX - Childress
TX - Galveston
TX - Harris
TX - Jackson
TX - Jefferson
TX - Kenedy
TX - Kleberg
TX - Matagorda
TX - Nueces
TX - Orange
TX - Refugio
TX - San Patricio
TX - Victoria

TX - Willacy

Congressional District(s):
TX - 2
TX - 18
TX - 22
TX - 27
TX - 14
TX - 29
TX - 36
TX - 34
TX - 7
TX - 9
TX - 8
TX - 38

Narratives

Introduction and Overview:
The Oyster Reef Restoration Program focuses on the restoration of non-commercial oyster reef habitats and aligns with the Council's goal to restore and conserve habitat and replenish and protect living coastal and marine resources. This initiative aligns with the priority approach of restoring oyster habitats through techniques such as substrate placement, the construction of living shorelines, and the enhancement of spawning reserves.

Oyster reefs, found in both intertidal and subtidal zones across Texas bays and estuaries, have suffered significant declines. It is estimated that 50 to 80 percent of native oyster populations in the Gulf of Mexico have been lost relative to historic levels (Beck et al., 2011). Oysters play a critical role in ecological and economic systems, providing essential habitat, supporting secondary and tertiary production, and contributing to ecosystem services such as nutrient regulation, shoreline protection, wave attenuation, potential oyster harvest, and recreational fishing opportunities (Coen et al., 2007; Stunz, Minello, and Rozas, 2010; Olander et al., 2020; Smith, Cheng, and Castorani, 2023). This program aims to restore and create non-commercial oyster reef habitats to enhance the ecosystem of Texas bays and shorelines.

Oyster reefs in Texas and across the Gulf of Mexico face numerous threats from both natural and anthropogenic sources, including saltwater intrusion, reduced freshwater inflow, disease, man-made disasters, habitat destruction (e.g., dredging and mechanical harvesting), coastal development, nutrient runoff, pollution, and a lack of shell replacement (La Peyre et al., 2014; Pollack et al., 2012). In response, the Texas Parks and Wildlife Department (TPWD) has restored over 500 acres of oyster habitat in Texas estuaries since 2009. Other entities, such as the Galveston Bay Foundation, Texas A&M University System, and The Nature Conservancy, have restored an additional 100+ acres along the Texas coast (TPWD, 2022). To date, Deepwater Horizon (DWH)

funds have invested $15.1 million in enhancing oyster restoration research and implementation (DWH project tracker). Despite these efforts, the decline in oyster populations continues, highlighting the need for sustained restoration efforts to support fisheries and ecosystem services (The Nature Conservancy, 2023).

A content analysis of 119 planning and restoration documents, including those from local, state, and federal entities as well as NGOs, identified oyster reefs as a habitat of concern within estuarine environments. These documents included various area management plans, state environmental program plans, conservation plans for different species, and restoration project documents either funded or in need of funding. In July 2023, the proposed programs were presented for discussion to two Texas working groups, comprising government agencies and NGOs, that advise the Texas RESTORE process. Following the presentation, a survey was administered to the working group. The survey results showed strong support for the program, with respondents emphasizing that oyster reefs are a foundational species in need of increased restoration, protection, and enhanced management in Texas. The survey also acknowledged the multiple ecosystem services provided by oyster reefs, including shoreline protection, thus supporting oyster restoration as a living shoreline and shoreline protection approach.

Public comments also expressed support for this program, noting that "Oyster reefs are important to Texas coastal economies and provide a suite of ecosystem services to coastal communities." Commenters advocated for collaboration across program areas and partners and emphasized the use of models and available tools for predicting restoration and aquaculture potential. However, two comments expressed concern, with one suggesting that water quality issues are a challenge in oyster restoration.

This program aims to address the loss of natural resources and associated ecosystem services through a prioritized approach of oyster reef restoration. Techniques for restoring oyster habitats include substrate placement, living shorelines, and the enhancement of spawning reserves. To implement this, the program will develop a framework for selecting priority projects. Example projects for consideration are outlined in current state planning documents such as the Texas Coastal Resiliency Master Plan (TCRMP) (Texas General Land Office, 2022). The TCRMP proposes an estimated $1.87 billion in 121 proposed Tier 1 coastal resiliency projects, spanning 10 priority statewide actions. These projects reflect careful consideration of the complex characteristics of the Texas coastal zone by the Texas General Land Office (TGLO) and the Plan’s Technical Advisory Committee (TAC), which includes coastal planners, community leaders, scientists, engineers, and other stakeholders. The potential project scales and budgets for oyster projects vary from $130K-31M. Considerations will be taken to leverage ongoing work and opportunities to make the most impact on oyster reef restoration. While these examples provide evidence of funding needs in Texas, funding for this program will be open to additional proposals and is not limited to those listed.

Potential budgets for oyster projects listed in the TCRMP vary from $130K-31M (Table 1). Considerations will be taken to leverage ongoing work and opportunities to make the greatest impact on oyster reef restoration. While the TCRMP projects provide evidence of funding needs in

Texas, funding for this program will be open to additional proposals and is not limited to those listed in Table 1. Fundable projects must demonstrate rigorous planning, feasibility and support by the public and conservation community, as well as the applicant's experience and demonstrated ability to conduct and manage these types of projects. These projects will incorporate activities as those expressed in the methods section.

Proposed Methods :

This program will implement a project selection process that evaluates the need for the project, its potential to benefit oyster reefs and oyster habitat, the feasibility of the design and location, and the applicant's (and team's) demonstrated ability to implement and successfully construct the project. In addition, project applicants will be required to submit project success metrics, examples of which are presented in the section titled “Metrics and Measures of Success.”

To address the loss of oyster habitat, this program will support initiatives such as substrate placement, living shoreline construction, and the enhancement of spawning reserves. It is recommended that the proposed project utilize a habitat suitability assessment to assess the potential for long-term success or failure for the proposed project (Deepwater Horizon Natural Resource Damage Assessment Trustees, 2017). In Texas, habitat suitability models are available and studies for freshwater requirements are also helpful in determining appropriate locations for restoration (Buzan et al., 2009; Jennifer Beseres Pollack et al., 2012; Powell, Matsumoto, and Brock, 2002) as well as the online mapping tool Oyster restoration siting on the Texas Coast (Pollack et al., 2019).

A critical component of oyster reef restoration is the construction of a substrate that effectively attracts and supports oyster larvae, forming a high-relief structure that mimics a natural oyster reef. These three-dimensional formations can be established in either intertidal or subtidal zones. The engineering design for these structures can range from simple, using basic cultch materials, to more complex designs that involve the installation of large rocks or prefabricated materials (Texas General Land Office n.d.). Common materials used as cultch includes oyster shells, crushed limestone, or crushed concrete, and rock material (Baggett et al., 2014; Goelz, Vogt, and Hartley, 2020). When planning the engineering design and selecting substrate placement types and materials, it is essential to consider the hydrodynamics of the project site.

The supply and successful settlement of larvae are crucial for the development and persistence of oyster populations. Local stocks can be enhanced through the use of sanctuary reefs, which can lead to increased oyster settlement, recruitment, and overall densities (Puckett and Eggleston, 2012; Schulte and Burke, 2014). A study comparing natural, restored, and protected reefs found that restored and protected reefs have a larval output potential that is approximately 4 to 700 times greater per square meter than restored and harvested or natural and harvested reefs, respectively (Peters et al., 2017). Projects adopting this approach must consider hydrodynamic processes as these processes are essential for larvae transport, enabling them to disperse over significant distances (Knights and Walters, 2010). Additionally, marine reserves, which create no-take zones, can potentially support harvested populations at nearby reef locations through larval spillover (Peters et al., 2017).

Living shorelines that incorporate oysters can be highly effective in reducing erosion and protecting coastlines. For example, a study by Manis et al. (2015) demonstrated that one-year-old treatments of marsh grasses (Spartina alterniflora) combined with live eastern oysters (Crassostrea virginica) attenuated 67% of the wave energy generated by a single recreational boat wake, compared to bare sediment. Besides protecting coastlines from erosion, living shorelines also enhance invertebrate and fish diversity and abundance compared to armored shorelines (Bilkovic et al., 2016). The effectiveness of an oyster reef, however, depends on multiple factors, including size, orientation, and location. Depth also plays a crucial role, as reefs that are fully subtidal are likely to have a reduced ability to diminish wave energy (USACE, 2022). To optimize the creation of self-sustaining reefs, it is essential to understand the appropriate benthic topography that fosters optimal recruitment conditions —such as hydrodynamics, settlement surfaces, protection from predators, and sedimentation —and how these factors may need to adapt under changing climate conditions (Morris et al., 2019). When evaluating living shorelines, it is crucial to consider the inundation regime. Morris et al. (2021) found that living shorelines submerged less than 50% of the time were not ideal habitats for oysters but were effective in reducing wave height by 68%. Conversely, reefs with more than 50% inundation were suitable for oysters, but their wave attenuation was comparable to control sites (no reef).

Environmental Benefits:

Given their importance as habitat, their economic significance, and the ecosystem services they provide, oyster reef restoration has been recognized as a critical priority in the Gulf of Mexico. Restoring oyster habitats supports recreational and economic benefits, improves water quality, enhances shoreline protection, and bolsters overall ecosystem health (Stunz, Minello, and Rozas, 2010; La Peyre et al., 2014; Blomberg et al., 2018; Olander et al., 2020; Smith, Cheng, and Castorani, 2023).

Monitoring and metrics of success will be tailored to the specific type of project being implemented. For example, a living shoreline design may prioritize outcomes such as erosion control and habitat stabilization, while a submerged reef project may focus on metrics like increases in oyster population densities. Metrics will be selected on a project-by-project basis to ensure they align with the unique objectives and desired outcomes of each initiative, providing a customized framework for evaluating success.

Metrics:

Metric Title: HR006 : Marine habitat restoration - Acres of oyster reef restored

Target: 0.99

Narrative: Number of acres of oyster reef restored. Target to be determined.

Metric Title: SP001 : Population - Density (# individuals/acre) - Oysters

Target: 0.99

Narrative: Number of individuals/acre. Target to be determined

Metric Title: HR012 : Shoreline protection - Miles of living shoreline installed

Target: 0.99

Narrative: Miles of living shoreline installed. Target to be determined.

Metric Title: PRM013 : Restoration planning/design/permitting - # environmental compliance documents completed

Target: 0.99

Narrative: Number of environmental compliance documents completed.

Metric Title: PRM011 : Restoration planning/design/permitting - # E&D plans developed

Target: 0.99

Narrative: Number of E&D plans developed.

Risk and Uncertainties:

In Texas, coastal habitats and communities are increasingly vulnerable to storm surge damage, especially when combined with heavy precipitation. Periodic and long-term inundation of estuarine habitats can profoundly alter the hydrology of these systems, (Hayhoe et al., 2018; Sweet et al., 2022) undermining their resilience and ability to support diverse wildlife and ecosystem functions. Trends in sea level rise along Texas bays, as reported by NOAA's Tides and Currents website, exhibit variation along the coast. In Cameron County, Port Isabel shows a rate of 4.32 mm/year, and Port Mansfield records 3.69 mm/year. Along the central coast, Rockport experiences a higher rate

of 5.66 mm/year. The upper coast, particularly Eagle Point, shows the most significant trend at 12.93 mm/year (NOAA Center for Operational Oceanographic Products and Services, 2025). These trends contribute to submergence and erosion, saltwater intrusion, and a decline/change in coastal wetlands (Gornitz, 1991; Nicholls and Cazenave 2010; Mitchell, Herman, and Hershner, 2020). These hydrologic changes are expected to significantly impact the abundance, growth, and survival of intertidal and shallow subtidal species such as oysters. Studies suggest while some reefs may experience negative impacts others will be more resilient (Solomon, Donnelly, and Walterst, 2014; Rodriguez et al., 2014). Intertidal oyster growth is influenced primarily by two factors: salinity and aerial exposure, the latter being the amount of time intertidal oysters are exposed during a tidal cycle. Aerial exposure creates strong vertical zonation patterns, with distinct growth boundaries shaped by physiological and external stressors. Rapid changes in hydrologic conditions can shift these critical boundaries, potentially leading to scenarios where oyster reef accretion cannot keep pace with rising sea levels (Ridge et al., 2015). Uncertainty remains, as bay bathymetry and shoreline dynamics may also be altered in the future (Passeri et al. 2015). Considerations for relative sea level and hydrologic trends along the Texas coast and local hydrodynamics should be integral in evaluating the potential success and longevity of restoration projects. In cases where data is lacking, expert opinions could be valuable in bridging these gaps (Cooke et al. 2021).

Climatic events, including hurricanes, extreme storms, and prolonged droughts, pose substantial risks to restoration activities. These events can cause increased erosion, sediment displacement, and habitat destruction, directly affecting the construction, effectiveness, and longevity of restoration projects (Zabin et al., 2022). Hurricanes and extreme storms can degrade estuarine water quality, and sediment deposition can temporarily reduce oyster abundance, spat settlement, and increase disease levels (Wetz and Yoskowitz, 2013; Pollack et al., 2010; Martinez et al., 2022). Additionally, oyster populations may suffer significant declines during extended periods of high freshwater inflow or heavy rain events, and can be decimated during prolonged droughts, when conditions favor oyster predators, parasites, and diseases that thrive in higher salinity conditions (Buzan et al., 2009). Considering Texas estuarine water budgets is crucial when planning for successful oyster restoration. Also, hydrodynamic-oyster population models can be useful for simulating potential oyster health scenarios (Powell, Matsumoto, and Brock, 2002).

Risk mitigation, particularly for unforeseen events such as weather-related impacts mentioned above, will be addressed by requiring applicants to provide detailed mitigation plans as part of their proposals. Additionally, risks will be managed through robust monitoring and adaptive management strategies, as outlined in the following section. These measures will ensure a proactive approach to minimize potential disruptions and enhance resilience against unexpected challenges.

Monitoring and Adaptive Management:

Given the uncertainties in restoration, the principles of adaptive management are useful in both planning and managing projects to increase the probability of success. Adaptive management is a method to systematically assess and improve the performance of restored systems and contribute

to restoration technology (Thom, 2000). In essence, adaptive management involves synthesizing existing knowledge, exploring alternative actions, making explicit predictions of their outcomes, implementing actions, monitoring to determine whether outcomes match those predicted, and using these results to adjust future plans (Murray and Marmorek, 2003).

In implementing adaptive management, this program will use a goal-oriented approach focused on improving estuarine health through expanding oyster reefs. The program will engage established working groups in the development of criteria to select priority projects and utilize monitoring to assess needs and performance. Adaptive management is important considering the risks and uncertainties mentioned above, in particular those that may lessen the effectiveness, delay, or prevent project implementation (e.g., storms, drought, permitting issues). Due to these and other potential challenges, the program allocates 10% of the total budget for contingencies, providing a buffer for adaptive management.

Restoration project monitoring contributes to adaptive management and involves the systematic collection of data for three primary purposes: (1) to determine whether a project was completed as specified in the restoration plan (construction monitoring); (2) to evaluate the performance of a restoration project relative to its objectives (performance monitoring); and (3) to learn from the restoration effort in a structured manner, enhancing the long-term effectiveness of future restoration efforts (La Peyre et al. 2014; National Academies of Sciences, Engineering, and Medicine, 2017). A wide range of monitoring metrics are available for oyster reef restoration, covering various categories such as habitat metrics (e.g., reef height, reef rugosity), geomorphology (e.g., shoreline gain/loss), hydrology (e.g., dissolved oxygen, salinity), sediment (e.g., sedimentation rate, reef subsidence rate), adjacent habitat (e.g., density and percent cover of aquatic vegetation, species composition), and oyster population attributes (e.g., oyster density, size frequency distribution, disease prevalence) (Baggett et al., 2014; National Academies of Sciences, Engineering, and Medicine, 2017). It is highly recommended that monitoring includes evaluation of the long-term impact including those socio-economic outcomes to the communities surrounding the resource (Olander et al., 2020). In addition to the metrics reported above, metrics for adaptive management will be selected based on the reef type, location, and overall project goals and objectives.

Data Management:

Data management for this program is designed to promote transparency in the project selection process. Information used in decision-making, such as supporting plans, program budgets, and past project performance reports, will also be accessible to guide potential project decisions. Once projects are selected, geotechnical and engineering data, along with construction specifications, will be made available. Furthermore, data related to post-project implementation will be collected and shared publicly. This includes information on project performance, such as potential metrics previously mentioned.

The Texas Commission on Environmental Quality (TCEQ) and the Gulf of Mexico Research

Initiative Information and Data Cooperative (GRIIDC) will collaborate with data producers to ensure data is shared after key activities conclude. GRIIDC, a multidisciplinary repository, tracks, curates, and archives diverse datasets, making them publicly discoverable through digital object identifiers and detailed ISO 19115-2 metadata. This publicly accessible repository will facilitate data access for performance monitoring and adaptive management and ensure data interoperability and reuse.

Collaboration:

This program is positioned to foster collaboration, partnership, and leveraging opportunities. It will build on existing state and federal efforts, including the Department of Interior' Oyster Reef Restoration Program (proposed under FPL4). Continued engagement in the FPL 4 process will integrate with ongoing coastal restoration planning processes such as TGLO's Coastal Resiliency Master Plan. Furthermore, leveraging will be a key consideration during the project selection process, ensuring that selected projects yield the greatest environmental benefits while aligning with the program's goals.

Public Engagement, Outreach, and Education:

The engagement process for FPL 4 is ongoing and involves multiple steps to ensure comprehensive input and alignment with restoration priorities. A content analysis of 119 planning and restoration documents, including those from entities participating in our federal/state and NGO working groups, was conducted to identify key concerns, past restoration projects and programs, and current restoration needs. This analysis, combined with other environmental data, guided the development of potential FPL 4 programs. These programs were presented to the working groups in the summer of 2023 and followed by a survey to gather feedback on the level of support and to request suggestions for changes.

The working groups were also given the opportunity to submit additional programs for consideration. After edits and budget adjustments, the proposed programs were opened for public comment in March of 2024. Based on the feedback received and the availability of funding, the programs were then refined, combined, and revised to better meet the needs and priorities identified throughout the process.

Moving forward, the selection process for FPL 4 grant subrecipients will require that projects are vetted through the Texas FPL 4 process or other public process, such as the TGLO's Coastal Resiliency Master Plan, NRDA, or NFWF. Criteria for selecting projects will include but are not limited to, the following factors: alignment with issues outlined in the program activity description, availability of funds for the program, project readiness, leveraging opportunities, scalability, risk/benefit ratio, and distribution of funds across the Texas coast. This comprehensive process, which includes both completed and forthcoming steps during program planning and implementation, will ensure that the final project selections align with the RESTORE Planning Framework document and reflect the input of workgroups, elected officials, the public, and the Office of the Governor.

Leveraging:
N/A

Environmental Compliance:
The FPL Category 1 portion of this program involves only planning actions that are covered by the Restore Council's NEPA Categorical Exclusion for planning, research, or design activities (Section 4(d)(3) of the Council's NEPA Procedures). The implementation component has been identified as an FPL Category 2 priority for future funding consideration.

The implementation of oyster reef construction or restoration projects necessitates obtaining a USACE Nationwide Permit 27 for Aquatic Habitat Restoration, Enhancement, and Establishment Activities, as well as a submerged lands lease from the Texas General Land Office. Additionally, projects that aim to enhance spawning or involve the placement of spat or live organisms will require a permit from the Texas Parks and Wildlife Department for the introduction of shellfish or aquatic plants into public waters.

If living shoreline projects are chosen for implementation under this program, they will also require Section 10 and 404 permits from the U.S. Army Corps of Engineers (USACE) and a submerged lands lease from the Texas General Land Office. The USACE permitting process ensures adherence to all relevant federal laws, particularly environmental regulations such as the Clean Water Act. Coordination is planned with the USACE and other reviewing agencies, including the Texas General Land Office, United States Fish and Wildlife Service, NOAA, Texas Historical Commission, and the Texas Commission on Environmental Quality to ensure compliance with applicable environmental laws.

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Budget

Project Budget Narrative:

A total budget of $12,800,000 is proposed for FPL 4 activities associated with this program. These

funds are intended for planning, implementation, and monitoring of activity related to oyster reef restoration. An estimated 3% will be used for project planning, which includes activities such as project selection and development. An additional estimated 5% will be allocated for monitoring and data management activities which include project activity monitoring and collection of data to support metrics for evaluation of success.

Total FPL Project/Program Budget Request:
$ 12,800,000.00

Estimated Percent Monitoring and Adaptive Management: 5 %

Estimated Percent Planning: 3 %

Estimated Percent Implementation: 82 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: 10 %

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
Given the program's budget of $12.8 million and Texas's estimated need of over $82.5 million (Table 1. TCRMP Tier 1 projects: Oyster Restoration*), this program will prioritize and scale projects to maximize impact. The program will consist of several independent projects, which can be scaled down or reduced in number based on available funding.

Environmental

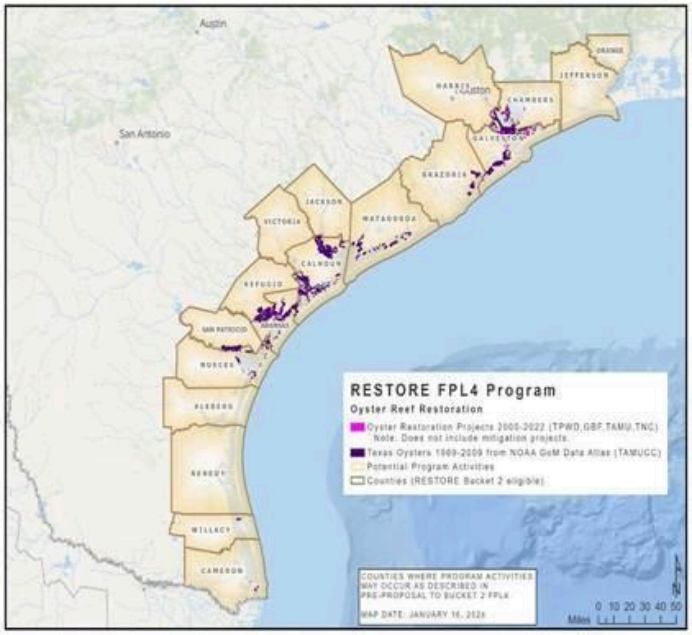
Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	N/A	Note not provided.

Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.

Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures

Additional Information



Caption : Figure 1. Map showing location of potential program activity, oyster habitat and previous oyster restoration projects in Texas

Other Uploads

TX Oyster Reefs-Table1
Table 1. TCRMP Tier 1 projects: Oyster Restoration*

Project ID	Project Name	Millions
9187	Carancahua Bay Community Reefing Project	$0.13
922	Oliver Point Shoreline Protection and Reef Restoration	$1.60
600	Half Moon Oyster Reef Restoration - Phase 3	$2.80
1332	Paired Subtidal and Intertidal Oyster Reef Restoration in Texas Bays	$4.00
1359	Texas Point NWR Shoreline Protection Sabine Neches Waterway and Oyster Habitat Creation	$5.00
9226	Oyster Reef Restoration in Mesquite-Carlos-Ayres Complex	$10.00
9253	Going to Scale: Expanding Oyster Restoration in Aransas Bay	$28.00
9287	Rincon Reef Breakwater	$31.00
	Total	**$82.53**

**For more information on these projects visit the TGLO's website at https://www.glo.texas.gov/coast/coastal-management/coastal-resiliency/resources/files/2023-tcrmp-overview.pdf*

GIS Data:
TX_FPL3b_LS.zip

Council Staff Review: Oyster Reef Restoration Program

FPL Internal Staff Review

Project/Program	Oyster Reef Restoration Program		
Primary Reviewer	Heather Young	Sponsor	Texas
EC Reviewer	John Ettinger	Co-Sponsor	N/A

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	More information needed
Notes	The FPL 4 proposal provides the total funding amount requested for the activity, along with the percentage breakdown between FPL Categories 1 and 2. By applying the percentages to the total for the activity the requested amount in FPL Category 1 is $2,304,000 and Category 2 is $10,496,000. Need to verify numbers are correct. This comment has been addressed.

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	The implementation component is in FPL Category 2.

Summary of Best Available Science Review: Oyster Reef Restoration Program

The Texas Oyster Restoration proposal received strong support across all reviewer levels for its scientific basis and methodological rigor. Reviewers agreed that the proposal was well justified with peer-reviewed and publicly available sources, specifically relevant to the Texas Gulf Coast. Literature was accurately cited and represented in a fair and unbiased manner. The proposal addressed environmental risks, including climate impacts, and included a robust adaptive management approach. While all reviewers affirmed the proposal's scientific credibility, there were some concerns about the clarity of implementation roles and past project experience. Goals and objectives were generally well received, though some requested more specificity. The proposed methods were deemed scientifically sound and appropriate, and the project's potential environmental benefits were clearly outlined. Metrics for success were included, but some reviewers noted a lack of defined targets and needed more detail on monitoring timelines. Long-term and short-term risks were well addressed by most reviewers, though one noted a gap in mitigation planning. The use of recent and relevant scientific information was praised, as was the integration of stakeholder feedback. While the proposal demonstrated an understanding of factors influencing oyster restoration success, it lacked specific evaluations of past project outcomes. The monitoring and adaptive management plans were widely praised, though minor requests for more detail were made. Overall, reviewers found the proposal to be scientifically robust and recommended it for advancement.

Summary of Texas' Response to BAS Comments: Oyster Reef Restoration Program

In response to BAS comments, the state clarified that the proposal represents a program and that past projects have been implemented by likely project partners. Additional information on risk mitigation was included, along with case studies highlighting both successful and unsuccessful oyster restoration efforts in Texas. The state also provided potential scenarios related to risk and uncertainty to illustrate its monitoring and adaptive management approach.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Oyster Reef Restoration Program
Location (If Applicable): Program activity is in the Upper and Middle Texas Coast, particularly in areas with historical location of oyster reefs; including areas within the following Texas RESTORE eligible counties: Nueces, San Patricio, Aransas, Refugio, Victoria, Jackson, Calhoun, Matagorda, Brazoria,Harris, Galveston, Chambers, Jefferson, Orange Counties.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: In State
Date of Review: November 4, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
Applicant provided multiple peer-reviewed and publicly available sources to justify the problem, objectives to meet a possible solution, and methods to reach that solution. Sources include scientific studies, management plans, and recommendation documents from federal agencies and NGOs.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
Proposal directly pertains to the Gulf Coast.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Many sources were used in this proposal from a wide background and using multiple perspectives, from federal to state to NGO to academia. Additionally, these sources were accurately sited and used in an unbiased manner.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Risks were addressed, specifically relating to climate and environmental concerns. Risks considered include hurricanes, storms, and droughts.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	

The peer-reviewed and publicly available data cited in this proposal are from diverse sources providing the perspective of multiple entities to build their goal, objectives, and methodology. Citations are mostly from recent publications within the last 10 years, with some older publications expressing the status of oyster reefs over time. Scientific sources are from recognized oyster experts with supporting metrics that enhance the proposal.

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The applicant provided statistics that justify the problem and the historical decline of oyster populations. The applicant cited multiple peer-reviewed publications to justify the methods for restoring oyster reefs and the additional investigations required to determine the best site selection, cultch material, etc. Data provided from citations show integrity and quality, and these data support the proposal's objectives.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Risks are well documented using multiple citations from known researchers on the Texas Gulf Coast. The risks are communicated and uncertainties in the outcomes.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
The applicant does not refer to previous projects that they have personally implemented, but the methods and monitoring indicate an understanding of this process. More information would be needed to specifically understand the applicant's history with oyster reef restoration projects.	

Question B	
Does the project/program have clearly defined goals and objectives?	Need more information

Comments:	
The objectives are vague including the targeted number of oyster reefs to be restored, the area, and/or the specific systems where the reefs will be restored in. However, the goal specifies restoration of non-commercial oyster reefs along the Texas Gulf Coast and seems to be broad to allow for unique designs. It is implied that objectives and targets will be defined throughout the planning process.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The applicant lists methods that have been scientifically backed with peer-reviewed papers or publicly available documents like management plans and recommendations from NGOs. There are multiple approaches that the applicant considers depending on the environment, showing an understanding of the different factors that may influence the success of a project.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The applicant describes how non-commercial oyster reefs can provide habitat benefits, shoreline protection, fisheries support, and more by citing peer-reviewed publications. The applicant also refers to multiple management plans, including the Texas Coastal Resiliency Master Plan.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information
Comments:	
Success measures are not clearly defined.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The applicant clearly states the project's vulnerability to long-term environmental risks and indicates consideration of these risks throughout the project planning and implementation process.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	No
Comments:	
Implementation risks and mitigation plans to reduce risk were not mentioned in this proposal.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Scientific peer-reviewed articles were mostly from the last decade with many more recent in the last 2-5 years. The applicant took recency of their citations into consideration to help define the problem and address the solution.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
It is not clear whether the applicant has evaluated past successes or failures of similar efforts, but they reference other restoration projects led by different organizations. The citations point to publications by other agencies and NGOs that have engaged in oyster reef restoration.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information

Comments:

While the applicant states the options for monitoring and the importance of adaptive management, metrics are not clearly stated including recommended monitoring timeline. However, the applicant does state that the metrics will be selected based on the project goals and objectives.

Please summarize any additional information needed below:

This proposal considers recent, peer-review publications along with publicly available documents from state and federal agencies, NGOs, and academia. The citations build a strong backing for the problem at hand (decline in oyster populations) and the proposed solution (restore non-commercial oyster reefs). The applicant provides sufficient justification on their design preferences, methods, and risk that may impact this project. Multiple management plans and state-wide guidance documents like the Texas Coastal Resiliency Master Plan were considered and will continue to be considered throughout the project lifecycle. This applicant provided unique and highly valuable information by incorporating working group feedback with government agencies and NGOs, which allows participants to provide feedback through a survey. Survey results indicated strong support and emphasized the need for a program like this in Texas.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Oyster Reef Restoration Program
Location (If Applicable): Program activity is in the Upper and Middle Texas Coast, particularly in areas with historical location of oyster reefs; including areas within the following Texas RESTORE eligible counties: Nueces, San Patricio, Aransas, Refugio, Victoria, Jackson, Calhoun, Matagorda, Brazoria,Harris, Galveston, Chambers, Jefferson, Orange Counties.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of State
Date of Review: September 10, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
The objectives and methods are justified and use well-established peer reviewed information that is particularly relevant to the Texas Gulf Coast.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
To reiterate my previous comment, the information is very relevant to the Texas Gulf Coast	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
I am familiar with quite a few of the cited references and authors. The proposal cites excellent and relevant publications.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
The proposal does an excellent job in spelling out and evaluating specific, uncertainties (weather and climatic events, anthropogenic impacts, etc.) The proposal spells out adaptive management strategies to address these real concerns to the success of the project(s).	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The applicant did a thorough job in providing justification for the project using excellent and relevant peer-reviewed data.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
Well-established metrics for success were spelled out that support the ability to maximize quality, objectivity and integrity of information.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Risks and uncertainties were well documented and understood.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
The project sponsor demonstrated an excellent history and track record of implementing previous projects similar to this one.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Primary Goal: Restore and Conserve Habitat Primary Objective: Restore, Enhance and Protect Habitats Secondary Goal: Replenish and Protect Living Coastal and Marine Resources Secondary Objective: Protect and Restore Living Coastal and Marine Resources	

Question C

Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes

Comments:

In general, the proposed methods are ones that the restoration community supports. Also, the fact that they propose intertidal and subtidal reef restoration, living shorelines using oyster cultch and oyster spawning reserves is an excellent comprehensive approach. I also like their proposal to utilize a habitat suitability assessment to assess the potential for long-term success or failure for the project.

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes

Comments:

Environmental benefits of enhancing lost oyster habitat and productivity were well defined. They also describe several underlying stressors leading to the historical loss of oyster habitat along the Texas coast and how their plans will deal with those stressors.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:

Success measures were clearly spelled out in the proposal. These include reef area, oyster recruitment and density and length of shoreline protection.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

Proposers identify climatic events, including hurricanes, extreme storms, and prolonged droughts as substantial risks which can cause increased erosion, sediment displacement, and habitat destruction, directly affecting the construction, effectiveness, and longevity of restoration projects. Proposers recommend considering Texas water budgets when planning for successful oyster restoration. They also mention that hydrodynamic-oyster population models can be useful for simulating potential oyster health scenarios.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The proposers describe many, if not all, of the short-term risks and uncertainties of oyster restoration, and because of these concerns they smartly describe their intention and approach to adapt the principles of adaptive management, which are critically useful in both planning and managing restoration projects, to increase the probability of success.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Their section on Risks and Uncertainties goes into great detail in discussing (and referencing) the many issues confronting oyster habitat restoration. The information is both recent and relevant, so they have a clear understanding of the challenges they will be facing.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
The project identified risks associated with oyster habitat restoration, but I did not find any information in the proposal that evaluated past successes or failures from previous projects. From my own experience, I have had both success and failure in undertaking this kind of work – there is no guarantee that any one project will be successful. But the proposers demonstrate an understanding of this, and have proposed methods to minimize failure by identifying such vulnerabilities in their site selection criteria.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how	Yes

is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	

Comments:

The proposers do an excellent and comprehensive job in their approach to monitoring and data management. They identify a suite of well-established metrics to measure success, including habitat metrics (e.g., reef height, reef rugosity), geomorphology (e.g., shoreline gain/loss), hydrology (e.g., dissolved oxygen, salinity), sediment (e.g., sedimentation rate, reef subsidence rate), adjacent habitat (e.g., density and percent cover of aquatic vegetation, species composition), and oyster population attributes (e.g., oyster density, size frequency distribution, disease prevalence).

They also recognize the critical importance of adaptive management in considering the risks and uncertainties, in particular those that may set back, delay, or prevent the project implementation. Recognizing this, they have allocated 10% of the total budget for contingencies, providing a buffer for adaptive management.

Please summarize any additional information needed below:

This review was requested to determine if the Best Available Science (BAS) was being utilized to accomplish the goals and objectives of this project/program. It is my expert opinion that they have very successfully demonstrated this to be true. They have shown previous success in Texas oyster habitat restoration projects, a thorough understanding of risks and uncertainties and how to address them, and the environmental benefits of this project. Their approach using adaptive management is sound, and their proposed methods are considered tried-and-true within the oyster habitat restoration community.

Therefore, I have no concerns in recommending this proposed project to move forward from a scientific perspective.

Thank you for the opportunity to review this proposal on its scientific merits.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Oyster Reef Restoration Program
Location (If Applicable): Program activity is in the Upper and Middle Texas Coast, particularly in areas withhistorical location of oyster reefs; including areas within the following Texas RESTORE eligiblecounties: Nueces, San Patricio, Aransas, Refugio, Victoria, Jackson, Calhoun, Matagorda, Brazoria,Harris, Galveston, Chambers, Jefferson, Orange Counties.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of Gulf
Date of Review: October 10, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
The proposal includes many citations to relevant peer-reviewed literature, and the literature review appears to be comprehensive.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The proposal directly pertains to the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Yes, the literature is cited accurately and fully.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Several risks and sources of uncertainty have been identified, particularly those that affect coastal hydrology and water budgets.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The proposal is well supported by peer-reviewed literature and publicly available data/reports. Cited literature include seminal works and recent publications.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The proposal includes consideration of many different factors that could affect the success of oyster restoration projects, supported by peer-reviewed literature, and also includes expectations of project candidates to consider habitat suitability models when siting projects. The adaptive management section also outlines monitoring expectations across different phases of each restoration project to ensure accountability.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Risks and uncertainties are well summarized and supported by literature, and plans to mitigate the risks are also included.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
There is discussion of many oyster restoration projects that have been implemented in Texas, but it is unclear whether the proposing team managed or oversaw those projects. Language throughout the proposal, such as in the discussion of permitting requirements, indicates the team has led oyster restoration projects previously, but their role in managing prior projects is not stated explicitly.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes

Comments:
The proposal includes a well defined goal and key considerations to be made of candidate projects, though there are no specifically defined objectives.

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The methods include several key considerations that should be made before instituting oyster reef restoration projects, and outlines an expectation that supported initiatives use habitat suitability modeling to inform project siting. The proposal does not discuss cost-effectiveness or include other specific review criteria.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The “Environmental Benefits” section outlines several benefits of oyster reef restoration. This section does not describe underlying environmental stressors, but such stressors are comprehensively discussed earlier in the proposal. Several regional plans are cited throughout the proposal in which oyster reef restoration projects are called for.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Five metrics are included, though the targets are listed as 0 for each, and the narratives for each metric do not elaborate on the metrics in detail.	

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

Yes, several risks that drive coastal hydrology (e.g. extreme weather events, sea level rise, erosion, wetland loss) are discussed along with their potential impacts to oyster reef restoration projects, and the risks and uncertainties section is well supported by peer-reviewed literature.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

The proposal has a particularly strong adaptive management section in which a monitoring plan is outlined, which will facilitate data collection at different restoration project stages to create points in time when adaptive actions can be taken to mitigate project failure. There is also discussion of monitoring metrics beyond just the biophysical (e.g., to evaluate socio-economic outcomes to nearby communities), but it is unclear whether such monitoring will actually occur.

Question H

Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes

Comments:

The proposal cites a combination of seminal works and recent publications and reports.

Question I

Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes

Comments:

The proposal, in many places, explains factors that are known to contribute to the success or failure of oyster reef restoration projects. Specific project successes and failures are not described, but the factors that generally lead to success or failure are.

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes

Comments:

The monitoring and adaptive management plan is particularly strong, and well supported by literature. The monitoring plan will produce information needed to assess whether adaptive actions are required to mitigate project failures. The monitoring plan does not directly reference the performance metrics, but there is some overlap between the metrics and the proposed monitoring measures. The data management plan is also clearly conveyed and comprehensive.

Please summarize any additional information needed below:
Click here to enter text.

Protecting and Restoring Waterbird Rookery Habitat Program

RESTORE Council Proposal Document

General Information

Title:
Protecting and Restoring Waterbird Rookery Habitat Program

Project Abstract:
The Protecting and Restoring Waterbird Rookery Habitat Program for Texas is dedicated to safeguarding and enhancing critical nesting habitats for waterbirds. With over 600 bird colonies mapped across Texas, many located on dredge-material islands, resources are needed to address waterbird population decline associated with factors such as inadequate ground cover, human disturbance, and predation. This program aligns with the Council's Goal 1 to restore and conserve habitats by focusing on the protection and enhancement of rookery islands. With a proposed budget of $12.8 million, the program will support restoration techniques that include sediment placement, protecting natural shorelines, and habitat management and stewardship. It will also include planning, implementation, and monitoring activities to ensure success. Priority will be given to projects that have undergone prior vetting and align with key criteria, such as project readiness, scalability, and potential effectiveness. The overall goal is to improve the resiliency and sustainability of waterbird populations in Texas.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: N/A

Co-sponsoring Agency(ies):
TX

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

Priority Criteria Justification:
This is a large-scale program that will help restore coastal bird populations through restoring key nesting habitats along the entire Texas coast. Protecting and restoring waterbird habitat is an important issue of Gulf-wide importance. In Texas, nearly $34.4 M have been invested to enhance the understanding and implementing restoration of bird rookeries (DWH project tracker), yet additional work is needed to continue to address this large-scale concern.

Colonial waterbirds and their island rookeries are key resources addressed in various regional, state, and Gulf-wide Plans including:

- The Texas Coastal Resiliency Master Plan (GLO, 2023)
- Deepwater Horizon Oil Spill Natural Resource Damage Assessment Texas Trustee Implementation Group Draft Restoration Plan/Environmental Assessment #2: Restoration of Wetlands, Coastal, and Nearshore Habitats; Nutrient Reduction; Oysters; Sea Turtles; and Birds (2022)
- Restoring the Gulf of Mexico for Birds and People (The National Audubon Society, 2019)
- San Antonio Bay Rookery Island Management Plan (San Antonio Bay Partnership, 2015)
- Whooping Crane Strategic Plan (International Crane Foundation, 2016)
- Gulf Coast Join Ventures Conservation Plans (various: reddish egret (2009), little blue heron (2016), mottled duck (2007))
- Colonial Waterbird and Rookery Island Management Plan (Coastal Bend Bays and Estuaries Program 2005)
- North America Waterbird Conservation Plan (USFWS 2002)

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Protect and Restore Living Coastal and Marine Resources

Secondary Comprehensive Plan Goals:
Replenish and Protect Living Coastal and Marine Resources

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Protect natural shorelines
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement
Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship

Location

Location:
Texas Coastal Zone, particularly in areas identified as rookery habitat. This includes coastal and estuarine areas within Texas RESTORE eligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris, Jackson, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Orange, Refugio, San Patricio, Victoria, and Willacy.

HUC8 Watershed(s):
Arkansas-White-Red Region(Red-Washita) - Red-Lake Texoma(Southern Beaver)
Texas-Gulf Region(Neches) - Neches(Lower Neches)
Texas-Gulf Region(Neches) - Neches(Pine Island Bayou)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(West Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Spring)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(East Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Buffalo-San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(North Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(West Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Austin-Oyster)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Lower Brazos)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Lower Colorado(Lower Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(San Bernard)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Navidad)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(Lower Guadalupe)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Lower San Antonio)

Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Mission)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Lower Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Palo Blanco)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Laguna Madre)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Sabine Lake)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Lavaca)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(San Fernando)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Baffin Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central Laguna Madre)

State(s):
Texas

County/Parish(es):
TX - Aransas
TX - Brazoria
TX - Calhoun
TX - Cameron
TX - Chambers
TX - Galveston
TX - Harris
TX - Jackson
TX - Jefferson
TX - Kenedy
TX - Kleberg
TX - Matagorda
TX - Nueces

TX - Orange
TX - Refugio
TX - San Patricio
TX - Victoria
TX - Willacy

Congressional District(s):
TX - 18
TX - 22
TX - 27
TX - 14
TX - 36
TX - 34
TX - 7
TX - 9
TX - 8
TX - 38

Narratives

Introduction and Overview:
The Protecting and Restoring Waterbird Rookery Habitat Program for Texas is dedicated to safeguarding and enhancing critical nesting habitats for waterbirds. This initiative aligns with the Council's Goal 1: Restore and Conserve Habitat and Objective 1: Restore, Enhance, and Protect Habitat. The program considers planning and implementation projects that use the Council's priority approaches to create, restore, and enhance coastal wetlands, islands, shorelines, and headlands (sediment placement and protect natural shorelines) and protect and conserve coastal, estuarine, and riparian habitats (habitat management and stewardship).

A study found that since 1970, there has been a net loss of 2.9 billion birds (a 29% reduction) across all biomes in the continental United States (Rosenberg et al., 2019). Texas is home to numerous important nesting waterbirds, including various herons, egrets, ibises, terns, skimmers, and gulls. Over 600 bird colonies have been mapped in Texas, many of which are located on dredge-material islands (Gao and Hardegree,2022) (see Figure 1). Yet, populations of water birds in Texas have been declining; this decline is attributed to several causes, including the availability of appropriate ground cover and substrate, impacts from recreational activities and human disturbance, and competition among birds for limited nesting space (Chaney, Blacklock, and Bays, 2003). Also contributing to this decline is predation from imported red fire ants, raccoons, coyotes, and feral pigs (Gibson et al., 2018; DeRose-Wilson et al., 2018; Hardegree, 2014).

A content analysis of 119 planning and restoration documents, including those from local, state, and federal entities as well as NGOs, was conducted to identify priority issues and coastal restoration and conservation needs in Texas. These documents included various area management plans, state environmental program plans, conservation plans for various species, and documents

related to restoration projects that were either funded or in need of funding. This analysis identified altered, degraded, or lost habitat as a primary issue of concern. Rookery habitat was identified as the third most mentioned habitat in the plans, following wetlands and rivers and streams. This information, in addition to other habitat trend information, was used to create an initial list of potential programs for Texas.

The proposed programs were presented for discussion in July of 2023 to two Texas state working groups (government agency and NGO) that advise the Texas RESTORE process. Following the presentation, a survey was administered to the working groups. The responses indicated that the rookery program is a high priority for many of the working group agencies and their contributing partners. There was significant interest in examining alternative approaches, ways to reduce costs, and concerns regarding the longevity of habitat due to erosion and submersion.

The rookery program was one of five that proceeded to public comment in March of 2024. This program received 14 comments, five of which were in support of the program. Two supporting comments highlighted the decline in waterbird populations and argued that this program would help address that need. There were no specific comments opposing the program.

Many rookery islands in Texas were originally created through the placement of channel dredge material in shallow coastal bays and estuaries (Chaney et al.,1978). Some of these islands have developed into productive habitats for colonial waterbirds, while others have eroded and are now submerged. Many dredge spoil islands have not been replenished over the years and face erosion, putting them at risk of becoming unusable (Hackney et al., 2016).

To address these issues, the program will fund planning and implementation projects that include key strategies such as:
1.) Dredge Material Placement: The use of dredged material can help address erosion and build habitats.

2.) Erosion Control: Shoreline protection measures, such as living reefs, shoreline armoring and nourishing, segmented breakwaters, and artificial reef structures, can help control erosion.

3.) Vegetation Planting and Control: Restoration can be enhanced by planting specific vegetation required by certain species for nest construction. The removal of exotic grasses, which can invade uplands where woody vegetation would otherwise establish, is beneficial for maintaining the preferred substrate for the colony.

4.) Control of Predation and Other Disturbances: Managing predation and reducing human disturbances are crucial for protecting waterbird nesting success. This may include activities like public education.

Rookery island protection and restoration are top priorities for several Texas working group entities. Various plans, such as those by Coastal Bend Bays and Estuaries, Texas Audubon, and Gulf Coast Joint Ventures, identify rookery habitats for restoration across the state. These reports outline

conservation and management goals for primary nesting sites, focusing on focal species and habitat goals. Focal species in this program include, but are not limited to, Great Blue Heron, Great Egret, Reddish Egret, Little Blue Heron, Gull-billed Tern, Black Skimmer, Caspian Tern, and Tricolored Heron (Hardegree, 2014; Harte Research Institute, 2024a).

The program will develop a framework for selecting priority projects. Example projects for consideration can be found in current planning documents such as the Texas Coastal Resiliency Master Plan (TCRMP) (Texas General Land Office, 2022). The TCRMP proposes an estimated $1.87 billion in 121 Tier 1 coastal resiliency projects, spanning 10 priority statewide actions. These reflect a careful consideration of the complex characteristics of the Texas coastal zone by the TGLO and the Plan's Technical Advisory Committee (TAC). The TAC includes coastal planners, community leaders and decision-makers, coastal scientists and engineers, ports and navigation professionals, private industry leaders, technical experts, resource agency and regulatory staff members, and individuals. There are 11 rookery projects on the TCRMP Tier 1 list with budgets ranging from $2.3M to $37.5M (see Table 1). In selecting which projects to support through this program, considerations will be taken to leverage ongoing work and opportunities to make the most impact on rookery habitat conservation. While the TCRMP Tier 1 list provides examples of funding needs, consideration of support from this program will be open to other proposals as well.

Fundable projects must demonstrate rigorous planning, feasibility and support by the public and conservation community. These projects will incorporate activities such as those described in the methods section.

By implementing these strategies, the Protecting and Restoring Waterbird Rookery Habitat Program for Texas will help to ensure the sustainability and enhancement of vital waterbird habitats, contributing to the conservation of these important species and their ecosystems.

Proposed Methods :
This program will implement a project selection process that evaluates the need for the project, its potential to benefit key species, the feasibility of the design and location, and the applicant's (and team's) demonstrated ability to implement and successfully construct the project. In addition, project applicants will be required to submit project success metrics, examples of which are presented in this program description under "Metrics."

Funds will be used for activities related to the planning and implementation of waterbird rookery habitat conservation and restoration. It is recommended that proposed projects utilize a habitat suitability assessment to determine the potential for long-term success or failure of the proposed project. Resources to support placement of a project include the Colony Island Network Design and Implementation (CINDI) Project Mapping Application (Harte Research Institute, 2024). the Texas Waterbird Survey (Texas Waterbird Society, 2024), and the Texas Beneficial Use Master Plan (in development)(RESTORE the Texas Coast, 2024).

This program will support the beneficial use of dredge material for the restoration of bird island

habitat. The EPA reports that several hundred million cubic yards of sediment are dredged from U.S. ports, harbors, and waterways each year. The beneficial use of dredged material involves repurposing sediment that would otherwise be disposed of in a manner that benefits society and the natural environment, such as for habitat restoration and development (US EPA, 2007). In Texas, dredging of the Gulf Intracoastal Waterway (GIWW) has led to the development of bird island habitats, showing success in providing habitat for waterbird colonies (Chaney et al., 1978). Project planning activities may involve an assessment of the feasibility of using dredged material, obtaining the appropriate permits, and construction designs. Project implementation would involve coordination and construction of the designed project.

This program would also support the use of erosion control and shoreline stabilization methods. The use of breakwaters protects shorelines from wave activity and promotes sediment retention. They can be in the form of living reefs, shoreline armoring, segmented breakwaters, and artificial reef structures. Projects implementing shoreline protection should consider substrate and shoreline slope requirements for specific bird species.

Restoration can be enhanced by planting specific vegetation required by certain species for nest construction. The removal of exotic grasses, which can invade uplands where woody vegetation would otherwise establish, is beneficial for maintaining the preferred substrate for the colony. Some bird islands may require additional material such as crushed shell, oyster, or limestone to reduce the growth of undesirable vegetation (NFWF, 2024; Raynor et al., 2012).

Managing predation and reducing disturbances are crucial for protecting waterbird nesting success. This may include activities like creating deeper trenches to prevent predator access to the islands, physically removing predator species, or treating pests such as fire ants (Raynor et al., 2012; A. C. Chaney, Blacklock, and Bays, 2003). A public education campaign may also be implemented to prevent human disturbances to islands, which can lead to rookery abandonment and negatively impact the survivability of hatchlings.

Environmental Benefits:

This program will fund projects with the highest potential to enhance the availability and quality of nesting habitats, thereby increasing avian utilization. The goal of these investments is to protect and bolster colonial waterbird populations in the region by improving the resiliency and sustainability of their critical nesting habitats. Projects will be evaluated based on their ability to reduce mortality and enhance the survivability of key waterbird populations. By focusing on strategic enhancements, the program aims to ensure long-term conservation and support for these vital bird populations. Supporting healthy bird populations enhances the ecology of estuarine ecosystems across Texas and the Gulf of Mexico.

Metrics:

Metric Title: HR013 : Wetland restoration - Acres restored

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: the number of acres restored, cubic volume or mass of sediment deposited, and the number of vegetation plugs. Target to be determined.

Metric Title: HR012 : Shoreline protection - Miles of living shoreline installed

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: linear feet of shoreline protection installed. Target to be determined.

Metric Title: HR008 : Removal of invasives - Acres restored

Target: 0.99

Narrative: The program will consider the following as it applies to individual project goals: acres of management types (i.e., acres over which different management activities are performed) or acres restored (if only one management activity is performed). Target to be determined.

Metric Title: PRM013 : Restoration planning/design/permitting - # environmental compliance documents completed

Target: 0.99

Narrative: Number of environmental compliance documents completed

Metric Title: PRM011 : Restoration planning/design/permitting - # E&D plans developed

Target: 0.99

Narrative: Number of E&D plans developed

Risk and Uncertainties:

Throughout the Gulf states, the U.S. Army Corps of Engineers (USACE) contracts the dredging of more than 100 million cubic yards of sediments annually from federal navigation channels, an estimated 30% of this material is used for beneficial use projects (Parson and Swafford, 2012). The availability, source, and timing of materials present is one of the largest uncertainties in implementing the program. Many ports and channels have maintenance dredging permits, specifying the amount of material to be dredged to maintain navigation. However, the implementation and timing of maintenance dredging depends on various factors, such as budget availability. Another potential delay to the implementation of a restoration project can result from the planning, engineering, and permitting process for a beneficial use project typically taking between three to six years (Parson and Swafford, 2012).

In Texas, coastal habitats and communities are increasingly vulnerable to storm surge damage, especially when combined with heavy precipitation. Periodic and long-term inundation of estuarine habitats can profoundly alter the hydrology of these systems, (Hayhoe et al., 2018; Sweet et al., 2022) undermining their resilience and ability to support diverse wildlife and ecosystem functions. These potential effects on coastal areas include submergence and erosion, saltwater intrusion, and a decline/change in coastal wetlands (Gornitz ,1991; Nicholls and Cazenave, 2010; Mitchell, Herman, and Hershner, 2020). These impacts also extend to the nesting habitats of coastal bird nesting species (Von Holle et al., 2019). Considerations for relative SLR along the Texas coast and local hydrodynamics should be integral in evaluating the potential success and longevity of restoration projects. In cases where data is lacking, expert opinions could be valuable in bridging these gaps (Cooke et al., 2021; Windhoffer et al., 2024).

Impacts of increasing and prolonged inundation extend to nesting habitats of coastal bird species (Von Holle et al., 2019). Trends in sea level rise along Texas bays, as reported by NOAA's Tides and Currents website, exhibit variation along the coast. In Cameron County, Port Isabel shows a rate of 4.32 mm/year, and Port Mansfield records 3.69 mm/year. Along the central coast, Rockport experiences a higher rate of 5.66 mm/year. The upper coast, particularly Eagle Point, shows the most significant trend at 12.93 mm/year (NOAA Center for Operational Oceanographic Products and Services, 2025). These variations highlight regional differences in sea level rise influenced by factors such as subsidence, hydrodynamic changes, and localized environmental conditions. Considerations for relative tide levels and hydrologic trends along the Texas coast and local hydrodynamics should be integral in evaluating the potential success and longevity of restoration projects. In cases where data is lacking, expert opinions could be valuable in planning restoration projects (Cooke et al., 2021; Windhoffer et al., 2024).

Climatic events, such as hurricanes, extreme storms, and prolonged droughts, pose significant risks to restoration activities. These events can lead to increased erosion, sediment displacement, and habitat destruction, directly impacting the construction, effectiveness, and longevity of

restoration projects (Zabin et al., 2022). Hurricanes and extreme storms can affect estuarine water quality and can redistribute sediment across barrier islands and bay systems (Wetz and Yoskowitz, 2013; Hayes, 1978). Recently, a report examined the impacts of two 2024 tropical storm events on bird rookeries on the Texas central coast. Tropical Storm Alberto primarily affected bird populations through storm surge and heavy rainfall, leading to widespread nest failures, particularly for Black Skimmers and Royal Terns on low-elevation islands. Hurricane Beryl followed Alberto and had a less severe initial impact because many species had ceased nesting. Subsequent predation and habitat erosion in northern areas, however, led to long-term challenges, including loss of nesting substrate and reduced habitat quality for waterbirds (Gawlik et al., 2024). Because hurricane activity is variable and uncertain from year to year, addressing these potential impacts requires incorporating adaptive management strategies, such as flexible project designs and ongoing monitoring, to ensure the resilience and sustainability of restoration activities in the face of climatic uncertainties.

In addition to the challenges previously mentioned, predation and human disturbance significantly threaten the success of rookery habitat projects. Ground-nesting seabirds often rely on offshore islands as refuges from mammalian predators, yet predators can reach islands from nearby lands. For example, raccoons, coyotes, and feral pigs can pose substantial risks (Ellis et al., 2007; Chaney and Blacklock, 2005). Factors like predation by red imported fire ants, snakes, and other predators further jeopardize breeding success (Chaney and Blacklock, 2005; Hardegree, 2014). Human disturbances, including recreational activities, exacerbate the difficulty of protecting nesting birds (Stanzel et al., 2018; Hardegree, 2014). Effective measures, such as predator control, public education, and signage to minimize disturbances during nesting seasons, are critical to support the recovery and resilience of these habitats (Hardegree 2014).Project risk and probability of success will be assessed considering the challenges mentioned above.

Monitoring and Adaptive Management:

Given the uncertainties in restoration, the principles of adaptive management are useful in both planning and managing projects to increase the probability of success. Adaptive management is a method to systematically assess and improve the performance of restored systems and contribute to restoration technology (Thom, 2000). In essence, adaptive management involves synthesizing existing knowledge, exploring alternative actions, making explicit predictions of their outcomes, implementing actions, monitoring to determine whether outcomes match those predicted, and using these results to adjust future plans (Murray and Marmorek, 2003).

In implementing adaptive management, this program will use a goal-oriented approach focused on increasing the success of coastal waterbirds. The program will engage established working groups in the development of criteria to select priority projects and utilize monitoring to assess needs and performance. Adaptive management is important considering the risks and uncertainties mentioned above, in particular those that may lower the effectiveness, delay, or prevent the implementation of a project (e.g., storms, drought, permitting issues). Due to these and other potential challenges, the

program allocates 10% of the total budget for contingencies, providing a buffer for adaptive management.

Monitoring activities will occur at both the program level and for each project. The core components for determining the success of rookery habitat restoration and creation include metrics such as acres of habitat restored or created, linear feet of shoreline protected, volume of sediment deposited, number of vegetation plugs planted, area restored from invasive species, and number of successful predator treatments. Also, tracking the successful use of the project sites by waterbirds is important to determine if program outcomes are achieved.

Monitoring of coastal habitat restoration sites will follow established guidance from entities such as TPWD and USFWS and reference guides like the GoMAMN Strategic Bird Monitoring Guidelines (Frederick and Green, 2019). Monitoring will use established reference sites or baseline bird colony data and trends as reference conditions for this program.

Data Management:

Data management for this program is designed to promote transparency in the project selection process. Planning data will be made publicly available, including historical shoreline change data for rookery islands in the state's estuaries, vegetation cover, elevation data, and ecological data related to bird diversity and abundance. Additionally, other information used in decision-making, such as supporting plans, program budgets, and past project performance reports, will also be accessible to guide potential project decisions.

Once projects are selected, geotechnical and engineering data, along with construction specifications, will be made available. Furthermore, data related to post-project implementation will be collected and shared publicly. This includes information on project performance, such as shoreline position, sedimentation, elevation, vegetation succession, bird diversity and abundance, and bird nesting and chick survival.

The Texas Commission on Environmental Quality (TCEQ) and the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC) will collaborate with data producers to ensure data is shared after key activities conclude. GRIIDC, a multidisciplinary repository, tracks, curates, and archives diverse datasets, making them publicly discoverable through digital object identifiers and detailed ISO 19115-2 metadata. This publicly accessible repository will facilitate data access for performance monitoring and adaptive management and ensure data interoperability and reuse.

Collaboration:

Two Texas workgroups were established to provide input on coastal priorities: state & federal Representatives (federal/state) and Non-Governmental Organizations (NGO). Moving forward, the

FPL 4 process will also integrate with ongoing coastal restoration planning processes such as TGLO's Coastal Resiliency Master Plan. The Texas Rookery Program will leverage state and federal efforts including the DOI-FWS Colonial Waterbird Program (FPL 4 proposed). Engagement will also continue with Texas stakeholders and working groups during the project selection process and at that time potential leveraging opportunities (co-funding, adjoining or building on other work) will be considered.

Public Engagement, Outreach, and Education:
The engagement process for FPL 4 is ongoing and involves multiple steps to ensure comprehensive input and alignment with restoration priorities. A content analysis of 119 planning and restoration documents, including those from entities participating in our federal/state and NGO working groups, was conducted to identify key concerns, past restoration projects and programs, and current restoration needs. This analysis, combined with other environmental data, guided the development of potential FPL 4 programs. These programs were presented to the working groups in the summer of 2023 and followed by a survey to gather feedback on the level of support and to request suggestions for changes. The working groups were also given the opportunity to submit additional programs for consideration. After edits and budget adjustments, the proposed programs were opened for public comment (March of 2024). Based on the feedback received and the availability of funding, the programs were then refined, combined, and revised to better meet the needs and priorities identified throughout the process.

Moving forward, the selection process for FPL 4 grant subrecipients will require that projects are vetted through the Texas FPL 4 process or other public process, such as the TGLO's Coastal Resiliency Master Plan. Criteria for selecting projects will include, but are not limited to, the following factors: alignment with issues outlined in the program activity description, availability of funds for the program, project readiness, leveraging opportunities, scalability, risk/benefit ratio, and distribution of funds along the Texas coast. This comprehensive process, which includes both completed and forthcoming steps during program planning and implementation, will ensure that the final project selections align with the RESTORE Planning Framework document and reflect the input of workgroups, elected officials, the public, and the Office of the Governor.

Leveraging:
N/A

Environmental Compliance:
The planning of this program's activity is covered by the Council's NEPA Categorical Exclusion for planning and related activities (Section 4(d)(3) of the Council's NEPA Procedures).

For implementation of FPL activity, environmental compliance will be updated. Potential permitting that may be necessary in implementation of rookery habitat restoration includes USACE permits,

permits for Beneficial Use of Dredge Material, Coastal Zone Management Consistency Certification (TGLO), Surface Lease (TGLO), 401 Water Quality (TCEQ), and consultation with appropriate agencies related to Essential Fish Habitat, Endangered Species Act, Migratory Bird Treaty and Marine Mammal Protection Act. All specific environmental compliance needs will be identified during project identification and development activities.

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Budget

Project Budget Narrative:

A total budget of $12,800,000 is proposed for FPL 4 activities associated with this program. These funds are intended for planning, implementation and monitoring of activity related to the protection and restoration of waterbird rookery habitat. An estimated 3% will be used for project planning, which includes activities such as project selection and development. An additional estimated 5% will be allocated for monitoring and data management activities which include project activity monitoring and collection of data to support metrics for evaluation of success.

Total FPL Project/Program Budget Request:

$ 12,800,000.00

Estimated Percent Monitoring and Adaptive Management: 5 %

Estimated Percent Planning: 3 %

Estimated Percent Implementation: 82 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: 10 %

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
Given the program's budget of $12.8 million and Texas's estimated need of over $92.9 million (Table 1. Texas Coastal Resiliency Master Plan Tier 1 Rookery Habitat Projects*), this program will prioritize and scale projects to maximize impact. The program will consist of several independent projects, which can be scaled down or reduced in number based on available funding. For instance, funds might be allocated to restore one island in a chain where broader restoration is required, allowing additional funds to be leveraged for further restoration efforts.

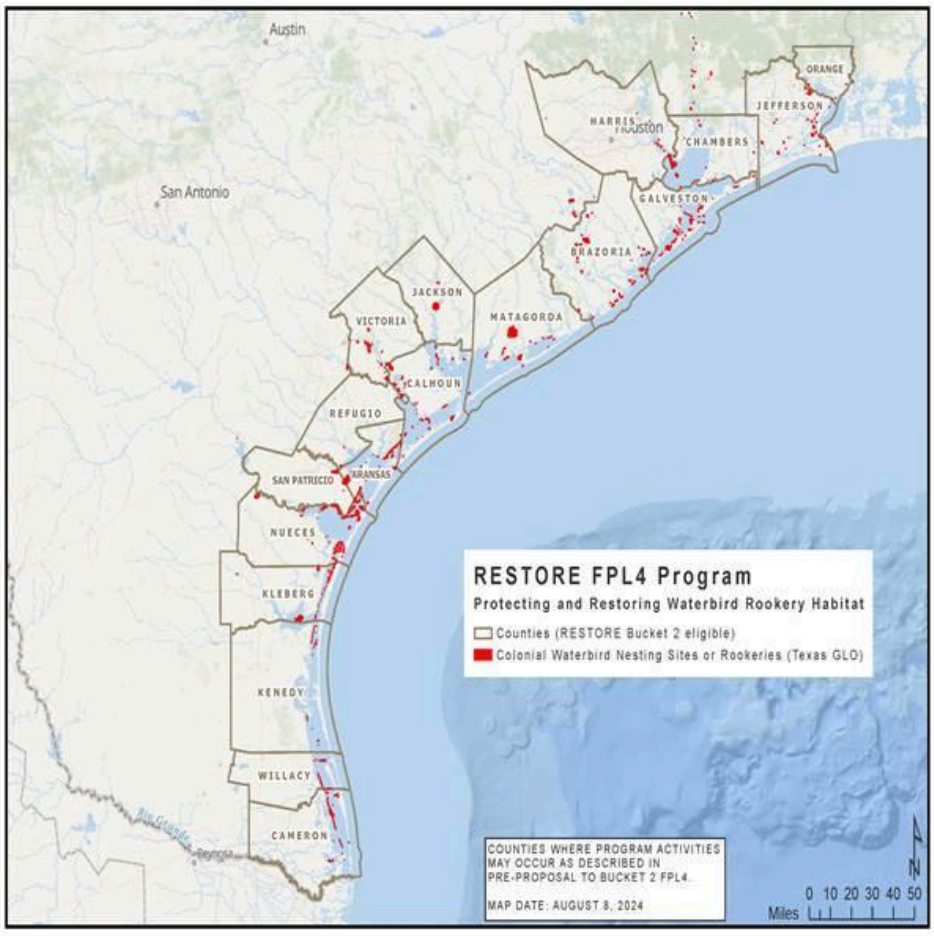
Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	N/A	Note not provided.

Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.

Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Protecting and Restoring Waterbird Rookery Habitat Program

Other Uploads

Tx-Rookeries-Table1.docx
Table 1. Texas Coastal Resiliency Master Plan Tier 1 Rookery Habitat Projects*

Project ID	Project Name	Project cost (Millions)
9230	Bay Harbor Island Stabilization	$2.30
9228	Jones Bay Oystercatcher Habitat Restoration	$3.20
1394	Protection and Restoration of Rabbit Island South	$3.30
1268	Bird Island Restoration and Creation of Gulf Cut Island Complex	$4.00
1393	Protection and Restoration of Benny's Shack Islands	$4.70
72	Long Reef and Deadman Island Shoreline Stabilization and Habitat Protection	$5.30
696	Shamrock Island Restoration - Phase 2	$5.90
1202	Tern Island and Triangle Tree Island Rookery Habitat Protection	$5.90
797	Dickinson Bay Rookery Island Restoration – Phase 3	$6.40
9062	Restore Laguna Madre Rookery Islands	$14.40
21	Galveston Bay Rookery Island Restoration	$37.50
	Total	**$92.90**

**For more information on these projects visit the GLO's website at https://www.glo.texas.gov/coast/coastal-management/coastal-resiliency/resources/files/2023-tcrmp-overview.pdf*

GIS Data_4:

TX_FPL3b_LA.zip

Council Staff Review: Protecting and Restoring Waterbird Rookery Habitat Program

FPL Internal Staff Review

Project/Program	Protecting and Restoring Waterbird Rookery Habitat Program		
Primary Reviewer	Heather Young	Sponsor	Texas
EC Reviewer	John Ettinger	Co-Sponsor	N/A

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	More information needed
Notes	Location states all activity will be within TX Coastal Zone within Texas RESTORE eligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris, Jefferson, Matagorda, and Refugio. However, 18 counties were selected in PIPER and featured on a map. Need clarification. Response: TX added the 8 other eligible counties: Orange, Jackson, Victoria, San Patricio, Nueces, Kleberg, Kenedy, Willacy

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	More information needed

Notes	The FPL 4 proposal provides the total funding amount requested for the activity, along with the percentage breakdown between FPL Categories 1 and 2. By applying the percentages to the total for the activity the requested amount in FPL Category 1 is $2,304,000 and Category 2 is $10,496,000. Need to verify numbers are correct. This comment has been addressed.

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	The implementation component is in FPL Category 2.

Summary of Best Available Science Review: Protecting and Restoring Waterbird Rookery Habitat Program

The Texas Rookery Islands proposal was generally well-received by reviewers for its scientific foundation and thoughtful planning. Reviewers agreed that the proposal is supported by peer-reviewed and publicly available information, with clear objectives and methods that are relevant and adaptable to the Gulf Coast region. The proposal includes a comprehensive bibliography and acknowledges a variety of environmental risks, including sea level rise and storm impacts, though some reviewers recommended further elaboration on these risks and the inclusion of additional literature—particularly regarding sustained predator and human disturbance management. Reviewers praised the adaptive management framework and the use of the GRIIDC data repository for monitoring and data management.
However, several areas were flagged for improvement. These include the need for clearer articulation of success metrics (e.g., restoration targets), prioritization of species or geographic areas, and better definition of potential project selection criteria. Some reviewers noted the lack of explicit discussion of past successes or failures from similar efforts, suggesting that incorporating case studies would strengthen the proposal. Despite these gaps, the proposal was recognized for integrating best available science, employing sound restoration principles, and offering a flexible, adaptive structure suited to evolving conditions and varied implementation scenarios. Overall, the proposal is seen as scientifically robust and ready for advancement, with minor enhancements recommended to improve clarity and strategic focus.

Summary of Texas' Response to BAS Comments: Protecting and Restoring Waterbird Rookery Habitat Program

In response to BAS comments, the state committed to strengthening the proposal by addressing several key areas. They included additional information on the risks posed by sea level rise (SLR) along the Texas coast and also incorporated discussion of predator risks and long-term sustainment of restored rookery islands. The state provided more detail on how priority species or habitats may factor into project selection, as well as example scenarios illustrating potential project risks. Furthermore, considerations for past project successes, failures, and challenges were used to inform future efforts. Lastly, they included more detail on the types of projects that may be selected or the criteria that will guide project selection.

Best Available Science Review Forms: Protecting and Restoring Waterbird Rookery Habitat Program

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Protecting and Restoring Waterbird Rookery Habitat Program
Location (If Applicable): The location of this program activity within the Texas Coastal Zone, particularly in areas identified as rookery habitat. This includes coastal and estuarine areas within Texas RESTOREeligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris,Jefferson, Matagorda, and Refugio.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: In State
Date of Review: 1 October 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	

The proposal adequately provides justification using peer-reviewed and publicly available information. In the narrative/overview, I think use of the Texas Colonial Waterbird Society dataset would have provided stronger justification for declining waterbird species. Otherwise, the available information was properly used in the proposal.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
This project proposal is within the Gulf Coast region, specifically along the Texas coast.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Overall, yes. In some sections of the proposal, more literature could have been provided. For example, in risks and uncertainties, the section on sea level rise was minimal in terms of available literature out there on modeling SLR and future scenarios for GOM including Texas coastline. SLR is potentially the greatest risk and uncertainty facing rookery islands and using available literature and developed models will be important in determining which subprojects are funded.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Yes but as discussed in Question 3, sea level rise and more specifically the extent of rise and potential exacerbation by storms, storm surge, etc. play a significant role in achieving the proposal's stated goals, especially over the long-term.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Yes, this proposal is justified and based on sound science.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
Yes, development of the proposal included many planning and restoration documents, discussion with state working groups and made available for public comment.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	
Risks and uncertainties are definitely addressed in the proposal and communicated. I would recommend that the sustainment of predator management and human disturbance mitigation be included in risks and uncertainties as these management issues likely persist into the future and funding beyond the proposed projects would be needed to ensure a restored rookery continues to function as suitable habitat for nesting waterbirds.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	

Yes, project sponsor and partners have achieved similar goals in waterbird rookery restoration and protection and the experience and expertise needed to achieve these goals are present as outlined in the Collaboration section of the proposal.

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The proposal goals are overall clearly stated. I am unsure if creation of rookery islands is a goal or is the focus on restoration and protection of rookery islands. There is some verbiage about creation of habitat but unclear if this is goal or just was used in the proposal under Council's priority for "create, restore, enhance coastal wetlands, islands….". I would recommend that rookery island creation be included in potential projects to be funded especially as the proposal outlines in risks and uncertainties concerning availability, source, and timing of materials of beneficial use. Opportunities may present themselves where creation of islands may be more feasible and achievable.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
It would be useful to include if there are priority species and or priority areas (e.g., estuaries, bays) that this proposal would target for proposed projects. For example, if Black Skimmers are prioritized (just an example), would proposed projects need to address if this species would benefit. Likewise, if a bay or estuary was deemed priority due to loss of existing rookery islands, would proposed projects need to address potential benefits. Also, it is unclear how predator management and/or human disturbance management would be sustained after the proposed projects are implemented. Predator and human disturbance management should be included in risks and uncertainties since these management actions would likely be required into the future for any restored rookery island.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	

Yes, the proposal identifies the environmental benefits, namely enhancement of nesting habitats for waterbirds and improving resiliency and sustainability of rookery islands. The proposal is a bit vague on how these restored rookeries will be sustained against environmental stressors like human disturbance, predation and even sea level rise (other than shoreline protection).

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information

Comments:

Perhaps I am unclear here but the proposal lists metrics to be collected and evaluated but there is no target provided for any of the metrics (e.g., acres restored – target: 0). While sub-projects under this may vary in size and scope, it seems useful for overall project proposal with budget of 12.8M would have some idea of targets to be achieved.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

Yes, the proposal discusses potential risks to long-term environmental change. See Question G for some concerns that I have.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

As stated before, I would recommend any proposed project clearly state how future projections of SLR could impact the proposed rookery restoration. I think this is the biggest risk to proposed projects is the sustained protection of rookeries over the long-term after they have been restored in the short-term.

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Yes	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No
Comments:	
While I think this proposal is very sounds, there does not seem to be any documented evaluation of past successes and or failures of similar efforts. The proposal discusses the risks and uncertainties but no examples of evaluations of successes and failures. There are known rookeries that have been extensively restored in Texas (e.g. Chester's Island) but there does not seem to be examples like this included in proposal.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
Yes, use of GRIIDC is sound and will ensure data storage and sharing.	

I recognize this is a review of proposal for FPL program so project-specific details are lacking. I would recommend more thought be given to what specific types of projects may be most needed for this program, that is, ones that benefit species of greatest conservation need or bays/estuaries experiencing the greatest loss of rookery islands, or other factors. I think a prioritization list of project ideas could be beneficial in selecting projects funded under this program/proposal.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Protecting and Restoring Waterbird Rookery Habitat Program
Location (If Applicable): The location of this program activity within the Texas Coastal Zone, particularly inareas identified as rookery habitat. This includes coastal and estuarine areas within Texas RESTOREeligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris,Jefferson, Matagorda, and Refugio.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of State
Date of Review: Sept. 23, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
Yes, there is good and sufficient reference given to existing work that is relevant to this proposed project.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
Yes, though there is specific reference to the proposed area of this work the references provided do afford broad perspective and applicability to a variety of locations.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Yes, there is a diversity among the references provided, diversity in focal area, sources, and how they are presented in support of the proposed efforts.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Yes, risks and potential limitations are noted. There are specific objectives noted and the larger framework is presented as adaptive in that the methods incorporate an updatable program that can be modified dependent upon outcomes and learning.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Yes, given the limited scope in which the project proposal can be delivered I believe the applicants have done a good job capitalizing on presenting the most relevant information in a clear, tractable manner.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The application is presented in a clear way that manages objectives within a clearly-defined scope. The integration of existing programs within the proposed work also supports the strength of this project and it proceeds in using existing science to improve and implement targets.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Please see response to questions B and C, above.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program	Yes

similar to the one being proposed?	
Comments:	
The collaborators in this proposal are defined. Although not explicit in noting prior, comparable accomplishments, the descriptions of collaborative venture showcase that they are capable of providing sound results.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Yes, goals and objectives are provided in a clear manner in that metrics of success are interpretable.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
This project provides clear methodology including potential contingencies based on possible changes that could occur through various circumstances. There is also good reference to existing plans and programs that lend to the adaptive framework proposed. Inclusion of control systems to act as comparables through the restoration process is commendable.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The objectives are associated with particular goals and means by which success can be appraised during the implementation process.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:
Included within the proposal are goals and means through which meeting these objectives can be evaluated. The adaptable nature of the proposed work along with allowance for contingencies allows for some flexibility that presents in a realistic fashion.

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Yes, including contingencies there is also detail on potential for stochastic events that can affect the performance of this project and where the goals may be influenced. These potential changes are more aligned with physical changes to natural systems and less on socioeconomic changes that may be borne out through unexpected events. As a proposal focused on restoration this contingencies make sense in context.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Yes, see response to question F, above.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
The potential for unexpected occurrences that could affect project implementation are noted along with relevant references. The possibility of unforeseen events is also noted within context of the adaptive framework proposed for this project.	

Question I

Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information

Comments:

There is some reference to similar projects that have been carried out. There is also consideration to potential unexpected events and inclusion of an adaptive process within the methods. There did not appear to be specific mention to how other projects hve curbed their methods when potential unexpected events occurred that affected methods.

Question J

Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes

Comments:

Specific goals and objectives are noted within the proposal. These objectives provide a framework by which the delivery of the proposed work can be assessed. Inclusion of specific goals and objectives for a variety of facets and scales within the proposed work points a positive image for this proposal.

Please summarize any additional information needed below:

Overall, the project seems very well-conceived and detailed. The proposal builds on an adaptive foundation that includes potential limits while clearly defining goals and milestones. Specific details within this project such as evaluation of metrics specific to restoration and some of the oganisms involved shows that there is consideration and assessment at a variety of different ecological, temporal, and spatial scales.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Protecting and Restoring Waterbird Rookery Habitat Program
Location (If Applicable): The location of this program activity within the Texas Coastal Zone, particularly in areas identified as rookery habitat. This includes coastal and estuarine areas within Texas RESTOREeligible counties including Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris,Jefferson, Matagorda, and Refugio.
Council Member Bureau or Agency: Texas Commission on Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of Gulf
Date of Review: 31 October 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
I appreciated the extensive Bibliography.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Choose an item.
Comments:	
Project is within the Gulf Coast region; question not applicable.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
The proposal contains a thorough and correctly prepared literature cited section.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
The applicants provide a detailed description of what can go wrong with such projects, and describe steps to mitigate challenges.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The applicants draw on a wide array of peer-reviewed and publicly-available literature.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
Click here to enter text.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Applicants seem well aware of the challenges associated with large scale restoration projects.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
Applicants demonstrate a clear understanding of how these kinds of projects are implemented.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Goals are defined as clearly as possible considering it is not yet known which restoration projects will be selected for implementation.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
Understood that this project seeks to fund restoration projects, but not clear exactly what criteria are used to select projects – is it based entirely on using the CINDI tool being developed by the Harte Institute?	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Click here to enter text.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information
Comments:	
Difficult to answer since metrics of success are likely different depending on each specific project.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:
Applicants do a good job describing risks related to storms, sea level rise, invasive species, etc.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
Difficult to answer since these kinds risks and uncertainties could vary considerably on which specific projects are chosen for implementation.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Need more information
Comments:	
Difficult to answer since not yet known which project will be implemented.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
Although specific past failures are not cited, it seems to me this is the purpose of developing adaptive management approaches, which the applicants discuss.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	

I appreciate that the Data Management Plan includes the use of GRIIDC, which is a well-established data repository, and that data (as a measure of restoration success) are collected via standardized bird survey approaches (GoMANN).

Please summarize any additional information needed below:

This proposal outlines a substantial project to select and fund restoration projects for coastal waterbirds in Texas. The approaches seem well-supported by the available peer-reviewed and other literature, and I appreciate the effort taken to demonstrate an awareness of the many entities involved in coastal restoration activities along the Texas coast.

Appendix C: Coastal Louisiana Proposal Packet

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Chandeleur Islands Restoration Project

RESTORE Council Proposal Document

General Information

Title:
Chandeleur Islands Restoration Project

Project Abstract:
The Chandeleur Islands Restoration Project is an entire ecosystem restoration project that will restore wildlife and fish habitats for several species. It will also focus on preserving and enhancing 5,200 acres of the island's marine seagrass meadows. The project is located on a remote barrier island complex in SE Louisiana, more than 20 miles offshore and managed as Breton National Wildlife Refuge. This project include restoration activities on both North Chandeleur and New Harbor Islands in St. Bernard Parish.

The restoration strategy is designed to reverse decades of erosional wetland loss and provide direct benefits to a wide range of wildlife and fish species that were impacted by the 2010 DWH Oil Spill. This includes sea turtles such as Loggerhead, Green, and the endangered Kemp's Ridley. Several bird species will benefit, including colonial nesting waterbirds and foraging birds. A wide variety of fish species including reef fish, sharks, and game fish will benefit. Additionally, eighty species designated as 'Species of Greatest Conservation Need' will benefit from this project.

Restoration of the Chandeleur Islands will rebuild an important barrier island that serves as a first line of defense for many communities in St. Bernard Parish. The island is rapidly eroding, and its restoration is featured in St. Bernard's 2022 Coastal Strategy Document to mitigate against storm surges from tropical storms and hurricanes. This project is being implemented by Louisiana Coastal Protection and Restoration Authority and the United States Fish and Wildlife Service.

FPL Category: Cat2: Implementation Only

Activity Type: Project

Program: N/A

Co-sponsoring Agency(ies):
DOI/FWS

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.
(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.
(IV) Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Priority Criteria Justification:
This project is designed to address the primary threats that are limiting the population growth and existence of many species. The project will build nesting habitat for a wide variety of colonial water birds, and solitary waterbirds, Loggerhead sea turtles, Green sea turtles and Kemp's Ridley sea turtles. The project will also protect and enlarge the subaqueous habitats for the continued existence and expansion of the Northern Gulf of America's most diverse assemblage of marine seagrasses. These sea grasses are important nursery grounds for pelagic reef fishes, Lemon Sharks, and foraging habitat for Gulf Sturgeon, Redhead Ducks, and a variety of sea turtles. Without this project these habitats will continue to be lost at an ever increasing rate.

This project is a unique opportunity for whole ecosystem restoration. North Chandeleur Island spans 13 miles long. The project will restore the basic building blocks to ensure that the island is resilient in the face of future storms and will continue to build critical and declining wildlife and fisheries habitats into the future.

The Chandeleur Islands Restoration Project is a barrier island restoration project. This project and similar barrier island maintenance projects are highlighted in Louisiana's 2023 Comprehensive Master Plan for a Sustainable Coast and the 2015 Louisiana Wildlife Action Plan.

The Chandeleur Islands are one of the closest landmasses to the DWH oil spill. It was impacted early and repeatedly by the oil spill. The timing and location of the oil spill not only impacted the beaches, marshes and seagrasses of the islands but also its nesting sea turtles and the largest most species diverse assemblage of nesting waterbirds in the Gulf of America. This project is designed to reinvest lost sediment back to the island in a manner that will make it resilient in the face of future hurricanes so the islands will endure for decades into the future.

Project Duration (in years): 3

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Protect and Restore Living Coastal and Marine Resources

Secondary Comprehensive Plan Goals:
N/A
PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement

Location

Location:
The Chandeleur Islands are remote island chain located in Southeast Louisiana. The islands are 75 miles east of New Orleans, LA and 26 miles south of Biloxi, MS. They are located in St. Bernard Parish between Chandeleur Sound and the Gulf of America. Latitude N29.951776 W-88.825202. They are managed by the USFWS as Breton National Wildlife Refuge.

HUC8 Watershed(s):
Lower Mississippi Region(Lower Mississippi) - Lake Pontchartrain(Eastern Louisiana Coastal)

State(s):
Louisiana

County/Parish(es):
LA - St. Bernard

Congressional District(s):
LA - 1

Narratives

Introduction and Overview:
The Chandeleur Islands Restoration Project is an ecosystem level habitat restoration opportunity that will benefit 4 NOAA endangered species act resources, 21 NOAA managed

species, provide co-benefits to 5 USFWS endangered species act resources, and benefit 80 species of “greatest conservation need” in Louisiana (Holcomb, 2015). In addition to restoring an entire ecosystem for many species of wildlife and fisheries, the restoration of these barrier islands will enhance community resilience to St. Bernard, Orleans and Plaquemines Parishes from hurricanes and tropical storms.

The Chandeleur Island restoration project is designed with the specific goal to restore valuable habitat for fish and wildlife. This restoration will be accomplished by using nature-based solutions to increase and maintain the footprint of the island to an historical acreage. The project will restore important geomorphological features necessary to build and maintain EFH for fisheries that have eroded away. A major focal point of the project will be to enlarge and conserve the marine seagrass meadows and design project features that will allow the island to be resilient for decades into the future. Engineers have already begun to look at future sea level changes at our project location and will design and build an island that is prepared to adapt to those increases in the coming decades. This design will ensure habitats endure well into the future and enhance the island’s ability to dampen effects of hurricanes in this region of the Gulf of America. The project will also include the restoration and protection of New Harbor Island, a remnant barrier headland island located just west of the North Chandeleur Island. New Harbor is home to one of the largest Brown Pelican colonies in the Northern Gulf. Concurrent construction activities will restore a historically larger footprint of the island while providing long-term protection.

The restoration of these islands is truly a high priority, transformational opportunity within the Northern Gulf of America. Without significant restoration of this island and the associated EFH will likely disappear in the next two decades. The loss of this habitat will further compromise the future outlook of 27 species listed as threatened, endangered, or managed by NOAA and the USFWS. The loss of this important habitat linkage between the eastern and western Gulf of America will also compromise 80 Species of Greatest Conservation Need in Louisiana and leave several underserved communities without their first line of defense from hurricanes and tropical storms.

The Chandeleur Islands have influence on over 1.5 million acres of wetlands and shallow waters. They are the eastern boundary of Chandeleur Sound and impact salinity regimens, tidal flow, wave energy, and fisheries movement patterns over much of Southeast Louisiana. The Chandeleur Islands represent the distal border of the Pontchartrain Basin and serves as the littoral boundary between the Gulf of America and the Chandeleur Sound. The barrier island complex has offered a suite of immeasurably important habitats for a wide variety of fish, birds, marine mammals, and sea turtles. So much so, that President Theodore Roosevelt established the Breton National Wildlife Refuge in 1904 by executive order as the second federal refuge of many to follow, and it was the only refuge he ever visited in person.

Unfortunately, the Chandeleur Islands have lost approximately 89% of their late 1800’s historical acreage (11,000 acres to 1,000 acres). This loss of acreage has resulted in loss of various habitats including essential fish habitat such as submerged marine seagrass which impacts a wide variety of species important to NOAA, USFWS, and Louisiana. This loss of acreage has made several underserved communities of Southeast Louisiana more vulnerable to

climate hazards such as tropical storms and hurricanes. The Chandeleur Islands are the first line of defense for several underserved communities in St. Bernard and Plaquemines Parishes. As the islands erode, we lose the first line of defense for these communities against storm surges. This loss compromises the entire multiple line of defense strategy and impacts the resiliency of coastal Louisiana residents.

The major project features include construction of beach, dune, and salt marsh habitats that will work to conserve and protect seagrass habitat on the bay side of North Chandeleur Island. The overall size of the project benefit area is approximately 12,000 acres which includes 1,341-1,512 acres of beach and dune restoration; 468-698 acres of salt marsh restoration; 109 acres of bird colony restoration on the adjacent New Harbor Island; 5,200 acres of marine seagrass meadow preservation and enhancement; and the balance would be the back barrier island watershed acreage that will be conserved by the restoration footprint.

Proposed Methods :

The use of both hopper and cutterhead suction dredge alternatives for excavation, transportation, and placement are anticipated to be used to convey sediment from the borrow area, Hewes Point, to North Chandeleur and New Harbor Islands. Hopper dredges would suspend the sand within the hoppers and directly pump the sand to the island, with assistance of a booster pump and sediment pipeline. Alternatively, a conventional cutterhead dredge would excavate the sand mechanically using a rotating cutter and a large suction pump to pump it to the surface to be transferred through a spider-barge distribution system into multiple scow barges. These scow barges would be towed to a pump-out area where a hydraulic resuspension system connected to a booster pump and sediment pipeline would offload the scows and pump the sand to the islands.

Once the sediment has reached the Island it will be handled in the normal manner. The discharge pipeline will be extended the length of the beach, dune and marsh templates using pipe-handling loaders and bulldozers and the sand will be graded to conform to the plan dimensions using bulldozers, front-end loaders, and other earth moving equipment. Beach slopes and elevations will be conducive to sea turtle nesting (Culver et al 2020) and implemented in previous projects on Florida nesting beaches completed in 2024 such as Lover's Key, Bonita Beach, and Estero Island.

As part of the Project design phase, a conveyance corridor alignment extending from the borrow areas to the shoreline of the Island is delineated. The purpose of designating the corridors is to ensure that the sediment pipelines are sited in alignments that minimize environmental disturbances and potential conflicts with existing infrastructure. The analysis included a review of existing pipeline database maps and potential significant cultural resources. The conveyance corridor alignments were laid out to balance the shortest distance between the Borrow Area and the Island with the lowest number of pipeline crossings. Further, the conveyance corridors were aligned to avoid previously charted obstructions and potential cultural resources. Once tentatively established, the conveyance corridor was surveyed for cultural resources and obstructions using sidescan sonar and magnetometer. Results of the analyses of those data were then used to further refine the conveyance corridor alignment.

Anchoring activities may take place within the conveyance corridor.

The dune platform will have sand fencing installed. The single row of sand fence will promote deposition of windblown sand and conserve sand placed within the fill template. The sand fencing will be constructed of wooden slats, appropriately spaced laterally, and secured with fence wire to wooden posts to form a porous barrier constructed four (4) feet in height above the dune platform (Khalil 2008).

Vegetative planting of the dune and marsh is a vital component of barrier island habitat restoration. The Project includes vegetation of the entire length of the dune and marsh platform at a planting density and composition similar to recent barrier island restoration projects in Louisiana.

The dune platform will be planted immediately following construction. The vegetative plantings would include a mixture of some or all of the following herbaceous species: Bitter Panicum (Panicum amarum var. amarum 'Fourchon'), Seashore Paspalum (Paspalum vaginatum 'Brazoria'), Seacoast Bluestem (Schizachyrium maritimum 'Timbalier'), Seashore Dropseed (Sporobolus virginicus), Sea Oats (Uniola paniculata 'Caminada'), Marshhay Cordgrass (Spartina patens 'Gulf Coast'), and Gulf Cordgrass (Spartina spartinae).

After construction and consolidation, the newly created marsh platform will be planted with Smooth Cordgrass (Spartina alterniflora var 'Vermilion') and other appropriate species.

New Harbor Island will be constructed in the same method as North Chandeleur Island but will enjoy the added benefit of rock placed around the island for shoreline protection from wave driven wind energy. The design of this island will be to preserve and expand the existing Brown Pelican and Reddish Egret Colony. Guidance from Louisiana's Coastal Ecosystem restoration and Monitoring to Create or Improve Bird-Nesting Habitat (Deepwater 2023) have been implemented into the design of this project. The shoreline protection will have gaps along the eastern side to facilitate fisheries access to the island where the existing tidal Black Mangrove marsh will be preserved. The design will not feature a dune or beach feature but will target marsh elevations over the next 20+ years. Vegetative plantings installed will be Black Mangrove (Avicennia germinans), Matrimony Vine (Lycium barbarum), and Smooth Cordgrass (Spartina alterniflora var 'Vermilion').

The design of New Harbor Island implements lessons learned from three recently completed colonial bird nesting restoration projects Queen Bess (BA-202), Rabbit Island (CS-80) and the North Breton Island restoration project built by DOI. Each of these projects demonstrated a significant increase in nesting abundance one year after construction was complete.

No closure of Katrina Cut between North and South Chandeleur Island is planned for this restoration project.

The Chandeleur Island Restoration project will employ lessons learned from previous barrier island and bird colony restoration projects. The restoration of Louisiana's barrier islands and barrier island systems has been a priority over the past several decades. In all, 40 barrier island

projects have been constructed to date (including 11 in the Early Lafourche Barrier System, 20 in the Late Lafourche Barrier System, 6 in the Modern Barrier System, and 3 in the St. Bernard Barrier System and 2 are in design stage as Future Projects (1 in Early Lafourche and 1 in St. Bernard). Most of these constructed barrier island projects have been monitored, and their performance has been assessed to adaptively improve resilience and longevity of these projects and future barrier island projects.

The benefits to sea grasses will be in the preservation of the existing seagrass meadows and the anticipated increased species diversity and density or "percent cover" on the north end of Chandeleur Island. The proposed Chandeleur Island Restoration project will slow down erosion rates of the island footprint by enhancing and enlarging the dune, beach, and marsh features that exist on the island thus preserving habitat conditions on the lee side of the island. The lee side of the islands is where the seagrass meadows exist. As the island erodes and becomes smaller and more tidal, habitat conditions for seagrasses deteriorate and the meadows respond with coinciding loss of acreage. The project proposes building a dune and marsh complex on the north side of Chandeleur Island. These features once existed in this location but have now been reduced to a tidal shoal. Since those features have been lost, the seagrasses behind them also have suffered a significant reduction from multiple species to a single species (Shoal grass). The acreage of seagrasses in this location has also significantly reduced to sparse small pockets of sea grasses. The design of this restoration project will restore the habitat conditions on the lee side of the northern end of Chandeleur Island which will restore the necessary habitat conditions for multiple species of seagrasses to return to this location and allow the existing pockets of Shoal grass to expand into their historical footprint. Planting of seagrasses is also being explored by the design team to help jumpstart the recovery once the dune and marsh complex is complete on the north side of the island.

Barrier island restoration has been a successful technique to restore critical habitat in Louisiana and across the United States (Campbell, 2005; Marine Board, 1995; Rosati, 2009; Rosati, 2007a; Rosati 2007b). With several major barrier island restoration projects in place, the post-restoration estimated Year of Disappearance (YOD) for several barrier island systems in Louisiana have been extended from years to decades. This increase in island longevity throughout the system is a direct benefit of the restoration projects. Further, with the increase in both frequency and intensity of major hurricanes over the past decade (and similar projections into the future), in the absence of the restoration and protection program, it is expected many of these islands would have disappeared much sooner than original projections. (CPRA 2024)

Environmental Benefits:

The project will use nature-based solutions to restore multiple habitat types that support multiple species of wildlife, including many that are at-risk, at the Chandeleur Islands. These habitats exist in a strategic location and abundance that makes the area unique. While restoring specific habitat features for fish and wildlife we will also be restoring a barrier island with resiliency as a focal point. This barrier island is the first line of defense to mitigate storm surges for coastal communities. Restoration of this barrier island will provide benefits to fisheries,

wildlife, and local communities.

Impacts of the project will have wide benefits to a multitude of species listed as threatened or endangered (6 species) and managed (21 species) and species of Greatest Conservation Need in Louisiana (80 species) (Holcomb et al 2015) . This restoration project has synergy with many federal, state, and local restoration and conservation plans including: NOAA's National Saltwater Recreational Fisheries Policy, NOAA's Recovery plan for the northwest Atlantic population of the loggerhead sea turtle, NOAA's Recovery Plan for the U.S. Population of Atlantic green turtle, and has synergy with NOAA's Bi-National Recovery Plan for the Kemp's ridley sea turtle and the Gulf Sturgeon Recovery/Management Plan.

This project will conserve and restore habitat identified by the National Audubon Society as a Globally Significant Bird Area (birds at Chandeleur have been observed in 33 other countries around the world). The project will conserve the largest and most diverse assemblage of seagrass in the northern Gulf of America which is essential nursery habitat for many species of reef and pelagic fisheries and endangered sea turtles whose ranges are Gulf wide.

The project will conserve, restore and protect the beach, dune, marsh, and seagrass habitat on Chandeleur Island using nature-based solutions. The restored habitat will sequester carbon, benefit the estuary by reducing gulf wave energy and regulating the salinity gradient, and provide habitat essential for a range of wildlife and fisheries.

The Chandeleur Islands are the first line of defense (barrier islands) from storm surge for residents of St. Bernard as well as those living on the east bank of Plaquemines and Orleans Parishes.

These barrier islands are remote and difficult to access. One of the benefits of this project is its ability to restore fish and wildlife habitat in a setting that has few anthropogenic threats. Its remoteness and designation as a federal Wilderness Area and federal Refuge allow for nearly undisturbed utilization of habitats by fish and wildlife that disperse far outside the boundaries of the refuge. This provides enhanced wildlife viewing and consumptive recreational opportunities both at the islands and locations far removed from the Chandeleurs. Fisheries species that use the islands as spawning and nursery habitat include speckled trout, redfish, flounder, menhaden, and several species of snapper. These and several species of waterfowl are important to many outdoor enthusiast in the Northern Gulf of America.

This project will restore salt marsh habitat as identified in the Salt Marsh Keystone Initiative. As articulated in the USDOI Restoration and Resilience Framework, bird species populations that depend on salt marsh are in deep decline. The Chandeleur Islands are a hot spot for bird populations that depend on this habitat and restoration of salt marsh habitat will benefit multiple species. The CPRA has the experience and expertise designing, constructing and monitoring marsh restoration and colonial bird nesting habitats. Our agency's expertise in marsh restoration is demonstrated and articulated in the Marsh Creation Design Guidelines that our agency staff authored.

Metrics:

Metric Title: HR004 : Habitat restoration - Acres restored

Target: 2140

Narrative: (1) Beach and Dune habitat restored (1,340 acres) - Beach and Dune Fill will be accomplished utilizing compatible sediments from a borrow area near the Project. Fill material will be placed at varying elevations and widths along the existing shoreline. (2) Marsh habitat restored (690 acres) - The Marsh Fill will be constructed on the north end of North Chandeleur Island behind the constructed Beach and Dune Fill where a narrow bare sandy beach and an expansive low-lying, nearly unvegetated, sandy intertidal platform currently exists. Marsh Fill elevations selected will provide foraging habitats as well as a stable platform to accept washover sediments enhancing the longevity of the Project. (3) Colonial Bird nesting habitat (110 acres) - Bird habitat will be created by restoring mangrove habitat on New Harbor Island. This island is home to one of Louisiana's largest Brown Pelican colonies, however much of this island's acreage has eroded to open water. One hundred and ten acres will be restored via sand fill and the existing mangrove habitat will be preserved with the construction of rock breakwaters.

Metric Title: HR007 : Marine habitat restoration - Acres of SAV restored

Target: 5200

Narrative: (1) Marine Seagrasses protected (5,200 acres) - The restoration of the beach and dune features will provide protection to the existing SAV by adding longevity to the existing Island footprint. (2) Marine Seagrasses enhanced (1,395 acres within the above 5,200 acres) - The restoration of the Island will provide low-energy/low-turbidity conditions that allow the SAV to thrive. Restoration of the beach, dune, and marsh is expected to enhance the environment for SAV resulting in enhanced species abundance, species diversity, and percent cover.

Risk and Uncertainties:

The risks and uncertainties associated with the construction of this project, which is expected to exceed two years, will be localized and temporary. Due to the rapid erosion of these islands, the risk of "no action" will have a far larger impacts to nesting birds, sea turtles, marine mammals, and fisheries than the restoration project and its associated construction. Since the mid 1800's more than 1,000 hectares of the islands acreage and associated seagrass meadows have disappeared (McBride et al., 1992). This erosion is some of the highest barrier island losses in the United States (Fearnley et al 2009) This continuing trend is lowering the quantity and quality of essential fish habitat, nesting habitat, and foraging habitats for many wetland obligate species. If the restoration project is not built the loss of habitat will continue.

The borrow source for this restoration project, Hewes Point, has been investigated and found to be approximately 93% sand. This sand was once part of the island and has been transported to

this shoal via natural erosion and longshore transport. This restoration project proposed recycling this sediment back to the island to build the project features that will preserve the islands for decades into the future. The Hewes point sand is the same grain size, color, and composition as the sands that make up the island and is ideal for restoration purposes and compatible for nesting sea turtles and birds. This sediment is very close to the project location making it the most economically efficiently source to acquire sand to restore the island. Other sediment sources such as the St. Bernard shoal were evaluated but ruled out due to the long distance transport costs.

The median grain size (0.13mm) and the low percentage of fine material (approximately 6.1% fines) of the Hewes point sediment is ideal for barrier island restoration. This sediment will have very little small flocculate plumes associated with the placement of material and impacts to seagrasses and fisheries is expected to be local, temporary, and minor. Most of the sediment placement for this project will be on the dune, beach, and feeder beach. Sediment placed for these features will have to dewater through the back barrier marsh before reaching the sea grass meadows. This process will be a nourishment benefit for the back barrier marshes and will remove most of the fine material before it has an opportunity to reach the sea grasses. There are locations where pocket marsh and sand reservoirs will be adjacent to sea grass meadows. In these locations sediment management techniques such as silt curtains or training dikes will be implemented to contain the flocculent plumes.

Due to the long duration of construction (in excess of two years) it is highly likely that a hurricane or tropical event will impact the project site during construction. This project is anticipated to be under construction all months of the year without pause except for significant weather events. CPRA is experienced in constructing barrier islands during hurricane season and having impacts to the projects while under construction. A couple recent examples include the impact of Hurricane Ida on West Grand Terre Island, and hurricanes Laura and Delta in 2020 on the Rabbit Island restoration project. Hurricanes and their redistribution of sediment is a natural process of barrier island morphology. The Chandeleur Island project takes storm surge impacts, erosion, and relative sea level rise into consideration as part of the design. If a storm surge hits the island during construction sediment will be naturally relocated to the back side of the island. Some sediment will also be suspended into the longshore transport which may re-nourish the shoreline of the island. The impacts of a storm surge during or immediately after a construction may mobilize more sediment as compared to “no action” scenario. This increased mobilization of sand will simply nourish the backside of the island creating a larger platform for the recovery of tidal wetlands and seagrasses. This is believed to be benefit as compared to a “no action” scenario. The project is designed to allow natural process to rework the sediment to nourish the island for decades into the future on a seasonal and episodic timeframes.

In collaboration with The Water Institute of the Gulf (TWIG), the potential for storm recovery at the Project Area was evaluated. TWIG performed an analysis of historical survey data from the U.S. Geological Survey and the Coastal Protection and Restoration Authority to determine the storm recovery response of Chandeleur Island following major tropical storms. It was determined that North Chandeleur Island experienced dune accretion at a rate of 0.043 ft3/ft2 over a 5-year period following Hurricane Katrina (CEC, 2024). The restoration of the beach and

dune system on North Chandeleur Island will add additional sand to the system to increase the longevity of the barrier island through resistance to and accelerated recovery from storms.

The impacts of hurricanes were modeled into the design of the project with respect to the historical frequency of storms. There may be long term risks and uncertainties if a catageory five or a higher frequency of storms relative to the historical record is realized at the project site. The risk associated with this occurrence would be a shorter project life, however the island is still expected to recover quicker and more effectively than the “no action” alternative.

The potential effects of sea level rise at the Project Area was also evaluated with TWIG’s assistance. Geotechnical research identified that a majority of North Chandeleur Island resides on a thick platform of sand (Twitchell et al., 2009 and GEOEngineers, 2024) which is liberated as the shoreline erodes and nourishes the shoreface (Miner et al., 2021). This liberation of sand allows for the beach and dune to respond to increases in sea level rise as shoreline equilibrium as a function of the Bruun Rule (D’Anna et al., 2021 and Bruun, 1988). Restoring the beach and dune system on North Chandeleur Island will add additional sand to the system to allow the coastal processes of the area to keep pace with sea level rise (Coastal, 2024).

CPRA and DOI staff have met with most of the charter boat captains that utilize the Chandeleur Islands on November 6, 2024 in Gulfport, MS. All participants expressed support for the project and only a few questioned impacts to fishing during construction. We explained how the equipment would be laid out and discussed the temporal and spatial impacts. No concerns were expressed about the proposed plans.

During construction we do anticipate mitigating impacts to nesting birds, foraging birds, nesting sea turtles, foraging sea turtles, sea grasses, and marine mammals in around equipment and on the project site. We are working closely with our federal partners to develop best management practices (BMPs) to properly handle these sensitive issues. We have already held early compliance calls with DOI and NOAA on these subjects. We will continue to work closely with DOI, NOAA, and the USFWS refuge staff to correctly implement all compliance guidance that is recommended. Some anticipated compliance BMPs that may be implemented include construction shut downs on New Harbor Island, bird hazing on Chandeleur Island, buffer zones around nesting birds, relocation of sea turtle nests, buffer areas around sea turtle nests, and equipment shut downs when marine mammals approach equipment. Environmental monitors will be employed on this project that are subject matter experts on birds and sea turtles during the nesting seasons, and to look out for sensitive species during the fall and winter migratory bird seasons.

Temporary and minor disturbances to marine sea grass beds (<4%), nesting sea turtles and birds are anticipated during the construction window.

Monitoring and Adaptive Management:

We anticipate that a significant portion of the construction funding will be provided by the Louisiana and Open Ocean TIG’s Joint Restoration Plan and Environmental Assessment #1. Utilization of these funds will require a robust monitoring plan be developed prior to

implementation of the restoration project. The monitoring plan that will be developed for this project will be similar in format and design to previous LA TIG plans and will start one year after construction completion. Each of the project features will be monitored and reported through the DIVER portal for at least 15 years after construction. Monitoring will include collection of geo-rectified aerial imagery to measure lengths and acreages of project features over time. The same imagery will allow for documentation of marsh types, vegetation cover and shoreline erosion and accretion rates. On the ground topographic and hydrographic transect surveys will also be collected at set intervals to see how elevations are changing for the different project features and to inform on the health of the vegetative plantings. Submerged aquatic vegetation monitoring will also be conducted. This will require some combination of aerial surveys and in-water diver surveys to assess the health and extents of the seagrass meadows. Surveys for birds and sea turtle nesting will also be required to monitor wildlife response. All this information will be provided to the adaptive management team that will have funding and a project-specific "monitoring and adaptive management plan" to address management needs of the project.

Pre-construction surveys and post-construction "as-built" surveys will be collected as part of this project. The Louisiana and Open Ocean TIG's Joint Restoration Plan and Environmental Assessment #1 will include measurable restoration parameters and goals. Most parameters such as beach and dune elevation, length, and acreage will be measurable immediately after construction is complete, however some parameters will take time to mature before success can be determined. Parameters such as acres of sea grass meadows or acres of tidal marsh will take up to five years for sediments to stabilize and vegetation to colonize before success criteria and determinations can be made. Multi-year monitoring will assess project success and inform adaptive management needs. Any challenges or limitations found during the monitoring will be addressed using funds set aside for adaptive management.

Data Management:

Data collected in association with this project will be managed in accordance with established CRMS, SWAMP, and survey standards data management protocols, where applicable, and made publically available. CPRA's data management system is called the Coastal Information Management System (CIMS; https://cims.coastal.la.gov/) and is our overall enterprise data repository that combines a network of webpages hosted by CPRA. It includes a spatial (GIS) database and relational tabular database in one public-facing, GIS-integrated system capable of robust visualizations and data delivery. It also has a library for sharing documents pertinent to CPRA's mission. CIMS facilitates CPRA, its partners, and the general public's access to CPRA's suite of protection and restoration projects as well as CRMS and SWAMP stations, Coastal Master Plan activities, geophysical data, and coastal community resiliency information. CIMS is the official repository for environmental, modeling, and monitoring data for restoration and protection projects undertaken by the State of Louisiana.

Additionally, environmental compliance documentation, construction completion reports, and monitoring and adaptive management data generated for this project will be added to the publicly accessible DWH Administrative Record.

Collaboration:

The Chandeleur Island Restoration Project is a barrier island maintenance project that is an

important part of Louisiana's Comprehensive Mater Plan for a Sustainable Coast (Coastal 2023). This plan is a publicly vetted document that was unanimously approved by the Louisiana Legislature in 2023.

The Chandeleur Islands Project enjoys a broad stakeholder group that provided information and expertise influencing the project's design. The group consists of NOAA, USFWS, USGS, LDWF, The Water Institute of the Gulf, The Gulf Coast Joint Venture, MS Dept. of Marine Resources, The Pontchartrain Conservancy, Ducks Unlimited, Plaquemines Parish, St. Bernard Parish, and others.

Subject matter expert teams were assembled to help define project habitat characteristics to be part of the design package for construction. Teams consisted of biologists that are subject matter experts in marine sea grasses, sea turtles or nesting coastal water birds from federal, state, NGO and the private sector including NOAA, USFWS, USGS, LDWF, University of Southern Mississippi, SWCA Environmental, The Water Institute of the Gulf, SEG Environmental, and CPRA.

The design team met with several charter boat captains, and recreational boaters that frequent the Chandeleur Island on November 6, 2024 in Gulfport, MS. An overview of the proposed restoration project was presented and comments were solicited. Many comments were received concerning work on the southern end of the island. The audience was overall pleased with the work and collaboration. There was no concern expressed for the spatial or temporal footprint of the construction work or infrastructure expressed at this meeting.

Funding for the project also enjoys strong collaboration among several federal state, NGO, and private organizations. The RW TIG funded the E&D effort, which consists of support from all five Gulf Coast States and the RW TIG federal trustee agencies. Funding for construction has support from the LA TIG, which includes the state of Louisiana and federal trustee agencies. Funding has been proposed through a federal NAWCA grant, which has match partners from Ducks Unlimited, St. Bernard Parish, and the Chandeleur Island Brewing Company.

The project has support from several state, NGO, and private companies that have written letters of support for funding opportunities including LDWF, USFWS, St. Bernard Parish, City of New Orleans, LA CCA, MS CCA, LA Ducks Unlimited, MS Ducks Unlimited, LA Wildlife Federation, Global Green, Healthy Gulf, Levees.org, Lower Ninth Ward CSED, Restore or Retreat, The Meraux Foundation, The Theodore Roosevelt Conservation Partnership, Environmental Defense Fund, Audubon, Pontchartrain Conservancy, Restore the Mississippi River Delta, Southern Seaplane, and the Chandeleur Island Brewing Company.

Public Engagement, Outreach, and Education:

The project has been presented to the public through three CPRA board meetings on August 17, 2022; September 13, 2023; and most recently July 17, 2024. These meetings are open to the public and have a remote viewing option as well. In addition to these meetings, the public has been advised of the project through the public interface of the Region-wide TIG that provided the engineering and design funds and the public will be engaged again through the

Louisiana and Open Ocean TIG's Joint Restoration Plan and Environmental Assessment #1 public engagement process.
The project team will also be working with the 4-H club in St. Bernard Parish to active engage high school students in the project. Coordination on this project aspect will begin in the fall of 2024.

Leveraging:

Funds: $8,000,000.00

Type: Co-funding

Status: Received

Source Type: Other Federal

Description: DWH NRDA Funds from RW TIG for Project's E&D

Funds: $150,000,000.00

Type: Co-funding

Status: Proposed

Source Type: Other

Description: $150,000,000 - $200,000,000 anticipated. DWH NRDA Funds from LA TIG formal request expected early 2025

Funds: $5,000,000.00

Type: Co-funding

Status: Proposed

Source Type: Other

Description: $5,000,000 - $20,000,000 anticipated. DWH NRDA Funds from (OO TIG) formal request expected early 2025

Funds: $10,000,000.00

Type: Co-funding

Status: Committed

Source Type: Other Federal

Description: NOAA Grant funding for projects that restores coastal habitat and strengthen coastal community resilience under the Bipartisan Infrastructure Law and Inflation Reduction Act

Funds: $5,000,000.00

Type: Co-funding

Status: Proposed

Source Type: Other Federal

Description: NFWF - 2024 America's Ecosystem Restoration Initiative: America the Beautiful Challenge

Funds: $2,680,000.00

Type: Co-funding

Status: Committed

Source Type: State

Description: State Surplus Funds from FY2022

Funds: $2,900,000.00

Type: Co-funding

Status: Proposed

Source Type: Other Federal

Description: North American Wetlands Conservation Act administered by the USFWS. Public-Private partnership grant funds for long term conservation projects that benefit wetland associated migratory birds.

Environmental Compliance:
Formal consultation through NOAA and USFWS officially began on April 25, 2025. Data collection for compliance pieces have been concluded. Data collection efforts include marine

mammal surveys, bird surveys, sea grass surveys, and cultural surveys. The NEPA and NHPA compliance will be led by DOI's Restoration Planner Amy Mathis through the Louisiana Trustee Implementation Group (LA TIG). Fields Environmental Consulting has been hired by CPRA to assist the USFWS with the NEPA compliance documentation through the Louisiana and Open Ocean TIG's Joint Restoration Plan and Environmental Assessment #1.. This information will be made available through NOAA's DIVER Portal under the Deepwater Horizon Restoration Projects link.

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Budget

Project Budget Narrative:
The entire budgeted amount included in this proposal is for construction (implementation).

Total FPL Project/Program Budget Request:
$ 84,900,000.00

Estimated Percent Monitoring and Adaptive Management: 0 %

Estimated Percent Planning: 0 %

Estimated Percent Implementation: 100 %

Estimated Percent Project Management: 0 %

Estimated Percent Data Management: 0 %

Estimated Percent Contingency: 0 %

Is the Project Scalable?:
No

If yes, provide a short description regarding scalability.:
N/A

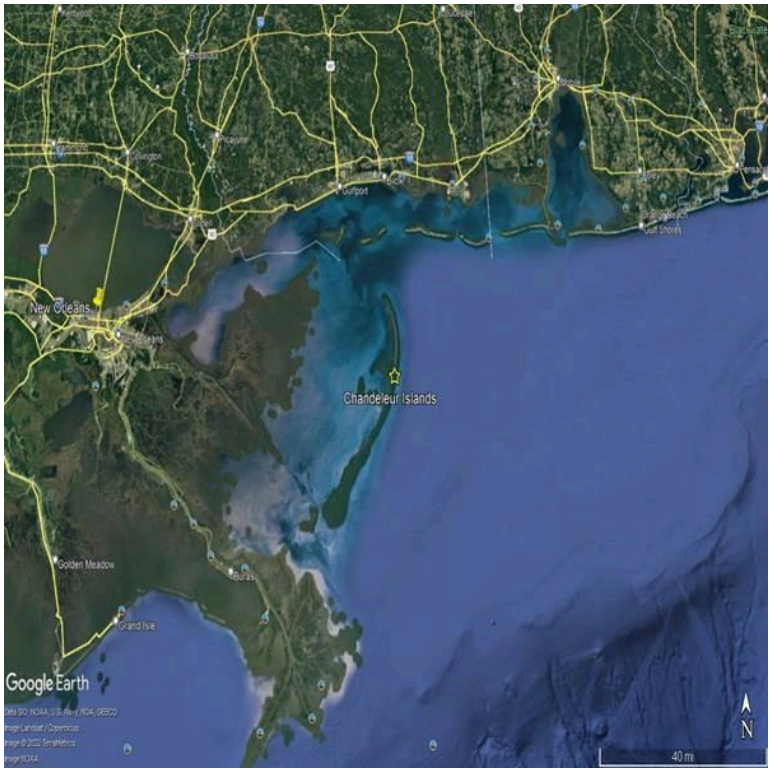
Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)

National Environmental Policy Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
Endangered Species Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
National Historic Preservation Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
Magnuson-Stevens Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
Coastal Barrier Resources Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
River and Harbors Act (Section 10)	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.

Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
Bald and Golden Eagle Protection Act	No	We anticipate that formal compliance will start before the end of the 2024 calendar year.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Region Image Project Location

Caption : Islands locations

Other Uploads

Main Uploads_0:
PO-0199_Alternative 5_01-18-2024.pdf
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4105/77

GIS Data_3:
Chandeleur.gdb.zip
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4145/77

Council Staff Review: Chandeleur Islands Restoration Project

FPL Internal Staff Review

Project/Program	Chandeleur Islands Restoration Project		
Primary Reviewer	John Ettinger	Sponsor	Louisiana
EC Reviewer	John Ettinger	Co-Sponsor	DOI

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes
Notes	100% construction

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?		More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments. Note: Restore Council staff worked with the state to resolve these comments.	

8. Have appropriate metrics been proposed to support all primary and secondary goals?		Yes
Notes		

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?		N/A
Notes	The implementation component is in FPL Category 2.	

Summary of Best Available Science Review: Chandeleur Islands Restoration Project

The Chandeleur project proposal, reviewed by three external BAS reviewers, aims to restore and conserve vital coastal habitats such as barrier shorelines, dunes, salt marshes, and seagrass meadows. The proposal demonstrates alignment with regional conservation goals and is guided by the Louisiana Comprehensive Master Plan. Reviewers recognized the credibility and experience of the Louisiana Coastal Protection and Restoration Authority (CPRA), which brings a solid foundation to the effort. The project includes long-term monitoring and adaptive management plans, supported by established data systems like DIVER and CIMS.
However, the proposal would be significantly strengthened by more detailed explanations of the proposed methods, including sediment transport, dune and vegetation restoration, and how key features like the Hurricane Katrina cut will be addressed. Scientific citations and peer-reviewed literature to support the proposed techniques and anticipated outcomes are limited, and the proposal does not fully articulate long-term risks related to climate change, sea level rise, or storm events. While short-term impacts to wildlife and seagrass are mentioned, no mitigation strategies are outlined. In summary, the proposal reflects a strong vision and draws from extensive institutional expertise, but it would benefit from more rigorous scientific justification, clearer methodological detail, and a more thorough risk assessment to fully support its implementation and long-term success.

Summary of Louisiana's Response to BAS Comments: Chandeleur Islands Restoration Project

In response to BAS reviewer comments, the State significantly strengthened the Chandeleur project proposal. Key updates include the addition of secondary benefits and a comprehensive revision of the bibliography, expanding it from 2 to 19 sources with citations now integrated throughout the document. The Methods section was substantially revised to provide greater detail, including clarification that Katrina Cut will not be closed as part of this project. The proposal now includes a thorough discussion of risks and uncertainties, emphasizing that the project is expected to provide clear benefits over a no-action scenario, regardless of storm activity or seasonal variation. Additionally, the updated proposal highlights best management practices to address potential sediment plume impacts and notes that restoration materials are composed of 93% sand, minimizing risk to sensitive habitats. The response also references the CPRA’s extensive track record, citing over 40 past barrier island projects and two bird colony restorations to demonstrate experience and capability. Overall, the updates aim to directly address reviewer concerns by enhancing scientific justification, clarifying methods, and expanding the discussion of environmental risks and management strategies.

Best Available Science Review Forms: Chandeleur Islands Restoration Project

Proposal Title: Chandeleur Islands Restoration Project
Location (If Applicable): The Chandeleur Islands are remote island chain located in Southeast Louisiana. The islands are 75miles east of New Orleans, LA and 26 miles south of Biloxi, MS. They are located in St. BernardParish between Chandeleur Sound and the Gulf of America. Latitude N29.951776 W-88.825202. They are managed by the USFWS as Breton National Wildlife Refuge.
Council Member Bureau or Agency: Louisiana Coastal Protection and Restoration Authority
Type of Funding Requested: Implementation

Reviewed by: In State
Date of Review: September 24, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information

Comments:

As indicated in the proposal under the heading GOALS the primary comprehensive plan objective is to “Restore and Conserve Habitat” and there are no secondary plan objectives provided or secondary goals. It seems odd that there are no secondary objectives mentioned inasmuch that the proposal states numerous times that a benefit of the proposed work would to also be to enhance inland community resiliency because of storm-surge reduction created by an enhanced Chandeleur barrier system.

The singular mention of a METHOD in the proposal is that sand-rich sediment will be conveyed from the northern most tip of the Chandeleur system (Hewe’s Point) to the project location toward the south. However, there are no details provided about: 1) how sediment will be conveyed, other than design drawings that show a conveyance pipeline corridor, 2) how sediment will be placed, 3) how dune and aquatic seagrass plantings will take place, 4) how sediment will be placed at New Harbor Islands along with detached rip rap, or 4) how a large cut (H. Katrina cut) with a large tidal exchange and prism will be blocked during construction.

One can assume that these types of things have been successfully implemented in the past and that the sponsor has developed this proposal on the best available science but not a single reference is provided indicating that this has been done elsewhere, that the methods are valid or even a reference indicating that there is adequate enough sediment available at the proposed borrow site. The singular item in the bibliography that might address these questions is an engineering report produced for Louisiana Coastal Protection and Restoration Authority.

Question 2.

If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes

Comments:

Proposal addresses a Gulf of America concern, so question is seemingly not applicable.

Question 3.

Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information

Comments:

There are essentially no literature sources cited in this proposal. The only literature source cited in the bibliography relevant to the suggested use of sediment, construction and revegetation is a report by an engineering firm. There are many, many scientific peer-reviewed publications from academia and state and federal agencies that address all of these topics in the Chandeleur system and for other areas along the Louisiana coast. Although the cited engineering report addresses some of the mentioned issues the use of the engineering report as the singular bibliographic entry, that is relevant to the proposed activity of sediment conveyance, construction and vegetative plantings, is a current shortfall of the proposal per Question 1.
The proposal does mention that teams of Subject Matter Experts were convened to develop the goals and metrics of the proposed habitat restoration and conservation. Accordingly Subject Matter Experts would be aware of the literature sources to support the intended project goals, but these sources are not provided in the proposal.

Question 4.

Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	No

Comments:

The singular mention of risks and uncertainties is "Temporary and minor disturbances to sea grass beds, nesting sea turtles and birds…." To list this as the only risk is very short sighted. Yes there no doubt will be these types of disturbances during the construction window but importantly these disturbances will likely affect more than just the project footprint and there is no mention for the spatial or temporal scale of disturbances.
Depending upon the season of construction sediment on the Gulf side of the barrier system will be litorally transported into adjacent areas potentially causing disturbances shore parallel to the construction site. As shown by peer-reviewed publications the seasonality strongly influences Gulf side transport magnitudes and directions. Further, there is no mention of the potential impacts over longer time periods, only the statement of minor disturbances.
Back barrier disturbances will similarly occur due to sediment relocation, let alone the large number of vessels, barges, and other pieces of equipment that will be active in the area during the construction phase. Additionally there are going to be disturbances to the fishery ecosystem (not just seagrass, turtles, and birds), causing disturbances to a large number of recreational fishers that particularly rely upon this area of the barrier system for productive catches, let alone habitat used by fishes for reproduction or as nurseries (again seasonal dependent).
There is no mention of the overall uncertainties, which are many. What if Hurricane Katrina cut with an already large tidal prism exchange can not be easily closed? What if during construction a tropical cyclone takes place and displaces any sediment that was placed prior to cyclone impact? What affect would seasonality have on the construction window? What if construction can not be completed during the relative low wave-energy conditions characteristic of the late spring, summer and early fall seasons?

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Need more information
Comments:	
It is reasonable to assume that the Louisiana Coastal Protection and Restoration Authority is operating from the base of the peer-reviewed and publicly available information but this is not identified clearly in the proposal.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
There is mention in the proposal that the intended goals of the project (habitat restoration and conservation, namely) are supported by the opinions of Subject Matter Experts but it is not clear how these experts are maximizing the quality, objectivity and integrity of information. There is no mention of statistics that support the objectives. No mention even of a case study where there has been success, limited success or failure in similar situations.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	
The proposal does not reasonably or effectively communicate that risks and uncertainties are based on the science of risks and uncertainties in such projects.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	

Yes the Louisiana Coastal Protection and Restoration Authority has a long history of barrier shoreline sediment renourishment, dune creation and vegetative restoration projects along the Louisiana coast and consequently habitat restoration and conservation. They have successfully lead such projects with a wide array of partnering/co-sponsoring agencies. This particular proposed effort will be unique in the context of the other renourishment projects they have undertaken because of the remoteness of the Chandeleur system and the overall size of the H. Katrina cut that they propose to close, but nonetheless they have faced similar types of challenges elsewhere along the Louisiana coast.

Question B

Does the project/program have clearly defined goals and objectives?	Yes

Comments:

Yes the goal of habitat creation and restoration is clearly stated with indications of total acreasges of barrier shoreline, dunes, saltmarsh and seagrass meadows that will be generated/affected by the proposed construction effort. The goal of creating an ecosystem-level project is articulated as well as the numerous species that will be positively affected by the success of such a project.
Further there is mention of the positive benefits that a post-construction, more continuous barrier system may have on storm surge reduction and therefore benefits to more interior wetlands, although this is less well articulated relative to the ecosystem goals and objectives.
Although not stated as a goal or objective the idea of storm surge reduction is mentioned numerous times and that this would benefit inland communities and wetlands.

Question C

Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information

Comments:

The proposal is overall lacking in these areas in that there is no clear statement of how sediment will be transferred, the stages of construction that will be undertaken, how H. Katrina cut will be closed, how revegetation of dunes will be completed, or the methods of reestablishment of seagrass across a flood tidal delta/washover platform. There is no mention about the scientific soundness of any approaches that are anticipated nor the cost-effectiveness in terms of the expected environmental benefits.
The methods to be used in the restoration and conservation of the New Harbor Islands is also not clearly expressed. There is mention that engineering plans/designs are still currently underway and seemingly those plans would address such methods and rationals but this is not described in the proposal.

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes

Comments:

Yes, the project identifies in the qualitative sense the environmental benefits for the many species that utilize this barrier island system. Basically, the underlying statement is along the lines of: if you build it they will come. Because of the substantial geomorphologic change that is historically endemic to the system and the consequential loss of habitat, any additional habitat creation will in total benefit the entire ecosystem.

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Yes the proposal clearly states the intended metrics of success in the form of total acreage of the various habitats to be created as well as the protection that a continuous barrier shoreline will provide to existing seagrass habitat peripheral to the construction area.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
The only mention of risk in the proposal seems to be centered around the disturbance to some wildlife and the existing seagrass beds during the construction phase. There is a subtle indication that design plans that are currently underway, as well as the existing pre-construction design templates provided, are intended to create a project with longevity in a regime of rising relative sea level rise and possible impacts by tropical cyclones. In general these aspects for consideration are not clearly articulated.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	

The only clearly identified risk seems to be wildlife and habitat disturbances during the construction phase. There is little to no mention of the many uncertainties that exist (as stated in previous responses). For the singular risk of wildlife and habitat disturbance mentioned in the proposal there is no mitigation plan presented.

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	No
Comments:	
No mention of recent or relevant information pertaining to the singular risk of disturbance mentioned in the proposal.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
The Louisiana Coastal Protection and Restoration Authority has historically had a strong adaptive management program in place for all of its coastal projects and the lessons learned from such projects have continuously been integrated into future projects. There is little doubt that this project too will incorporate such information and there is a section in the proposal that specifically emphasizes that adaptive management strategies will be implemented through pre and post-construction surveys to determine whether the pre-project metrics have been successfully met.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
The Louisiana Coastal Protection and Restoration Authority has had robust monitoring programs in place for all coastal projects as well as a very strong data management approach through the agency Coastal Information Management System. This system provides GIS data, tabular data and project documents that are all easily available to the public.	

Please summarize any additional information needed below:
Click here to enter text.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Chandeleur Islands Restoration Project
Location (If Applicable): The Chandeleur Islands are remote island chain located in Southeast Louisiana. The islands are 75miles east of New Orleans, LA and 26 miles south of Biloxi, MS. They are located in St. BernardParish between Chandeleur Sound and the Gulf of America. Latitude N29.951776 W-88.825202. Theyare managed by the USFWS as Breton National Wildlife Refuge.
Council Member Bureau or Agency: Louisiana Coastal Protection and Restoration Authority
Type of Funding Requested: Implementation

Reviewed by: Out of State
Date of Review: 9/28/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
Proposed methods are primarily justified through the Louisiana Comprehensive Master Plan.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
Supporting documents all pertain to the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
No comments provided.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	
The proposal does address short term risks due to disturbances to seagrasses and wildlife but does not address any long-term risks or uncertainties to the proposed project.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Need more information
Comments:	
Being a highlighted project type in the Louisiana Comprehensive Master Plan, this provides indirect science support and justification of this project. However, the applicant does not specifically address the science used to inform methodology or provide direct reference.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
The applicant could provide better justification around the body of science that supports project implementation as well as include how monitoring and adaptive management programs may play a role in informing data gaps and future project implementation.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	
The applicant could provide additional resources to better support the proposal in respect to the risks and uncertainties addressed. As previously indicated, the proposal could provide additional information around long-term uncertainties and risks of project implementation.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
No comment provided.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
No comment provided.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
The proposal provides clear methods but does not provide any general justification or support for methodology.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
While overall benefits were discussed, the proposal would be stronger if more literature support was provided.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Success metrics align with Master Plan and other conservation plan objectives.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
The proposal does not explicitly describe long-term risks.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or	Yes

socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	
Comments:	
Short-term risks to existing seagrass beds and wildlife from project implementation disturbance was mentioned. However no specific mitigation plans to address these issues were discussed, although I assume that may be in the planning stages and will be provided prior to implementation.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Need more information
Comments:	
No literature or supporting information provided for the implementation risks section of proposal.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
The proposal does not provide any direct information regarding past success and failures of similar efforts.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
Monitoring and data management strategies are provided in a general sense, but no science justification is provided.	

Please summarize any additional information needed below:

As a reviewer I would assume that the science and planning support for implementation projects, such as the proposed, are primarily informed through the Master Plan in Louisiana. That said, this proposal would have been stronger if more reference to that plan and the science that drove decisions and project selection therein. In addition, having some discussion around success and failures and long-term uncertainties of barrier island maintenance projects would be beneficial.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Chandeleur Islands Restoration Project
Location (If Applicable): The Chandeleur Islands are remote island chain located in Southeast Louisiana. The islands are 75miles east of New Orleans, LA and 26 miles south of Biloxi, MS. They are located in St. BernardParish between Chandeleur Sound and the Gulf of America. Latitude N29.951776 W-88.825202. Theyare managed by the USFWS as Breton National Wildlife Refuge.
Council Member Bureau or Agency: Louisiana Coastal Protection and Restoration Authority
Type of Funding Requested: Implementation

Reviewed by: Out of Gulf
Date of Review: 10/19/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	

The proposal does base the objectives and methods in existing plans, such as the 2023 CMP and the 2015 LA Wildlife Action Plan, however, it does not explicitly utilize peer review literature to justify the engineering design or benefits of the project, even those these resources do exist.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
Prefer to answer N/A as the benefits of the project have large-scale implications ofr the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
The limited number of resources used are adequately cited.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
The proposal discusses the risks of not acting and the loss of these habitats in the next 2 decades without the project. There is not extensive discussion of other risks with the implementation of the project, however as a reviewer, I am aware of the long-time expertise and experience in barrier island restoration by the applicants and assume the risks and uncertainties are low. I do not foresee a situation where the project would be completely obsolete.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
I believe with the reliance on previous planning efforts that are heavily based in science, the applicants have achieves this.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
This includes a commitment to an extensive monitoring program for at least 15 years after construction.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
These issues are discussed briefly and deferring to an extensive history of similar projects by both applicants.	

Science Context Evaluation:

Question A

Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
As a reviewer, I am well aware of both applicants extensive experience in implementing barrier island and wildlife restoration projects, however this expertise is not mentioned directly in the proposal.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Click here to enter text.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
Click here to enter text.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The proposal has an extensive list of benefits to the northern GOM.	

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Yes and includes long-term monitoring and adaptive management plans and data management and availability through DIVER and CIMS.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
The project does indicate that the islands and the wildlife that rely on its diverse habitats would be lost in 2 decades to continued degration and climate change if the project was not implemented. The project would extend the lifespan of these key geologic features. The proposal does not, however, discuss things like, specific SLR projections and risks to the restored island.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The project mentions short-term impacts to grass beds, nesting sea turtles and birds during the construction of the project. The proposal does not have any explicit mitigation plans but assumed would be part of the environmental compliance.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	

The project includes some of the latest data on the Chandelier Islands, as well as gathered experts and interested parties for input.

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No
Comments:	
Past similar projects are not discussed.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
The proposal identifies extensive aerial, in water and on-the-ground monitoring that will be conducted for 15 years post-construction. The proposal identified funding that will be available for management needs in the future as part of an adaptive management program.	

Please summarize any additional information needed below:
Although the proposal may have overrelied on the extensive expertise of the applicants in planning, engineering, constructing and managing barrier island restoration projects instead of explicitly including the details needed, however an opportunity for more information should be provided considering 1) the breadth of science that does support this proposal, 2) the extensive benefits to the project throughout the northern GOM, and 3) the knowledge and experience of the applicants.

Appendix D: Mississippi Proposal Packets

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Coastal Nearshore Habitat Restoration and Development Program in Mississippi

RESTORE Council Proposal Document

General Information

Title:
Coastal Nearshore Habitat Restoration and Development Program in Mississippi

Project Abstract:
Mississippi, through the Mississippi Department of Environmental Quality (MDEQ), is requesting an increase of $25M in Council-Selected Restoration Component funding for the Coastal Nearshore Habitat Restoration and Development Program in Mississippi. This program would support the primary RESTORE Comprehensive Plan goal to restore and conserve habitat through activities to create, restore, and enhance coastal habitat, including marsh, beach, and dunes through the dedicated sourcing of materials. Program activities include program management and oversight, planning, engineering and design, and construction of habitat in the three coastal counties of Mississippi, and builds off work funded by the Initial FPL, FPL 3b, as well as National Fish and Wildlife Foundation Gulf Environmental Benefit Fund projects. To accelerate habitat creation and restoration, MDEQ may utilize multiple methods for sourcing material for habitat construction.

Coastal nearshore habitats provide many important ecosystem services including acting as natural buffers to protect shorelines from erosion, storm surge protection, fisheries production, and water quality benefits through sediment and nutrient reduction. The creation of new coastal nearshore habitats and the restoration of these habitats would continue to support and increase these ecosystem services to coastal systems in Mississippi. Program duration is 10 years.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: Coastal Nearshore Habitat Restoration and Development Program in Mississippi

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:

(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

(IV) Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Priority Criteria Justification:

Marsh creation and restoration using BU sediments and other dredging activities are ways to restore the ecological integrity of any coastal bay and estuary system. Marsh systems arguably provide the greatest contribution of ecosystem services (natural buffers, storm surge protection, improves fisheries production, faunal support, sequesters carbon etc.) to coastal systems. Marsh creation and restoration within the State of Mississippi and across the Gulf substantially enhance natural resources and coastal wetland ecosystems. Coastal and Marine Resources is a foundational program in the Mississippi Gulf Coast Restoration Plan (MDEQ, 2017). Several documents and organizations have highlighted the need and economic values in using BU including the Gulf of America Alliance Habitat Conservation & Restoration Team (GOMA HCRT, 2009, 2010), earlier versions of the Gulf Regional Sediment Management Master Plan, the Final Master Plan for the Beneficial Use of Dredge Material for Coastal Mississippi, and Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi (CH2Mhill, 2011a&b). By restoring existing marsh and creating new marsh in coastal waters, the State and other partners around the Gulf are enhancing the resilience of the system allowing it to continue to provide the ecosystem services listed above.

Project Duration (in years): 10

Goals

Primary Comprehensive Plan Goal:

Restore and Conserve Habitat

Primary Comprehensive Plan Objective:

Restore, Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Protect and Restore Living Coastal and Marine Resources
Restore and Enhance Natural Processes and Shorelines

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Protect natural shorelines
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement

Location

Location:
Coastal waters of the State of Mississippi including the Mississippi Sound and Barrier Islands

HUC8 Watershed(s):
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Pascagoula)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Escatawpa)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)
South Atlantic-Gulf Region(Pearl) - Pearl(Lower Pearl)

State(s):
Mississippi

County/Parish(es):
MS - Hancock
MS - Harrison
MS - Jackson

Congressional District(s):
MS - 4

Narratives

Introduction and Overview:
NOTE: Best available science throughout this proposal underwent review in the FPL 3b proposal Coastal Nearshore Habitat Restoration and Development Program in Mississippi. Mississippi elects to use the existing BAS review materials for the new FPL 4 funding proposal given that this proposal includes the same scope of work and is adding funds to the existing program. Based on the previous BAS review, modifications were made to the final proposal

submitted under FPL 3b, which is acknowledged in the BAS response document.

General Description of Activity:
The Coastal Nearshore Habitat Restoration and Development Program in Mississippi (Program) would support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region by creating, restoring, and enhancing coastal habitat, including marsh, beach, and dunes through the dedicated sourcing of materials. To accomplish this, the Program would incorporate planning, engineering and design (E&D), and construction of habitat in the three coastal counties of Mississippi. This program builds off the planning, E&D, and permitting work funded with the Enhancing Opportunities for Beneficial Use of Dredge Sediments project under the Initial Funded Priority List (FPL) as well as National Fish and Wildlife Foundation Gulf Ecosystem Benefit Fund (NFWF-GEBF) projects. In order to accelerate habitat creation and restoration, MDEQ may utilize multiple methods for sourcing material for habitat construction (e.g. dedicated material sourcing from borrow sites, upland sites, beneficial use of dredge materials, etc.). To receive any materials for habitat creation and restoration, all applicable environmental permitting, testing, and compliance would need to be completed, including sediment testing.

Primary Goal and Objective:
The Program addresses the Gulf Coast Ecosystem Restoration Council Comprehensive Plan Goal #1: Restore and Conserve Habitat. The Program would restore and create habitat within Mississippi coastal waters, including priority bays and estuaries, and within the Mississippi Sound. The activity of the Program, restoring and creating coastal marsh habitats, is consistent with RESTORE Council's primary objective of Restore, Enhance, and Protect Habitats.

Commitments in 2022 Comprehensive Plan Update:
The following describes how this Program addresses the commitments set forth in the 2022 Comprehensive Plan Update:

• Regional ecosystem-based approach to restoration: There have been several documents on strategies (GOMA HCRT, 2009, 2010) to coastal restoration that highlight the beneficial use of dredged sediments as a priority investment to an ecologically and economically sustainable coastal habitat. The Gulf Coast Ecosystem Restoration Task Force (GCERTF, 2011) identified restoring and conserving nearshore habitats, with a focus on marshes as a major action across the Gulf, under one of the four main restoration goals.

• Leveraging resources and partnerships: The State of Mississippi has invested in BU of dredge materials for marsh restoration using NFWF-GEBF, RESTORE, and Natural Resource Damage Assessment (NRDA) funding. MDEQ would consider previous planning efforts and coordinate with ongoing BU marsh restoration activities during site identification and scope development for project implementation.

• Engagement, Inclusion, and Transparency: The State of Mississippi's prioritization of this

Program is based on multiple public and stakeholder engagement activities; including the Annual Mississippi Restoration Summit and the Mississippi Coastal Restoration Plan (NFWF-GEBF). Throughout Mississippi's restoration public engagement and planning efforts, stakeholders have consistently identified the restoration and protection of marsh and critical habitats as a top priority (see Public Engagement, Outreach, and Education section).

• Science-based decision-making: Sustainable and effective coastal wetland enhancement is linked with sediment management in coastal ecosystems (Parson and Swafford, 2012; Parson et al., 2012; ERG, 2014). The use of BU of dredge materials is a viable conservation strategy for coastal wetland restoration (Cornwell et al., 2020; Guilfolye et al., 2020). There are multiple examples of studies around the United States where the use of sediment, dredge materials, and BU, has successfully been undertaken in coastal habitat restoration: Coos Bay, Oregon (Cornu and Sadro, 2002), thin-layer sediment application in North Carolina (Leonard et al., 2002) and Louisiana (Ford et al., 1999), beneficial use of dredge materials to supplement subsidence in diked marshes in California (Marcus, 2000), marsh creation in Louisiana (Edwards and Proffitt, 2003) and Texas (Minello and Rozas; Rozas and Minello, 2001).

• Delivering results and measuring impacts: The proposed Program would utilize project-level workplans that would adhere to site-specific milestones and monitoring success criteria. These would be documented in observational data management plans.

General Description of Environmental Benefits: Coastal marshes play a vital role in the ecological integrity of open shoreline habitats and are vital components of ecosystem health within a broader landscape context of coastal ecosystems (Wigand et al., 2017). They are keystone habitats within the coastal environment as they provide the base for a host of ecosystem services and benefits (Purcell et al, 2020). These ecosystem services include: serving as natural buffers to protect shorelines from eroding; storm surge protection (Gittman et al., 2014); fisheries production, water quality enhancement through sediment and nutrient reduction, faunal support, carbon sequestration, and providing habitat for a multitude of trophic levels within the ecosystem (Barbier et al., 2011; Mendelssohn et al., 2012). The creation of new marsh and the restoration of existing marsh in Mississippi's coastal system would continue to support and increase these ecosystem services in Mississippi.

Environmental Stressors being addressed: Between 1998 and 2004, wetland loss rates in the Gulf of America were 25 times higher than anywhere in the U.S (Stedman and Dahl, 2008). In Mississippi, increased development over time (as well as storms and other impacts) has accelerated the rate of wetland loss. As a result of wetland loss, coastal services protecting the main land areas against soil erosion, flooding, as well as providing refuge for many threatened and commercially important species are being lost (Chapman and Reed, 2006). Wetland losses can detrimentally impact coastal ecosystems through increases in the ecosystems' vulnerability to storm surge and flooding, changes in nutrient cycling, declines in net primary and secondary productivity, fluctuations in species composition, habitat loss for fisheries and wildlife, and loss of recreational, aesthetic, and ecosystem services. Mississippi is estimated to have lost 60 percent of its wetlands statewide over the last 200 years (Dahl, 1990; Chapman and Reed,

2006). Since 1950, 15 percent (9,000 acres) of the marsh south of Interstate 10 (I-10) has been lost (Schmid, 2001).

Shoreline erosion in Mississippi's salt marsh systems is extensive. For example, shoreline erosion rates at Grand Bay have been recorded at more than 24 feet/year or 7 acres/year (Schmid, 2000). This rate of loss continues today and would be exacerbated by expected increases in sea-level rise. Rising sea level can have multiple impacts due to its potential to alter ecosystems (Craft et al., 2009) and threaten coastal communities (Woodrey et al., 2012) by increasing the potential for tidal flooding and enhanced storm surges. Sea level trends recorded at NOAA's Dauphin Island tide station show the mean sea level trend is approximately 3.50 mm/year based on monthly mean sea level data from 1966 to 2016 which is equivalent to a change of approximately 1.15 feet in 100 years (NOAA, 2013). Coastal wetland modification and degradation can reduce wetland function and impair natural hydrological functioning and biological integrity. Primary causes for wetland modification include increases in impervious surfaces in watersheds, agricultural practices, flood control structures (e.g., canals, ditches, levees), and industry. Although regulations and incentives have reduced wetland habitat loss since the 1970s, continued urban growth and other landscape alterations can leave wetlands open to hydrological and biological fluxes (Mitsch and Gosselink, 2000) that negatively impact ecosystem functioning including increased stormwater inflow, increased sedimentation and nutrient loading, and decreased species richness and abundance, including coastal bird species (DeLuca et al., 2008).

In addition to stresses on coastal habitat, species that utilize the coastal habitat mosaic have also endured impacts. Ecosystem ramifications resulting from bird injury following the Deepwater Horizon oil spill are well documented (Barron, 2012; Haney et al., 2014; Trustees, D.N., 2016 [PDARP]). Impaired performance or reduction in numbers had multiple effects on reproduction and trophic dynamics in the ecosystem. The Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement (PDARP/PEIS) identified ninety-three bird species that were directly impacted by the oil spill. Mississippi's bird injury was extensive with thousands of birds impacted including several species of shorebirds (colonial and solitary nesters), wading birds, and marsh birds (Trustees, D.N., 2016 [PDARP]).

Proposed Methods :

The proposed Program would include the following primary activities:

Program Management and Oversight:

Program management and oversight would cover all activities associated with the Program. MDEQ personnel and its contractors would provide administrative programmatic functions and/or support during the life of the grant. MDEQ, with contractual support, would also manage the data associated with this Program in accordance with the procedures outlined in the Observational Data Plan and the Data Management Plan.

Permitting and E&D:

Engineering, design, and permitting of the identified solutions would utilize and apply standard engineering practices for similar projects, including certified and stamped plans. Engineering and design services would provide the design for containment and habitat dimensions for identified sites. The number of engineering and design plans would depend on the availability of source material and sites selected for project implementation.

The appropriate state/federal agencies would be engaged for permitting requirements for containment structure and source material placement. Project design would take into consideration best management practices. Additional activities may include environmental compliance, testing of sediments, geotechnical investigations and other needs associated with site design.

Construction Implementation:

Federal, state, and local groups undertake dredging activities constantly in the Gulf environment for navigation maintenance, infrastructure, and/or hydrological connectivity. Synergistically linking sediment management to the science of habitat creation helps to address coastal habitat loss through sustainable resource management (GCERTF, 2011; CH2M Hill, 2011a, b; ERG, 2014). In identifying sites and developing scopes of work for implementation, MDEQ will consider previous planning efforts. In 2011, the Final Master Plan for the Beneficial Use of Dredge Material for Coastal Mississippi (CH2M Hill, 2011a) provided an appendix of potential material sources for marsh creation projects including maintenance cycle timing, date of last dredge event, timing for next dredge event, typical quantities/current disposal, and types of dredge material. In 2015, the State of Mississippi initiated a planning project titled Utilization of Dredge Material for Marsh Restoration in Coastal Mississippi (NFWF-GEBF #45721) which revisited and updated the 2011 efforts. Construction implementation would be based on final plans and specifications developed during engineering, design and permitting. Construction implementation may include all potential activities associated with habitat construction and BU capacity development. Construction implementation may include, but is not limited to, containment construction, materials sourcing (e.g. dedicated material sourcing from borrow sites, upland sites, BU of dredge materials, etc.), transport of materials, pumping costs to sites, and marsh/beach/dune construction. Engineering and design and construction services would be procured consistent with applicable procurement standards.

Coastal Habitat Site Selection:

Site selection for coastal habitat restoration and creation will consider ecological principles, as well as economic and implementation feasibility. MDEQ will support BU site locations and designs which maximize direct and indirect ecological benefits to the extent practicable based on individual project dynamics. MDEQ would assess factors such as availability of material, proximity to material supply/dredging sites, material transport logistics, overall cost feasibility (e.g., cost estimates for containment, materials sourcing/transport, and construction), and permitting. The State of Mississippi has been investing in multiple coastal habitat restoration projects. Unlike other coastal restoration programs, the landscape for coastal nearshore habitat restoration at large scales is limited by geographic variables, regulatory compliance measures,

as well as opportunities to build back coastal habitat in strategic locations. The State has undertaken two planning exercises that have identified several coastal habitat restoration locations through NFWF-GEBF and the Initial FPL BU project (MDEQ 2017). From a large scale perspective, several coastal habitat restoration sites have already been identified and prioritized within the Mississippi coastal landscape including the following: Deer Island (several ongoing coastal habitat restoration projects including Deer Island Marsh Restoration [DIMR] IV, United States Army Corps of Engineers (USACE) Lagoon, and the Mississippi Coastal Improvements Program [MsCIP] proposed expansion), Round Island, Greenwood Island, Cat Island, Pelican Key, Wolf River, Beardslee, and Graveline Bayou. Significant planning has occurred for each of these sites, and they are in various phases of development (e.g., E&D, permitting, construction, land acquisition, etc.). The State of Mississippi will continue to develop all of these sites but will also be working with state and federal agencies to determine additional sites that would allow strategic coastal habitat restoration to take place.

Monitoring
See monitoring section.

Environmental Benefits:
As discussed previously, there are a number of drivers and stressors of coastal marsh impacts, including erosion, land conversion, and sea-level rise. All the stressors and drivers result in marsh loss at varying rates. Efforts to mitigate this loss include the creation and restoration of marsh through targeted placement of appropriate dredged sediment and the use of marsh protection and conservation techniques, such as the installation of living shorelines, and acquisition, protection, and management of upland habitats adjacent to coastal marsh habitats that can serve as habitat transition corridors. MDEQ is currently using all of these approaches under various restoration programs. For this proposed Program, MDEQ would re-establish habitats by implementing large-scale, multi-nearshore-habitat coastal restoration projects. The projects would support the following environmental benefits: benefits to a multitude of trophic levels within the ecosystem; provide several ecosystem services including shoreline protection, storm surge buffering (Broom et al., 2019), carbon sequestration (Drake et al., 2015); and enhance water quality by trapping and holding sediment and creating biogeochemical conditions for nutrient assimilation and transformation (Tobias and Neubauer, 2019).

Sustainable restoration and creation of coastal habitats is key when confronting threats from sea-level rise and tropical storms. The creation of multiple habitat types driven by topographic variation (Kim et al., 2010), distance to tidal streams, and other factors ensures habitat viability and resilience into the future. Integrated habitats from low marsh to uplands also provide benefit to multiple species with each vegetation zone comprised of distinctive macrophyte assemblages and the species that use them (Moffet et al., 2010).

New Round Island is a recent example of the environmental benefits that can be received from utilizing BU to create a large-scale, multi-nearshore-habitat site in the Mississippi Sound. MDEQ, in collaboration with the Port of Pascagoula, MDMR, NFWF, and USACE, benefited from a federal dredging opportunity to construct approximately 220 acres of coastal nearshore

(marsh and sand beach) habitat near the existing Round Island in the Mississippi Sound. The configuration of the island provides bird habitat, shoreline protection, and storm surge buffering to the cities of Pascagoula and Gautier; and with its topographical range has the capability to support numerous habitat types from low marsh to vegetated dunes. Since its creation in 2016, thousands of shorebirds and pelicans have used the habitat for nesting, loafing, and foraging. Notable examples include: the largest count of Western Sandpiper recorded in Mississippi (900); the largest count of brown pelicans recorded in Mississippi (2,200); the only colony of Sandwich Terns recorded in Mississippi since the 1960's (nest count of 2,724), and; the largest count on record in Mississippi of Wilson's Plover (27). Additional species that have nested on the site include Snowy Plover, American Oystercatcher, Least Tern, Caspian Tern, Gull-billed Tern, Royal Tern, Laughing Gull, and Black Skimmer. As the project site evolves and marsh vegetation colonizes in the interior sections of the island, it is expected that more bird guilds will utilize the habitat. New Round Island also provides ample opportunity to apply restoration approaches and techniques to refine habitats specific to species or groups of species (e.g., shorebird nesting habitat). Coastal habitats created under this proposed Program could have similar ecological and ecosystem service benefits as New Round Island.

Metrics:

Metric Title: PRM011 : Restoration planning/design/permitting - # E&D plans developed

Target: 0.99

Narrative: The number of E&D plans for habitat creation projects

Metric Title: PRM013 : Restoration planning/design/permitting - # environmental compliance documents completed

Target: 0.99

Narrative: The number of permits/compliance documents for habitat creation projects.

Metric Title: HR013 : Wetland restoration - Acres restored

Target: 100

Narrative: The number of acres of coastal nearshore habitat systems created.

Risk and Uncertainties:

The amount, source, and timing for available materials is the largest uncertainty. Many ports and channels have maintenance dredging permits in which a certain amount of material is expected to be dredged to maintain access; however, the implementation and timing of maintenance dredging is contingent on a number of factors (e.g., budget availability). If availability of dredge material through the Program is limited or later than expected, there are alternatives available for sourcing sediments to establish sites. Alternatives to explore include stockpiled material sites and borrow sites for deriving materials. Timing of sediment availability, as well as the cost associated with alternative material options will be identified, vetted, and weighed against site characteristics to determine the best course of action moving forward for creating containment and habitat construction.

Additionally, there may be uncertainty about the suitability and quality of identified source materials which will be considered in planning, design and permitting. Based on the geology of the sediments, compaction and settlement may occur at respective sites. To mitigate this risk, engineers may design the habitat/marsh to a higher elevation to account for compaction and settlement. Environmental suitability of source materials will also be assessed. Sediments identified as a source will undergo any required environmental compliance sediment testing to ensure that the material is appropriate for use. If a sediment source is determined to be environmentally unsuitable, alternative material sources may be considered.

Sea-level rise and storm surge are two risks and uncertainties to project implementation performance. The threat of storms is a project risk for many coastal restoration projects. In the case of marsh restoration, a containment and/or breakwater structure constructed will buffer storm damage to natural marsh but may be susceptible to damage. Engineering and design of containment will utilize best practices from similar projects and be based on best available science and factors such as wave and wind energies to minimize these risks as much as possible. Given the variability in sea level rise prediction as well as the anticipated immediate ecosystem service benefits of the implementation of coastal marsh restoration, sea-level rise considerations may be evaluated. (Hummel et al., 2018) summarized a national assessment of coastal facilities at risk for sea level rise. Mississippi was classified as low risk, with low exposure across a sea level rise gradient from 1ft to 6ft.

Monitoring and Adaptive Management:

Monitoring activities would occur at the program level for each individual workplan implemented. The core components of determining whether coastal habitat restoration and creation was successful include dimension (e.g., marsh elevation and spatial extent) and vegetation density (e.g., abundance and species composition), as applicable to each site. Monitoring of coastal habitat restoration sites is anticipated to follow established monitoring guidance, including potentially utilizing established reference sites as baseline/reference conditions for this Program in the Mississippi coastal landscape. MDEQ may consider applicable monitoring information from the NRDA Cross Trustee Implementation Group (TIG) Monitoring and Adaptive Management (MAM) and the Council Monitoring and Assessment Program. Each project's observational data plan would document the timing of monitoring activities, frequency

of data collection, and the duration of the monitoring component.

Data Management:

MDEQ will store project information on a server that utilizes the Amazon Web Services cloud-based server environment. In addition to the network and server administration provided by Amazon Web Services, MDEQ manages the server, operating system, software and services. Project information is backed up in three locations. The data is included in server snapshots performed by and stored at Amazon Web Services. Duplicate datasets are also located on a secure, cloud-based system. This system includes separate cloud backup and storage on two separate network attached storage arrays located in Gulfport and Jackson, MS. Finally, copies of the data are stored on an internal server. All electronic data and metadata are available upon request.

Collaboration:

MDEQ's project identification and development process would include collaboration with the MDMR BU program staff and with the USACE to better understand dredging schedules, source material options, and availability. Future efforts would also include coordination with local units of government to identify local dredging plans and priorities and coordination with relevant state and federal agencies (e.g., MDMR, USACE). MDEQ would engage with cities, counties and other local entities to understand dredging needs, schedules, quantities, and BU site capacity needs, as well engage other federal agencies (e.g., Department of the Interior, Bureau of Ocean and Energy Management) as needed to discuss source material options (e.g., dedicated material sourcing from borrow sites, upland sites, beneficial use of dredge materials, etc.) and availability, environmental compliance and other due diligence issues which may arise in the identification and assessment of project options.

Public Engagement, Outreach, and Education:

The State of Mississippi's prioritization of the Program is based on multiple public and stakeholder engagement activities. Throughout Mississippi's restoration public engagement and planning efforts, stakeholders have consistently identified the restoration and protection of marsh and critical habitats as a top priority. The following are examples of public engagement, outreach and education activities which were considered in the selection of this proposal:

Annual Mississippi Restoration Summit: MDEQ has hosted the Mississippi Restoration Summit annually for four consecutive years. The public is invited to learn about restoration projects and programs and to provide input on current and future priorities for restoration. The priority of marsh restoration and protection through the beneficial use of dredge material has been highlighted each year. Based on the input received at the annual summits, investing in coastal habitat restoration and protection continues to be a top priority of stakeholders.

Mississippi Coastal Restoration Plan (NFWF-GEBF): In 2014, MDEQ undertook a multi-year planning effort to develop a comprehensive plan to support NFWF-GEBF restoration program activities in Mississippi. Development of the Mississippi Coastal Restoration Plan included

extensive engagement with the public, NGO's/subject matter experts and state and federal agencies. MDEQ's community engagement activities included community conversation and resource summits held in each of the three coastal counties. The community conversation meetings had more than 200 participants, representing 125 organizations, across the three coastal county locations. The priority of habitat conservation and restoration, including utilization of beneficial use of sediments, was a top common value voiced across all three coastal counties.

RESTORE Act Mississippi State Expenditure Plan: Since 2016, MDEQ has solicited stakeholder input to support planning and development of the Mississippi State Expenditure Plan (MSEP). Engagement with a wide range of stakeholders, including private citizens, non-governmental organizations, business owners, elected officials, and other community leaders, has informed the priorities for restoration. In 2023 MSEP planning and development, MDEQ received input from stakeholders that projects which support the beneficial use of sediments be prioritized.

Leveraging:

Funds: $34,600,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: These funds are obligated for coastal habitat creation through the RESTORE FPL 3b program Coastal Nearshore Habitat Restoration and Development Program in Mississippi.

Funds: $44,000,000.00

Type: Leveraging

Status: Received

Source Type: Other

Description: These funds are obligated for marsh creation through two projects (Utilization of Dredge Material For Marsh Restoration in Coastal Mississippi Phase I+II). MDEQ has worked with state and federal partners to identify priority sites for marsh creation and has invested in planning, engineering and design, and permitting for sites, as well as construction funding for containment.

Funds: $2,200,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: The Enhancing Opportunities for Beneficial Use (BU) of Dredge Sediments in the Mississippi Sound (Planning) project provides funding for planning, engineering and design, and permitting for BU sites.

Funds: $13,000,000.00

Type: Leveraging

Status: Received

Source Type: Other

Description: 46 acres of marsh would be created and restored in Heron Bay through the Hancock County Marsh Living Shoreline Early Restoration project.

Environmental Compliance:
Environmental compliance documentation will be updated. Similar to project specific implementation information, environmental compliance checklists and required environmental compliance information will be provided on individual projects as identified. All specific environmental compliance needs will be identified during project identification and development activities.

Bibliography (All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

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Budget

Project Budget Narrative:
A total of $25,000,000 has been requested from FPL 4 to fund activities associated with the Program. The funds will be used for the planning, implementation, and monitoring associated with the Program. An estimated 20% will be used for FPL Category 1 activities such as project planning (e.g., project selection and development), program and project administration (e.g., administrative programmatic functions, coordination, and sub-recipient / contractual support for project implementation), engineering and design, permitting, monitoring, adaptive management and data management activities. An estimated 80% will be for FPL Category 2 implementation (i.e., construction) activities associated with the Program. The need for contingency costs will be considered as appropriate when developing individual project-specific budgets.

Total FPL Project/Program Budget Request:
$ 25,000,000.00

Estimated Percent Monitoring and Adaptive Management: 6 %

Estimated Percent Planning: 10 %

Estimated Percent Implementation: 80 %

Estimated Percent Project Management: 3 %

Estimated Percent Data Management: 1 %

Estimated Percent Contingency: N/A

Is the Project Scalable?:
Yes

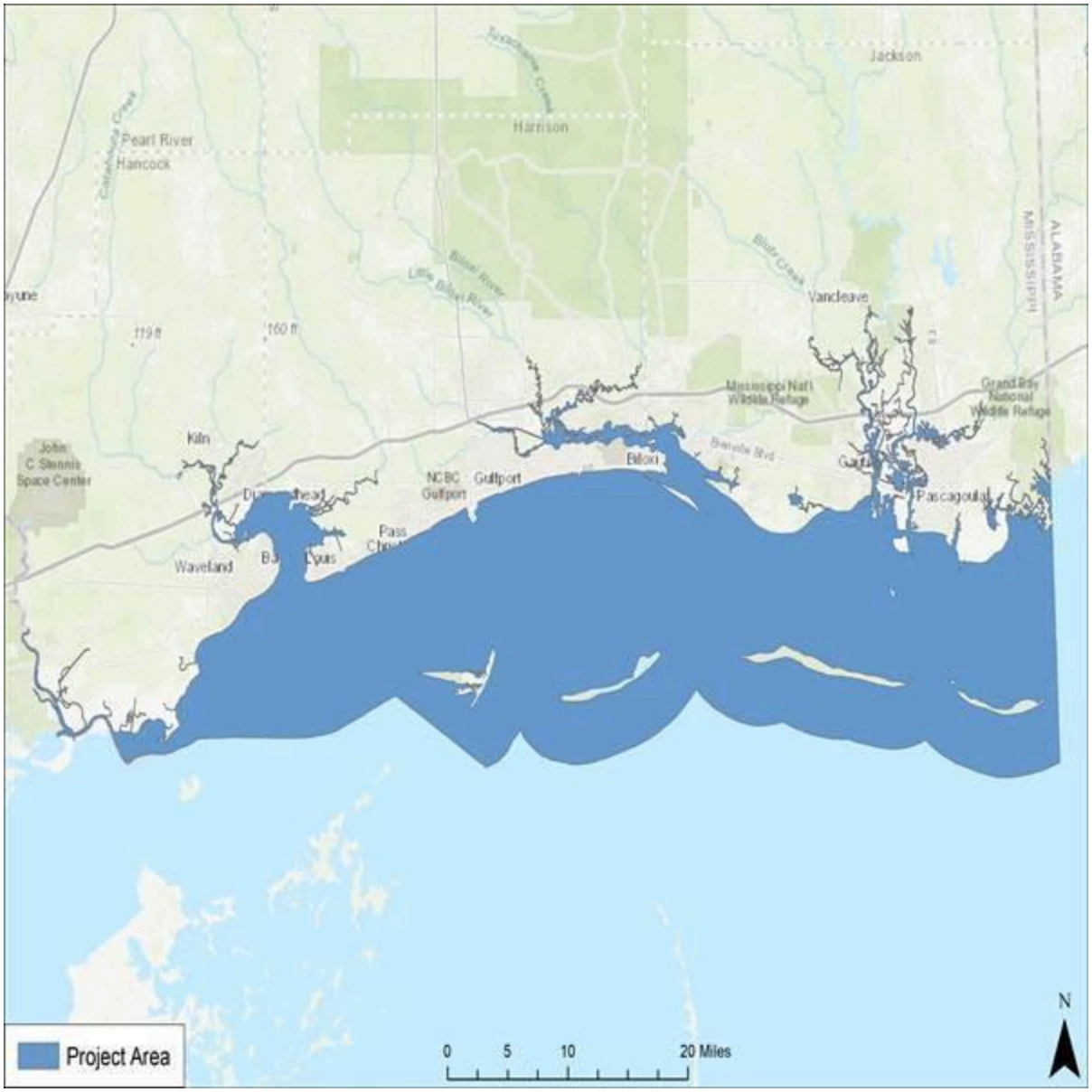
If yes, provide a short description regarding scalability:
The extent of implementation of BU is scalable to a point. If construction funding is necessary to complete a containment or a filling project, that specific construction effort may not be scalable based on engineering and design.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	In Category 1, this proposed activity involves only planning actions. These planning actions are covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures). Additional NEPA compliance will be required for Category 2 efforts.
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.

Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Program Map

Other Uploads

GIS Data_1:
MS_FPL4_CoastalHabitat.gdb.zip
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4099/91

Council Staff Review: Coastal Nearshore Habitat Restoration and Development Program in Mississippi

FPL Internal Staff Review

Project/Program	Coastal Nearshore Habitat Restoration and Development Program in Mississippi		
Primary Reviewer	Heather Young	Sponsor	Mississippi
EC Reviewer	John Ettinger	Co-Sponsor	N/A

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded program.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	More information needed

Notes	The FPL 4 proposal provides the total funding amount requested for the activity, along with the percentage breakdown between FPL Categories 1 and 2. By applying the percentages to the total for the activity the requested amount in FPL Category 1 is $5,000,000 and Category 2 is $20,000,000. Note: Restore Council staff worked with the state to resolve these comments.

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	Mississippi applied BAS reviews that were completed upon original proposal of the program in Funded Priorities List 3b. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	Implementation funding is in FPL Category 2.

Best Available Science Review: Coastal Nearshore Habitat Restoration and Development Program in Mississippi

This program was reviewed for BAS under FPL 3b. Under FPL 4, Mississippi is proposing a continuation of the program.

The original BAS review as well as the state's response to the BAS comments can be found at **https://www.restorethegulf.gov/our-work/fpl/fpl-2026/.**

Restoration of Grand Batture Island

RESTORE Council Proposal Document

General Information

Title:
Restoration of Grand Batture Island

Project Abstract:
Mississippi and Alabama, through the Mississippi Department of Environmental Quality (MDEQ) and the Alabama Department of Conservation and Natural Resources (ADCNR), is requesting $55M in Council-Selected Restoration Component funding for the proposed Restoration of the Grand Batture Island project in Mississippi and Alabama. This would include planning funds as FPL Category 1, as well as an implementation component as an FPL Category 2 priority for funding. This project will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region by creating, restoring, and enhancing coastal habitats through the restoration of Grand Batture Island in Jackson County, Mississippi and Mobile County, Alabama. The project includes, but is not limited to, project management, planning, engineering and design (E&D), monitoring, and construction of habitats to restore the former barrier headland in a cross-border project sponsored by Alabama and Mississippi. The remnants of Grand Batture Island are characterized by natural sandy beaches, dunes, and back barrier marsh. In the past, the island played a crucial role by protecting extensive intertidal marshes and supporting thriving oyster and Submerged Aquatic Vegetation (SAV) beds within Point aux Chenes Bay, Middle Bay, and Grand Bay in Mississippi and Alabama. Restoration actions would reduce erosion rates, protect essential coastal marsh and create crucial habitat for many species including shorebirds and the diamondback terrapin.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Project

Program: N/A

Co-sponsoring Agency(ies):
AL

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:

(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

(IV) Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Priority Criteria Justification:

Between 1848 and 2012, the seaward facing edge of Grand Batture Island has been reduced to 1/5 the length of the former island (Figure 2). The degradation of Grand Batture Island has resulted in increased shoreline exposure on the mainland shore, increasing wave energy to the shoreline and extirpating back-island habitats. Due to these increasing impacts, the Grand Bay National Estuarine Research Reserve has identified large-scale barrier restoration as an action in the 2023-2027 Management Plan (GNDNERR, 2023). The management plan includes work to understand how mitigative actions (e.g., shoreline protection, barrier island nourishment, infrastructure revision, etc.) might influence the outcome for marshes. Management actions are currently being assessed in detailed workshops with researchers and stakeholder partners as part of this management plan. The project also aligns with the primary objective in the Mississippi Gulf Coast Restoration Plan (MDEQ, 2017) to restore priority habitats in coastal Mississippi. Additionally, this is a priority habitat restoration project for the State of Alabama. There has been a significant amount of work implemented to date to benefit the Grand Bay ecosystem as a whole. Mississippi and Alabama have collectively invested $25 million for land acquisition and habitat restoration in the area, which have allowed for the linking of existing protected areas to facilitate a holistic approach to long-term management and stewardship for the Grand Bay ecosystem. The restoration of the Grand Batture headlands will help protect these investments for both states and create a substantial amount of habitat to benefit species that have been impacted by severe habitat loss. For example, shoreline habitats that are important nesting areas for the diamondback terrapin are eroding at high rates. This loss of nesting habitat leads to a decrease in local populations of the diamondback terrapin.

Project Duration (in years): 10

Goals

Primary Comprehensive Plan Goal:

Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Protect and Restore Living Coastal and Marine Resources
Restore and Enhance Natural Processes and Shorelines

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Protect natural shorelines
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement

Location

Location:
The project location is in southeast Jackson County, MS and southwest Mobile County, AL. The project would occur, in part, within the administrative boundaries of the Grand Bay National Estuarine Research Reserve and include both the State of Mississippi and the State of Alabama.

HUC8 Watershed(s):
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)

State(s):
Alabama
Mississippi

County/Parish(es):
AL - Mobile
MS - Jackson

Congressional District(s):
AL - 1
MS - 4

Narratives

Introduction and Overview:

Description of the Proposed Activity; Goals and Objectives

The Restoration of Grand Batture Island project will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region by creating, restoring, and enhancing coastal habitats through the restoration of Grand Batture Island in Jackson County, MS and Mobile County, AL. This project will support the planning, engineering and design (E&D), and construction of habitats to restore the former barrier habitat in a cross-border project sponsored by the states of Alabama and Mississippi.

The project addresses the Gulf Coast Ecosystem Restoration Council Comprehensive Plan Goal #1: Restore and Conserve Habitat. The project would restore and create habitat within coastal waters of Mississippi and Alabama, including priority bays and estuaries, and within the Mississippi Sound. The activity of the project, restoring and creating coastal island and marsh habitats, is consistent with RESTORE Council's primary objective of Restore, Enhance, and Protect Habitats. The Comprehensive Plan goal and objective would be directly addressed through restoration of the former barrier headland by means of habitat creation to mitigate high erosion rates in the Grand Bay marsh system. Additionally, the project would provide protection of seagrass and oyster resources in the area and increase habitat availability for numerous species including, but not limited to, shorebirds, wading birds, and the diamondback terrapin.

Alignment with FPL Planning Framework:

This project aligns with the FPL Planning Framework priority approaches and techniques by addressing the approach "Create, restore and enhance coastal wetlands, islands, shorelines, and headlands," and the techniques "Sediment Placement" and "Protect Natural Shorelines." Additionally, the proposed project builds off previous investments from the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund (NFWF-GEBF), RESTORE Comprehensive Plan Component (Initial FPL) and Spill Impact Component (MSEP), and Natural Resource Damage Assessment (NRDA) restoration projects.

Commitments in 2022 Comprehensive Plan Update:

The following describes how this project addresses the commitments set forth in the 2022 Comprehensive Plan Update:

• Regional ecosystem-based approach to restoration: MDEQ and ADCNR are dedicated to restoring lost coastal wetland and island habitat through various funding streams. Mississippi currently has seven habitat creation projects implemented and planned (~850 acres); Alabama has eight of these projects implemented and planned (~700 acres). These combined projects total nearly 1,550 acres to benefit the overall Mississippi Sound Ecosystem. Restoration at Grand Batture Island would continue this effort and focus on an important ecological area in the Eastern Sound that has yet to be restored

• Leveraging resources and partnerships: The states of Mississippi and Alabama have coordinated to implement this cross-border project. Garnering support and engaging through

coordination with project partners, including the Mississippi Department of Marine Resources (MDMR) and the Grand Bay National Estuarine Research Reserve, has been critical to the formulation of the project concept. Partner engagement would continue through project implementation and is a key component of project success. Additionally, the NFWF GEBF has expressed interest in leveraging funds for the implementation component of the project.

• Engagement, Inclusion, and Transparency: The state of Mississippi's prioritization of this project is based on multiple public and stakeholder engagement activities; including the Annual Mississippi Restoration Summit and the Mississippi Coastal Restoration Plan (NFWF-GEBF). Throughout Mississippi's restoration public engagement and planning efforts, stakeholders have consistently identified the restoration and protection of marsh and critical habitats as a top priority. The state of Alabama's prioritization of this project is based on stakeholder input obtained through Alabama's restoration summits in 2018 and 2022, as well as FPL 1-funded planning activities carried out by the Mobile Bay National Estuarine Program watershed planning project and Alabama's Grand Bay modeling project. (see Public Engagement, Outreach, and Education section).

• Science-based decision-making: The proposed project is supported by an initial effort to model various restoration scenarios for Grand Batture Island funded by the NFWF-GEBF. A project team from the United States Geological Survey (USGS) and the University of Southern Mississippi (USM) will assess potential changes in hydrodynamics, salinity, sediment transport under different restoration scenarios and how these changes may impact seagrass habitat suitability. The team will evaluate the coastal processes driving salinity and sediment transport through time, benchmark the response to those processes, and determine the likely impact of potential restoration scenarios. Once these dynamics are better understood, MDEQ and ADCNR, along with project partners, would choose the most favorable restoration scenario to accomplish the goal to restore habitats.

• Delivering results and measuring impacts: The proposed project would adhere to site-specific milestones and monitoring success criteria. These would be documented in observational data management plans.

General Description of Environmental Benefits:
Barrier headlands like Grand Batture Island serve as invaluable natural buffers, shielding the mainland from the devastating impacts of storm surges and coastal erosion. These barrier features serve as the first line of defense against oceanic waves and storm surge generated flooding (Johnson et al., 2020). In the past, Grand Batture Island protected extensive intertidal marshes, oyster reefs, and SAV beds within Point aux Chenes Bay, Middle Bay, and Grand Bay in Mississippi and Alabama. The coastal wetlands in the Grand Bay system are vital nurseries for numerous species of marine life. Additionally, this area provides crucial habitat for hundreds of birds, including migratory species that utilize the headlands as essential nesting, stopover, and wintering habitat.

Large-scale habitat creation would significantly benefit these species that have been impacted

by severe habitat loss. The proposed project would provide habitat protection for one of the largest expanses of coastal wildlands in Mississippi and Alabama. There has been a significant amount of work implemented to date to benefit the Grand Bay ecosystem as a whole. Mississippi and Alabama have collectively invested $25 million for land acquisition and habitat restoration, which has allowed for the linking of existing protected areas to facilitate a holistic approach to long-term management and stewardship for the Grand Bay ecosystem. Investment into habitat protection measures is critical for this area to maintain large-scale ecosystem functioning. Restoration of the Grand Batture headland would ensure protection from erosion for many years to come.

Environmental Stressors being addressed:
The remnants of the Grand Batture headland, situated on the south side of the Grand Bay National Estuarine Research Reserve, is characterized by natural sandy beaches, dunes, and back-barrier marsh. In 1850, the US Coast Survey mapped approximately 450 acres of barrier headland spanning a length of approximately 5 miles (Meyer-Arendt and Kramer, 1991). However, by the 1950s, it had dwindled to shoals. Since 1850, the rate of shoreline erosion has averaged up to 15 feet per year, and presently, the remaining headland is retreating even faster (Terrano, 2018). Restoration actions would reduce erosion rates, protect essential coastal marsh, and create habitat for many species including shorebirds and the diamondback terrapin (Heaton et al, 2022). The restoration of Grand Batture Island would not only reinstate the original barrier headland but also mitigate erosion along adjacent bayshores and curtail the degradation of marshes owing to reduced wave action.

Total Cost: $55,000,000

Timeline: 10 years

Proposed Methods :
This project would support the following activities: 1) Project Management and Oversight; 2) Planning, including permitting and engineering and design; 3) Construction of appropriate habitats to reestablish the former Grand Batture Island including, but not limited to, beach/dune and back barrier marsh habitats; and 4) Monitoring.

Project Management and Oversight:
Program management and oversight will cover all activities associated with the project. MDEQ and ADCNR personnel and its contractors will provide administrative programmatic functions and/or support during the life of the grant. MDEQ and ADCNR, with contractual support, will also manage the data associated with this project in accordance with the procedures outlined in the Observational Data Plan.

Permitting and E&D:
Engineering, design, and permitting for the project would utilize and apply standard engineering practices for similar projects, including certified and stamped plans. Engineering and design services will provide the design for the headland restoration and protection measures, such as

living shorelines.

The appropriate state/federal agencies will be engaged for permitting requirements habitat creation and source material placement. Project design would take into consideration best management practices. Additional activities may include bathymetry and survey data collection, geotechnical investigations, and other needs associated with site design.

Construction Implementation:
Federal, state, and local groups undertake dredging activities constantly in the Gulf environment for navigation maintenance, infrastructure, and/or hydrological connectivity. Synergistically linking sediment management to the science of habitat creation helps to address coastal habitat loss through sustainable resource management (GCERTF, 2011; CH2M Hill, 2011a, b; ERG, 2014). In developing the scope of work for implementation, MDEQ and ADCNR will consider previous planning efforts and techniques/lessons learned from similar projects in the northern Gulf of America (e.g., Curole and Hartman, 2016; Taylor and Dartez, 2019). Construction implementation will be based on final plans and specifications developed during engineering, design, and permitting. Construction implementation may include all potential activities associated with habitat construction and development of appropriate habitat types to support flora and fauna native to the area. Construction implementation may include, but is not limited to, materials sourcing (e.g., dedicated material sourcing from borrow sites, Beneficial Use of dredge materials, etc.), transport of materials, pumping costs to sites, marsh/beach/dune construction and grading, and protection measures such as living shorelines. Engineering and design and construction services will be procured consistent with applicable procurement standards.

Monitoring:
See monitoring section.

Environmental Benefits:
Marsh-edge erosion from waves reduces the areal extent of a salt marsh, converting marsh to open-water embayments. This process is one of the main drivers for marsh loss worldwide (Nowacki and Ganju, 2021). Wetland loss in the form of shoreline erosion is a significant management concern in the Grand Bay wetland system. Shorelines in some areas are eroding more than six meters per year (Terrano et al., 2019; Schmid, 2000; Otvos, 1990). With relative sea level rise of 0.41 centimeters per year, the erosion rates are higher than would be expected based on wetland retreat from sea level rise alone (Smith et al., 2021a). Currently, a prevalent sand shoal remains where Grand Batture Island once existed. The degradation of Grand Batture Island has resulted in increased connectivity with the Mississippi Sound (Passeri et al., 2023), altered salinity and sediment type, and reduced protection from large water waves. The environmental benefits to the proposed project are directly related to the primary environmental stressor that is prevalent in the area, which is coastal habitat erosion. The issue is two-fold. First, loss of the barrier spit has led to increased erosion of salt marsh located to the north of former headland. Second, the degradation of headland habitats, including natural sand beaches and back-barrier marsh has impacted species that use natural sand beach habitats for

nesting and foraging such as the diamondback terrapin and solitary and colonial nesting birds, among others.

The reduction of erosive forces at the Grand Bay marsh is critical for habitat sustainability over time. Salt marsh wetlands are being transformed to shallow open water habitat due to wave-driven marsh erosion as barrier islands and headlands degrade and sea levels rise along the northern Gulf of America coast (Douglass et al., 2012). These eroding areas are ecologically productive and many of the commercial and non-commercial finfish and shellfish species of the Gulf spend a critical portion of their lifespan in these salt marshes. Salt marshes are keystone habitats within the coastal environment as they provide the base for a host of ecosystem services and benefits (Purcell et al, 2020). These ecosystem services include: serving as natural buffers to protect shorelines from eroding; storm surge protection (Gittman et al., 2014); fisheries production, water quality enhancement through sediment and nutrient reduction, faunal support, carbon sequestration (Battaglia et al. 2012), and providing habitat for a multitude of trophic levels within the ecosystem (Barbier et al., 2011; Mendelssohn et al., 2012). The creation of habitat and the protection of existing marsh in Mississippi's coastal system would continue to support and increase these ecosystem services in Mississippi and Alabama.

Sustainable restoration and creation of coastal habitats is key when confronting threats from sea-level rise and tropical storms. The creation of multiple habitat types driven by topographic variation (Kim et al., 2010), distance to tidal streams, and other factors ensures habitat viability and resilience into the future. Integrated habitats from low marsh to uplands also provide benefit to multiple species with each vegetation zone comprised of distinctive macrophyte assemblages and the species that use them (Moffet et al., 2010).

New Round Island in Mississippi is a recent example of the environmental benefits that can be received from utilizing sediment materials to create a large-scale, multi-habitat site in the Mississippi Sound system. MDEQ, in collaboration with the Port of Pascagoula, MDMR, NFWF, and the US Army Corps of Engineers (USACE), benefited from a federal dredging opportunity to construct approximately 220 acres of coastal habitat (marsh and sand beach) near the existing Round Island in the Mississippi Sound. The configuration of the island provides bird habitat, shoreline protection, and storm surge buffering to the cities of Pascagoula and Gautier; and with its topographical range has the capability to support numerous habitat types from low marsh to vegetated dunes. Since its creation in 2016, thousands of shorebirds and pelicans have used the habitat for nesting, loafing, and foraging (Gamblin et al., 2023). New Round Island also provides ample opportunity to apply restoration approaches and techniques to refine habitats specific to species or groups of species (e.g., shorebird nesting habitat).

In addition to habitat use by birds, these habitat types in the Grand Bay ecosystem are used by the Diamondback terrapins for nesting. In recent years, nest surveys conducted by the Grand Bay National Estuarine Research Reserve found the lowest numbers of nest detections since surveys began in 1994. Terrapins are known to exhibit nest site fidelity, and it is likely that the lower numbers of nests and adult terrapins seen at Grand Batture Island over time is related to the shoreline retreat and loss of nesting habitat observed in the area. Additionally, erosion of

the remaining headland has led to a shift of marsh vegetation habitat type, from high marsh species in sandy sediment, which is used by terrapins for nesting, to low marsh species in silty sediment (Heaton et al., 2022). Restoration of beach/dune and high marsh habitats at the Grand Batture headland would provide a significant amount of nesting habitat for terrapins in the Grand Bay system.

Metrics:

Metric Title: PRM011 : Restoration planning/design/permitting - # E&D plans developed

Target: 1

Narrative: The number of E&D plans developed for implementation.

Metric Title: PRM013 : Restoration planning/design/permitting - # environmental compliance documents completed

Target: 1

Narrative: The number of permits/compliance documents completed

Metric Title: HR013 : Wetland restoration - Acres restored

Target: 100

Narrative: The number of acres of coastal nearshore habitat created.

Risk and Uncertainties:

The threat of tropical storms is a project risk for all coastal restoration projects. In the case of marsh or beach/dune restoration, project components would be designed to buffer storm damage to habitats but could be compromised requiring infrastructure repairs after a storm. Additional project risks include constructed sediment compaction and subsidence occurring to a greater degree than anticipated. Based on the geology of the sediments, engineers would build the habitats to a higher elevation with the anticipation of compaction and settling. Through the Monitoring and Adaptive Management Plan (see Monitoring and Adaptive Management section), adaptive management strategies and corrective actions would be identified to address project risks associated with structural integrity. Further, engineering assessments will explore cost-effective wave attenuation features that balance structural protection with ecological integrity. Also, with large-scale restoration, there could be a risk of changing broader ecosystem dynamics as they currently exist. Scientific evaluations to assess the impacts of restoration

efforts on estuarine hydrodynamics and water quality would take place before project implementation to better understand potential changes to ecosystems, including seagrass habitat and influence design considerations.

Sea level rise (SLR) is a project risk for all coastal habitat projects. At Grand Bay, the area is experiencing a relative sea level rise of 0.41 centimeters per year (Smith et al., 2021a). An increase in water levels can cause increased exposure to wave driven erosion and the submergence of habitats over time. For the Grand Bay ecosystem, the level of current lateral erosion to marsh habitats is outpacing water level increases over time. Due to this, it is imperative to provide protection to existing resources and reduce amplification of further erosion from sea level rise. However, mitigation measures to reduce shoreline erosion could also reduce suspended sediments in tidal floodwaters and therefore sediment delivery into the marsh platform, impacting elevation gain which is an important component for marsh systems to adapt to rising sea level (Smith et al., 2021b). A better understanding of hydrodynamic and sediment transport pathways under different restoration scenarios is needed to inform potential impacts from restoration and provide insight into how large-scale restoration can alter the physical estuarine processes under present-day conditions as well as future SLR (Passeri et al., 2023). ACDNR previously funded research to assess potential impacts of large-scale restoration at Grand Batture Island on the Alabama side of the system. Findings from this research, published in Passeri et al. (2023), indicate that restoration efforts on Grand Batture Island could alter sediment deposition patterns, stabilizing the island and indirectly benefiting the surrounding coastal marshes by reducing wave energy and preventing further erosion. Jenkins et al. (2023) also highlighted that restoring these interior structures could help mitigate saltwater intrusion, thereby stabilizing habitats for species such as seagrass and oysters, which are sensitive to salinity fluctuations. MDEQ currently has a proposal under review to leverage this research for a cross-border project that will include restoration scenarios for both Mississippi and Alabama. Information from the study would help inform restoration and the design of a full headland structure.

Monitoring and Adaptive Management:

Monitoring activities would occur after implementation of the project. The core components could include dimension (elevation and spatial extent) of the created habitat, plant survivorship/mortality for vegetative plantings, erosion monitoring of marsh habitat that is being protected by the headland, SAV monitoring, and biological response (e.g., wildlife use such as birds and terrapins). Monitoring would follow established monitoring guidance and be documented in a Monitoring and Adaptive Management Plan. Additionally, this plan would be developed as part of the proposed project to address project uncertainties, adaptive management strategies, and corrective actions as needed. The project's observational data plan would document the timing of monitoring activities, frequency of data collection, and the duration of the monitoring component. To the extent applicable, monitoring activities would leverage ongoing work at the Grand Bay National Estuarine Research Reserve.

Data Management:

MDEQ will store project information on a server that utilizes the Amazon Web Services cloud-based server environment. In addition to the network and server administration provided by Amazon Web Services, MDEQ manages the server, operating system, software and services. Project information is backed up in three locations and a backup will be provided to ADCNR for use by the State of Alabama. The data is included in server snapshots performed by and stored at Amazon Web Services. Duplicate datasets are also located on a secure, cloud-based system. This system includes separate cloud backup and storage on two separate network attached storage arrays located in Gulfport and Jackson, MS. Finally, copies of the data are stored on an internal server. All electronic data and metadata are available upon request.

Collaboration:

The states of Mississippi and Alabama have collaborated to implement this cross-border project. Garnering support and engaging through coordination with project partners, including the Mississippi Department of Marine Resource and the Grand Bay National Estuarine Research Reserve, has been critical to the formulation of the project concept. Partner engagement would continue through project implementation and is a key component of project success.

Public Engagement, Outreach, and Education:

The State of Mississippi's prioritization of the project is based on multiple public and stakeholder engagement activities. Throughout Mississippi's restoration public engagement and planning efforts, stakeholders have consistently identified the restoration and protection of coastal wetlands and critical habitats as a top priority. The following are examples of public engagement, outreach and education activities which were considered in the selection of this proposal:

Annual Mississippi Restoration Summit: MDEQ has hosted the Mississippi Restoration Summit annually for four consecutive years. The public is invited to learn about restoration projects and programs and to provide input on current and future priorities for restoration. The priority of marsh restoration and protection through the beneficial use of dredge material has been highlighted each year. Based on the input received at the annual summits, investing in coastal habitat restoration and protection continues to be a top priority of stakeholders.

Mississippi Coastal Restoration Plan (NFWF-GEBF): In 2014, MDEQ undertook a multi-year planning effort to develop a comprehensive plan to support NFWF-GEBF restoration program activities in Mississippi. Development of the Mississippi Coastal Restoration Plan included extensive engagement with the public, NGO's/subject matter experts, and state and federal agencies. MDEQ's community engagement activities included community conversation and resource summits held in each of the three coastal counties. The community conversation meetings had more than 200 participants, representing 125 organizations, across the three coastal county locations. The priority of habitat conservation and restoration, including utilization of beneficial use of sediments, was a top common value voiced across all three coastal counties.

RESTORE Act Mississippi State Expenditure Plan: Since 2016, MDEQ has solicited stakeholder input to support planning and development of the Mississippi State Expenditure Plan (MSEP). Engagement with a wide range of stakeholders, including private citizens, non-governmental organizations, business owners, elected officials, and other community leaders, has informed the priorities for restoration. During MSEP planning and development in 2023, MDEQ received input from stakeholders that projects which support the beneficial use of sediments be prioritized.

The state of Alabama's prioritization of this project is based on stakeholder input obtained through Alabama's restoration summits in 2018 and 2022, as well as FPL 1-funded planning activities carried out by the Mobile Bay National Estuarine Program watershed planning project and Alabama's Grand Bay modeling project.

Alabama Restoration Summits: ADCNR and the State of Alabama held restoration summits in 2018 and 2022. Habitat creation and restoration and beneficial use of sediments were priorities identified by the coastal stakeholders at the summits.

Conservation Advisory Board: Alabama's Conservation Advisory Board (CAB) assists in formulating policies for the Department of Conservation. During meetings held in March 2024 and May 2024, the CAB discussed habitat restoration in Alabama and affirmed the use of beneficial use for habitat conservation and restoration as an agency priority.

Planning Efforts: Additionally, the Mobile Bay National Estuarine Program (MBNEP) is currently holding public meetings and Steering Committee meetings to develop and publish a watershed management plan for Grand Bay. Watersheds have no state boundaries and the MBNEP, through FPL 1 funding, is developing the Alabama portion of the Grand Bay watershed management plan. The Environmental Protection Agency (EPA) is funding the development of the watershed management plan on the Mississippi side of Grand Bay. Stakeholder input and public outreach is a critical part of the planning process to engage the community and gather information about watershed issues. Although early in the process, the public is already involved and, before the plan is published, public opinion of the plan will be elicited through public meetings and a comment period, leading to a plan that the community influenced.

Leveraging:

Funds: $1,048,258.00

Type: Leveraging

Status: Proposed

Source Type: Not For Profit

Description: This project will evaluate different restoration scenarios for Grand Batture Island and assess potential changes in hydrodynamics, salinity, sediment transport and how these changes may impact seagrass habitat suitability. The United States Geological Survey (USGS) St Petersburg Coastal and Marine Science Center (SPCMSC) modeling team will use numerical models to evaluate the coastal processes driving salinity and sediment transport through time, benchmark the response to those processes, and determine the likely impact of potential restoration scenarios.

Funds: $364,964.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: In June 2023, USGS, as a subrecipient to ADCNR, completed hydrodynamic, salinity, and sediment transport modeling under different restoration scenarios for the AL portion of Grand Batture Island. Modeling exercise was first step in exploring restoration actions to increase estuarine resilience including reconstructing the degraded interior headlands.

Environmental Compliance:
Environmental compliance documentation will be updated. Environmental compliance checklists and required environmental compliance information will be provided as a part of the planning component of this project.

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Budget

Project Budget Narrative:
A total of $55,000,000 is being requested to fund activities associated with the project. The funds will be used for project management, planning, implementation, and monitoring associated with the project. An estimated 25% will be used for FPL Category 1 activities such as project planning, project administration (e.g., administrative programmatic functions, coordination, and sub-recipient / contractual support for project implementation), engineering and design, permitting, monitoring, and data management activities. An estimated 75% will be for FPL Category 2 implementation (i.e., construction) activities associated with the project.

Total FPL Project/Program Budget Request:
$ 55,000,000.00

Estimated Percent Monitoring and Adaptive Management: 6 %

Estimated Percent Planning: 10 %

Estimated Percent Implementation: 75 %

Estimated Percent Project Management: 8 %

Estimated Percent Data Management: 1 %

Estimated Percent Contingency: N/A

Is the Project Scalable?:
Yes

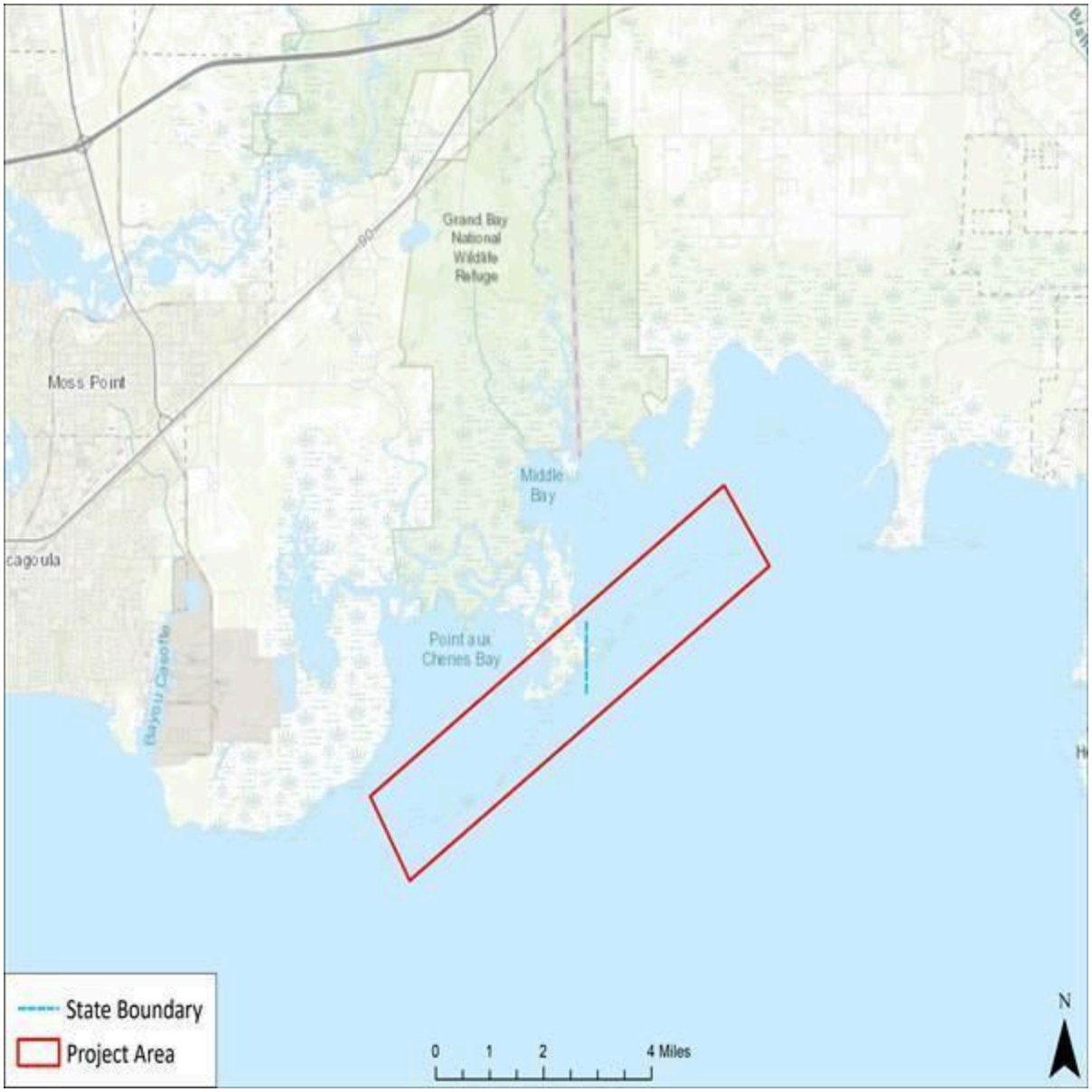
If yes, provide a short description regarding scalability.:
The extent of the restoration footprint will be determined by several factors including subsurface geology, potential impacts to existing habitats, modeling outputs, and partner input. The project footprint could represent historical shoreline boundaries (e.g., 1853,1917) or a variation of those depending on the factors mentioned previously.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	In Category 1, this proposed activity involves only planning actions. These planning actions are covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures). Additional NEPA compliance will be required for Category 2 efforts.
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.

Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Project Area

Caption : Grand Batture Island - 1850 Shoreline

Other Uploads

GIS Data_2:
RESTORE_GIS_Template.gdb.zip
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4093/79

Council Staff Review: Restoration of Grand Batture Island

FPL Internal Staff Review

Project/Program	Restoration of Grand Batture Island		
Primary Reviewer	Heather Young	Sponsor	Mississippi
EC Reviewer	John Ettinger	Co-Sponsor	Alabama

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes

Notes	$55M (25% Planning, & Monitoring, 75% construction implementation) MAM 6 %, Planning: 10 %, Project Management: 8 %, Data Management: 1 %, Implementation: 75 %, Contingency 0% Note: Restore Council staff worked with the state to resolve these comments.

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	Implementation funding is in FPL Category 2.

Summary of Best Available Science Review: Restoration of Grand Batture Island

The Grant Batture Island Restoration proposal received generally positive evaluations across in-state, out-of-state, and out-of-Gulf reviews, though several areas were identified as needing additional information. Reviewers agreed that the proposal was grounded in best available science, referencing appropriate literature and leveraging peer-reviewed and public sources, although some cited works were not publicly accessible or directly applicable to the site. The project goals—restoring habitat, protecting marshland, and supporting wildlife—were clearly stated, but more detail on methods, risk mitigation, and metrics was requested. Reviewers noted a lack of specificity regarding construction methods, monitoring strategies, sediment data, and adaptive management plans. While some risks, such as sea level rise and erosion, were discussed, contingency planning for events like hurricanes or sediment transport changes was insufficient. Experience from past restoration projects was cited, but lessons learned from failures were underexplored. Despite these gaps, reviewers supported funding the project, citing strong cross-state collaboration between Mississippi and Alabama, alignment with RESTORE Act goals, and the opportunity to build upon existing monitoring infrastructure. The project is seen as a crucial next step in regional ecosystem protection, though success will depend on more detailed planning and integration of modeling and protective measures.

Summary of Mississippi's Response to BAS Comments: Restoration of Grand Batture Island

The state’s response to BAS comments outlines several key points related to project planning and management. Construction methods and alternatives will be addressed in the engineering and design phase, with a Monitoring and Adaptive Management Plan to be developed. This plan will include strategies for monitoring uncertainties, adaptive management, and corrective actions. The proposal also details plans to include monitoring for structural integrity, shoreline position, and sediment dynamics, with opportunities for collaboration with partners on monitoring efforts like SAV, bird, and erosion monitoring. The proposal has been updated to include additional information on erosion risk, protection measures such as living shorelines, and findings from studies like Passeri et al. (2023) and Jenkins et al. (2023). Regarding Round Island, the state clarifies that while erosion has occurred, there has also been accumulation in some areas, and the site’s expansion will include protective measures. The state also refrains from commenting on other restoration projects in different states, as it is unclear whether corrective actions were taken by those project sponsors. The response reaffirms that a Monitoring and Adaptive Management Plan will be part of the proposed project.

Best Available Science Review Forms: Restoration of Grand Batture Island

Proposal Title: Restoration of Grand Batture Island
Location (If Applicable): The project location is in southeast Jackson County, MS and southwest MobileCounty, AL. The project would occur, in part, within the administrative boundaries of the Grand BayNational Estuarine Research Reserve and include both the State of Mississippi and the State ofAlabama.
Council Member Bureau or Agency: Mississippi Department of Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: In State
Date of Review: 10/28/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	

The following resources have been provided within the “Proposed Methods/Construction Implementation” section:
GCERTF, 2011; CH2M Hill, 2011a, b; ERG, 2014; Curole and Hartman, 2016; Taylor and Dartez, 2019.

ERG 2014 is neither peer-reviewed nor publicly available.

GCERTF 2011 does not specifically list any construction implementation methods.
CH2M Hill 2011a and 2011b do not discuss any activities at Grand Battures.

Proposal provides the Caminada Headland and West Belle Pass Headland Restoration projects as examples but the proposal does not specify which of the other described methods would apply to Grant Battures restoration. For example, will there be analysis performed using GENCADE or GENESIS on alternative implementations? Also the proposed project details are not provided such as length, width, slope, volume, sediment type, size, borrow area, etc. Also the need for constructing a containment structure (dike) is not discussed to provide protection to the fill sites during construction. Also, considering the high erosion rates (USGS ref. Terrano et al, 2019), the restored island may be eroded again over time because it is subject to the highest erosion rates in the study area, and the proposal do not include any plan to combine the nourishment (dredge/fill) proposal with a combination of shoreline protection measures (for example, submerged breakwaters or other protective measures).

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The information supporting the proposal directly pertains to the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Yes, the literature sources used to support the proposal are accurately and completely cited and represented in a fair and unbiased manner. All references are cited!	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	
For risks, the proposal lists some risks but do not evaluate or present any contingency plans regarding achieving objectives. For example, there are no reconfiguration plans if a hurricane affects the project site during construction/implementation. The risk of construction delays and the associated erosion and shoreline changes is not mentioned (i.e. a background erosion estimation/evaluation is not proposed).	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The provided list of references are appropriate for the proposal. Most of the references are from recent years and provide examples of best available science from journals, reports, webpages, etc.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	

Environmental Benefits section of the proposal provides reasonable justification that the outcomes of the proposed projects may be similar to other successful past applications. Risks and Uncertainties section also list recent modeling studies for the project site which are critical for the proposed project. However, the construction implementation section lacks references especially from the study area, i.e. Mississippi Sound. Some recent examples are Ship Island restoration and Round Island restoration projects in Western and Central Mississippi Sound and Little Bay Project in Alabama.

Besides, the construction implementation section does not provide a detailed view to the proposed project activities. For example, for the Round Island restoration project multiple containtment cells were used as a combination of dikes and sand berms. Ship Island project was a beach nourishment project and Little Bay project included a nearshore breakwater complex with wave attenuation devices. The proposal lacks a list of design options, a declaration of the preferred design method and a discussion of alternatives.

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information

Comments:

Although the applicant extensively discusses SLR as a risk, other critical risks, such as the breaching of the restored site during a storm, or limited lifetime of the project because of regular sediment drift are not considered in detail in the Risks and Uncertainties section. For example, for the Round Island project, because there was no direct protection from wave action (i.e. no hard structures protecting the restoration area), most of the initially placed material was lost after a certain time and frequent re-nourishment was recommended for continuous environmental benefits. This will be true for any site, such that based on the sediment supply availability and the dominant wave and current-driven sediment transport patterns; any nourished restored site might experience similar erosion and the lifetime of the project might be limited. Also in the Little Bay project, wave attenuation devices were found to provide minimal attenuation and had to be optimized to enhance flow and water quality for aquatic species.

There are two studies mentioned (Passeri 2023 and Jenkins 2023) focusing on the east side of the island for the impact of proposed restoration scenarios on hydrodynamics, water quality and morphology and sediment transport. Also, they conclude that “Additional modeling that takes into account the feedback processes of marsh erosion, resuspension, and deposition would be required to determine if shoreline change rates could be impacted by restoration scenarios.” Therefore, at this stage it is unclear whether the restoration of the island will guarantee positive impact on the marsh restoration efforts because it is said while it will provide protection from waves and reduce marsh shoreline erosion, it will also reduce the sediment supply to the marsh and these are not discussed in detail in the proposal.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
The proposal states that “Mississippi currently hasseven habitat creation projects implemented and planned (~850 acres); Alabama has eight of theseprojects implemented and planned (~700 acres). These combined projects total nearly 1,550 acres tobenefit the overall Mississippi Sound Ecosystem.” and also “Mississippi and Alabamahave collectively invested $25 million for land acquisition and habitat restoration”. Although no further information is provided on the type of projects and the similarity of those projects to the one being proposed.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The proposed project aims to: - restore Grand Battures Island - provide natural protection to the marshland by the restoration of Grand Battures Island - create habitat by reducing erosion rates in Grant Bay marshland - provide protection to aquatic species - increase habitat for birds and diamondback terrapin	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
Monitoring is listed as a proposed activity under methods and is described in a separate section. However, cost-effectiveness is not discussed also the listed activities are not detailed enough raising questions such as: Will there be small boat surveys? Will there be on-land field surveys on the marsh? Will there be water quality surveys? What is the proposed frequency of all measurements? Annual? Seasonal? Monthly? Will there be bathymetric surveys before and after the restoration of Grand Battures? Will there be surveys on breeding non-breeding bird nests? Will there be instruments/sensors deployed for continuous measurements? What will be the during construction and post-construction	

monitoring for the marshland? Will aerial surveys be conducted to monitor shoreline change? Will there be LiDAR surveys (either terrestrial or aerial)? There may be other questions regarding the proposed monitoring activities.

Construction and Implementation is the main method proposed to restore the Grand Battues Island/Headland and it is clear that the goal is to use dredged material for the proposed restoration project. However, the applicant is not clear which method will be selected. It is mentioned that the methods will be based on finals plans and specifications developed during engineering, design and permitting. Even if the West Belle Pass Headland restoration and Caminada Headland restoration projects are listed as previous studies to be considered, no method is listed as proposed or listed to be used as a list of possible methods to select from.

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Yes, the proposal extensively discusses the environmental benefits of the proposed Grand Battures Restoration project via the creation of habitat and protection of marshland. The applicants also discuss the benefits in reference to the stressors including salt marsh erosion, headland habitat degradation. They provide the recent Round Island Project as an example of environmental benefits.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information
Comments:	
PRM011, PRM013 and HR013 are listed as metrics but details are provided except 100 acres of wetland will be restored (i.e. coastal habitat created). So, although a metric is included for habitat creation and wetland restoration. There seems to be no metric included for the success of nesting increase for birds or diamondback terrapin or any metrics included as fas as the success of protection for aquatic species such as oysters and seagrass.	

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

The proposal extensively discusses vulnerability to Sea Level Rise, i.e. climate risk. The applicants refer to multiple studies (Passeri et al., 2023 and Jenkins et al., 2023) already conducted by funding from one of the partners (ADCNR). Both are modeling studies focusing on the impact of the proposed restoration (combined with other restoration activities) on both hydrodynamics, water quality and morphodynamics while considering SLR scenarios. One thing to note is both studies focus on the eastern side of the proposed project site while it is also very important to also study and analyze the potential impacts on the western side (Pascagoula side) because the implementation will potentially modify the sediment transport dynamics in the downdrift western side. These are is critical habitat for the threatened Gulf Sturgeon, therefore it is crucial to under the potential long-term impacts of the proposed implementation on the water quality and hydrodynamics of the entire study area.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information

Comments:

The proposal discusses the storm threats and the possibility of repairs; unanticipated compaction and subsidence; also potential chances to ecosystems. However, There is no specific mitigation plan to address short-term risks. The proposal does not consider any socio-economic impacts. For example, the positive impacts of marshland restoration on coastal communities is not discussed, or the influence of enhance protection for oyster provided by the restorated island on oyster fishermen is not discussed, among others. Also recent studies (Jenkins et al., 2023) indicated that the proposed project might lead to sediment supply issues for the marshland but the proposal does not discuss this risk/uncertainty.

Question H

Does the project/program consider recent and/or relevant information in discussing the elements above?	Need more information

Comments:

The proposal refer to several recent studies such as Passeri et al. and Jenkins et al. (2023) studying the impacts of the restoration of Grand Battues Island, however they do not provide sufficient information from their findings.

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
Proposal refers to past headland restoration efforts and also to another successful study in Mississippi: Round Island restoration. However, the failures during those projects and the potential similar risks for the proposed project are not discussed in detail. For example, there were construction failures during the initial West Belle Pass Headland Restoration project which had adverse impacts such as volume deficits, marsh tracks, and elevated spoil embankmentsband a significant reduced wetland acreage below the goal. There were data collection difficulties during the Caminada Headland restoration project. The Little Bay project was a living shoreline success and this was not discussed in the proposal at all. The successes and environmental benefits of the Round Island project was discussed. However, the short term (and also longterm benefits) to certain bird species was not discussed. Also the fact that the sand berm solution was subject to erosion and went back to pre-implementation levels was not discussed. This is important because it highlights the need for a combination of a soft solution (nourishment, filling with dredged material) with a green solution (e.g., a living shoreline) adding a level of protection for the project.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information
Comments:	
The proposal discusses a monitoring plan and also includes a data management plan. However, the monitoring plan is not detailed and therefore there is no direct linkage between their support of project metrics and measures of success. Also, adaptive management is not articulated in the proposal.	

Please summarize any additional information needed below:

The restoration of Grand Battures Island could be a critical project and will help preserve and protect the ecosystem as well as marshland in Mississippi Sound. The proposal very well articulates the environmental and ecosystem benefits of the proposed project. The study site experienced the largest shoreline retreat in the study area and this means even after the sand fill and nourishment with dredged material for the restoration of the island, it will remain subject to high erosion rates. For this reason, it would be beneficial for the applicants to combine the sandfill approach with a coastal protection method. This could be porous energy buffer, wave attenuation devices, living shorelines, or other alternatives such as frequent re-nourishment activities planned.

Here are some additional comments/suggestions:

The proposal does not discuss the possibility of using a modeling system to predict the impact of Grand Battures restoration on marsh accretion. There are models available to study marsh dynamics, marsh edge erosion, marsh lateral erosion, marsh vertical growth and vertical accretion due to biomass production, submerged aquatic vegetation growth. It would be crucial to utilize such models as well as morphological/shoreline change models in conjunction with the sediment transport models, hydrodynamics models, wave models to analyze the impact of the proposed restoration effort before construction begins. (For example, see Kalra et al. 2021, Front. Mar . Sci. Vol. 8 https://doi.org/10.3389/fmars.2021.740921)

The proposal did not provide technical details (even if they may change during planning and implementation) such as fill material, sediment type, sediment size, protection material, riprap, fill slope, fill height, fill width/thickness, fill length, etc.

The proposal does not discuss baseline bathy=topo surveys, baseline habitat surveys, monthly monitoring surveys, hydrodynamic (wave/currents affecting sediment transport) measurements and also types of surveys to determine volumetric changes and accretion calculations to assess project metrics.

Proposal Title: Restoration of Grand Batture Island
Location (If Applicable): The project location is in southeast Jackson County, MS and southwest MobileCounty, AL. The project would occur, in part, within the administrative boundaries of the Grand BayNational Estuarine Research Reserve and include both the State of Mississippi and the State ofAlabama.
Council Member Bureau or Agency: Mississippi Department of Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: In Gulf
Date of Review: 10/25/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
This is a barrier island/beach construction and monitoring project. The proposal has referenced many pertinent studies and work that shows supports for their goals/objectives.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
Methods are supported with adequate documentation. This construction project is for a specific geographic location that spans both Mississippi and Alabama coastal habitats.	

Question 3.

Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Accurately and well-represented literature citations are documented in a fair and unbiased manner.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
There are risks and uncertainties discussed in the proposal, but the near and long term benefits of the project are considered to be essential and will never be obsolete. There is no indication that the project will not function as planned. Protecting interior wetland habitat while providing a barrier headland/beach for wildlife usage is fundamental to good stewardship at a practical level even with the ever-present erosional and potential ephemeral nature of such habitats.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Throughout the project proposal the applicant provides ample peer-reviewed and publicly available data references that support their goals/objectives.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The proposal is based on peer-reviewed as well as comprehensive agency reports that provide data information and proper statistical approaches. There is ample evidence in the literature that this project is of high quality.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
I was very pleased to see that the proposal highlighted the uncertainties that accompany all such barrier beach/headland construction projects.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
The sponsors and project partners have all the necessary experience through other sponsored coastal projects similar to the one being proposed.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The proposal has a very broad-stroke goal and objective statement and I would have expected more habitat-specific and biota-specific information to be included. However, when reading the entire proposal, the authors provide much of that information in their following narrative sections.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The authors cite past projects that have specific science-based methodologies that will be similarly used in this project. They also state that methodologies will be established according to accepted management protocols.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The proposal gives a good account of potential environmental stressors and associated risk of project success. They appear to have a firm understanding of those stressors. The potential benefits are also discussed in the proposal and in my opinion outweigh the risks.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Comments already provided above satisfy this question. Aligns with RESTORE Act requirements.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The proposal gives a good account of potential environmental stressors and associated risk of project success. They appear to have a firm understanding of those stressors. The potential benefits are also discussed in the proposal and in my opinion outweigh the risks.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Comments already provided above satisfy this question. Aligns with RESTORE Act requirements.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
The proposal cites numerous scientific studies that support the above questions, and does an adequate job of discussing them.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
This is captured in the narrative with scientific citations. Aligns with RESTORE Act requirements.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
Comments already provided above satisfy this question. Aligns with RESTORE Act requirements.	

Please summarize any additional information needed below:

I would recommend this project for funding. I base this recommendation on the following:
*The proposal is submitted by MDEQ, but there is a partnership with the Alabama ADCNR. This creates a strong proposal with the cooperation of both states since the project footprint borders both, and ultimately benefits both with the protection of Grand Bay National Wildlife Refuge.
*Monitoring in the nearby GBNRR is extensive and on-going, e.g.. the Sentinel Monitoring Program. Opportunity to develop a monitoring plan for the project with an infrastructure of already available supporting staff and expertise. An opportunity to better understand barrier beach habitat changes over time. This project can potentially become a sentinel for how storms, currents, etc. change habitats and how the biota adapt with those habitat changes.
*This construction of barrier headlands will support the protection of interior marsh habitats that have been previously funded from NFWF, NRDA, and the RESTORE Act. This is a very logical next-step project.
*Such a large-scale project will require extensive planning before final development of proper monitoring strategies. They state this in the document with the need for incremental procedures, and realistically propose a 10-year plan timeline.
*MDEQ, ADCNR, and GBNERR have experience in construction and monitoring of such a proposed project, which insures proper oversight and fulfillment of project goal/objective.
*I was very pleased to see in the proposal that the work proposed will be used to leverage future research opportunities for cross-state projects that will include restoration scenarios for both Mississippi and Alabama.
*Outreach to the public by MDEQ, ADCNR, and others have indicated that habitat preservation and enhancement are high priorities. This project definitely encompasses the wishes of the public. Additionally, MDEQ hosts an annual Restoration Summit.
*Understanding the hydrodynamics of sediment transport to/from the proposed barrier headland project is essential. The USGS had been funded to model this for the Alabama part of the headland and MDEQ has a pending project with a Not For Profit to do the same for the Mississippi part of the headland.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Restoration of Grand Batture Island
Location (If Applicable): The project location is in southeast Jackson County, MS and southwest MobileCounty, AL. The project would occur, in part, within the administrative boundaries of the Grand BayNational Estuarine Research Reserve and include both the State of Mississippi and the State ofAlabama.
Council Member Bureau or Agency: Mississippi Department of Environmental Quality
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of Gulf
Date of Review: 10/21/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
Click here to enter text.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
N/A as the project benefits directly to the Gulf Coast.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Literature is well used in describing benefits, project designs and risks.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
The proposal does an excellent job of identifying these risks to the project utilizing recent literature.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Click here to enter text.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
Click here to enter text.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Click here to enter text.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
The proposal does detail the adjacent work that has been ongoing in AL and MS, as well experience in permitting, engineering and construction.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
At this stage, yes the goals are clearly defined and assume they will get more detailed during the E&D process.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
Click here to enter text.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those	Yes

benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	
Comments:	
Click here to enter text.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Click here to enter text.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Yes, the proposal does discuss this, as well as has a modeling team from USGS and USM that will be conducting scenario modeling to reduce risks during the planning and E&D stage.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The proposal does identify short-term risks. At this stage, there are plans to conduct scenario modeling to reduce risks, as well as a parralel project to better understand hydrodynamic and sediment transport pathways under different restoration scenarios and future environmental conditions that will inform the future details of the design of the project.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes

Comments:
Click here to enter text.

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
The proposal doesn't explicitly discuss past efforts, but does note a few literature resources around sediment resource management and techniques/lessons learned from similar projects.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
The proposal does identify key monitoring and data management needs for the projects and makes a commitment to that, however the details (such as performance criteria) are lacking most likely due to the stage of the project in development.	

Please summarize any additional information needed below:
Overall, the project is justified by the best available science and the proposal has explicit reliance on peer-reviewed and other public literature. Where details are lacking, it simply seems to be due to the stage of the project in early development and more information will become available during the permitting, E&D and environmental compliance stages of the project.

Appendix D: Coastal Alabama Proposal Packets

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Coastal Alabama Regional Water Quality Program

RESTORE Council Proposal Document

General Information

Title:
Coastal Alabama Regional Water Quality Program

Project Abstract:
Alabama, through the Alabama Department of Conservation and Natural Resources (ADCNR), is requesting $8M in Council-Selected Restoration Component funding to continue the FPL 3b-funded Coastal Alabama Regional Water Quality Program. This request includes $2.4M in planning funds as Category 1, and $5.6M in implementation funds as an Category 2 priority for potential funding to continue to build the Water Quality program over the next 10 years. In addition, Alabama is requesting to utilize $1,500,000 in unspent funds associated with the FPL 3b project Perdido Watershed Water Quality Improvements and Restoration Assessment Program, and apply those savings to the Alabama 2026 FPL Coastal Alabama Regional Water Quality Program. The program will support the primary RESTORE Comprehensive Plan goal to restore water quality and quantity. The program and projects included for implementation may include, but are not limited to: planning-related work (e.g., project prioritization and selection, engineering and design, permitting and environmental compliance activities), construction of or upgrades to stormwater and wastewater management systems, low impact development, green infrastructure activities, and septic to sewer conversions. Planning activities will be conducted according to State and Federal engineering and design guidelines, environmental compliance, and construction standards. Utilizing the public engagement and project identification process established under the FPL3b Water Quality Program, ADCNR will select projects for Category 1 implementation; projects may be added during the life of the program. Category 2 workplans will also be considered. ADCNR works in partnership with local entities implementing water quality improvement projects in Coastal Alabama and stakeholders continue to prioritize water quality improvement as a basis for restoring the environment and economy of coastal Alabama.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: Coastal Alabama Regional Water Quality Program

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(IV) Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Priority Criteria Justification:
Improving water quality is a foundational restoration action that will yield the greatest contributions to restoring and protecting coastal living and marine resources. Water quality is a pervasive concern across the Gulf Coast. Projects and programs that restore or improve water quality will contribute to overall ecosystem health of multiple coastal habitats and living marine resources in Alabama. Sediments can be reduced by installation of stormwater infrastructure, living shorelines, retention ponds and upland stream restoration. Nutrient and fecal bacterial entering coastal waters can be reduced by repairs, upgrades, and improvements to sewer systems including backup energy for pumps during storms. Septic to sewer projects and improvements to treatment facilities in locations along the Alabama Gulf Coast will begin to address the degradation of water quality due to growth in population along coastal Alabama. Improvements to water quality has been identified in the Coastal Alabama River Basin Management Plan, Mobile Bay National Estuarine Program Comprehensive Conservation Management Plan, and National Wildlife Federation planning documents as a priority for Gulf-wide restoration. Water quality improvement and the decrease of point and non-point source pollution into receiving waters enhances the long-term resilience of multiple coastal and marine living resources, creating a vibrant coastal ecosystem. Clearer waters due to decreases in sediment and pollutants like nutrients let more light through the water column and may increase seagrass cover, a critical fish habitat. Oysters will filter microscopic algae instead of pollution out of coastal waters, improving the fishery. The growth of healthy oyster reefs will create critical fish habitat. Birds and sport fish will feed on benthic organisms and small aquatic organisms that aren't loaded with pollutants, resulting in less bioaccumulation of pollutants, perhaps resulting in abundant and more robust offspring.

Project Duration (in years): 10

Goals

Primary Comprehensive Plan Goal:
Restore Water Quality and Quantity

Primary Comprehensive Plan Objective:
Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Objectives:
Promote Community Resilience

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Reduce excess nutrients and other pollutants to watersheds: Erosion and sediment control
Reduce excess nutrients and other pollutants to watersheds: Stormwater management
Reduce excess nutrients and other pollutants to watersheds: Wastewater system improvements

Location

Location:
Coastal Alabama: Mobile and Baldwin Counties

HUC8 Watershed(s):
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido Bay)
South Atlantic-Gulf Region(Alabama) - Alabama(Lower Alabama)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile-Tensaw)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Escatawpa)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)

State(s):
Alabama

County/Parish(es):
AL - Baldwin
AL - Mobile

Congressional District(s):
AL - 1

Narratives

Introduction and Overview:
Restoration of water quality has been identified as a major restoration goal by the state of Alabama and the Alabama Department of Conservation and Natural Resources (ADCNR). Multiple stakeholder engagement forums with coastal Alabama communities, municipalities, and non-governmental organizations have prioritized the improvement of water quality for promoting ecosystem health as an important driver of restoring the environment and economy of coastal Alabama (MBNEP 2019). Within the Mobile Bay National Estuary Program (MBNEP) Comprehensive Conservation and Management Plan (CCMP), water quality was identified as one of the six guiding values of conservation management (MBNEP 2019). Alabama continues

to invest millions of dollars into water quality improvements via the RESTORE Spill Impact Component, RESTORE Direct Component, and RESTORE Council Selected Component projects across Mobile and Baldwin Counties, including projects in Fairhope, Mount Vernon, Bayou La Batre, Dauphin Island, Mobile, Satsuma, Chickasaw, and Loxley (AGCRC 2018, AGCRC 2019, GCERC 2021).

In Alabama, water quality is monitored by the Alabama Department of Environmental Management (ADEM) and other local entities. The 2024 ADEM 303(d) List of impaired water bodies is submitted to the Environmental Protection Agency (EPA) each year. In the coastal counties of Alabama, Mobile and Baldwin, over 100 impaired water bodies were listed. The listed water bodies are utilized for public water supply, shellfish harvesting, swimming, fish and wildlife, and several hold designations of Outstanding Alabama Water. Organic enrichment, pathogens including Enterococci and E. coli bacteria, and metals including arsenic, thallium, and mercury are reported pollutant(s) leading to the impaired designation. Sources listed include municipal collection system failures, urban runoff, industrial activities, siltation, storm sewers, agriculture, and on-site wastewater systems (septic). These impaired waterbodies include, but are not limited to: Mississippi Sound, Portersville Bay, Grand Bay, Fowl River, Silver Creek, Mobile Bay, Pelican Bay, Boggy Branch, Perdido River, Styx River, Perdido Bay, among others (ADEM 2024).

ADCNR proposes the continuation of the Coastal Alabama Regional Water Quality Program (the Program). The program and projects may include, but are not limited to: planning-related work (e.g., project prioritization and selection, engineering and design, and permitting and compliance activities), construction of stormwater and wastewater management systems (including upgrades and repairs to existing systems), low impact development/green infrastructure activities, and septic to sewer conversions. Utilizing a process established for public engagement and project identification under the FPL3b Coastal Alabama Regional Water Quality Program, ADCNR will select projects for Category 1 implementation; additional projects will be added during the life of the program. E&D, permitting, and other pre-construction planning activities will be conducted according to State and Federal engineering and design guidelines, environmental compliance and construction standards. Category 2 workplans will also be considered.

There are five goals within the RESTORE Councils comprehensive plan. This Program addresses one of those goals, Goal #2: Restore Water Quality and Quantity. The Program ties in with RESTORE Councils primary objective of Restore, Improve, and Protect Water Resources. Under the 2016 Comprehensive Plan update the Council advanced the following commitments:

- Regional ecosystem-based approach to restoration: Through extensive engagement opportunities as a result of the CPS support funds, it is clear that water quality is a priority goal for the Restore Council members from Florida to Texas. Addressing water quality degradation and impairment is a foundational component of restoring/enhancing a host of living and coastal marine resources. Addressing water quality sustains multiple

elements of local Alabama coastal communities as well as regional resilience to multiple living coastal marine resources within Alabama, and across the Gulf.

- Leveraging resources and partnerships: The State of Alabama has invested significant funding under National Fish and Wildlife Foundation Gulf Environmental Benefit Fund (NFWF-GEBF) as well as the initial Funded Priorities List (FPL) into developing watershed planning documents that have opportunities to fund prioritized water quality related improvement projects. Additionally, the Alabama Recovery Council has identified several Direct Component (B1) and Spill Impact Component (B3) water quality improvement projects that would leverage and coordinate with planning process and eventual project selection under this program. Lastly, GOMESA funding is anticipated to be leveraged into the implementation of this water quality improvement program, maximizing the number of projects that could get implemented and providing unforeseen contingency funding if needed.
- Engagement, Inclusion, and Transparency: Since 2010, ADCNR and the State of Alabama have provided multiple opportunities for the public to identify restoration funding priorities. Water quality improvement has been a strong and consistent theme in this public input. Within the MBNEP stakeholder engagement efforts for the CCMP development, water quality, its assessment and improvement, are identified as a priority restoration activity.
- Science-based decision-making: Utilizing the best available science as well as relying on the local knowledge of water quality issues from counties and municipalities and, wastewater and stormwater maintenance concerns and repair history, ADCNR would prioritize and select water quality projects for implementation. Additionally, technical expertise would be provided through a small technical work group during the project evaluation and categorization process.
- Delivering results and measuring impacts: Monitoring the pervasive water quality degradation and the indirect impacts on living coastal and marine resources is challenging. This program would monitor individual projects (impact dependent on purpose) and roll up water quality improvements from a construction, E&D, and permitting perspective to gauge broader program success.

The improvement of water quality conditions has multiple environmental benefits (Capps 2019). Through water quality improvement (i.e., nutrient and other pollutant reduction) multiple living coastal marine resources benefit. A decrease in nutrient loads to downstream receiving water bodies reduces the development of algal blooms (as well as harmful algal blooms) thus reducing the opportunity for hypoxia to develop and result in mortality of sedentary benthic organisms and harm to mobile marine resources such as fisheries. Water quality degradation of coastal water bodies in Alabama is both an economic (recreational and commercial) and environmental stressor. In the case of bacterial and viral contamination of aquatic systems, fisheries and oyster harvesting may need to be closed, causing deleterious consequences on coastal workforce and economies. Bacterial and nutrient loading from pollutant sources results in harmful algal blooms, oyster reef closures, hypoxia development, and indirect consequences on coastal economies. A number of water quality assessments conducted in Alabama over the last decade underscore the importance of addressing water quality impairments stemming from

wastewater discharge and stormwater runoff holistically (see MBNEP 2012, MBNEP 2014, MBNEP 2016, MBNEP 2018, MBNEP 2019).

Total Cost: $8,000,000. Water quality implementation is scalable, with 90% of these funds being used for implementation.

Timeline: 10 years.

ADCNR would work and partner with coastal counties, municipalities, non-profits, and utility associations to implement water quality improvement program objectives. This Program aligns with the planning framework approach to reduce excess nutrients and other pollutants to watersheds and downstream receiving waters. Further, this program would utilize planning framework techniques including storm-water management, erosion and sediment control, and wastewater system improvements.

Proposed Methods :
The Program will be very similar to the water quality improvement programs funded by the State of Florida, Mississippi, and Texas. Alabama's program will immediately support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region (GCERC, 2016). Activities within this specific proposed program could run concurrently and would include, but not be limited to, the following:

- Planning, project identification, project vetting, and project selection;
- engineering and design (E&D), and permitting;
- conversion from septic to sewer in coastal communities; and
- implementation of new or repairing/upgrading existing stormwater and wastewater systems and/or low impact development activities.

Planning, Project Identification, and Selection
In order to fund any engineering and design and construction projects, ADCNR will utilize a process established for public engagement and project identification under the FPL3b Coastal Alabama Regional Water Quality Program. ADCNR will select projects for Category 1 implementation; additional projects will be added during the life of the program. E&D, permitting, and other pre-construction planning activities will be conducted according to State and Federal engineering and design guidelines and construction standards. Category 2 workplans will also be considered.

Application Preparation: An application narrative would be put together that could include, but not be limited to, the following:

- water quality improvement activities proposed;
- location and receiving water body that it would impact;
- current impairments/ degradation of receiving water body;

- potential community need;

- ecological benefits of implementation;
- possible resiliency considerations; and
- matching funds / leveraging opportunities.

The project application window would be open between 45 – 60 days. Within this application window ADCNR would hold an info session / webinar for potential applicants. The information contained in the proposals in the above areas will inform the categorization and selection of projects for implementation.

Technical Team Review: A small technical group would review proposals according to an evaluation process that would review the information provided, address additional logistical considerations and additional evaluation criteria, as determined by ADCNR and the technical group. The technical group would categorize projects as follows:

Category 1: those projects which have the potential to be most beneficial and/or that are closer to implementation;
Category 2: Those projects which represent a medium priority or benefit;
Category 3: Those projects that do not have enough information to make decisions or that are a better fit for another funding source.
ADCNR reserves the right to move projects between categories.

Public Comment: The categorized project list would be presented to the public via a webinar or public meeting to receive public input in order to further evaluate and refine and reprioritize the list as appropriate. ADCNR, with the support of the technical team, would evaluate funding availability and leverage opportunities and would meet with the potential sub-recipients to get additional information on the projects as needed.

Project Selection: ADCNR, with input from the technical team, will select a slate of projects for inclusion in the program. The slate of projects could include several alternates given possible logistical considerations and budget changes. ADCNR would engage the RESTORE Council on Category 1 and Category 2 projects, respectively, based on environmental compliance needs or inclusion, and would initiate the grant application process on behalf of the sub-recipient with the RESTORE Council.

E&D and Permitting: Engineering, design, and permitting of the identified projects would be considered for funding utilizing standard engineering practices, including certified and stamped plans. Depending on the style and type of system upgrade (conventional gravity sewers, pumping stations, treatment works, etc.), repair or construction, standard engineering principles or guidelines would differ. Specific engineering guidelines would be informed by Alabama state agency policy decisions.
Implementation: Implementation within the water quality improvement program would focus on stormwater and wastewater improvement practices. Any implementation would follow standard

construction and environmental practices, and any other applicable state and federal requirements (Walsh et al., 2005a, b; Hogan and Walbridge, 2007; Walsh et al., 2016). Implementation could include a broad range of activities to treat and improve water quality moving downstream, including, but not limited to:

- connection of existing septic systems to main line sewer infrastructure;
- crushing and filling of discontinued septic systems;
- upgrades, repairs, and replacements of sewer lines, including cure in place pipe (CIPP) technologies;
- installation of low impact development infrastructure/features;
- wastewater treatment plants, stormwater connections, manholes, and pump stations; and
- installation of water control structures and integration of existing drainage canals with green infrastructure.

Design teams could consider additional resources on new technologies tied to upgrades and improvements to wastewater collection systems, wastewater and sludge processing or treatment, emerging contaminants, and powering treatment stations. For example, the EPA has a searchable Clearinghouse on Wastewater Technology and have published a list of references on emerging contaminant reports and technologies as well as publications on alternative energy systems that generate power at treatment facilities. Construction would be conducted following specific Alabama guidelines for construction practice implementation (e.g., The Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management on Construction sites and urban Areas; ASWCC, 2018). Additionally, this program would be coordinated with other water quality improvement efforts under other Deepwater Horizon related funding streams, including water quality activities funded with more than $90M in local, Direct Component, Council-Selected Component, Spill Impact Component, GOMESA, and NFWF-GEBF funds.

Environmental Benefits:

Degraded water quality is a consistent threat to Alabama coastal waters. Restoration and improvement of the quality of water, as a natural resource, would benefit the marine/coastal ecosystems, habitats, and fisheries within Alabama waters, and regionally within the Gulf. Water quality impacts of nutrient and bacterial pollution in coastal systems is a global phenomenon (Mallin et al., 2000; Bennett et al., 2001; Diaz and Rosenberg, 2008; Vörösmarty et al., 2010; Lymer et al., 2018; O'Mullan et al., 2019). Decreasing water quality due to eutrophication by nutrients of streams, lakes, rivers, bays and marine water bodies results in changes in the physiochemistry of the water column, including pH, oxygen, loss of light penetration and excessive growth of plants and algae (Akinnawo 2023). Water quality degradation is often associated with rural food production (fertilizer and fecal bacteria), urban runoff, discharge of contaminated waters from septic tanks, antiquated municipal sewer infrastructure and sanitary sewer overflows (SSO). The causes of water quality degradation are often associated with wastewater management issues (Zhang et al, 2023). There are numerous studies and governmental reports that point to SSOs, overflow issues, and other infrastructure failures impacting and contributing to decreases in water quality in downstream receiving systems, shellfish bed closures, and other environmental problems (see EPA, 2004). The EPA estimates

that there are at least 23,000 – 75,000 sanitary sewer overflows (SSOs) per year in the U.S. EPA SSO website), causing serious water quality issues including contamination of water bodies with diseases (viruses and bacteria), harmful chemicals, and nutrients, and are a public health threat. Planning for replacement of aging or failing stormwater and wastewater infrastructure will take climate into consideration. addressing anticipated impacts of sea level rise, changes in precipitation and changes in water temperature. (Kessler 2011).

The Program will use the following strategic objectives for projects that will improve water quality in Alabama coastal waters: 1) evaluation and assessment; 2) E&D and permitting; 3) implementation; and 4) monitoring.

Evaluation: Broad geographic water quality evaluation and assessment could identify the source, dynamics, and cost effective stormwater and wastewater improvement practices to improve water quality (Park et al., 1994; Sharpley et al., 2007; Spellman, 2008). A project evaluation and categorization process could inform project selection. Consideration of priorities identified in Mobile Bay NEP Watershed Management Plans will also be included in the evaluation process.

Engineering and Design: Engineering, design, and permitting to restore water quality using standard engineering practices, including certified and stamped plans, would be informed by respective state engineering design standards. This objective identifies and evaluates wastewater-related engineering solutions for specific issues; assembles background information; examines alternate solutions during preliminary plans, presents solutions using best practices to ADCNR while identifying assumptions; receives feedback and narrows down the project solution focusing on efficiency, effectiveness and provides cost estimates.

Implementation: Implementation of designed stormwater and wastewater improvement practices would follow standard construction and environmental practices, and any other applicable state and federal requirements (Walsh et al., 2005a, b; Hogan and Walbridge, 2007; Walsh et al., 2016). In addition, all implementation activities would follow construction best management practice requirements to mitigate both on-site and off-site environmental and societal risks (e.g., ASWCC, 2018)

Monitoring: Water quality monitoring would document project outcomes and project-specific changes to downstream receiving waters allowing the state to make data-based decisions about specific solutions based on measured improvements (Fu et al., 2019; Tolouei et al., 2019). This would include monitoring the success of the respective practices (Kondolf and Micheli, 1995; Spellman, 2008; Lindenmayer and Likens, 2009a, 2009b; Reynolds et al., 2016), specifically wastewater discharges.

The methodologies and objectives in the Scope of Work section follow best available science for water quality improvement projects, are scientifically defensible, and allow for an on-the-ground operational decision-making process to best improve water quality. Proposed metrics are subject to change based on individual project considerations.

Best available science throughout this proposal underwent review in the FPL 3b proposal Coastal Alabama Regional Water Quality Program. Alabama elects to use the existing BAS review materials for the new FPL 4 funding proposal given that this proposal includes the same scope of work and is adding funds to the existing program. Based on the previous BAS review, modifications were made to the final proposal submitted under FPL 3b, which is acknowledged in the BAS response document.

Metrics:

Metric Title: PRM009 : Research - # studies reported to mgmt.

Target: 0.99

Narrative: The number of studied conducted would indicate the number of water quality implementation projects moved forward to planning and/or implementation.

Metric Title: PRM012 : Tool development for decision-making - # tools developed

Target: 0.99

Narrative: The number of tools developed would indicate the number of water quality implementation projects moved forward to implementation.

Metric Title: RES004 : Upgrades to Stormwater and/or Wastewater Systems - CFU Reduction in bacterial loads

Target: 0.99

Narrative: Target for metric regarding CFU reduction in bacterial loads is project-specific and will be dependent on baseline information to be obtained at a later date.

Metric Title: PRM011 : Restoration planning/design/permitting - # E&D plans developed

Target: 0.99

Narrative: The number of E&D plans would indicate the number of water quality implementation projects moved forward to implementation.

Metric Title: PRM013 : Restoration planning/design/permitting - # environmental compliance documents completed

Target: 0.99

Narrative: The number of permits/compliance documents would indicate the number of water quality implementation projects moved forward to implementation.

Metric Title: RES002 : Watershed management - # upgrades to stormwater and/or wastewater systems

Target: 0.99

Narrative: The number of implementation activities would indicate the number of projects implemented for water quality improvement.

Risk and Uncertainties:
There are risks and uncertainties related to the construction and implementation of water quality improvement projects.

Practice Implementation: Typically, counties and municipalities have working on the ground knowledge of the best infrastructure repairs and upgrades. Entities may be unsure about the water quality improvement benefits associated with a variety of newer technological options versus traditional repairs and upgrades. Planning and research around benefits of respective technologies reduces the risk and uncertainty of practice implementation.

Cost: Implementation costs may be highly variable considering undiscovered issues and logistics associated with newer technologies. Not being able to measure water quality improvements resulting from new technologies is a typical concern. The risk associated with undetectable improvements can be mitigated with due diligence and appropriate, tailored, monitoring targeting the area of concern. Uncertainty is further reduced by specifying tasks and objectives for planning and evaluation, clarifying and targeting the scientific basis for implementation, determining the types of practices implemented, which can result in respective costs reduction. Diligent project management and oversight is a key element of mitigating these risks.

Experience: Counties and municipalities are potential subaward recipients that, with long-term experience in implementing wastewater and stormwater improvement projects across coastal Alabama, they are familiar with environmental and societal risks associated with the implementation of a variety of practices. Project management by ADCNR should lead to utilization of appropriate mitigation measures (best management practices). Risk considerations include environmental degradation from construction practices and mitigating offsite effects.

Risks are mitigated in the near-term through the use of best management practices for erosion and sediment control, sediment (ASWCC, 2018). The implementation of the water quality improvement reduces the long-term environmental risk.

Sea Level / Storm Surge: Sea level rise and storm surge are two risks and uncertainties to project implementation performance. Hummel et al. (2018) summarized a national assessment of coastal wastewater treatment facilities at risk for sea level rise. The Gulf coast of Alabama and Mississippi was classified as low risk, with low exposure across a sea level rise gradient from 1ft to 6ft. Given the variability in sea level rise prediction as well as the anticipated immediate ecosystem service benefits of the implementation of sewer and wastewater infrastructure, is imperative that engineering consider the resilience of pipe infrastructure implementation to potential scenarios of sea-level rise. Storm surge is another factor that will need to be taken into consideration and may require upgrades (i.e., pump stations, backflow valves, electrical connections etc.) based on storm surge predictions to ensure that engineered solutions include surge in modeling and planning, ensuring reliability under variable conditions.

Monitoring and Adaptive Management:
Project-specific monitoring would include documentation of water quality improvements for the identified water resource issues (i.e., nutrients, sediment, bacteria, inflow and infiltration). As-built monitoring would include surveys and other data collection as needed. Pre-implementation and post-implementation monitoring for degradation sources would be monitored to observe trends over time which could be compared to long-term advisory information. There is the potential to document changes, but that will be highly dependent on the availability of monitoring data to identify trends. Additional monitoring that could take place for construction improvements could include pressure gauge and/or smoke testing, infiltration and inflow (I&I) testing and modelling. Post implementation monitoring would identify project-specific outcomes. Any project-specific monitoring metrics or measures identified would be cross-referenced with NRDA MAM manual (DWH 2017) as well as any associated water quality monitoring guidance from the Council Monitoring and Assessment Work Group.

Additional metrics may be added on a project specific basis.

These potential metrics would be assigned on a project-specific basis and all required documentation (ODP, GIS, etc.) would be provided at that time.

Data Management:
To the extent practicable, environmental and biological data generated during monitoring activities would be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets, electronic notes, notebooks, and photographs would be retained by the ADCNR. Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. All data would have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a

Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy will be made and the original preserved. Data would be made publicly available and accessible on a website that is still to be determined.

Collaboration:
Through the FPL collaborative planning process, Alabama identified an opportunity for further funding to improve Water Quality across the Gulf. The States of Alabama, Florida, Mississippi, and Texas all share a collaborative desire to improve water quality, with Mississippi and Florida sharing watersheds and boundary waters to enhance regional water quality opportunities for collaboration. The State of Alabama, via the Mobile Bay National Estuary Program, has funded the development of several watershed plans that have included grassroots engagement of coastal Alabama stakeholders to determine priorities as well as potential restoration actions and activities to address those restoration priorities. Water quality has shown to be a priority restoration objective for the stakeholders of coastal Alabama.

Public Engagement, Outreach, and Education:
ADCNR and the State of Alabama held a restoration summits in 2018 and 2022 as well as several meeting for the Councils' planning framework for FPL 3. Water Quality was one of the priorities that was identified by the coastal stakeholders at the Summit. In addition, the Alabama Recovery Council public engagement effort resulted in several Bucket 1 and Bucket 3 Water Quality projects that were prioritized for funding.

To further facilitate Alabama stakeholder prioritization of water quality as a restoration priority, and to encourage transparency throughout the program life, there would be two info / webinar sessions during the project selection process:

- The first would be for potential applicants to provide additional thoughts, questions, and solicit input around proposed water quality improvement ideas;
- The second would be to provide decisions / results of project categorization process for all submitted projects.

This second webinar would provide the public an opportunity to see the results of project categorization, and obtain feedback and comments on the projects. This information could be incorporated into the final DCNR decision making process for final project selection.

Leveraging:

<u>Funds:</u> $3,000,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: In the 2015 Initial FPL, the Council funded the development of watershed plans for this geographic area, the establishment of an estuary program, and the implementation of submerged aquatic vegetation (SAV) restoration and monitoring

Funds: $16,130,748.66

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: FPL 3b Coastal Alabama Regional Water Quality Program grant award for planning and implementation.

Funds: $19,000,001.34

Type: Leveraging

Status: Committed

Source Type: Other Federal

Description: FPL3b Coastal Alabama Regional Water Quality Program Cat 1 approved/Cat 2 committed funds not yet awarded

Funds: $550,180.00

Type: Leveraging

Status: Received

Source Type: Local Funder (e.g., city, county, parish)

Description: Local funding commitments to workplans awarded under the FPL3b Coastal Alabama Regional Water Quality program grant award.

Funds: $45,250,000.00

Type: Leveraging

Status: Received

Source Type: Other

Description: Land Acquisition/Conservation: Protection, conservation and enhancement of habitat adjacent to an established bird sanctuary and important migratory stopover habitat.

Funds: $7,477,500.00

Type: Leveraging

Status: Received

Source Type: Other

Description: Protection and conservation of priority coastal habitat in Grand Bay, one of the most pristine and diverse areas remaining on the Alabama Gulf coast.

Funds: $26,829,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: Aloe Bay/Mississippi Sound Water Quality Enhancement Project: Design plans, management protocols, environmental compliance documents and constructed mitigation measures leading to improved water quality and community resilience.

Funds: $2,154,842.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: Engineering and Design work necessary to complete plans, specification and engineering for certain water distribution system upgrades located within the service area of the Utilities Board of Bayou la Batre; Bayou la Batre Utilities Septic to Sewer Improvements Projects.

Funds: $23,866,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: The City of Mobile will complete the engineering and construction for the restoration and protection of water quality of the area's fresh, estuarine, and marine water resources by providing bank and stream stabilization along Twelve Mile Creek and the dredging and restoration of Langan Park Lake, both of which drain into Three Mile Creek and Mobile Bay. Additionally, existing sanitary sewer crossings will be protected from damage caused by widening of the stream. Dredging of Langan Park Lake will increase the capacity of the lake, support flood control and aid apple snail control efforts. Additional invasive species control measures will be undertaken.

Funds: $250,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: Engineering and Design of City of Loxley Corn Creek Tributary Restoration

Funds: $14,230,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: Fairhope Area Community-Based Comprehensive Land Use Plan: This project involves the creation of a community-driven comprehensive land use plan for the

City of Fairhope to address growth with an emphasis on environmental stewardship and legal foundation for implementation. Fairhope Sewer Upgrade Phase I This project is Phase I - Planning to address the most urgent needs within the sewer system by instituting major rehabilitation measures for the complete replacement of 4 main pump stations and rehabilitation of the major gravity outfall lines utilizing cost-effective and environmentally sensitive engineering solutions. Activities include engineering, design and permitting.

Environmental Compliance:

This Program would partition funding between Category 1 Planning and Category 2 Implementation funding. Coordination with council members will continue for the discovery and use of NEPA documentation, including categorical exclusions (CEs) to maximize the amount of funding placed into Category 1. The Category 1 planning activities are covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures). Subsequent FPL amendment(s) and additional environmental compliance will be needed to approve implementation funding for the Category 2 efforts under this program. It is well understood that funding placed in Category 2 is not guaranteed and is determined by NEPA.

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Budget

Project Budget Narrative:
A total of $8,000,000 is being requested from FPL 4 to fund additional planning, implementation and monitoring associated with the Program. This project is scalable. The funds being requested are solely intended to be used to determine and implement water quality related infrastructure improvement implementation. Any additional leveraging and cost sharing, from respective cities, municipalities, or additional Deepwater Horizon related funding streams are not part of this request. An estimated 70% is being requested for construction and project implementation. Implementation within the Program may include, but is not limited to, program management, individual project management, project implementation related work (e.g., engineering and design, any required permitting), construction of stormwater and wastewater management systems (including upgrades and repairs), as well as possible septic to sewer conversions. An estimated 20% is being requested for project planning activities such as program planning, project selection and identification. An estimated 5% is being requested for project administration, including administrative programmatic functions, coordination, and sub-recipient / contractual support for project implementation. An estimated 4% is being requested for monitoring and adaptive management activities to ensure progress is made towards water quality improvement. An estimated 1% is being requested for data management activities.

Total FPL Project/Program Budget Request:
$ 8,000,000.00
Estimated Percent Monitoring and Adaptive Management: 4 %

Estimated Percent Planning: 20 %

Estimated Percent Implementation: 70 %

Estimated Percent Project Management: 5 %

Estimated Percent Data Management: 1 %

Estimated Percent Contingency: N/A

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
This project proposes to add funds to the FPL3b projects. As planning activities are

accomplished, implementation costs will be refined and the implementation activities will be prioritized.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	The Category 1 planning activities are covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures). Subsequent FPL amendment(s) and additional environmental compliance will be needed to approve implementation funding for the Category 2 efforts under this program.
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.

Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures

Caption : Coastal Alabama Regional Water Quality Program Map

Other Uploads

GIS Data_1:
RESTORE_GIS_Template.gdb.zip
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4070/85

Council Staff Review: Coastal Alabama Regional Water Quality Program

FPL Internal Staff Review

Project/Program	Coastal Alabama Regional Water Quality Program		
Primary Reviewer	Matt Love	Sponsor	Alabama
EC Reviewer	John Ettinger	Co-Sponsor	

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	Continuation of an FPL3b program.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?		More information needed
Notes	The FPL 4 Coastal Alabama Regional Water Quality Program proposal provides the total funding amount requested for the activity, along with the percentage breakdown between FPL Categories 1 and 2. By applying the percentages to the total for the activity the requested amount in FPL Category 1 is $2,400,000 and Category 2 is $5,600,000. Need to verify numbers are correct. Note: Restore Council staff worked with the state to resolve these comments.	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?		Yes
Notes	Alabama applied BAS reviews of Program that were completed upon original proposal of the program in Funded Priorities List 3b. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing. Note: Restore Council staff worked with the state to resolve these comments.	

8. Have appropriate metrics been proposed to support all primary and secondary goals?		Yes
Notes		

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?		N/A
Notes	Implementation funding is in FPL Category 2.	

Best Available Science Review: Coastal Alabama Regional Water Quality Program.

This program was reviewed for BAS under FPL 3a. Under FPL 4, Alabama is proposing a continuation of the program.

The original BAS review as well as the state's response to the BAS comments can be found at **https://www.restorethegulf.gov/our-work/fpl/fpl-2026/.**

Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

RESTORE Council Proposal Document

General Information

Title:
Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

Project Abstract:
Alabama, through the Alabama Department of Conservation and Natural Resources (ADCNR), is requesting $24M in Category 2 Council-Selected Restoration Component funding to construct a 100-acre wetland restoration cell in Upper Mobile Bay as the first phase of 1,200 acres of tidal wetlands. This is a continuation of FPL 1 Upper Mobile Bay Beneficial Use Wetland Creation Site project, which funded design and environmental compliance. The primary goal of this project is to restore and conserve habitat by creating and restoring estuarine tidal marsh through the construction of containment and placement of sediment material. This initial cell will accept dredged materials from the Port of Mobile to begin restoring over a century of emergent wetland losses. The project will enhance utilization of navigation channel maintenance sediment and contribute to maximizing use of dredge material for effective and sustainable coastal restoration. The project will support the primary RESTORE Comprehensive Plan goal to Restore and Conserve Habitat by restoring the estuarine marsh through the construction of a semi-submerged containment area and placement of dredge material. Secondary objectives to include: providing habitat for living coastal and marine resources, enhancing community resilience by providing buffer to a main thoroughfare between Mobile and Baldwin Counties, and enhancing the economy of the region by providing cost effective disposal options for the many navigation related industries located along the Mobile River.

FPL Category: Cat2: Implementation Only
Activity Type: Project
Program: N/A
Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast

region.

Priority Criteria Justification:
This proposal is relevant to all four priority criteria. It will directly implement a 100-acre wetland restoration cell as a cornerstone for the 1200-acre project over the next 20 years (Figure 1 attached), ensuring fisheries habitat and long-term ecosystem resilience by maximizing ecological retention of dredged material resources. The project will, as the first phase of the phased creation of 1200 acres of tidal wetlands, become Alabama's largest coastal ecological restoration to date. Proven adaptive design and construction methods will be employed to rebuild ecosystem and community resilience. This will immediately begin rebuilding wetland habitats in Mobile Bay lost to municipal development and riverine infrastructure while solidifying programmatic processes to continue restoration in the face of increasing climate driven losses. Restoration of this lost habitat is regionally important in supporting essential fish habitat (EFH) for many of the nation’s most productive and valuable commercial and recreational fisheries and their prey (zuErmgassen et al. 2021).The created wetland habitat will provide enhanced recreational opportunities such as improved birdwatching, fishing, and eco-tourism, and fostering a deeper connection between residents and their environment. The created marsh acts as a natural filter, trapping pollutants and enhancing water clarity. BU is a powerful ecologically and economically logical restoration tool available to address marsh loss and landform change due to sea level rise. The project addresses Mobile Bay National Estuary Program Comprehensive Conservation and Management Plan- Goal for Ecosystem Restoration and Protection (ERP-3.1.a.)- Incorporate a strategy for beneficial use of dredged material (partner with USACE and ASPA).

Project Duration (in years): 3

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Protect and Restore Living Coastal and Marine Resources

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement

Location

Location:
Mobile Bay

HUC8 Watershed(s):
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile Bay)

State(s):
Alabama

County/Parish(es):
AL - Mobile

Congressional District(s):
AL - 1

Narratives

Introduction and Overview:
This project is a continuation of the FPL1-funded Upper Mobile Bay Beneficial Use Wetland Creation Site planning effort. The planning effort completed design and environmental compliance project requirements. Implementation will expand ecosystem restoration and beneficial dredged sediment management (BU) for ecosystem and community resilience to climate-driven hazards in Mobile Bay. This project will fund construction of the first 100-acre BU cell of a planned 1,200-acre project that will also kick-start the Alabama Beneficial Use Program (ABUP). The project site will accept up to one million CY of dredged materials from the Port of Mobile to begin restoring over a century of emergent wetland losses. It is expected that 350,000 CY/year of Port Authority maintenance material will be available, taking 3-5 years to fill the first 100 acres. The water depth of this first cell is 4-6 feet. Without this project, sediment will be lost to upland disposal sites, removing it from the Mobile Bay system. Large scale creation of estuarine wetlands is critical to increasing habitat diversity and productivity for eight managed species, restoring essential fish habitat, and for directly addressing sea level rise impacts. Project implementation will span years, necessitating multilateral coordination with ongoing dredging operations. This coordination, via the ABUP, will prioritize BU for regionally important restoration across Mobile Bay over institutionalized disposal, which will enable restoration at a fraction of the financial costs of project-specific dredging. The project is locatedin Mobile, who through nature-based Bayside parks, will have access to wetland habitats and their ecosystem services. These parks are opportunities to engage communities about the economy and environment associated with the industries and jobs the Port supports and the importance of

being wise stewards of our sediment resources and the wetlands they can create.

There are five goals within the RESTORE Councils comprehensive plan. This Project addresses one of those goals, Goal #1: Restore and Conserve Habitat. The Project ties in with RESTORE Councils primary objective of Restore, Enhance and Protect Habitat. Under the 2016 Comprehensive Plan update the Council advanced the following commitments:

- Regional ecosystem-based approach to restoration: Resource managers across the Gulf recognize that dredged material should be used as a resource to compensate for coastal erosion, to nourish beaches, to build habitat, and to return areas that have subsided below sea level back to an elevation within the tidal range. Creating and restoring marsh habitat takes advantage of opportunities for mitigating the loss of resources and shorelines by keeping sediment into the system utilizing a regional approach. Such restorative efforts are not only beneficial on a local scale, by retaining and returning sediments into natural systems this provides expanded benefits on larger regional levels. USACE-conducted planning activities utilized a strategy to emphasize the connection between maintenance dredging requirements of the Bay channel, beneficial uses for purposes of ecological restoration, and regional sediment management methods.
- Leveraging resources and partnerships: The State of Alabama has worked with the Mobile Bay Interagency Working Group (IWG) for more than 15 years to evaluate and provide guidance pertaining to alternative sediment management practices in Mobile Bay. The IWG consists of local, State and Federal agencies as well as academia and other non-governmental entities. The approach taken to beneficially use dredged material in conducting restoration practices provides the ability to coordinate and collaborate; integrate numerous tools, technology, and data; leverage funding; and enhance partnerships.
- Engagement, Inclusion, and Transparency: The project includes the support and participation from the diverse stakeholders who live, work, and play in the Gulf Coast region through the establishment of the IWG. Further engagement activities have occurred during project planning and permitting.
- Science-based decision-making: The Mobile Bay IWG evaluated alternative sediment management practices in Mobile Bay. The IWG, consisting of local, state and federal agencies, recommended several sediment management alternatives in the context of BU and environmental restoration (Mobile Bay IWG 2014), including the planning and construction of a long term BU site in upper Mobile Bay. The decisions made pursuant to the project will be based on the best available science, and this project will evolve over time to incorporate new science, information, and changing conditions. Commitment to best available science is evidenced in the previously conducted hydrographic, SAV, and cultural resources surveys.
- Delivering results and measuring impacts: The proposed project which includes monitoring and adaptive management shows the importance of achieving tangible results over a specified time frame and ensuring that funds are invested in a way to benefit the ecosystem of the Gulf of America.

Beneficial use of dredged material builds on the foundation of Working with Nature and Engineering with Nature principles as discussed in the Deer Island Aquatic Ecosystem Restoration Project report (Gerhardt-Smith, et al. 2014).

- Use science and engineering to produce operational efficiencies supporting sustainable infrastructure.
- Use natural processes to maximum benefit, thereby reducing demands on limited resources and enhancing the quality of project benefits.
- Broaden and extend the base of benefits provided by projects to include substantiated economic, social, and environmental benefits ("triple-win" benefits).
- Use science-based collaborative processes to organize and focus interests, stakeholders, and partners to reduce social friction, resistance, and project delays while producing more broadly acceptable projects.

Total Cost: $24,000,000. Implementation is not scalable.

Timeline: 3 years.

Proposed Methods :
The goal of the project is to expand ecosystem restoration and beneficial dredged sediment management for ecosystem and community resilience to climate driven hazards in Mobile Bay. This will be achieved through specific objectives including:

1. Construct the first 100-acres of containment structures for the southernmost and most substantive structures in preparation of receiving BU materials.
2. Perform implementation monitoring to document project performance and required adaptive management measures.

The project will construct the first 100-acre BU cell of a planned 1,200-acre footprint with the capacity for beneficial use placement of dredged material over a 20-year period. This footprint includes intertidal wetland habitat and internal and external containment dike features. Construction of the 1,200-acre footprint would be phased, based on volumes and timing of maintenance dredging activities and would be guided by adaptive design and management. This first cell will establish fundamental protection for the remaining cells to be constructed to the north and is the most substantive structure for the overall project due to the 30-mile fetch and prevailing winds. At the completion of the containment berms and the initial 100-acre marsh, the semi-confined site design will enable the entire site to have full tidal influence and allow marine life conveyance within the site until it is ultimately filled with dredged material and the wetlands are established.

The containment structure encircling this segment will be approximately 7,400 linear feet, constructed at 5-6 feet in height. The marsh is planned for +2-3 feet, with containment constructed at +5-6 feet depending on fetch. The external containment dikes around the initial 100-acre area would be constructed to completely protect the area until it is expanded. There would be a sand berm around the entire perimeter of the 100-acre area with rock riprap

revetment to protect it from environmental forces. The revetment would be constructed with varying rock riprap sizes according to the exposure direction from which waves would impact the dike. The revetment rock armoring on the exterior dikes has been designed to address regional sea level rise and to withstand environmental forces such as waves, including during operational and extreme conditions that result in inundation of the site. The site would attenuate waves under all water level conditions. When the site is not inundated, the exterior containment would attenuate wave energy. During inundated conditions such as during high storm surge in a hurricane, the site would also attenuate wave energy as depth-limited conditions occur when waves translate across the site, as the water depths would be shallower than the surrounding bay bottoms. Design considerations incorporated storm impacts and future sea level rise.

The 100-acre site would be divided into two 50-acre areas with internal dikes and would be filled with maintenance dredged material from nearby sources at a later date.

Recent mapping efforts indicate there are 6,200 acres of estuarine emergent marsh in Upper Mobile Bay/Lower Mobile-Tensaw Delta area (MBNEP, 2020). This project would support an increase in this habitat type as well as add more creeks and protected areas conducive to SAV growth that have been lost in the last 70 years. Without this project, valuable sediments would be lost to upland areas and would not contribute to the creation of coastal wetlands.

The project USACE permit is pending (SAM-2021-00246-DCH). Based on environmental and design considerations, the selected project design is the least environmentally damaging practicable alternative with the least direct, indirect, or cumulatively adverse impacts on physical, biological, or human use resources in one 1,200-acre wetland creation site. This site location minimizes affects to cultural resources and avoids SAV; is a sufficient distance from the airport and Mobile Ship Channel; provides local entities with enough capacity for their dredged material for the next 20 years; and creates valuable intertidal wetland habitat. The design minimizes linear feet of external containment to maximize wetland habitat and reduce conversion of water bottom to hard substrate and is located at water depths that reduce costs. The project would have long-term beneficial impacts on the recovery of intertidal wetland habitat in Alabama.

Environmental Benefits:

The Mobile Bay and Mobile Harbor navigation channels are terminal repositories of sediments transported downstream from several riverine systems and consists of mostly fine grain sediments. Current management practices place dredged materials in permitted upland areas or offshore disposal site, leading to concerns about the loss of sediments in the system and the resulting shoreline erosion and recession of wetlands in the north and west portions of Mobile Bay (GCRC, 2015). Since 1986, approximately 4 million cubic yards of material has been removed from the Mobile Bay navigation channel annually and transported and disposed of as much as 40 miles offshore at an annual cost of about $12 million. Offshore disposal of the

channel sediment results in the removal of the material from the Bay's natural sediment system. The effect of this sediment loss can be seen in recession of wetlands and submerged aquatic vegetation (SAV) beds in the north and west portions of the Bay (Byrnes et al. 2013). Establishing beneficial use sites within Mobile Bay will contribute to much-needed conservation of various ecological resources that exist in the Bay system and for estuarine habitat restoration through the beneficial use of dredged sediments. It is anticipated that SAV will become established along the protected shorelines of the containment berms and open areas of the marsh cells. Creating the tidal marsh will accomplish restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, and coastal wetlands of the Gulf Coast region.

Additionally, this project will directly benefit State or federally listed threatened and/or endangered species such as the Gulf sturgeon, Alabama Red-Bellied Turtle, and West Indies Manatee. By conducting this project, sediments which have traditionally been removed from the Mobile Bay littoral transport system will be placed back into the natural sediment system and used for habitat restoration.

Best available science throughout this proposal underwent review in the FPL 1 proposal Beneficial Use of Dredged Material to Create Emergent Tidal Marsh in Upper Mobile Bay project. Alabama elects to use the existing BAS review materials for the new FPL 4 funding proposal given that this proposal includes implementation of the same scope of work discussed in the FPL 1 proposal. Based on the previous BAS review, modifications were made to the final proposal submitted under FPL 1, which is acknowledged in the BAS response document.

Metrics:

Metric Title: HR013 : Wetland restoration - Acres restored

Target: 100

Narrative: construct 100-acre BU site

Risk and Uncertainties:

Sea-level rise and storm surge are two risks and uncertainties to project implementation performance. Storm surge associated with hurricanes and tropical storms poses a threat to containment berms and tidal marsh during and after project construction. Estimates of the quantity of dredged material available for marsh fill have been based on the Mobile Bay Federal navigation channel and other ASPA and private smaller dredging events. The containment berm at BU site may be susceptible to accelerated erosion due to ship wake and other hydrodynamic processes. Engineering and design of containment utilized best practices from similar projects and is based on best available science and factors such as wave and wind energies to minimize these risks as much as possible.

Regarding the potential for adverse effects related to sedimentation and hydrology, both a 2-D

and 3-D hydrodynamic model of the 5-river system that feeds Upper Mobile has been conducted during the design phase of the project. Results of these modeling efforts resulted in acceptance by the USACE regulatory and navigation team in determining no adverse effects of sedimentation and hydrology. Modeling data indicated no adverse effects on the ship channel or the adjacent SAV. Turbidity will be contained within containment structures, and all ADEM water quality conditions will be stipulated to the contractor. These stipulations will require that turbidity in the mixing zone be less than 50 NTUs above background, and construction monitoring will be mandatory.

Beneficial use of dredged material is commonplace in Port cities (Cornwell et al. 2020, Davis, et al. 2022; Davis et al. 2024, DiGiacomo et al. 2022). This Upper Mobile Bay Beneficial Use project design is based on the USACE Poplar Island (Cornwell et al. 2020), MD lessons learned (http://www.poplarislandrestoration.com/Home/About). The design was modified for the upper Mobile Bay system, planning for softer containment features and freshwater habitat design for tidal creeks and pond habitat enhancement. Elevations of wetlands and plant species selection have been based on local research in the area to ensure the engineered habitat reaches full production efficiently.

Regarding risk of lack of suitable BU material, the USACE dredges over 1 million cubic yards (mcy) from the upper end of the Mobile River project annually and has determined the percent of sand/fines mix is favorable for developing the initial 100 acre shallow water bottoms into tidal marsh within a short amount of time. Upon completion of berm construction, borrowing of suitable on-site material, followed by barging the remaining course grain sand required from the existing USACE stockpiles along the Black Warrior Tombigbee River System. These sand stockpiles are located approximately 80 river miles north of the tidal marsh footprint. Access channels will be constructed in the shallow areas for delivery of the sand and armament materials. The current plan is to construct the containment using RESTORE funding followed by the placement of approximately 1 mcy of suitable Federal channel material (Upper Mobile River) using USACE operations and maintenance dredging funds. Given the proximity of the site to the Mobile Harbor Upper River sumps, the initial 100-acre site meets the Federal Standard with regards to the least cost, environmentally acceptable and legal guidelines.

Monitoring and Adaptive Management:

Baseline pre-monitoring will include reference site vegetation and elevation monitoring metrics. Construction monitoring includes as-builts from the construction contractor that will be utilized as the baseline for the containment structure for the 100-acre site. Implementation monitoring is requested with this grant to monitor performance metrics of the containment structure to determine if this structure is performing as designed. Monitoring performance criteria will include structural-based metrics: elevation and position of containment structure. Implementation monitoring may also potentially include elevation of wetland platform from first

lift of material utilized beneficially (depending on timing).

Data Management:

To the extent practicable, all data generated will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amenable to record project-specific data, then project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets, notebooks, and photographs will be retained by the ADCNR. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy will be made and the original preserved. Data will be made publicly available and accessible on a website that is still to be determined.

By the time this project is in the implementation phase, ADCNR will utilize a publicly-accessible data repository. Data collected from the planning, environmental compliance, implementation and monitoring phases of this project will be stored in this repository.

Collaboration:

This project was identified as a high priority and received initial funding through the Federal RESTORE Act Bucket 2 FPL 1. Category 1 planning activities carried out by the USACE build on collaborative efforts initiated by the Mobile Bay Interagency Working Group (IWG), which consists of local, state and federal agencies as well as various non-governmental entities. Alabama Port Authority, Long-term Dredged Material Management Plan (2023) identified this project as a short-term and long-term ecologically sound solution to dredged material management as opposed to ocean dumping. This project complements many of the existing and on-going coastal marsh restoration and living shoreline initiatives occurring around the Mobile Bay.

Public Engagement, Outreach, and Education:

Over 15 years ago the Mobile Bay Interagency Working Group (IWG) started developing this project which included ADCNR, Mobile Bay National Estuary Program (MBNEP), APA, USACE, and several local NGOs. In 2013, the IWG led by USACE submitted the planning and engineering and design of the project to the Federal RESTORE Council. Additionally, a formal outreach and engagement plan for the project was developed and implemented over the last several years including creation of a dedicated website to provide project information (www.uppermobaywetlands.com), establishing a dedicated email for subscribers, providing

social media updates, formal letters, fact sheets, and providing press releases, hosting a virtual meeting, one-on-one meetings with key stakeholders, and providing information through MBNEP. USACE joint standard permit process has also included extensive outreach to stakeholders to inform design and respond to public comment.

Leveraging:

Funds: $63,000,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: obtained by the USACE for managing their dredge material

Environmental Compliance:
In anticipation of utilizing federal funds for construction, an Environmental Assessment (EA) is required for funding of the implementation of the project. In June 2023, an EA was prepared to define potential benefits and environmental consequences related to the proposed implementation of the Upper Mobile Bay Beneficial Use Wetland Creation Site Project to determine the least environmentally damaging and therefore most beneficial, practicable alternative.

The EA complies with requirements set forth under the National Environmental Policy Act (NEPA) of 1969, the regulations of the Council on Environmental Quality's (CEQ) Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation (ER) 200-2-2. Three primary phases of work were involved to assess the potential environmental impacts of the proposed project.
• Scoping process which led to consensus on important project and environmental issues within a project footprint.
• The Alternatives Descriptions (Section 2), which led to the development of specific alternatives, analysis of the alternatives, and identification of a least environmentally damaging practical alternative (preferred alternative) (Section 3).
• Environmental Documentation – including the selection of a preferred alternative identified in the EA and FONSI.

The project USACE permit is pending (SAM-2021-00246-DCH).

Approved permits, applicable documentation and final EA will be submitted when received

Bibliography (All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

Byrnes, Mark R. et al. 2013. Sediment Dynamics in Mobile Bay, Alabama: Development of an Operational Sediment Budget.

Cornwell, J.C., Owens, M.S., Staver, L.W., and Stevenson, J.C., 2020. Tidal marsh restoration at Poplar Island I: transformation of estuarine sediments into marsh soils. Wetlands 40, 1673–1686. doi: 10.1007/s13157-020-01294-5

Davis, J., Currin, C., and Mushegian, N., 2022. Effective use of thin layer sediment application in Spartina alterniflora marshes is guided by elevation-biomass relationship. Ecol. Eng. 177:106566. doi: 10.1016/j.ecoleng.2022.106566

DiGiacomo A.E., Giannelli R., Puckett B,. Smith E., Ridge J.T. and Davis J., 2022. Considerations and tradeoffs of UAS-based coastal wetland monitoring in the Southeastern United States. Front. Remote Sens. 3:924969. doi: 10.3389/frsen.2022.924969

Gulf Coast Recovery Council (GCRC). (2015). Response to Public Comment on Draft Initial Funded Priority
List. 83pp.

Gerhardt-Smith, J., J. MacDonald, S. Rees, and N. Lovelace. 2014. Deer Island Aquatic Ecosystem Restoration Project. ERDC-TN-EWN-TBD. Engineering Research Development Center, Vicksburg, MS

Mobile Bay National Estuary Program (MBNEP). (2020). FINAL Report. A Standard Habitat Classification
Scheme and Habitat Mapping Products Change Analysis 2001/2001 and 2015/2016. Report prepared by Geosyntec and Moffatt & Nichol.

Mobile Bay National Estuary Program (MBNEP) (2020). Submerged Aquatic Vegetation Mapping in
Mobile Bay and Adjacent Waters of Coastal Alabama in 2019. Mobile, AL: MBNEP.

Zu Ermgassen, P. S., DeAngelis, B., Gair, J. R., zu Ermgassen, S., Baker, R., Daniels, A., MacDonald, T. C.,Mekley, K. Powers, S., Ribera, M., Rozas, L. P., and J. H. Grabowski (2021). Estimating and applying fish and invertebrate density and production enhancement from seagrass, salt marsh edge, and oyster reef nursery habitats in the Gulf of Mexico. Estuaries and Coasts. Special issue: concepts and controversies in tidal marsh ecology revisited.

https://doi.org/10.1007/s12237-021-00935-0.

Budget

Project Budget Narrative:
A total of $24,000,000 is being requested from FPL 4 to fund construction of a 100-acre containment structures for the southernmost and most substantive structures in preparation of receiving BU materials. This project is not scalable. The funds being requested are solely intended to be used for construction/implementation. Any additional leveraging and cost sharing, from respective entities or additional Deepwater Horizon related funding streams are not part of this request. An estimated 78% is being requested for construction and project implementation. An estimated 20% is being requested for contingency. An estimated 2% is being requested for monitoring and adaptive management activities to ensure progress is made towards habitat improvement.

Total FPL Project/Program Budget Request:
$ 24,000,000.00

Estimated Percent Monitoring and Adaptive Management: 2 %

Estimated Percent Planning: N/A

Estimated Percent Implementation: 78 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: 20 %

Is the Project Scalable?:
No

If yes, provide a short description regarding scalability.:
N/A

Environmental

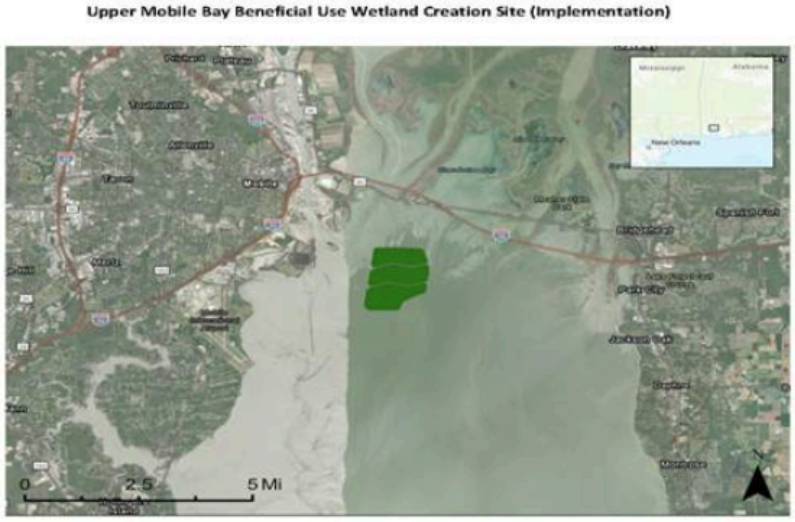
Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	USACE is federal lead agency. USACE permit application submitted (SAM-2021-00246-DCH).
Endangered Species Act	Yes	Gulf Sturgeon and Alabama redbellied turtle are in project area and covered in the EA and consultation with USFWS is complete. Green sea turtles, Kemp's ridley sea turtles, loggerhead turtles, Gulf sturgeon, and giant manta ray are in project area and are covered in the EA and the NOAA NMFS Southeast Regional Office Expedited Consultation document. Consultation with NOAA NMFS is complete.

National Historic Preservation Act	Yes	An assessment of the potential impact of the proposed project on historic properties that are within the proposed project's Area of Potential Effect (APE) has been completed and submitted to the Alabama State Historic Properties Office and the USACE. No adverse impacts to cultural resources are anticipated. Consultation is ongoing.
Magnuson-Stevens Act	Yes	Consultation complete.
Fish and Wildlife Conservation Act	Yes	Consultation in progress.
Coastal Zone Management Act	Yes	Consultation in progress.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.

Clean Water Act (Section 404)	Yes	Extensive coordination has taken place with USACE since 2021 for a Standard Individual Permit. USACE consultation is ongoing. Consultation with the state (Alabama Department of Environmental Management) is completed and the Water Quality Certification has been received.
River and Harbors Act (Section 10)	Yes	Extensive coordination has taken place with USACE since 2021 for a Standard Individual Permit. Consultation is ongoing.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	Yes	No take is anticipated and a determination of not likely to adversely affect was concurred with by NOAA NMFS and USFWS. Consultation complete.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.

Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Upper Mobile Bay BU Map

Other Uploads

GIS Data_1:
Mobile_Bay_BU_GIS_Template_.gdb.zip
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4081/86

Council Staff Review: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

FPL Internal Staff Review

Project/Program	Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)		
Primary Reviewer	Matt Love	Sponsor	Alabama
EC Reviewer	John Ettinger	Co-Sponsor	

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded project.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes

Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	Alabama applied BAS reviews that were completed upon proposal in previous FPL. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	Proposal seeks only FPL Category 2 funding.

Summary of Best Available Science Review: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

The Upper Mobile Bay restoration proposal was generally well received by reviewers and is supported by peer-reviewed and publicly available information. The project aims to create 100 acres of wetland using dredged sediment, building on previously vetted planning efforts and informed by collaborative input from the Mobile Bay Interagency Working Group. Reviewers agreed the proposal is grounded in sound science and aligned with RESTORE Council goals, particularly regarding habitat restoration. Methods were described as scientifically sound and cost-effective, leveraging lessons from similar past projects. However, one reviewer called for more detail on how the project would impact sediment dynamics and turbidity, especially around the shipping canal, and noted that some cited sources were missing from the reference list. Concerns were also raised about the lack of specificity in the proposal's water quality (WQ) monitoring strategy, including which parameters would be measured and how success would be evaluated. Despite these gaps, the project was acknowledged for its strong environmental benefits, clearly defined goals, long-term planning considerations, and thorough data management strategy, including adaptive management. One reviewer emphasized the need for improved articulation of hydrological, sediment, and WQ components, but overall, the proposal was considered scientifically justified and well-structured.

Summary of Alabama Response to BAS Comments: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

The State's response to the BAS comments addresses several key points related to the monitoring and planning of the proposed project. It clarifies that water quality (WQ) parameters will not be specifically monitored, and general references to "wetlands improving WQ" will be removed if necessary. The approved monitoring plan focuses on plant monitoring, with federal approval already secured. Regarding environmental modeling, extensive 2-D and 3-D hydrodynamic models were conducted during the permitting process to assess the effects on sedimentation and hydrology in Upper Mobile Bay. These models confirmed that the project would not adversely affect the ship channel or submerged aquatic vegetation (SAV), and turbidity will be controlled within containment structures, meeting the required water quality conditions. The planning effort primarily involved data collection, evaluation, design, and environmental compliance, without including project implementation details. The response also mentions that wetlands are assumed to improve water quality, though no direct WQ monitoring is planned beyond construction, which will comply with ADEM conditions. Additionally, the project's design incorporates lessons learned from other wetland creation projects, such as Poplar Island, and is tailored to the specific conditions of the upper Mobile Bay, with habitat enhancement features like tidal creeks and ponds.

Best Available Science Review Forms: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)
Location (If Applicable): Mobile Bay
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: In state
Date of Review: September 13, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	

Relevant and recent information from projects successfully completed in the northern Gulf Coast region were appropriately used to justify this project's objective and method to create 100 acres of habitat in Upper Mobile Bay with dredged sediment.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The proposed project directly benefits the Gulf Coast region, particularly the Mobile Bay area and nearby disadvantaged and underserved communities.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Literature sources include a variety of publication types, ranging from peer-reviewed journal articles to technical reports documenting completed projects. The sources are represented fairly and appropriately support the objectives and methodologies stated in the proposal.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	

Uncertainties and risks are described over a range of timescales in terms of impacts to the project (such as storms, boat wake, and sea level rise) and impacts of the project (such as quantity of dredge material available for fill).

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Reasonable justification is provided in the proposal for the implementation of this project. For example, the proposal references using best available science to reduce uncertainty in hydrodynamic forcing estimates and best practices (since this is an implementation proposal) to minimize risks through lessons learned.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The proposal provides justification for using science to maximize information both now and in the future. In the present-day, information on recently completed projects will be leveraged as lessons-learned and best practices for this initial phase. In the future, the proposal acknowledges science evolves and that new science, information, and changing conditions will be incorporated.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
The proposal references using best available science to reduce uncertainty in hydrodynamic fording estimates and best practices (since this is an implementation proposal) to minimize risks through lessons learned from similar projects. The project also has previously established several modes of communication through which these risks and uncertainties can be conveyed.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
While this project would be “Alabama’s largest coastal ecological restoration to date” (quoted from the proposal), the sponsor (ADCNR) is well-known to have implemented many similar projects. A map obtained from their website shows 153 restoration projects, most of which are located in the Mobile Bay area and many that are similar to the proposed project.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The project goal is clearly stated throughout the proposal (restore and conserve habitat) and supported with defined objectives (creating and restoring estuarine tidal marsh with dredged material). These goals and objectives directly meet the RESTORE Council’s Goal #1 to Restore and Conserve Habitat.	

Question C

Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes

Comments:

The proposal follows the implementation plan previously developed to construct the southernmost containment structures to protect the newly-placed dredged material for this project from waves, boat wake, and storm surge. The methods are adaptable, taking into account sea level rise and future phases of this project. Using BU and the methods/design proposed will reduce the overall cost of dredging, and funds for USACE to manage dredge material are leveraged.

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes

Comments:

The project will restore some of the emergent wetlands lost over the last century with benefits including habitat creation, increases in habitat diversity and productivity, enhances in community resilience, water quality improvement, and reduction in the economic and environmental impacts of dredging and disposing of dredged sediments.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:

This project aligns with Goal #1: Restore and Conserve Habitat with measures of success including constructing a 100-acre BU site to restore wetlands; monitoring during pre-project, construction, and implementation phases; following a detailed data management plan; enhancing collaborations among public, private, and academic entities; and continuing to involve the public through an existing outreach and engagement plan.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

Project vulnerability is described in both short- and long-term time frames. Long-term risks are mitigated through planning and design for changing conditions (i.e. the containment structures are designed at elevations that account for rising sea levels), monitoring the project before, during, and after construction, applying adaptative management practices and construction methods, and incorporating science as it evolves through the duration of the project.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

An Environmental Assessment was completed in June 2023 to capture direct, indirect, or cumulatively adverse impacts of physical, biological, or human use resources of this project and alternatives. Of the alternatives considered in the EA, the proposed project is the cited as the least environmentally damaging practicable alternative, and justification for this conclusion is provided in the proposal.

Question H

Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes

Comments:

Best practices from recently completed similar projects, conclusions from the recently completed EA of this project, and recently collected data at and near the project site are examples of recent information cited in the proposal.

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
Specifically, the proposal cites the report on the Deer Island Aquatic Ecosystem Restoration beneficial use of dredged materials project and lists four 'lessons learned' to be implemented in this project. These points leverage the successes (and failures) of the Deer Island project to reduce risks and uncertainties of the proposed project.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
A detailed data management plan is provided in the proposal. The monitoring plan is also comprehensive, covering pre-construction, construction, and implementation phases. Monitoring data are described in the data management plan. Those data will be used to evaluate project performance, adapt management activities as needed, and inform design and implementation for future phases of this project.	

Please summarize any additional information needed below:
The proposal is well-written and packed with information and justification for each of the points above. Statements made in the comments are directly from the proposal, as I understood it. I did not identify a deficiency in the quality, objectivity, or integrity of the information presented. The information provided was sufficient, in my opinion, to evaluate the use of best available science on this project proposal.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)
Location (If Applicable): Mobile Bay
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: Out of State
Date of Review: 10/09/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	
Most of the proposal objectives have been well explained. Yet, some components of the proposed methods, particularly linked with the water quality (WQ) improvement goals need to be better characterized. What would be the goals for the monitoring, which WQ parameters will be selected, where are the monitoring sites and frequency, etc.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The information that was provided is directly pertaining to the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information
Comments:	
There are a few unreferenced documents presented in the proposal but not present in the reference list: Page 4, Mobile Bay IWG 2014; Page 7, Long-term Dredged Material Management Plan (2023). The Environmental Assessment (EA) cites on page 7 is also not listed in the Reference List, I am not sure if this is already published.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	
Most risks have been identified in the proposal, but one risk that could be better discussed is how the future implementation of the wetlands would change the sediment migration dynamics near the area, both during episodical coastal storms and throughout a typical hydrological year. A question I have is whether this placement would influence sediment accumulation in the vicinity of the shipping canal. Another risk is the potential increase in turbidity in the water when sediments are replaced within the bay, which has been linked with environmental impacts. The EA assessment may have considered potential turbidity impacts, but stating this with the Risk and Uncertainties section would be useful.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
Yes, the proposal provides information that justifies the need based on public reports and a technical publication	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
For the most part, the answer is yes. The portion that needs more detail and information is on the management of environmental data.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	

Again, for the most part the risks have been communicated. There are two components that would need more information. First, the sediment placement and creation of wetlands can influence local sediment accumulation in the vicinity of the shipping canal, and the effects should be studied with a hydrodynamic study. Another risk is the potential increase in turbidity in the water when sediments are replaced within the bay, which has been linked with environmental impacts. While the EA assessment developed in the context of this project may have considered potential turbidity impacts, this was not clearly stated this with the Risk and Uncertainties section.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
The project is a continuation of a FPL1-funded Upper Mobile Bay Beneficial Use Wetland Creation Site planning effort. It Is not clear if the effort entailed actual implementation of coastal wetlands.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Yes, the implementation goals are clear.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	

For the most part, the answer is yes. The use of sediments within Mobile Bay rather than transport upland can be cost-effective and provide other indirect benefits such as reversing the coastal wetland loss in the area.

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Need more information

Comments:

Most environmental benefits of the implementation of wetlands in northern Mobile Bay are clearly articulated. The discussion that could have been improved is linked to how these wetlands would improve water quality. As an example, what are the sources of the contaminants, and what types of contaminants, would be improved with the implementation of the project.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information

Comments:

Aligned with Question D above, the proposal allocates 2% of the budget to monitor progress to water quality improvement, but what/where/etc. will be monitored and related metrics are not specified.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information

Comments:

Yes, this is discussed in the proposal adequately and is mostly adequate. Long-term change in sediment dynamics in northern Mobile Bay created by the implementation of the wetlands could be better articulated.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Yes, this is discussed in the proposal adequately.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Yes, this component is well addressed in the proposal.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information

Comments:
While the potential causes for failure and benefits were discussed, examples of failures and successes of coastal marsh implementation was not directly evaluated.

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information
Comments:	
Data Management strategy is adequate, and monitoring is partially adequate. Whereas the structural integrity of the project will be monitored, water quality aspects were not well detailed.	

Please summarize any additional information needed below:
This is a very good initiative that should be supported, in my point of view. The hydrological, sediment dynamics, and water quality aspects could be better articulated, though.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Upper Mobile Bay Beneficial Use Wetland Creation Site (Implementation)
Location (If Applicable): Mobile Bay
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: Out of Gulf
Date of Review: 26 September 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
This is a proposed implementation phase of a previously vetted site planning effort. Revisions from that multi-level review have been incorporated. Coordination and planning have included a multi-governmental agency/stakeholder group- the Mobile Bay Interagency Working Group (IWG), and builds on concepts developed by Gerhardt-Smith et al., for beneficial use of dredged material in ecological restoration.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The proposed implementation plan appears to have been very well reviewed by local, state, and federal entities to ensure the methods are appropriate for local site-specific characteristics. A USACE permit for the project has been submitted (pending), and will provide an additional layer of oversight.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Click here to enter text.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
This proposal seeks a long-term solution to dredge material disposal by treating what in the past has been considered waste for ocean dumping into a resource for ecosystem creation/restoration. There is a clear plan for approaching this in sections over many years, and adaptive management plans will ensure necessary modifications will be made. Implementation monitoring is included in the requested project scope. Major climate and physical factors that are major risks have been accommodated.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
See comment above.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The IWG review of this project incorporates extertise from local, state and federal agenecies familiar with the needs, implementation, and risks associated with the project, including state of the art beneficial use of dredge material. The Pending USACE permit review will add an additional layer of oversight.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	

See comment under Question B.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
See comment under Question B.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Not only are there clear goals and objectives for the proposed project, the project also will provide the foundation for a long-term solution to dredge spoil disposal and ecological benefit well beyond the scope of this implementation project.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	

The proposal is the implementation phase of a well vetted site planning project, will input and review from multiple levels of government and private stakeholder groups covering dredging, engineering, and environmental impacts.

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The upper Mobile Bay delta region is a rich ecological component of the Mobile Bay estuary and regional offshore environment, provide nursery habitat for commercial and non-commercial species. Regional loss of wetland habitat will be mitigated by the beneficial use of dredge material to add to this rich ecological engine. Although not mentioned, migratory waterfowl and other avian species will also benefit.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
There are clear goals and objectives that are measurable. Implementation monitoring is included in the project, along with an appropriate data management plan. Monitoring will feed directly into adaptive management.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	

Long term climatic risks are part of the reason for this project, and as such are a strong motivational force behind the proposed work. The project implementation appears to moving forward with their eyes wide open to future risks.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The review of site planning phase and development of this implementation phase project have been well vetted by numerous agencies focused on local conditions, needs, and risks.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
There is a clear monitoring program that involves a sufficient data amanagement plan feeding into a long-term adaptive management plan.	

Please summarize any additional information needed below:

West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)

RESTORE Council Proposal Document

General Information

Title:
West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)

Project Abstract:
Alabama, through the Alabama Department of Conservation and Natural Resources (ADCNR), is requesting $38M in Category 2 Council-Selected Restoration Component funding to restore 3.5 miles of linear dune, 40 acres of sandy water bottoms and 160 acres of beach and dune habitat, comprising 200 acres of barrier island habitat. The restoration of the west end of Dauphin Island will provide protection for the estuarine habitats of Mississippi Sound including, seagrasses, oysters, marshes, 30,000 acres of mainland conservation lands and vulnerable coastal villages, landward of the island. This project supports the primary RESTORE Comprehensive Plan goal to replenish and protect living coastal and marine resources. As part of the northern Gulf of America Barrier Island Complex that bedecks the coastline of the Gulf States with dunes, tidal creeks, bays, maritime forests, marshes and lagoons and where sand ceaselessly moves from east to west. The potential for the massive movement of sand along the northern Gulf is evident on Dauphin Island by the recent connection of Pelican Island complex to the island where 3 million cubic yards of sand is feeding the island, forming and widening beach, lagoon and dune habitat. Although the island has been cut off from the eastward source of sand for decades by ship channel dredging, sands continue the westward movement, starving the island of sand. This project supplements the volume of sand on the island to ensure the restoration of the transport of sand along the barrier island system , and in doing so, enhances sustainability of Dauphin Island and the coastline of southern Mobile County. This habitat restoration project provides for the enhancement of community resilience as a secondary goal of the RESTORE Comprehensive Plan goal.

FPL Category: Cat2: Implementation Only

Activity Type: Project

Program: N/A

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

Priority Criteria Justification:
This project will restore approximately 200 acres as follows: 40 acres of benthic sand habitat, 160 acres of beach and dune habitat, 3.5 miles of linear dune; restoring critical habitat for marine mammals and listed species in Alabama's coastal and offshore habitat (Atlantic Spotted Dolphin, Alabama Shad, Gulf sturgeon, three species of sea turtles, piping plover and others). Essential Fish Habitat (EFH) s is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. 1801(10)), protecting habitat for species of fish and shrimp at specific times in their life cycle. EFH for brown shrimp, pink shrimp, white shrimp, red drum, reef fish including red snapper, stone crab, and coastal migratory pelagics such as Spanish mackerel, Atlantic sharpnose sharks and Blacktip sharks; and highly migratory species (cobia, tuna, whahoo, bluefish, marlin, swordfish) use the northern Gulf of America waters off Dauphin Island.

There is an imminent threat of breaches by storms of Dauphin Island which will cause the sustainability of the island and all the habitats it consists of and protects in danger of elimination of birds, fisheries, and shellfish. The breach during Hurricane Katrina caused higher saline waters to reach the Mississippi Sound oyster habitat, the last remaining productive oyster reefs in Alabama. With higher salinities, oysters are decimated by oyster drills or disease.

The ecological issues caused by breach of Dauphin Island was clearly documented in the scientific literature after the Hurricane Katrina in 2005, when a west end breach formed (Park et al. 2014). Since closed in 2010, the oysters of Alabama have been carefully managed to back to harvestable size and being harvested using the traditional methods of oyster fishers in Alabama.

The project proposed was identified as a priority in the Alabama Barrier Island Restoration Assessment completed by the USACE and USGS (2020) and will complement on-going and completed projects on and around Dauphin Island. As part of the barrier island system that stretches from Florida to Mississippi, Alabama's barrier island littoral drift feeds the Mississippi Gulf Island National Seashore to the west, which has had $300M in federal investments in recent years as detailed in the Mississippi Coastal Improvement Plan.

Project Duration (in years): 5

Goals

Primary Comprehensive Plan Goal:
Replenish and Protect Living Coastal and Marine Resources

Primary Comprehensive Plan Objective:
Restore and Enhance Natural Processes and Shorelines

Secondary Comprehensive Plan Objectives:
Promote Community Resilience

Secondary Comprehensive Plan Goals:
Enhance Community Resilience

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement

Location

Location:
West end of Dauphin Island, AL in south Mobile County. Lat/Long: 30.25°N, 88.17°W

HUC8 Watershed(s):
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)

State(s):
Alabama

County/Parish(es):
AL - Mobile

Congressional District(s):
AL - 1

Narratives

Introduction and Overview:

Construction of this initiative will restore 3.5 miles of barrier island and 200 acres of sandy water bottoms and beach and dune habitat while protecting the Mississippi Sound estuarine habitats of seagrasses, oysters, and marshes. Dauphin Island (including its undeveloped western end) provides expansive coastal habitat, with over 200 acres of beach, dunes, overwash fans, intertidal wetlands, maritime forest and freshwater ponds in addition to shallow-water nearshore areas. These habitats support many living coastal and marine resources, including threatened and endangered species such as the piping plover. The island also protects the eastern Mississippi Sound ecosystem by reducing the wave energy and preserving the salinity structure for submerged aquatic vegetation (SAV), oysters, shrimp, crabs, and other species. Extreme events have severely impacted Dauphin Island over the past decades, including most recently Hurricanes Ivan, Katrina, and Isaac and the Deepwater Horizon Oil Spill. Restoration of Dauphin Island is critical as it serves as a sustainable barrier island to protect and restore island resources, including habitat and living coastal and marine resources. Protected fish and wildlife species, along with economically critical species, spend all or portions of their lives in these habitats. Additionally, human communities will benefit from the outcomes of this project, including some of the most underserved residents in coastal Alabama and the US. The project will reduce flood impacts as seas rise, protect economically important industries such as seafood and tourism, and provide access to and preservation of culturally significant natural spaces. Construction of the proposed initiative involves one primary goal and one secondary goal:

Primary Goal: Restore beach and dune habitats and re-introduce sand into the littoral barrier island system of the northern Gulf of America.

Secondary Goal: Support and Enhance Community Resilience through replenishing a protective barrier island that enhances community resilience of South Mobile County.

The planning, design and permitting for this project has been funded by National Fish and Wildlife Foundation Gulf Environmental Benefit Fund (NFWF GEBF) and Gulf of Mexico Energy Security Act (GOMESA).

There are five goals within the RESTORE Councils comprehensive plan. This Project addresses two of those goals, Goal #3: Replenish and Protect Living Coastal and Marine Resources and Goal #4: Enhance Community Resilience. The Project ties in with RESTORE Councils primary objective of Restore and Enhance Natural Processes and Shorelines and Promote Community Resilience. Under the 2016 Comprehensive Plan update the Council advanced the following commitments:

Regional ecosystem-based approach to restoration: The northern Gulf of America is an interconnected landscape of barrier islands, wetlands, and maritime forests stretching from the Florida panhandle to the Louisiana bayous and beyond. An interdependent complex, the barrier islands rely on east to west littoral downdrift of sand; interruptions in these pathways cause a

sediment imbalance that leaves the downstream islands in a deficit and perpetually eroding. Alabama's barrier island littoral drift feeds the Mississippi Gulf Island National Seashore to the west, which has had $300M in federal investments in recent years as planned for in the Mississippi Coastal Improvement Plan. Restoration of Dauphin Island's West End will reestablish the littoral downdrift, supporting the millions of dollars invested in the region by local, state, and federal agencies and non-profits.

Leveraging resources and partnerships: This proposed project is the culmination of decades of planning efforts informing the most sustainable and adaptive path forward. The initiative builds on completed USACE and USGS research, specifically the Alabama Barrier Island Restoration Assessment (USACE & USGS 2020), which identified this as a priority project for restoring this critical barrier island ecosystem. NFWF GEBF, in implementing the findings of the ABIRA (USACE & USGS 2020), funded the 30% land-side design of the project ($993K). ADCNR committed GOMESA funding to get full design and permitting in 2024 ($1.25M). Further, NFWF GEBF funded $30M for the East End restoration and Graveline Bay Marsh Creation. The USACE is entering into a MOA with the Town of Dauphin Island to ensure long-term sustainability of the project through beneficial use of future dredge ship channel sediments. This initiative supports restoration that is required for the northern Gulf of America barrier island system.

Engagement, Inclusion, and Transparency: The project is the culmination of decades of

planning efforts to inform the most sustainable and adaptive path forward. The initiative builds on recently completed research, specifically the Alabama Barrier Island Restoration Assessment, which identified priority projects for restoring critical ecosystems.

Science-based decision-making: A multidisciplinary study was conducted to investigate viable options for the restoration of Dauphin Island as a sustainable barrier island to enhance and restore island resources and the surrounding coastal resources. The study investigated sustainable restoration options through a feasibility-like study based on science and technical expertise that provides the ability to effectively evaluate the natural resource benefits and impacts of restoration measures. The study included modeling the island to evaluate: (1) beneficial use options and other sand placement activities; and (2) other resilient and sustainable island restoration options in support of critical habitats and resources (USGS, 2020). These proposed restoration activities were identified as those with the most potential to enhance the ecological resiliency and structure of Dauphin Island.

Delivering results and measuring impacts: The proposed restoration activities will support barrier island ecosystems that provide ecosystem services, such as water purification, fish and wildlife habitat, and biodiversity. They are also critical to providing wave dissipation, stabilization to the shoreline, sediment retention, and shelter for the marsh and meadows that naturally occur behind the beach and dunes.

Loss of barrier island area threatens the estuarine ecosystem goods and services of the Mississippi Sound and exposes the mainland coast and its associated wetlands and coastal habitats to increasing saltwater intrusion and damage from future storms and storm surges

(USACE, 2009). These coastal habitats are keystone within the coastal environment as they provide the base for a host of ecosystem services and benefits (Purcell et al, 2020). These ecosystem services include: serving as natural buffers to protect shorelines from eroding; storm surge protection (Gittman et al., 2014); fisheries production, water quality enhancement through sediment and nutrient reduction, faunal support, carbon sequestration, and providing habitat for a multitude of trophic levels within the ecosystem (Barbier et al., 2011; Mendelssohn et al., 2012). The restoration of Dauphin Island's west end would continue to support and increase these ecosystem services in Alabama.

Southern Mobile County has several towns and communities that could be exposed to higher levels of storm damage in the case of the contraction of the length or breadth of Dauphin Island. The island enhances the resilience of the coastal towns of Alabama Port, Coden, and Bayou la Batre by serving as a wave break during storms. Dauphin Island reduces high salinity intrusion into the estuarine bays of Mississippi Sound and Mobile Bay maintaining the oyster fishery and Essential Fish Habitat from Dauphin Island to the shoreline of South Mobile County.

Total Cost: $38,000,000. Implementation is scalable into multiple phases based on the section of beach, with 97% of these funds being used for implementation. Priority would be based on the most vulnerable areas of the island from breaching and landholder participation. However, there is an economy of scale once a dredge is mobilized.

Timeline: 5 years.

Proposed Methods :

The goal of the project is to restore 3.5 miles of barrier island and 200 acres of sandy water bottoms and beach and dune habitat while protecting the Mississippi Sound estuarine habitats of seagrasses, oysters, and marshes, as well as 30,000 acres of mainland conservation lands. This will be achieved through specific objectives including:

1. Restoration of 40 acres of benthic sand habitat.
2. Restore 160 acres of beach and dune habitat to support an adequately wide beach to absorb the energy of storms and to restore littoral down drift in the northern Gulf barrier island complex.
3. Creation of 3.5 miles of linear dune to protect infrastructure and promote natural dune habitat and function.
4. Perform implementation monitoring to document project performance and required adaptive management measures.

Benthic Sand Habitat and Beach and Dune Habitat Restoration

The project is being designed to work with natural processes controlling the beach and dune system of the west end of Dauphin Island. These beaches are partially controlled by a unique, cyclical, geologic phenomenon which happens every 150 years or so. Pelican Island migrates north and merges onto Dauphin Island and Pelican Passage closes. This is the phenomenon that has left the island's fishing pier landlocked since 2008, as predicted over a decade earlier (Douglass 1994, Sanchez and Douglass 1996). The ongoing migration of Pelican Island is slowly feeding roughly 3 million cubic yards of sand to the beaches of Dauphin Island. Most of

this sand will move west functioning as a very slow, natural beach nourishment project for the west end. Leveraging the extensive dredging operations in the region, this project will beneficially use dredged material to place 2.4M cubic yards of sand to restore 3.5 miles of barrier island and 200 acres of sandy water bottoms and beach and dune habitat while protecting the Mississippi Sound estuarine habitats of seagrasses, oysters, and marshes using dredge material that has been specifically sourced to meet the criteria for sand specific to Dauphin Island (APTIM 2022). A sand beach restoration project along this far west reach is anticipated to migrate 45% to the east and 55% to the west resulting in a net westerly migration. The easterly migration will meet the naturally migrating 3 million cubic yards of Pelican Peninsula sand bringing the natural and engineered beach together in the west in the decades to come. This strategy will optimize the engineered restoration project within budget constraints for implementation whilst taking advantage of the natural nourishment process. The beneficial use of dredged material for restoration of the beach and dune habitat is based on USACE recommendations (USGS, 2020) and aligns with the planning efforts and restoration priorities of multiple agencies and stakeholders.

Creation of 3.5 miles of linear dune

This component will enhance an existing linear dune feature that is intended to provide dune habitat while simultaneously protecting Town infrastructure. Similar to beach restoration, dune features are critical for retaining sand on the Gulf-facing beach during typical storm events and for protecting community assets behind the dunes. Without elevated dune habitat, overwash and breaching will be more common, infrastructure will incur expensive repair costs, and the building stock, which serves as the Town's primary economic engine, will face more frequent and extensive damages. Recognizing the value of a continuous elevated dune habitat for their long-term resilience, the project is proposing to elevate the access points for side roads. This will complement efforts by private landowners to also elevate access points on private property. Access points through the dune act as a funnel for seawater during high tide events, high wind events, and tropical systems that create saltwater flooding of and sediment deposition on public and private property, damaging critical infrastructure and economically essential building stock. Access points will be raised to connect the established healthy dune habitat on either side of the access points, enhancing the function of the linear dune feature while still providing public access.

Baseline monitoring and implementation monitoring will be conducted. See Monitoring section below.

The planning, design and permitting for this project is underway and has been funded by National Fish and Wildlife Foundation Gulf Environmental Benefit Fund (NFWF GEBF) and Gulf of Mexico Energy Security Act (GOMESA). Sand resources for this project have been identified and assessed for use on Dauphin Island for beach and dune restoration borrow sites (APTIM 2022). Two large areas of interest (AOI) on the Mobile Ebb Tidal Shoal, Area I & II. The East End Beach and Dune Habitat Restoration estimated a requirement of 1.2 million cubic yards (mcy) of beach-compatible sand from Area I, which is estimated to contain 5.3 mcy. Area II has about 2.5 mcy of beach-compatible sand. Cultural resource surveys of the borrow sites have been implemented and cleared for extraction (APTIM 2022).

Environmental Benefits:

Dauphin Island and the remainder of the barrier islands fronting the Mississippi Sound have been historically eroding and their capacity to protect mainland natural resources and infrastructure is diminishing (Byrnes et al., 2010). Moreover, loss of barrier island area threatens the estuarine ecosystem goods and services of Mississippi Sound and exposes the mainland coast and its associated wetlands and coastal habitats to increasing saltwater intrusion and damage from future storms and storm surges (USACE, 2009; USACE & USGS, 2020). (USACE & USGS, 2020)) documents various restoration scenarios that increase island sustainability and restores vital habitats. Barrier islands and associated habitats provide essential ecosystem services, such as water purification, carbon sequestration, fish and wildlife habitat, and ecological diversity that supports biodiversity. While beach and dune restoration would not eliminate shoreline loss or reduce shoreline recession rates, it would reduce loss of landward beach, dune, barrier flats, and intertidal marsh habitats under rising sea levels. On-the-ground implementation of this restoration project will result in a high likelihood of strengthened barrier island ecosystem resilience and direct benefits to the barrier island species and fisheries.

Metrics:

Metric Title: HR002 : Shoreline restoration - Miles of shoreline stabilized and restored

Target: 3.5

Narrative: Miles of linear dune to protect infrastructure and promote natural dune habitat and function.

Metric Title: HR013 : Wetland restoration - Acres restored

Target: 200

Narrative: Acres of submerged habitat, and beach and dune habitat to support an adequately wide beach to absorb the energy of storms and to restore littoral down drift in the northern Gulf barrier island chain.

Risk and Uncertainties:

Sea-level rise and storm surge are two risks and uncertainties to project implementation performance. Storm surge associated with hurricanes and tropical storms poses a threat to restoration beach and dune habitat during and after project construction. Engineering and design will utilize best practices from similar projects and is based on best available science and factors such as wave and wind energies to minimize these risks as much as possible. USACE & USGS (2020) the future of Dauphin Island without restoration (i.e., no action). was evaluated to

determine which island habitat features were vulnerable to degradation or loss under the various sea level change (SLC) and storm scenarios. Results indicate that increases in storms (frequency and strength) and SLC, both independently and in combination, contribute to increased island degradation and loss of habitat (Mickey et al., 2020, Enwright et al., 2020). The proposed restoration actions are critical in providing wave dissipation, stabilization to the shoreline, sediment retention, and shelter for the marsh and meadows that naturally occur behind the beach and dunes. For example, the restoration of 200 acres of beach and dune habitat reduces the risk of island breaching, which has become more common in recent years. Risk reduction to storms for the most vulnerable part of the island is reduced with the restoration of intertidal marsh, beaches, dunes and barrier island flats versus no action (USGS 2020).

Dauphin Island is part of the littoral sand system that moves from east to west from Pensacola Bay to Mobile Bay (Stone et al. 1992). The Mobile Bay ship channel dredge material, deposited in part by the littoral sand system, has been dredged and placed offshore for decades, starving the east end of Dauphin Island and the down stream islands, of essential sand resources that balance erosion on the barrier islands.

The Town of Dauphin Island has been working closely with the US Army Corp of Engineers (USACE) to enter into a Memorandum of Agreement (MOA). This MOA will include a mechanism in which Dauphin Island can receive sediments that are dredged by the USACE. The MOA is being pursued to address long-term sustainability of several project sites including, but not limited to, the West End, East End, Graveline Bay, Aloe Bay, and Little Dauphin Island. Once the Town secures a programmatic permit and funding is available, these USACE dredge events can be beneficially utilized to place sediments on appropriate project sites dependent on sediment types and volumes.

Monitoring and Adaptive Management:
Monitoring and adaptive management will be implemented during pre-construction, project-construction, and post-construction phases and monitoring plans will be updated regularly to reflect new information, including significant progress or resolution of recognized uncertainties, as well as any new uncertainties that might emerge during and following project construction (Steyer et al.
2020).

Baseline pre-monitoring will include reference site vegetation and elevation monitoring metrics. Construction monitoring includes as-builts from the construction contractor that will be utilized as the baseline. Implementation monitoring is requested with this grant to monitor performance metrics of the constructed improvements to determine if targeted outcomes are achieved.
Monitoring and Adaptive Management will be based on the 2024 Dauphin Island East End Dune and Beach Habitat Restoration project: Draft Monitoring and Adaptive Management prepared by Moffatt and Nichol (2023 V2) that includes feasibility-level monitoring and adaptive management consistent with National Fish and Wildlife Foundation, Gulf Environmental Benefit Fund Monitoring and Adaptive Management Plan guidelines and consistent with the Water Resources Development Act guidance for U.S. Army Corps of Engineers projects (USACE &

USGS, 2020).

Data Management:
To the extent practicable, environmental and biological data generated during monitoring activities will be documented using project-specific standardized digital field datasheets. If digital data sheets are not possible, field data sheets will be entered into spreadsheets.

Original hardcopy datasheets, electronic notes, notebooks, and photographs would be retained by the Contractor. Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into standard digital format. All data would have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and a Readme file that contains the information about the data including, how data was collected, QA/QC procedures, date of data collection, date of data entry, identity of scientists participating at each step, and format of data. Electronic data files will be named with the date on which the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy will be made and the original preserved. Data will be made publicly available on the Dauphin Island Sea Lab RESTORE data repository.

Collaboration:
This initiative is the culmination of decades of planning efforts informing the most sustainable and adaptive path forward. The initiative builds on completed U.S. Army Corps of Engineers (USACE) and U.S. Geological Survey (USGS) research, including the Alabama Barrier Island Restoration Assessment (ABIRA, USACE & USGS, 2020), under a grant from the National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund which identified this as a priority project for restoring this critical barrier island ecosystem. Development of the ABIRA report included a formal outreach and engagement effort including a virtual public meeting and a comment period.

Public Engagement, Outreach, and Education:
Development of the ABIRA report included a formal outreach and engagement effort including a virtual public meeting and a comment period. The town of Dauphin Island has a website page with fact sheets, public meeting slides, FAQs, funding sources and maps for the West End project along with the process for long-term sustainability: https://www.townofdauphinisland.org/westendnourishment.

Leveraging:

Funds: $993,000.00

Type: Leveraging

Status: Received

Source Type: Other

Description: 30% design

Funds: $1,250,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: 30% - 100% design and permitting

Funds: $30,000,000.00

Type: Leveraging

Status: Received

Source Type: Other

Description: East End restoration and Graveline Bay Marsh Creation

Environmental Compliance:
Environmental compliance activities are underway and are being funded through other funding sources. The project USACE permit is pending (SAM-2024-00553-DJL). Approved permits and applicable documentation will be submitted when received.

Bibliography *(All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America)*:

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Budget

Project Budget Narrative:
A total of $38,000,000 is being requested from FPL 4 to fund construction activities. This project is scalable, and there is an economy of scale once a dredge is mobilized. The funds being requested are solely intended to be used for construction/implementation. Any additional leveraging and cost sharing, from respective entities or additional Deepwater Horizon related funding streams are not part of this request. An estimated 97% is being requested for construction and project implementation. An estimated 1% is being requested for Construction Engineering Inspection (CEI). An estimated 2% is being requested for monitoring and adaptive management activities to ensure enhancement and restoration of barrier island sand movement and barrier island processes, reducing symptoms of sand starvation on Dauphin Island.

Total FPL Project/Program Budget Request:
$ 38,000,000.00

Estimated Percent Monitoring and Adaptive Management: 2 %

Estimated Percent Planning: 1 %

Estimated Percent Implementation: 97 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: N/A

Is the Project Scalable?:
Yes

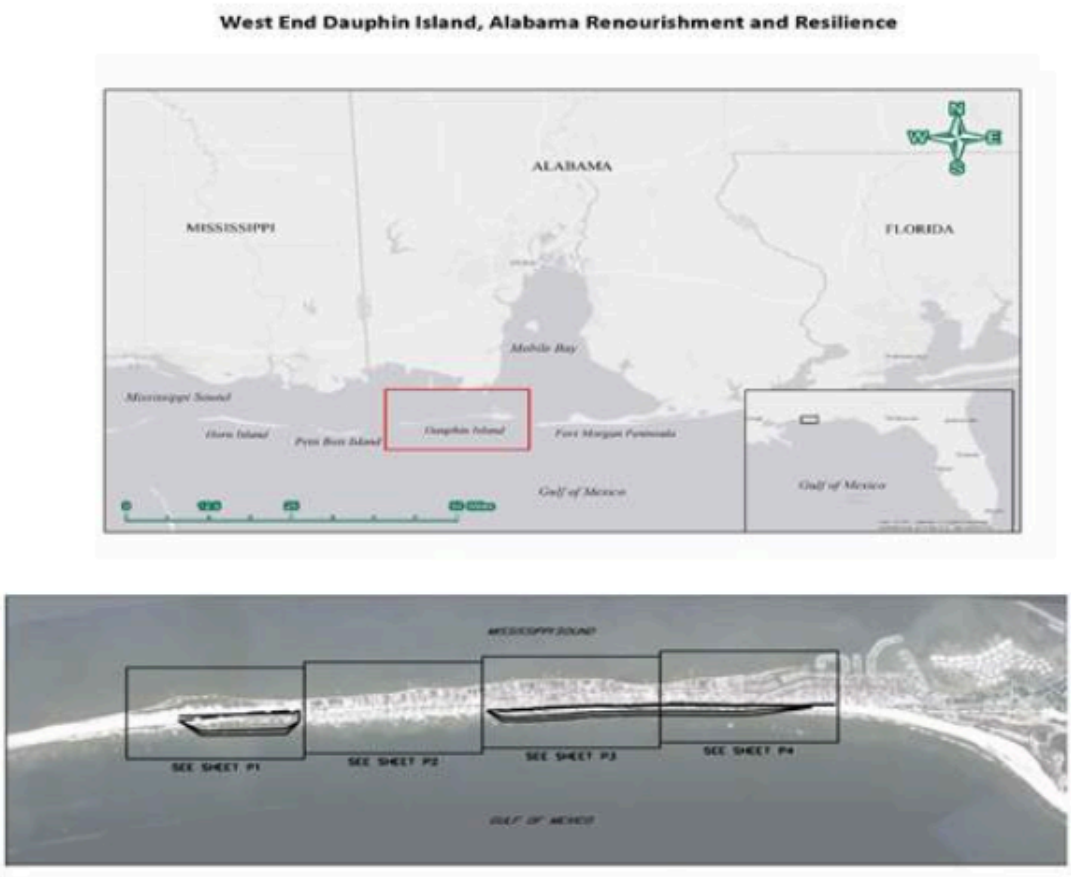
If yes, provide a short description regarding scalability.:
This project is scalable, and there is an economy of scale once a dredge is mobilized.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	No	The project USACE permit is pending (SAM-2024-00553-DJL).
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.

Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Dauphin Island West End Map

Other Uploads

GIS Data_1:
DI_Coastal_Resilience_GIS_Template.gdb.zip
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4079/89

Council Staff Review: West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)

FPL Internal Staff Review

Project/Program	West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)		
Primary Reviewer	Matt Love	Sponsor	Alabama
EC Reviewer	John Ettinger	Co-Sponsor	

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with	Yes

the proposed activity?	
Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	More information needed
Notes	Please see the external BAS review comments and external reviews summary attached with these review comments.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	Proposal seeks FPL Category 2 funding only.

Summary of Best Available Science Review: West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)

The Dauphin Island restoration proposal was generally well-received in reviews from in-state, out-of-state, and out-of-Gulf reviewers, all affirming that it is grounded in peer-reviewed and publicly available science. The project is supported by extensive prior studies, including the Alabama Barrier Island Restoration Assessment (ABIRA), and is recognized as a product of decades of planning and evaluation. The methods proposed are appropriate for the Gulf Coast region and reflect best practices from similar past efforts. Reviewers found that citations were complete and unbiased, though some suggested adding specific references (e.g., for oyster benefits) and further detail on construction methods and monitoring protocols.

The proposal's goals and objectives were clearly defined, and environmental benefits particularly to barrier island habitats and estuarine species were well articulated. Long-term risks such as sea level rise and storm impacts were acknowledged, though reviewers requested more detailed discussion on how these risks would affect beach and dune systems. Some uncertainties were noted around landowner participation and adaptive management strategies, and additional information was suggested on mitigation planning and data housing.

Monitoring strategies were described, but could be enhanced by including more detail on site plantings, adaptive management actions, and data access (e.g., collaborating with the Dauphin Island Sea Lab). While the proposal draws from relevant scientific and historical information, reviewers emphasized the value of adding outreach efforts to raise local awareness. Overall, the proposal is seen as scientifically sound and implementation-ready, with a few areas particularly risk mitigation, monitoring specifics, and community engagement—where additional clarity would strengthen it.

Summary of Alabama's Response to BAS Comments: West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)

The state provided targeted responses to comments on the Best Available Science (BAS) review for the Dauphin Island restoration project. Regarding land ownership, it was clarified that the majority of the project area is owned by the Town of Dauphin Island or the Property Owners Association (POA), with one construction easement still pending. Concerning sea level rise (SLR) and coastal flooding, the state explained that sediment in this littoral system is not lost but redistributed, and the project along with others like the East End and West End restorations—will help replenish the sediment-starved system. A comprehensive monitoring plan, modeled after the East End project, will include pre-construction, construction, and post-construction phases using surveys, aerial photography, and vegetation transects. Construction will involve dredging sand from a borrow area and shaping the dune system with heavy equipment, followed by extensive planting. Past project lessons, including failures like the "FEMA berms," have informed a more sustainable design with better fill density and drainage. Adaptive management will be part of the required USACE permit plan and will include long-term nourishment in partnership with USACE. Public outreach is robust, involving meetings, press releases, an updated website, fact sheets, and public hearings scheduled for Winter 2025.

Best Available Science Review Forms: West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)

Proposal Title: West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)
Location (If Applicable): West end of Dauphin Island, AL in south Mobile County. Lat/Long: 30.25°N,88.17°W
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: In State
Date of Review: 9/22/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	

The proposal discusses several previous actions, public plans, and research (inc. USACE and USGS, and specifically the Alabama Barrier Island Restoration Assessment (ABIRA)) that support the project and have identified the action in this proposal as a priority project for restoring this critical barrier island ecosystem.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
This proposal directly pertains to the Gulf Coast region. The proposal's methods complement those done east of the project at Pelican Island and will continue to help other barrier islands to the west in MS that are part of the National Seashore as the sand migrates. It also aid in dampening wave and storm energy reaching south Mobile County, an area where livelihoods are inherently linked with the water and that is underserved.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
There is discussion and referencing of several public actions, plans, and research, as well as citations for environmental impacts and benefits, that effectively support the proposed actions and ultimate outcomes.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	

The proposal mentions working with landowners to elevate access points along the dune to limit gaps that allow for saltwater overflow and sedimentation. It does not mention how many landowners, timing for agreements that may be needed, or the risk of landowners not participating.

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The proposal clearly identifies the plans and research that support the proposed actions. The protective value for oysters was highlighted as well known in the literature and models, but references were not provided for that benefit. The proposal would be strengthened by that addition.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The proposal clearly highlights science backing up storm-related impacts, environmental benefits to habitats and species, and climate impacts. These were well stated within the specific proposal sections.	

Question C

Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
The proposal clearly states that this project will not solve all issues with shifting sands along barrier islands, but targets meeting impacts with sea level rise and strengthening habitats for future impacts and change.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
The proposal alludes to past experience and use of best practices from them. The proposal does not clear identify similar past experiences and would benefit from that inclusion.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The proposal has a very clear goal of restoring beach and dune habitat through sediment placement. This is an implementation project. Planning, designs, and permitting have already been funded through NFWF's Gulf Environmental Benefit Fund and GOMESA. It is truly a shovel-ready project.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	

The actions presented in this proposal appear to have been identified by several public and private entities, all highlighting similar methodologies for the planned actions, thus supporting the methods selected. While this is an expensive project, it seems to reset the clock and the applicant is already working on long term strategies to sustain the benefits from this investment (i.e. MOU with Army Corps of Engineers).

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes

Comments:

Environmental benefits to birds, turtles, and fish are well documented in the proposal. This project also provides protective capacity for the highly productive MS Sound estuary, amplifying the benefits to nearshore, estuarine species and oysters, including wild harvest reefs and many off bottom aquaculture operations. The erosion impacts and climate stressors were identified in conjunction with these end benefits.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:

The project has specific metrics for miles of shoreline and acres of wetlands restored, both applicable. For beach and dune habitats, at the access points and other areas, plantings are not mentioned. The addition of plantings to help stabilize the sediment and dunes would strengthen this proposal, especially given known storm and storm surge impacts.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

The proposal identifies this area on the frontline of the Gulf of Mexico and its past impacts from storms and anthropogenic events. While those events are uncontrollable, it also states that the actions will address sea level rise and strengthen habitats for future climate impacts. The applicant also discusses developing strategies for long term sustainability through an MOU with the Army Corps of Engineers for continued sand placement to protect and sustain this investment.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
The proposal identifies storm impacts, especially storm surge, as an issue during and immediately following construction. It identifies using best practices from past projects to help minimize any storm-related impacts. The proposal does not clearly frame how private landowners (i.e. at access points) will be engaged and how the project might be altered if the landowners choose not to participate.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
The project clearly identifies several tropical storms and the DWH event as recent risks that contributed to the changes in sediment supply, island dynamics, and impacts to beach/dune habitats.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	

The proposal mentions using past experience to implement best practices to minimize impacts during and immediately post construction. Through the various planning efforts, it is implied that past successes and failures were reviewed to arrive at the current plan and methodology.

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information

Comments:

Monitoring incudes reference site vegetation and elevations. It is still unclear whether planting will occur as part of the proposed actions. The proposal could be strengthened with that addition. Other monitoring seems to be structural on sand placement and movement. No adaptive management actions were identified in the proposal and inclusion could help support the investment in this project.

While the proposal states that the data will be publicly available, it has not identified a specific website or location to house the data. Dauphin Island Sea Lab has data storage capacity and could be approached to house the data for the project.

Please summarize any additional information needed below:

A primary strength of the proposal is the many partners and plans that help support these actions and methodology.

The Public Engagement, Outreach, and Education section identifies many of the contributing partners and plans. It does not outline any outreach for this project specifically. Press releases, newsletter articles, town council meetings, and other outreach on the project could help inform residents and visitors on Dauphin Island, but also the adjacent communities in south Mobile County to raise awareness.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)
Location (If Applicable): West end of Dauphin Island, AL in south Mobile County. Lat/Long: 30.25°N,88.17°W
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: Jose G. Vasconcelos Neto
Date of Review: Out of State

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
Yes, this proposal is well substantiated in previous studies, particularly the Alabama Barrier Island Restoration Assessment (ABIRA).	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The information supporting the proposal is supported in previous studies performed at the selected implementation site.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Yes, through the ABIRA report and related appendices much of the needed support of the proposal is provided. A citation for the Mississippi Coastal Improvement Plan would be beneficial.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	
Whereas the risks of storm surges and sea level rise are listed, more discussion could be provided on how coastal flooding created by SLR would impact the proposed beach and dune habitats in the long term.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The proposal is well supported by a range of peer-reviewed publications and technical reports.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
Yes, the proposal data and information management in terms of types of collected data, scope, is adequate for the project goals. One point for improvement is to specify where will data be gathered more specifically, and how this data will be gathered that will ensure the metrics are attained.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	

For the most part yes. However, more discussion could be provided on how coastal flooding created by SLR would impact the proposed beach and dune habitats in the long term.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
Yes, through the East End restoration and Graveline Bay Marsh Creation project that is described in the proposal.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Yes, goals and objectives are clearly articulated.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	

Yes, the proposal presents the methods for aereal habitat restoration and for the linear restoration of dunes. The description is not much focused on construction methods, though. Another point for improvement is to specify where data will be gathered and which type of monitoring will be performed associated with the methods to ensure the metrics are attained.

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Yes, the proposal discusses and identifies the various potential environmental benefits. I also appreciated that there is a recognition that the shoreline loss processes will not be eliminated, which helps to delimit the beneficial aspects of the proposed project.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Yes, these are clearly identified.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	

As pointed above, more discussion could be provided on how coastal flooding created by SLR would impact the proposed beach and dune habitats in the long term.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
This is properly addressed in the proposal.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Yes, mainly through the ABIRA and its appendices.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information

Comments:
Partially. East End restoration and Graveline Bay Marsh Creation is an indication of recent past success, but more could have been presented on failures, as a means to identify risks.

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
Yes, these are sufficiently identified.	

Please summarize any additional information needed below:
In general, there only a few points in this proposal that could benefit from a little more clarification. The habitat restoration in Dauphin Island has the potential of creating numerous environmental benefits and increased resiliency to coastal communities.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: West End Dauphin Island, Alabama Renourishment and Resilience (Implementation)
Location (If Applicable): West end of Dauphin Island, AL in south Mobile County. Lat/Long: 30.25°N,88.17°W
Council Member Bureau or Agency: Alabama Department of Conservation and Natural Resources
Type of Funding Requested: Implementation

Reviewed by: Out of Gulf
Date of Review: 30 Sept 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
This implementation project is the result of decades of planning and scientific evaluation of resilience needs of the vulnerable western end of Dauphin Island, including federal and state agency and academic work.	

Question 2.

If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The supporting material both pertains directly to the Gulf Coast and also to other regions, certainly adaptable to the needs of the northern Gulf of Mexico coastal environment.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Citations are complete and thorough, and represent a track of evaluations and science that has stood up to the test of time.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Risks are the reason for the proposal, and have been considered in the development of this implementation project.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
This implementation proposal is based on years of evaluations and science by state and federal agencies and academic scientists, and so has, in effect, been vetted by those approaches and concepts that have survived years of critical evaluation and climatic events that will continue to affect the project area.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
See comment to Question A.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
Scientific evaluations from Hurricane Katrina impacts have informed the development of this project, as well as the Alabama Barrier Island Assessment (ABIRA) by USACE and USGS, and related projects evaluated by USGS in the region.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
The Alabama Department of Conservation and Natural Resources has the expertise and contacts in other state and federal agencies to ensure the success of this project	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	

The goals are clearly defined and have been developed from outside assessments and evaluations in addition to previous funding from the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund (NFWF GEBF) and the Gulf of Mexico Energy Security Act (GOMESA). The result is well informed and vetted project goals.

Question C

Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes

Comments:

Methodology for the work follows accepted current practices for such restoration, and has been informed by the extensive vetting of methods and needs assessments from multiple agencies.

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes

Comments:

Stabilizing this vulnerable part of Dauphin Island reverses sand starvation from channel dredging, and directly addresses well documented regional impacts from island breaching that occurred from hurricane Katrina. The science and regional plans/needs assessments have be previously indicated in comments above.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:

As an implementation project, the measures of success are well defined for construction/sand placement activities. Long term success is likely given the long history of evaluation of climatic and environmental factors in the region documented in the proposal.

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Yes see comment above.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Sea-level rise and strom surge have been identified as major risks to the project. Hurricanes in particular could result in delays and/or need to recoup losses to a partilly finished project. Availble evalutions from similar projects will be used to accommodate these risks to the extent possible.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Significant evaluations both historically and spatially across the northern Gulf of Mexico have been cited and will be used in reducing risk.	

Question I

Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
See comments above concerning the long history of assessments and planning that are informing this project.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
Monitoring is including in the project for environmental and biological parameters. There is a clear data plan including metadata and QA/QC procedures. Monitoing data will feed into an adaptive management approach to optimize a successful project.	

Please summarize any additional information needed below:
Click here to enter text.

Appendix E: Coastal Florida Proposal Packets

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Florida Gulf Coast Resilience Program

RESTORE Council Proposal Document

General Information

Title:
Florida Gulf Coast Resilience Program

Project Abstract:
The State of Florida, through the Florida Department of Environmental Protection (FDEP), was awarded RESTORE Act Council-Selected Restoration Component funds to establish the Florida Gulf Coast Resilience Program (Planning) in 2022.

The Florida Gulf Coast Resilience Program (FGCRP) supports the primary RESTORE Comprehensive Plan goal to enhance community resilience through activities that implement sustainable solutions to restore and improve coastal resilience. FGCRP activities include: planning and implementation of adaptation and mitigation strategies to address the impacts of flooding; living shorelines to protect against erosion and reduce wave energy; and land management and land acquisition activities to protect submerged lands and coastal ecosystems that enhance resilience.

Florida coordinates with FDEP's Florida Forever Program (FF) to identify land acquisitions and with its Office of Resilience and Coastal Protection (ORCP) for adaptation planning and mitigation, as well as activities that involve submerged lands management. Developing strategies to address resilience is critical to Florida's ability to adapt to a changing coastline. FGCRP results include resilience improvements, such as reducing repetitive loss of critical habitats and infrastructure; protecting against wave energy, erosion and storm surge; enhancing habitat protection (e.g., marshes, mangroves, seagrass, coral, and oyster reef restoration); enhancing sustainable healthy wildlife populations and fisheries, enhancing water quality benefits, and improving recreation and tourism opportunities.

FPL Category: Cat1: Planning/ Cat2: Implementation
Activity Type: Program
Program: Florida Coastal Resiliency Program
Co-sponsoring Agency(ies): N/A

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

(IV) Projects that restore long-term resilience of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Priority Criteria Justification:
FGCRP addresses RESTORE Act Priority Criteria (II), Large-scale projects and programs that are projected to substantially contribute to restoring and protecting natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

FGCRP is designed to result in large-scale environmental benefits, particularly in relation to the needs of Florida's coastal communities. Its low elevation and more than 8,000 miles of coastline (of which more than 5,000 is along Florida's Gulf Coast) makes Florida especially susceptible to the effects of hurricanes, and flooding, including impacts from sea level rise. Program activities will build on state investments that identify vulnerabilities and strategies to counteract those effects. Program activities include funding projects to improve resilience, such as planning and implementing adaptation and mitigation strategies; developing living shorelines that protect coastal areas against erosion; and acquiring and managing lands that mitigate effects of climate change. These activities will result in significant environmental benefits to coastal communities and help prepare communities most at risk for protection against storms, erosion, coastal flooding, and sea level rise.

The FGCRP addresses RESTORE Act Priority (IV), Projects that restore long-term resilience of natural resources, fisheries, marine and wildlife habitats, and beaches. Program activities help restore the long-term resilience of natural resources most impacted by the Deepwater Horizon oil spill by protecting and enhancing coastal communities and resources that were impacted by the spill. Protection of coastal marshes, mangroves, seagrass, coral, and oyster beds improves resilience by protecting communities against sea level rise and storm surge; and improves ecosystem resilience and sustainability by providing opportunities for coastal wetland migration.

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:
Enhance Community Resilience

Primary Comprehensive Plan Objective:
Promote Community Resilience

Secondary Comprehensive Plan Objectives:
N/A

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Protect natural shorelines
Improve science-based decision-making processes: Develop tools for planning and evaluation
Improve science-based decision-making processes: Increase environmental monitoring capacities
Protect and conserve coastal, estuarine, and riparian habitats: Land acquisition

Location

Location:
Florida coastlines and estuaries along the Gulf of America.

HUC8 Watershed(s):
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Upper Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Upper Conecuh)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Patsaliga)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Sepulga)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Lower Conecuh)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Florida Bay-Florida Keys)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Caloosahatchee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Peace)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Myakka)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Charlotte Harbor)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Sarasota Bay)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Manatee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Little Manatee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Alafia)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Hillsborough)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Tampa Bay)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Crystal-Pithlachascotee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Withlacoochee)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Waccasassa)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Econfina-Steinhatchee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Lower Suwannee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Santa Fe)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Lower Ochlockonee)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(New)

South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(St. Andrew-St. Joseph Bays)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Choctawhatchee Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Pensacola Bay)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Chipola)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Yellow)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Blackwater)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Pea)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Lower Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Escambia)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Aucilla)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Apalachee Bay-St. Marks)

State(s):
Florida

County/Parish(es):
FL - Escambia
FL - Pasco
FL - Pinellas
FL - Charlotte
FL - Citrus
FL - Collier
FL - Dixie
FL - Franklin
FL - Sarasota
FL - Taylor
FL - Wakulla
FL - Bay
FL - Gulf
FL - Santa Rosa
FL - Walton
FL - Hernando
FL - Hillsborough
FL - Jefferson
FL - Lee
FL - Levy
FL - Manatee
FL - Monroe
FL - Okaloosa

Congressional District(s):
FL - 3
FL - 14
FL - 15
FL - 26
FL - 11
FL - 13
FL - 16
FL - 18
FL - 12
FL - 1
FL - 19
FL - 2
FL - 17
FL - 28

Narratives

Introduction and Overview:
The Florida Gulf Coast Resiliency Program includes adaptation planning and mitigation activities for sustainable solutions to promote coastal resilience in the face of hurricanes, flooding, and other stressors. Florida has marshalled resources to prepare coastal communities for impacts associated with hurricanes and flooding, and has developed natural resource protection tools and funding to make Florida's coastline more resilient (FDEP 2018). FGCRP consists of a suite of intrinsically linked activities that in combination result in significant improvements in resilience. Eligible activities include: planning or implementing adaptation and mitigation strategies; living shorelines; and land acquisition and management. Program activities will occur within the 23 counties along Florida's Gulf of America coastline (see Figures 1 through 3) and will address the protection, restoration and improvement of critical assets, including natural resources, vulnerable to hurricanes and flooding.

Florida evaluates proposals submitted by the public and local governments and selects those that fulfill the program purpose (e.g., enhance resilience in vulnerable communities, protect natural resources, sustain healthy ecosystems). FGCRP enables FDEP to fund critical projects that will make significant, measurable improvements to the long-term resilience of natural resources, fisheries, marine and wildlife (essential) habitats, beaches, coastal habitats, and Florida's coastal communities.

Florida plans to apply Best Available Science (BAS) reviews of FGCRP that were completed upon original application of the program in Funded Priorities List 3b. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing. For example, the previous iteration of the program focused on completion of vulnerability assessments, which apply the background and data that drives activities in the next iteration. The next step is to complete planning, engineering, design, permitting and

implementation of site-specific adaptation and mitigation strategies. Likewise, more work has been done to site, design and construct living shorelines in Florida, only lending more credibility and experience to using natural solutions as a practice. Finally, land acquisitions will continue to be accomplished through Florida Forever, as described in the original program application.

Goals/Objectives: FGCRP addresses the Comprehensive Plan goal to Enhance Community Resilience and the objective to Promote Community Resilience. The program increases the capacity of the vulnerable communities to adapt to short-term changes, such as hurricanes and flooding; and long-term changes, such as rising sea levels. This is achieved through: implementing adaptation and mitigation strategies to address resilience, which is critical to Florida's ability to adapt to a changing coastline; creating living shorelines to reduce erosion, wave energy, and protect shorelines and inland communities against hurricanes; and acquiring and managing lands in critical areas to allow habitats and species to adapt or migrate in response to changing climate and coastlines.

Commitments: FGCRP builds on Florida's commitment to science-based decision making. FDEP's Office of Resilience and Coastal Protection (ORCP) has: (1) conducted a comprehensive statewide flooding and sea level rise vulnerability assessment, which incorporates state-of-the art flood modeling on a statewide basis, and (2) funded or provided input on local vulnerability assessments for each of Florida's 67 counties and nearly 410 municipalities. These studies presented valuable data related to the exposure and sensitivity of local critical assets to be assessed alongside sea level rise, storm surge, and rainfall scenarios now and in the projected future to assist in resilience planning. These efforts allowed FDEP and communities in Florida to identify science-based strategies to address the negative effects of changing future conditions. Florida leverages the Florida Forever Program (FF) Priority List (FF 2025); Florida Forever utilizes a science-based evaluation process, which includes a ranking of parcels based on environmental conditions, including protection of fragile coastal habitat, to mitigate the effects of sea level rise.

Florida is committed to public engagement and transparency. FDEP coordinated with numerous stakeholders to develop the FGCRP. The public can propose projects for funding. FDEP funded the preparation of vulnerability assessments, which frequently included public engagement aspects, including outreach to vulnerable populations (FDEP 2018). Grantees who are awarded FGCRP funds are required to post products of program-funded activities on a publicly-available website. FGCRP leverages resources and partnerships to identify and implement resilience-focused activities. When evaluating activities, Florida considers whether the project leverages other funding sources. For land acquisitions, Florida relies on Florida Forever to identify eligible projects. FDEP also coordinates with local entities to identify projects and program activities as well as FDEP's ORCP, which funded vulnerability assessments for communities. Finally, Florida's commitment to coordinating resources and partnerships, delivering results, and relying on the best available science, is illustrated through the Governor's appointment of the first Chief Resilience Officer (CRO) in August 2019. The CRO is tasked with preparing for the environmental, physical, and economic impacts of sea level rise.

Environmental Benefits: In 2018, much of the Florida coast was developed and approximately

80 percent of Florida's population lived within 10 miles of the coast (FDEP 2018). Florida has been designated as one of the fastest growing states between 2023-2024 with Panama City-Panama City Beach metro area along the Gulf coast as the second fastest growing metropolitan area in the state in the same time period (behind Ocala, Florida). (Census.gov 2024, Census.gov 2025). Due to low elevations, coastal communities and habitats are at significant risk from the effects of hurricanes and flooding. FGCRP provides environmental benefits to coastal communities by increasing coastal resilience, specifically through planning and implementation of adaptation and mitigation strategies, creating living shorelines, and conservation or increased protection of natural areas, including offshore submerged lands and riparian buffers.

Coastal habitats such as barrier islands, marsh, mangroves, seagrass, oyster reefs, and coral reefs have the capacity to reduce wave energy and erosion, protecting coastal communities from sea level rise and in some cases, storm surge (Beck et al. 2018, Boutwell and Westra 2016, Ferrario et al. 2014, Guannel et al. 2016, Liu et al. 2013, USGCRP 2018, Zhang et al. 2012). Natural vegetation and networks of connected wetlands stabilize shorelines by trapping sediments and filtering excess nutrients from urban runoff, while providing essential habitat for commercially valuable species. Living shorelines enhance shoreline stabilization and coastal protection (Bilkovic and Mitchell 2017).

Acquisition, conservation, and regulatory protection of natural areas, including unique, imperiled, and ecologically valuable habitats (e.g., riparian buffers, wildlife corridors, submerged lands), promotes coastal resilience and strengthens natural resources. Protecting large areas of natural lands preserves the ecosystems that reduce wave energy and erosion. Land conservation protects native biodiversity and ecosystem function, promotes connectivity, increasing genetic diversity and species fitness, and allows for migration or adaptation as environmental change induces shifts in species' range of distribution (Damschen et al. 2019, DeFreese 1995, Tewksbury et al. 2002). Land conservation enhances water resource protection by allowing water to filter naturally, reducing impervious surfaces, and flooding, and improving water quantity and quality (Shepard et al. 2016).

Florida has demonstrated success implementing these project types across the Gulf Coast of Florida. FDEP, in coordination with other State and Federal partners, developed the Florida Adaptation Planning Guidebook (FDEP 2018, updated 2025) and funded projects that produced vulnerability assessments for more than 95% of Florida communities including 100% of all counties. FDEP and partners successfully constructed a number of living shoreline projects, notably: "Project Greenshores" in Pensacola Bay (FDEP 2019a); a living shoreline in St. Andrews Bay recognized by EPA through its Gulf Guardian Award in 2013 (Florida Living Shorelines 2020); and Cat Point Living Shoreline in Apalachicola Bay, which won Best Restored Shores Award by American Shore and Beach Preservation Association in 2023 (NOAA 2023). Nearly 10 million acres of land is publicly managed for conservation in Florida, more than 2.6 million acres of which were purchased under Florida Forever and an earlier State land acquisition program (FNAI 2022).

Environmental Stressors: Comprehensive resource management and planning efforts, such as

Florida Forever, Florida Gulf Environmental Benefit Fund Restoration Strategy, Basin Management Action Plans, Aquatic Preserve and State Park Management Plans, the Statewide Vulnerability Assessment, local Vulnerability Assessments, and many others have identified stressors and threats to Florida's natural resources including habitat loss and fragmentation, storm surge, flooding, and sea level rise. FGCRP enhances resilience and sustainability by addressing habitat loss and fragmentation through acquisitions and land management protections as well as implementing adaptive strategies and constructing living shorelines to protect critical assets from hurricanes and flooding.

Costs: $20,000,000. FGCRP leverages funding and resources from Florida Forever and the Resilient Florida grant programs. $8,000,000 in Category 1 funds will be used for program management; monitoring and data management; adaptive management; living shoreline planning, design, and environmental compliance; and planning, design and environmental compliance for adaptation and mitigation strategies for future implementation. $12,000,000 in Category 2 funds will be used for implementation of adaptation and mitigation strategies, construction of living shorelines, land acquisition, and project monitoring.

Timeline: The duration of FGCRP planning and implementation is expected to be 7 years. Land acquisitions identified from the Florida Forever Priority List could begin upon receipt of funding and acquired lands will be maintained in perpetuity.

Partners: Florida relies on Florida Forever to leverage Florida's science-based approach to land conservation and to streamline the land acquisition process. FDEP will rely on ORCP to develop adaptation and mitigation strategies as well as continue resource management and stewardship activities on State submerged lands. In 2021, Governor DeSantis signed House Bill 1954, the Always Ready Bill, implementing Section 380.093, Florida Statute (F.S.), and creating the Resilient Florida Program within the FDEP's ORCP. The legislation forges a path for coordinated flood resilience planning and mitigation efforts in the state to protect critical assets defined by statute (including specifically identified types of public infrastructure). Since July 1, 2021, the state has appropriated nearly $1.8 billion dollars toward local and statewide flood planning and mitigation efforts. In addition to funding grants to communities, ORCP completed a comprehensive statewide flooding and sea level rise vulnerability assessment (Statewide Assessment), which is now undergoing post project QA/QC and analysis. This assessment will further allow communities to identify mitigation needs.

Funded Priorities List (FPL) Planning Framework: FGCRP is consistent with the Protect and Conserve Coastal, Estuarine, and Riparian Habitats priority approach identified in the FPL planning framework. The primary goal and objective of the program is to improve coastal resilience, through utilization of techniques such as adaptation and mitigation strategies, living shorelines and coastal habitat protection. Identifying strategies to improve coastal resilience will help ensure Florida's coastal communities are able to adapt to the effects of hurricanes and flooding by conserving Florida's natural resources, reducing wave energy, protecting against storm surge, and providing opportunities for species and habitat migration.

Proposed Methods :

FGCRP consists of a suite of intrinsically linked conservation activities designed to implement sustainable solutions to improve coastal community resilience. FGCRP includes activities such as: planning and evaluation tools, design, and construction of living shorelines (where needed and viable); acquiring and managing lands for conservation; and other activities that improve coastal resilience, such as habitat restoration (e.g., oyster reef, marsh, beach and dune, floodplain, mangrove, coastal hammock and forest, coral reef and seagrasses), or restoring flowways to sustain marsh vegetation. As such, the program will rely on a range of methods for the various activities. The methods Florida utilizes to select projects or activities under this program (i.e., decision criteria) and descriptions of methods for some of the activities are summarized below.

Project or activity selection criteria. The goal of FGCRP is to enhance and promote community resilience by increasing the capacity of Florida's coastal communities to adapt to short- and long-term changes such as increased flood risks, storm surge, and rising sea levels. The objectives of the program are to: fund adaptation and mitigation strategies for Florida Gulf coastal communities' assets which are most at risk from the effects of hurricanes and flooding; identify strategies to address coastal resilience; and implement sustainable solutions to improve coastal resilience, such as constructing living shorelines to reduce wave energy which protects against storms, or acquiring and managing coastal lands, urban riparian buffers, flowways or other habitats.

Florida leveraged funds from RESTORE Council's federal award for Commitment and Planning Support (CPS) to develop selection criteria for the FGCRP and its other FPL programs. Florida selects projects from proposals submitted by the public and stakeholders. FDEP utilizes project portals and issues a public notice to solicit proposals. The notices clearly describe the goal and objectives of the program and the types of activities that will be considered.

In selecting program activities from submitted project proposals, FDEP screens and evaluates each proposal to ensure it meets the goal and objective of the program. If a proposal meets the screening criteria, FDEP evaluates the proposal further in accordance with its evaluation criteria. FDEP then selects program activities based on the extent to which the proposals meet the evaluation criteria and are most cost-effective at addressing community resilience. Proposals that meet the initial screening and evaluation criteria are further evaluated as outlined below for each of the project types: adaptation and mitigation planning and/or implementation, living shorelines, and land acquisition. The number and type of projects selected for implementation depends on project proposals and will be scaled to the program budget.

Screening criteria:
Does the proposal have sufficient information to allow for screening and evaluation?
Is the project proposal consistent with the program goal and objective?
Is the proposed project feasible (i.e., has not already been completed, does not conflict with any State or Federal regulations, etc.).

Evaluation criteria:
Extent to which the project proposal is cost-effective (i.e., reasonable and comparable to other

equivalent activities; low cost compared to likely benefits).
Extent to which the project proposal is supported by the local community.
Extent to which the project proposal leverages other funding sources (including in-kind services).
Extent to which the project proposal provides benefits to multiple communities and/or multiple natural resources.
Extent to which the project proposal addresses the goals and objectives of the program.
Proposed project location (i.e., whether it is located in an area that is vulnerable to current and future risks including flooding, storm surge, erosion, or rising sea levels). If within an ORCP-managed area (National Estuarine Research Reserve, Aquatic Preserve or National Marine Sanctuary), does it meet the goals and objectives of the approved management plan?
Project readiness and sustainability and/or likelihood of long-term success of the proposed project.

When planning adaptation and mitigation strategies, Florida utilized a science-based process in coordination with ORCP staff and followed state guidance. Specifically, vulnerability assessments were developed in accordance with guidance outlined in the Florida Adaptation Planning Guidebook (FDEP 2018), the Sea-Level Rise Vulnerability Assessment Tools and Resources (FDEO 2015), and requirements found in s. 380.093, Florida Statutes, among others. FDEP may refer to previously conducted local and regional vulnerability assessments (e.g., Beever III et al. 2009, Taylor Engineering, Inc. 2019) which have included sea level rise and storm surge risk models such as the Sea Level Affecting Marshes Model (SLAMM) and an ADvanced CIRCulation Model (ADCIRC).

FDEP may consider living shoreline proposals independent of any specific vulnerability assessment or may prioritize them based on one or more vulnerability assessments. Selection of individual living shoreline proposals are based on best available science (Miller 2015, NOAA 2015). FDEP factors ecological resources present and adjacent land use in its evaluation of proposals as part of a science-based process to prioritize projects (Taylor Engineering, Inc. 2019). FDEP requires professional services contractors to conduct site investigations, complete necessary engineering and design, and regulatory compliance for any living shoreline proposals selected. Professional services agreements are drafted and executed in accordance with Florida laws and regulations. The selected professional services contractor will be required to conduct site visits as necessary, develop designs, construction drawings as applicable, and determine the necessary permits required to complete the project. Upon receipt of all needed approvals, an Invitation to Bid for construction will be issued in accordance with Florida State procurement laws.

FDEP will consider each land acquisition or management proposal independently. However, some land acquisition proposals may be prioritized based on the results of one or more vulnerability assessments. Land acquisitions may be suggested by the public through project proposals or identified through the Florida Forever Priority List which is updated annually (FF 2025). Florida utilizes a science-based process in identifying lands for acquisition and management. Parcels within the Climate Change Lands category of the Florida Forever Priority List, or other parcels that drain to the Gulf of America which may help strengthen coastal

resilience or mitigate the effects of climate change including: coastal salt marshes, mangroves, oyster reefs, riparian buffers, or flowways, may be considered by Florida for acquisition. The Florida Forever program conducts a thorough field review and a comprehensive natural resource analysis to score and rank parcels on the Florida Forever Priority List. The goal of the process is to conserve environmentally unique and irreplaceable lands or rare ecosystems, native flora and fauna, important breeding locations, natural areas for recreation, and archaeological or historic sites (Section 259.105, F.S.). A series of geographic data layers including information on various measures used by Florida Forever (e.g., rare species habitat conservation priorities, ecological greenways, landscape-sized protection areas, significant surface waters, natural floodplains, functional wetlands) are utilized, (see FNAI 2022 for additional details on the methods and process). FDEP, in accordance with Florida Statutes, Chapter 259, Land Acquisitions for Conservation or Recreation (Section 259.105, F.S.). FDEP's Division of State Lands or its local acquisition partners, contracts with parties as necessary to obtain services for appraisal(s) and required due diligence, such as environmental site assessments, to complete the acquisition(s). Lands acquired would be titled to the State and protected in perpetuity. Land management plans are required on acquired lands and could include: seagrass, coral reef, marsh, and mangrove restoration activities along with other types of stewardship activities.

Environmental Benefits:

Much of Florida's coast is developed and approximately 80 percent of the population live within 10 miles of the coast (FDEP 2018). Due to the State's low elevations, coastal communities are at significant risk from the direct and indirect effects hurricanes and flooding as well as sea level rise. Shoreline protection and conservation of coastal ecosystems can enhance community and ecosystem resiliency to mitigate those effects (USGCRP 2018). FGCRP will result in significant environmental benefits to coastal communities by increasing community resilience through adaptation and mitigation strategies, living shorelines, and land conservation and management.

Efforts to assess communities' vulnerabilities have been essential for building capacity to plan and implement appropriate mitigation and adaptation strategies. Vulnerability assessments have helped to identify those areas most at risk and evaluate the potential range and magnitude of impacts from flooding. Understanding communities' vulnerabilities to flooding allows resource managers to plan and implement corrective measures to mitigate future threats. Local and statewide vulnerability assessments have integrated projected sea level rise with critical assets to identify assets that might be most vulnerable, helping communities effectively plan for the future. Implementation of adaptation and mitigation strategies will be informed by the data that was collected to develop community-specific vulnerability assessments.

Natural communities such as barrier islands, marsh, mangroves, seagrass beds, oyster reefs, and coral reefs can reduce wave energy and erosion, protecting coastal communities from sea level rise and in some cases, storm surge (Beck et al. 2018, Boutwell and Westra 2016, Ferrario et al. 2014, Guannel et al. 2016, Liu et al. 2013, USGCRP 2018, Zhang et al. 2012). Wetland presence has been shown to be negatively correlated with economic damages following hurricanes and storm surge (Boutwell and Westra 2016), providing further evidence that wetlands increase community resilience. Natural vegetation and networks of connected

wetlands further stabilize shorelines by trapping sediments and filtering excess nutrients from urban runoff. Living shorelines are constructed to enhance shoreline stabilization and coastal protection by reducing wave and tidal influences, as well as periodic storm surge impacts. A review of restoration projects following Hurricane Sandy found that living shorelines were five to eight times more cost-effective than stone revetments for erosion control (Abt Associates 2019).

Florida ranks in the top three states nationally where existing coastal habitat is expected to defend the greatest number of people and property from sea level rise (Arkema et al. 2013). It is estimated that preserving and restoring coastal habitats in the U.S. could reduce the impacts of sea level rise on people and their property by half (Arkema et al. 2013). Conservation of natural lands in Florida, including unique, imperiled, and ecologically valuable habitat (e.g., riparian buffers, wildlife corridors), promotes coastal resilience. Protecting large areas of natural lands directly protects the communities by reducing wave energy and shoreline erosion. Land acquisition conserves native biodiversity, ecosystem function, promotes connectivity, increases genetic diversity and species fitness, and allows for migration as environmental changes induce shifts in species' distribution ranges (Damschen et al. 2019, DeFreese 1995, Tewksbury et al. 2002). Conservation of riparian buffers and natural flowways can help mitigate floods and protect coastal communities susceptible to flood risk (World Bank 2018). Finally, land conservation enhances water resource protection and management, reducing impervious surfaces, allowing water to filter naturally, and reducing flooding (Shepard et al. 2016).

Metrics:

Metric Title: HC003 : Land acquisition - Acres acquired in fee

Target: 0.99

Narrative: Florida will use this as a project or activity metric. The project or activity metrics may be adjusted as needed once projects or activities are funded. Metrics may be added, removed, or replaced as appropriate at the project work plan application stage. Once a project or activity is selected a target value will be established. Project or activity success will be determined as the total number of acres acquired in fee. The purpose of this metric will be to verify that acquisition has been completed, and the performance measure will be an executed and recorded deed. Upon transfer of the parcel to public ownership, this metric will be complete. The outcome will be an increase in protected acres.

Metric Title: HR012 : Shoreline protection - Miles of living shoreline installed

Target: 0.99

Narrative: Florida will use this as a project or activity metric. The project or activity metrics may be adjusted as needed once projects or activities are funded. Metrics may be added, removed, or replaced as appropriate at the project work plan application stage. Once a project or activity is selected a target value will be established. Project or

activity success will be determined as the number of miles of living shoreline installed. The purpose of this metric will be to verify that the living shoreline had been completed according to plans and designs. The outcome will be an increase in miles of living shoreline.

Metric Title: HC001 : Conservation easements - Acres protected under easement

Target: 0.99

Narrative: Florida will use this as a project or activity metric. The project or activity metrics may be adjusted as needed once projects or activities are funded. Metrics may be added, removed, or replaced as appropriate at the project work plan application stage. Once a project or activity is selected a target value will be established. Project or activity success will be determined as the total number of acres protected under a conservation easement. The purpose of this metric will be to verify that the conservation easement has been acquired and recorded in property records. The performance measure will be an executed and recorded conservation easement agreement. Upon receipt of the executed and recorded agreement, this metric will be complete. The outcome will be an increase in acres protected under easement, and lands will be conserved in perpetuity.

Metric Title: PRM010 : Research - # studies used to inform mgmt.

Target: 0.99

Narrative: Florida will use this as a project or activity metric. The project or activity metrics may be adjusted as needed once projects or activities are funded. Metrics may be added, removed, or replaced as appropriate at the project work plan application stage. Once a project or activity is selected a target value will be established. Project or activity success will be evaluated and determined as the number of vulnerability assessments or other studies completed and used to inform management over the duration of the program. The purpose of this metric will be to verify and track that the planning or evaluation of adaptation strategies have been completed, and the performance measure will be a completed planning or evaluation report.

Metric Title: RES003 : Community Resilience - # of community critical assets benefiting

Target: 0.99

Narrative: Florida will use this as a program-wide metric to evaluate the success of the program. Program success will be determined as the number of community critical assets by the program, as applicable. Because specific projects or activities are not yet identified, a target value or range of values is to be determined. As projects or activities

are selected for funding a range of values for this program metric can be proposed at that time. Each project or activity funded under this program may not be captured by this metric. Additional metrics will be determined to capture the benefits of each technique utilized under this program; specifically, each project or activity selected under the program will have specific metrics aimed at evaluating the success of the individual project or activity.

Risk and Uncertainties:

Florida's coastal communities are at significant risk from the effects of hurricanes and flooding, among other stressors. Florida has demonstrated a commitment to coastal resilience and adaptation planning. In 2009, the first Climate Leadership Summit was convened by Broward, Miami-Dade, Monroe, and Palm Beach Counties. Since that time, FDEP, in coordination with other State and Federal partners, has developed guidance on adaptation planning and vulnerability assessments (FDEO 2015, FDEP 2018). FDEP has funded over 100 projects that produced vulnerability assessments for more than 150 communities. In 2019, the Governor appointed the first Climate Resilience Officer to help prepare for the impacts of sea level rise in partnership with FDEP. Based on Florida's experience, and the technical assistance available, there is a strong likelihood of success for executing the resilience activities in this program. Nevertheless, both short-and long-term risks and uncertainties are inherent in planning and implementing this program. There are also risks associated with uncertainties with sea level rise and rainfall projections, which require careful consideration in planning for the long-term success of the program. FGCRP will promote long-term coastal resilience in each activity through an adaptive management approach and site-specific consideration of local and regional risks and uncertainties.

Near-term risks and uncertainties associated with FGCRP are related to planning and implementing program activities (e.g., adaptation and mitigation strategies, living shorelines, or acquisitions). Risks include uncertainty in project budget estimates, changes in local partners' capacity to manage funded projects after selection, delays in timelines, and cost overruns due to industry-wide increasing costs. These risks can be mitigated through careful cost estimation, including reasonable contingencies, effective planning and design, third-party oversight, and adaptive management. Entities receiving funding are required to document strong operation and management capabilities and financial resources to assure long-term project success.

Florida has successfully funded planning and implementation for adaptation and mitigation strategies and living shoreline projects, and conserved natural areas, and acknowledges unexpected issues can arise. In planning living shorelines, unknown aspects of current site conditions, changing conditions, and unanticipated changes to a project's scale can alter plans. For land acquisition projects, near-term risks and uncertainties include the continued availability of properties, the successful negotiation of sales with landowners, and the cost of the acquisition. These can be mitigated through thoughtful discussion with property owners, quality appraisals, and due diligence.

Florida does not anticipate near-term socioeconomic risks from land acquisition projects. Some

near-term socioeconomic risks may be associated with construction of living shorelines. Construction activities pose potential to impact aesthetics, increase noise and local traffic, or temporarily restrict access to recreational or commercial fishing sites or navigation channels. The potential negative effects associated with construction will be addressed through careful project planning, sequencing, and public engagement as necessary to minimize impacts. Further, impacts are likely to be offset by the socioeconomic benefits of the activities, such as reduced erosion, protection from storm surge, etc.

Long-term risks and uncertainties for FGCRP are primarily associated with the adequacy of flooding and rainfall projection models to inform project design and implementation. The success and sustainability of projects could be undermined if conditions do not match projection scenarios.

The Florida Flood Hub has developed sea level rise projection curves for Florida, while ORCP has published a statewide vulnerability assessment to evaluate projected impacts of sea level rise and flooding. Despite the uncertainties associated with any model predictions, the state has a science-based approach to model updates. In Florida, every coastal county was found to be at risk for storm surge and 12 counties had residents at extreme risk in the lowest prediction of sea level rise investigated. As cited in Stys et al. (2017), 25 percent of 1,200 species tracked by the Florida Natural Areas Inventory are expected to lose more than half of their current habitat area due to sea level rise. Studies have demonstrated the direct impact of sea level rise, reducing abundance and distribution of plant and animal species restricted to low elevation habitats in Florida (LaFever et al. 2007, Ross et al. 1994).

Completed vulnerability assessments rely on the selection and application of appropriate sea level rise and flooding vulnerability projections. Modeling and decision support tools will be used to develop scenarios of future conditions during planning of adaptation strategies and implementation, living shorelines and identification of lands for acquisition. FGCRP will limit risk associated with uncertainty in models by utilizing Florida-specific models and a science-based approach.

Assessing the long-term successes of living shorelines and land acquisition projects in sustaining resilience may depend on future sea level rise and rainfall projections. During project planning, accounting for future sea level rise in determining the appropriate siting for a living shoreline will help to effectively reduce wave energy for current and future shoreline protection. The success of conservation for coastal resilience depends on the appropriate consideration of impacts on lands being considered for acquisition. The sections below summarize some of the risks and uncertainties associated with model projections as well as the risks and uncertainties associated with the program activities and the long-term success of the program. A source for U.S. sea level rise and storm surge scenarios is the 2022 NOAA Sea Level Rise Technical Report. This multi-agency effort, representing the first update since 2017, offers projections out to the year 2150 and information to help communities assess potential changes in average tide heights and height-specific threshold frequencies as they strive to adapt to sea level rise.

Conservation and management of coastal habitats that have the capacity to provide a natural

buffer to waves and storm surge (e.g., marshes, mangroves, submerged aquatic vegetation, oyster reef, coral reef, and barrier islands) will increase Florida's resilience(Beck et al. 2018, Boutwell and Westra 2016, Ferrario et al. 2014, Guannel et al. 2016, Liu et al. 2013, USGCRP 2018, Zhang et al. 2012). Feagin et al. (2010) suggest that while coastal vegetation is effective in attenuating short-period wave energy, it may be less effective in reducing the impacts of storm surge. Thus, some uncertainty is associated with the ability of coastal habitats to reduce storm surge impacts.

Projects that conserve habitat corridors, riparian buffers, and natural flowways can sequester carbon, promote population and habitat connectivity, and provide protection against floods. However, the degree to which individual conservation lands achieve connectivity is uncertain. The effectiveness of a corridor depends on a variety of factors (e.g., size and shape of the patches connected by the corridor, distance between patches) and may be difficult to quantify (Tewksbury et al. 2002).

Despite the risks and uncertainties associated with model projections, FGCRP activities will focus on areas most at risk for hurricanes and flooding and implement projects that improve coastal communities' resilience through careful planning, effective strategies, and conservation of habitats that protect against the effects of climate change. While some risks and uncertainties exist for the long-term success of program activities, these may be mitigated through monitoring and adaptive management. Ultimately, any remaining risks and uncertainties are expected to be offset by the long-term environmental benefits of the program.

Florida anticipates limited long-term socioeconomic risks from the installation of living shorelines, adaptation and mitigation strategies, and land acquisition projects, the latter of which could limit economic development and reduce potential property tax revenues. Florida suggests long-term socioeconomic risks would be offset by potential long-term benefit of reduction of costs associated with hurricane and flood damage.

Other sources of long-term risk include a range of factors beyond the control of FDEP and project proponents, including: the trajectory and timing of population change and infrastructure development in project areas (which can in turn affect measures of resilience of physical assets and indicators of socioeconomic factors); the impact of natural disasters beyond the range of historical or projected science; or other site-specific factors. While some aspects of these long-term risks can be addressed through scenario analysis and project robustness, Florida expects that project proponents will address these factors qualitatively.

Monitoring and Adaptive Management:

Program-wide monitoring for RES003, Community Resilience - # of residential, commercial, and public facilities benefiting will occur for the duration of the program, as applicable to projects or funded activities. Program success will be tracked as the number of community critical assets benefited under this program; the total number benefitting will be verified using associated program implementation documents.

FDEP will utilize a monitoring and adaptive management framework consistent with the

Deepwater Horizon NRDA MAM Manual guidelines (DWH Trustees 2019) and the RESTORE Interim Observational Data Plan (ODP) Guidance (2021). The program will be adaptively managed to ensure the greatest benefits are achieved. For example, as new information on sea level rise and flooding becomes available, the information will be incorporated into planning and implementation of adaptation and mitigation strategies and living shorelines. Project reports will be utilized to document applicable lessons learned to allow for improvements to be incorporated into future activities.

Project or activity monitoring including the metrics, duration, performance criteria, and adaptive management activities, will vary depending on the technique implemented in each project or activity. Florida will require the development of adaptive management plans for all funded projects or activities to ensure long-term success.

Monitoring for HR012 - Miles of living shoreline installed will be conducted using surveys or aerial imagery, consistent with methods outlined in the NRDA MAM Manual (DWH Trustees 2019) and ODP Guidance (RESTORE 2021).

Monitoring for HC001: Conservation easements - Acres protected under easement and HC003: Land acquisition - Acres acquired in fee will take place following acquisition and acres will be verified by survey or aerial imagery, consistent with methods in the NRDA MAM Manual (DWH Trustees 2019) and ODP Guidance (RESTORE 2021).

Monitoring for PRM010: Research - # studies used to inform management will be used to verify and track the number of studies (i.e., adaptation and mitigation strategy planning and evaluation activities) will be tracked and documented for the duration of the program.

Data Management:
Florida developed a Program Observational Data Plan (ODP) and Data Management Plan detailing how program and project data will be collected and managed. FDEP will provide a publicly accessible central location to access relevant data.

Depending on the technique(s) used for individual projects, the following types of data will be collected: number, type, and location of adaptation and mitigation strategy activities; planning and engineering data and miles of living shoreline installed; acreage acquired, location, and property information. For any partnerships with Florida Forever, property information will be made available on the FDEP Oculus site. Information on any Florida Forever activities are available at https://floridadep.gov/lands/environmental-services/content/florida-forever.

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Collaboration:
During initial development of the FGCRP under FPL3b, Florida collaborated with numerous State, regional, and local entities and stakeholders to develop and refine this program. FDEP held meetings with local governments, Water Management Districts, National Estuary Programs (NEP), non-governmental organizations (NGO), Florida's RESTORE Act Center of Excellence

(COE), and other RESTORE Council members. At these meetings, NGOs, local entities, State agencies, and NEPs reiterated their support for funding coastal resiliency projects, especially living shorelines and land acquisition.

Florida will rely on ORCP which identified and funded vulnerability assessments for over 95% of Florida communities as well as the statewide vulnerability assessment to measure the impacts of sea level rise and identify critical assets at risk. ORCP awarded more than $100 million in planning grants to help coastal and noncoastal communities plan for the effects of flooding and sea level rise.

Through the CPS process, Florida extensively collaborated with partners and determined that coastal resilience is a priority for local governments, Water Management Districts, National Estuary Programs, non-governmental Organizations (NGO), and RESTORE Council Members.

Public Engagement, Outreach, and Education:
Florida collaborated with the public and local entities to develop the original proposal for this program through numerous meetings with local governments, Water Management Districts, NEPs, NGOs, and Florida's COE. FDEP will continue to collaborate with local entities and the public for their assistance in identifying potential program projects and activities. The public will be able to submit proposals for funding projects or activities under FGCRP. FDEP will hold a webinar to present project selection criteria and will make draft project lists available for public review and comment.

Florida will rely on Florida Forever to streamline the process of identifying potential lands for acquisition, which incorporates additional opportunities for public engagement, outreach, and education. Florida Forever promotes land acquisition on behalf of the public, to conserve valuable resources, improve public land management, and increase public access to natural areas. Public engagement is a critical component of the Florida Forever selection process. Acquisition projects may be nominated by Federal, State and local government agencies, conservation organizations, or private citizens. Acquisition and Restoration Council (ARC) meetings are publicly noticed, and the public is encouraged to provide comment on the projects. Nonprofit organizations may play a role in helping acquire conservation lands. They advocate for parcels to be placed onto the Florida Forever Priority List and can act as intermediaries with owners, including assisting them with tax and estate planning issues. Florida Forever has previously collaborated with The Nature Conservancy, the Trust for Public Land, and The Conservation Fund. In addition to providing opportunities for the public to participate in the site selection and land acquisition process, Florida Forever provides education and outreach to ensure the public has knowledge of the accessibility of public lands. A publicly available database and mobile application are available to provide the public with information on the location, types of recreational opportunities, access points, facilities, amenities, and restrictions for public lands in Florida (Section 259.105, F.S.).

Leveraging:

Funds: $1,856,124,990

Type: Leveraging

Status: Received

Source Type: State

Description: FGCRP will leverage funds, knowledge and resources from the ORCP and its Resilient Florida program when identifying and/or selecting program activities. The Resilient Florida program enhances efforts to protect inland waterways, coastlines and shores, which serve as invaluable natural defenses against sea level rise. Resilient Florida provides funding assistance to analyze and plan for vulnerabilities, as well as implement projects for adaptation and mitigation (FDEP 2019b). The amount represents funds legislative appropriated funds over the last five years and includes up to $650 million in American Rescue Plan Act of 2021 funding dedicated by the state to this program.

Funds: $$467,000,000

Type: Leveraging

Status: Received

Source Type: State

Description: The FGCRP will leverage funds and resources from Florida Forever, including the Florida Forever Priority List to help identify land acquisition projects that are eligible for funding under the program. The Florida Forever Priority List includes parcels ranked by the ARC that when protected will help to improve coastal resiliency. Florida Forever received $467,000,000 in legislative appropriations over the last 3 5 years.

Funds: $450,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: FGCRP will leverage resources for land conservation via the ORCP's Florida Coastal Management Program (FCMP), funded through NOAA Bipartisan Infrastructure Law Coastal Management Program Capacity Building. FCMP will increase

Florida's capacity to set conservation priorities for the State's Aquatic Preserve watersheds through the lens of sea level rise and Landscape Development Intensity with a focus on estuarine habitat migration corridors within those watersheds. FCMP will produce a detailed GIS-based habitat change-analyses of these watersheds using Coastal Connectivity Modeling through a contract with the University of Florida's Center for Landscape Conservation Planning.

Funds: $11,250.00

Type: Leveraging

Status: Received

Source Type: Other

Description: The FGCRP leveraged some CPS federal award funds to develop the project selection criteria for multiple FPL3b programs and present draft selection criteria in a public webinar. It is anticipated that the selection criteria and process will be adapted to future FPL programs. CPS funds are utilized for an array of activities that support planning and collaboration efforts to prepare grant applications prior to implementing specific projects through federal awards. The selection criteria put greater emphasis on projects that leverage other funding sources. Therefore, it is expected that individual projects will also leverage other federal funds and state funds. See Methods section for a description of selection criteria.

Environmental Compliance:

Under the RESTORE FPL Proposal Submission Guidelines, FGCRP includes Category 1 planning funds for planning, engineering, design and permitting for adaptation and mitigation strategies, planning, engineering design and permitting of living shorelines, which do not involve any construction or ground-breaking activities, and associated program management, monitoring and adaptive management, and data management activities. Thus, Florida will comply with the National Environmental Policy Act (NEPA) using the Council's NEPA Categorical Exclusion (CE) for planning, research, or design activities (Section 4(d)(3) of the Council's NEPA procedures). Implementation (construction) of projects that address adaptation and mitigation strategies, construction of living shorelines, and land acquisitions are currently in Category 2. Florida requires selected implementation projects to comply with all applicable federal, state and local laws. Because Council NEPA regulations allow the use of member NEPA CEs where appropriate (Section 4(d)(4) of the Council's NEPA procedures), selected project NEPA compliance will occur using the appropriate documentation (Environmental Assessments, Environmental Impact Studies, or CEs). Florida may work with other Council members to secure CEs (e.g., NOAA 6.03b.3(b)(2)) for NEPA requirements for land acquisition projects and activities implemented under this program.

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Budget

Project Budget Narrative:

The budget for FGCRP is $20,000,000, of which the majority (approximately 90%) will be used for planning or implementation of projects or activities aimed at improving coastal resilience. The total amount of funding in Category 1 is $8,000,000 and the total amount of funding in Category 2 is $12,000,000. The Category 1 funds will be used for State of Florida program administration and project or activity specific planning, engineering, design, and permitting. Program monitoring and adaptive management activities, and data management activities will also fall under Category 1. Category 2 funds will be used to implement projects or activities such as implementation of adaptation strategies, construction of living shorelines or land acquisitions and will include project or activity specific monitoring and adaptive management activities, and data management activities. More detailed budgets will be developed at the project or activity level when projects or activities are selected for funding under this program, including an appropriate contingency. The percentages listed below apply to the entire $20,000,000 budget.

Total FPL Project/Program Budget Request:
$ 20,000,000

Estimated Percent Monitoring and Adaptive Management: 5 %

Estimated Percent Planning: 15 %

Estimated Percent Implementation: 80 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: 0 %

Is the Project Scalable?:
Yes

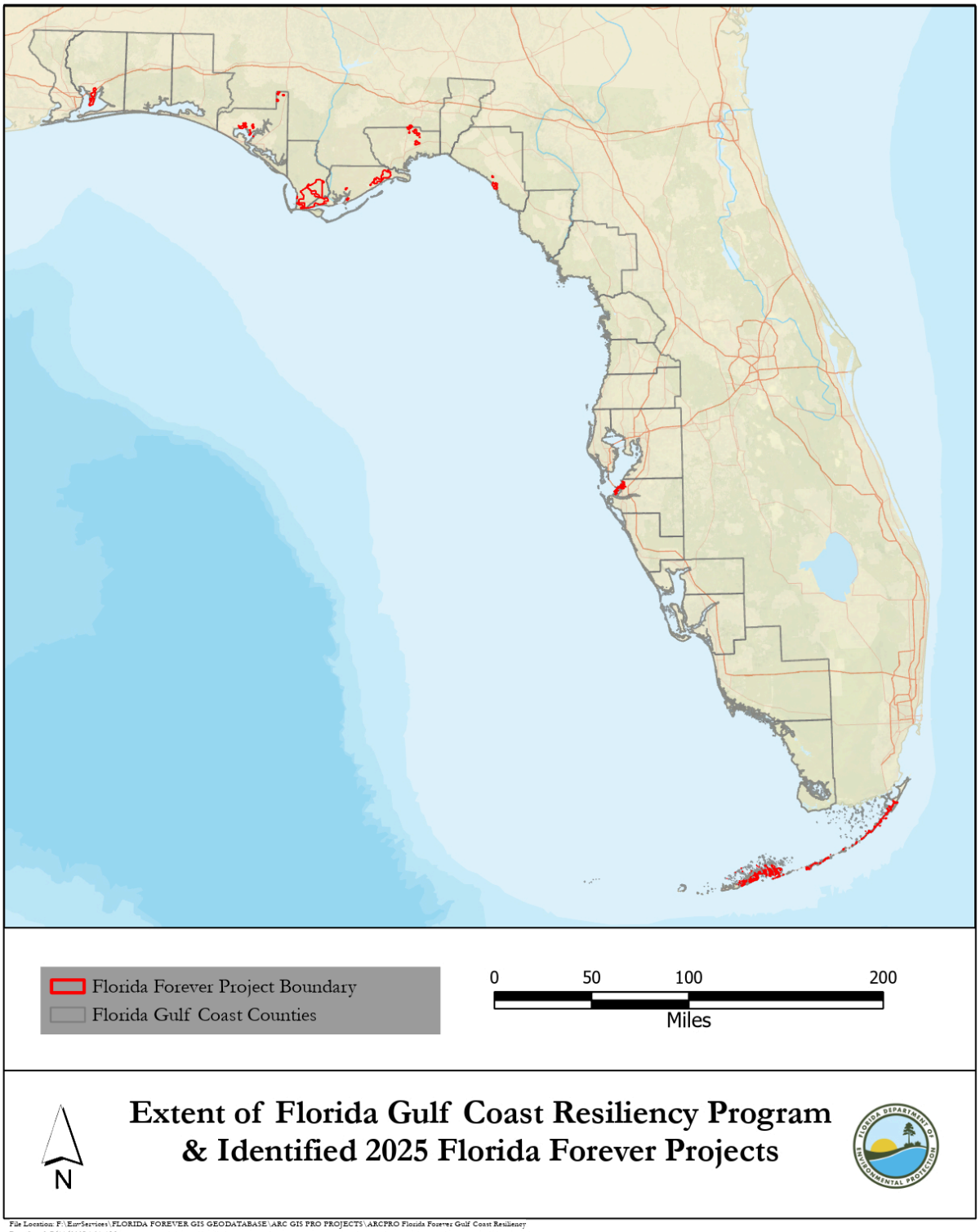
If yes, provide a short description regarding scalability.:
The program could be scaled to allow for more or fewer activities over a longer or shorter duration of time.

Environmental

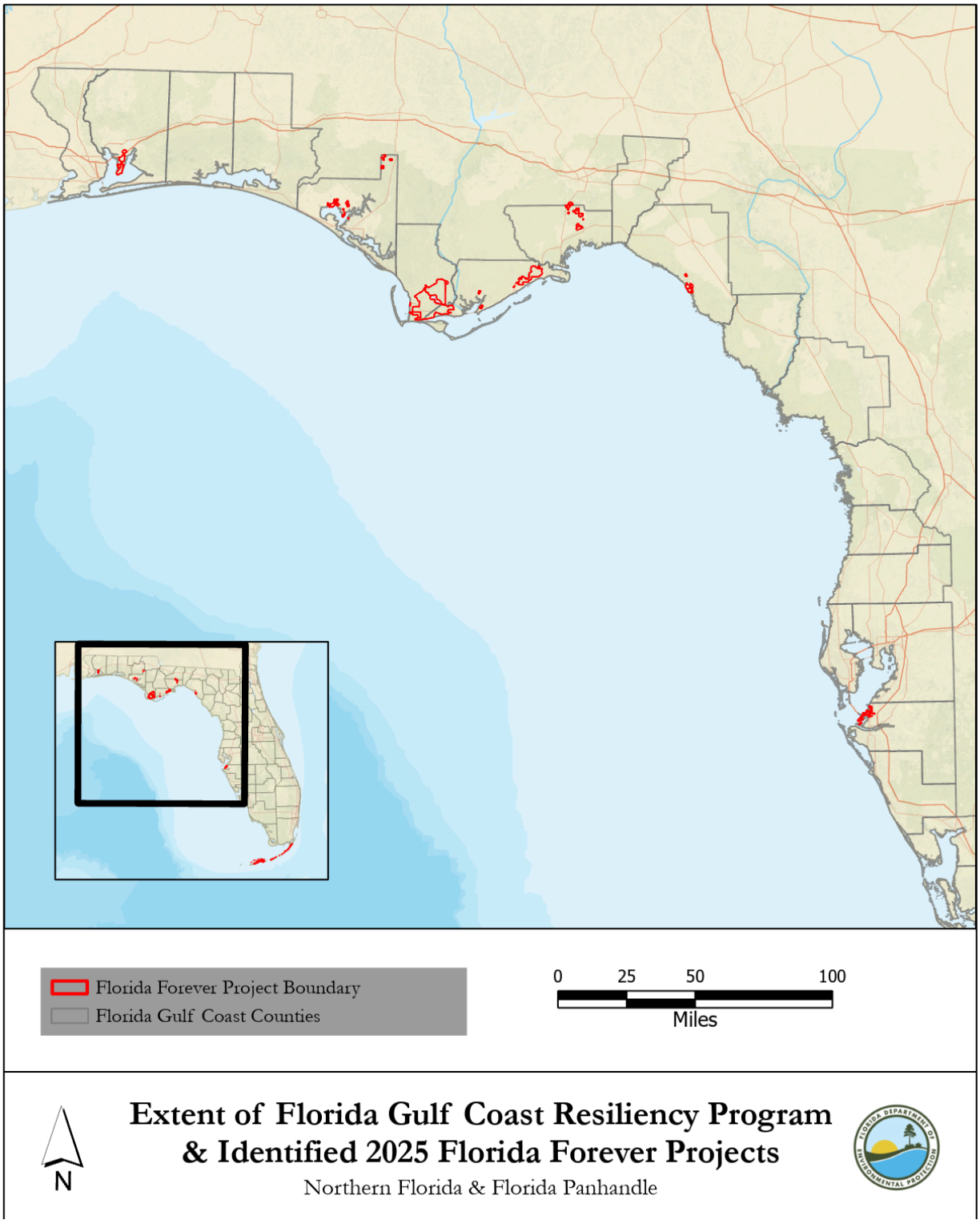
Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	N/A	Note not provided.
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.

Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	This activity is covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures).

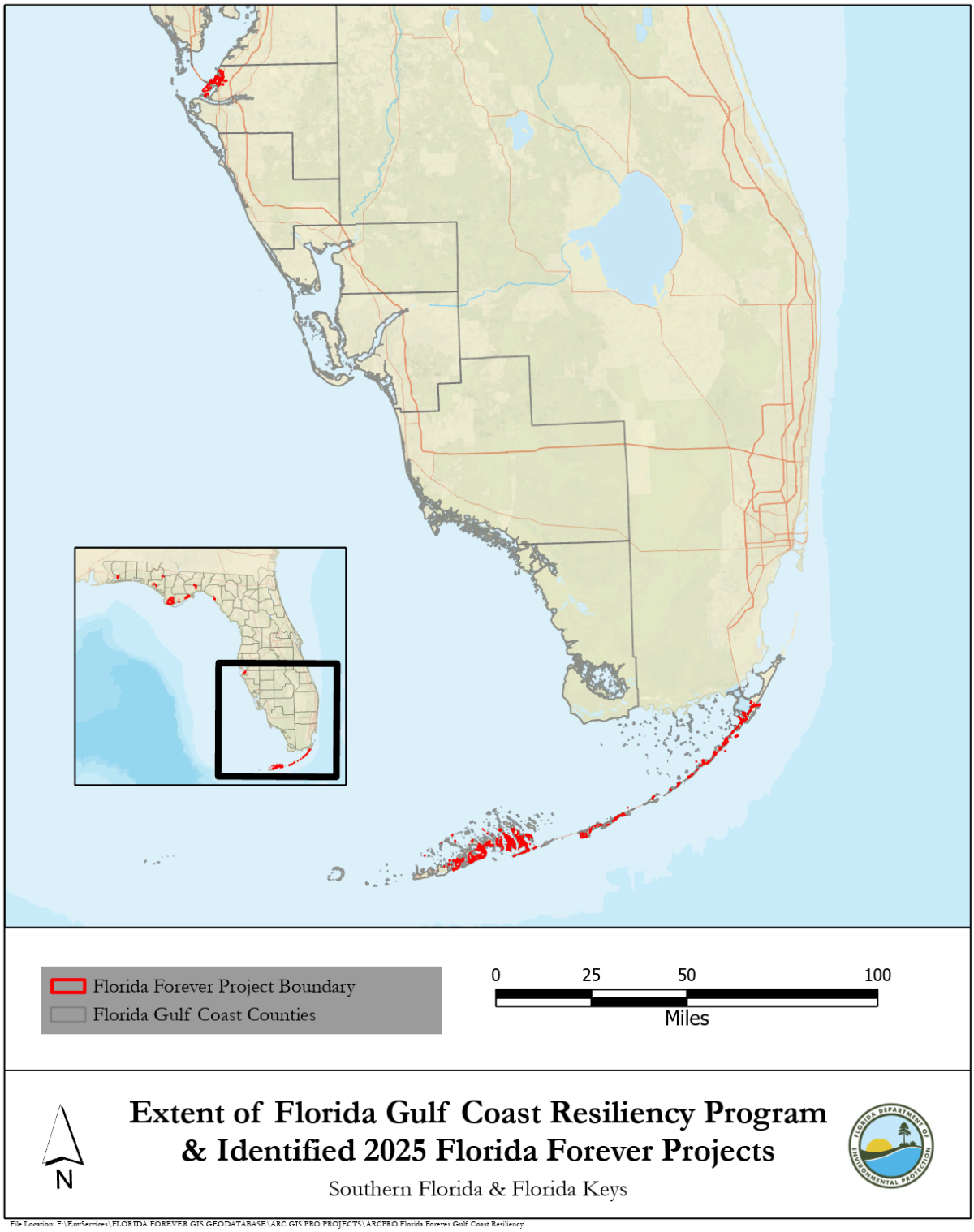
Maps, Charts, Figures



Caption : Map illustrating the extent of the Florida Gulf Coast Resiliency Program, including 23 counties along the Florida Gulf of America coastline. Areas for potential acquisition under this program, identified through the Florida Forever Program, are highlighted.



Caption : Map illustrating a closer view of the northern extent of the Florida Gulf Coast Resiliency Program and identified Florida Forever projects Lands for northern Florida and the Panhandle.



Caption : Map illustrating a closer view of the southern extent of the Florida Gulf Coast Resiliency Program and identified Florida Forever Projects for southern Florida and the Florida Keys.

Other Uploads

GIS Data_3:
FDEP_CoastalResiliency_GIS.gdb.zip

Council Staff Review: Florida Gulf Coast Resiliency Program

FPL Internal Staff Review

Project/Program	Florida Gulf Coast Resiliency Program		
Primary Reviewer	Heather Young	Sponsor	Florida
EC Reviewer	John Ettinger	Co-Sponsor	N/A

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded program.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes
Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	Florida applied Best Available Science (BAS) reviews that were completed upon original proposal of the program in Funded Priorities List 3b. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	Implementation funds in FPL Category 2.

Best Available Science Review: Florida Gulf Coast Resiliency Program

This program was reviewed for BAS under FPL 3b. Under FPL 4, Florida is proposing a continuation of the program.

The original BAS review as well as the state's response to the BAS comments can be found at **https://www.restorethegulf.gov/our-work/fpl/fpl-2026/.**

Florida Gulf Coast Tributaries Hydrologic Restoration Program

RESTORE Council Proposal Document

General Information

Title:
Florida Gulf Coast Tributaries Hydrologic Restoration Program

Project Abstract:
The State of Florida, through the Florida Department of Environmental Protection (FDEP), was awarded RESTORE Act Council-Selected Restoration Component funds to establish the Florida Gulf Coast Tributaries Hydrologic Restoration Program (Planning) in 2022.

The Florida Gulf Coast Tributaries Hydrologic Restoration Program (THRP) supports the primary RESTORE Comprehensive Plan goal to restore water quality and quantity throughout the Florida Gulf Coast by underwriting a comprehensive suite of linked, high-priority hydrologic improvement projects. Examples include canal plugging, restoring natural dimensions of tidal passes/inlets, restoring/reconnecting wetlands, installing erosion control or water control structures, etc. Planning and implementation projects proposed in Florida watersheds that drain to the Gulf of America will be considered under this program.

The THRP improves flow regime dynamics, nutrient cycling, salinity gradients, wildlife habitat and biodiversity, recreational experiences, and may help reduce algal blooms and fish kills. The THRP framework allows for administration of project funding that targets projects that provide cumulative benefits to the Gulf and link environmental benefits between selected projects and other restoration projects in a watershed or region. Combining or leveraging projects within a geographic area contributes to large-scale water resource improvements while maximizing each dollar. The program duration is 7 years.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: Florida Gulf Coast Tributaries Hydrologic Restoration Program

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.
(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

Priority Criteria Justification:
The Florida THRP addresses priority Criteria II large-scale projects and programs and Criteria III projects contained in RESTORE Council Comprehensive Plan (Council 2022). The THRP funds a suite of projects focused on restoration of hydrologic connectivity and natural salinity regimes in watersheds along Florida's Gulf Coast. The THRP improves estuarine and coastal waters within Florida at a large scale by restoring hydroperiods, salinity regimes, and freshwater flows. Projects selected for funding prioritize projects included in other state or federal restoration planning documents, such as Basin Management Action Plans (BMAPs), Minimum Flow Levels (MFLs) and their associated Recovery and Prevention Strategies, Surface Water Improvement Management (SWIM) plans, the State Expenditure Plan (SEP), and Florida Trustee Implementation Group (FL TIG) restoration plans, which identify both the need and benefits of such projects and which are based on strong science.

Deepwater Horizon (DWH) funds have been invested throughout Florida's Gulf Coast watersheds to improve water quality, hydrology, and habitats. DWH funds have leveraged State and local investments in BMAPs, SWIM Plans, and MFLs. The THRP significantly increases these investments. State environmental agencies, including FDEP, Florida Fish and Wildlife Conservation Commission (FWC), and the state's Water Management Districts (WMD) continue to collaborate with DWH funding partners to build on existing investments to enable Florida to fund projects that will make significant, measurable improvements to ecosystem resilience, sustainability, and natural defenses by re-establishing natural hydrology and connectivity between freshwater and marine habitats. While individual projects may be limited in scope, THRP's project selection ensures collective contribution to large-scale water quality, water quantity and habitat restoration in the Gulf Coast ecosystem.

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:
Restore Water Quality and Quantity

Primary Comprehensive Plan Objective:

Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Objectives:
N/A

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Protect and conserve coastal, estuarine, and riparian habitats: Land acquisition
Restore hydrology and natural processes: Restore hydrologic connectivity
Restore hydrology and natural processes: Restore natural salinity regimes

Location

Location:
Florida watersheds that drain to the Gulf of America including Perdido, Pensacola, Choctawhatchee – St. Andrew, Apalachicola – Chipola, Ochlocknee – St. Marks, Suwannee, Springs Coast, Withlacoochee, Tampa Bay, Tampa Bay Tributaries, Sarasota-Peace-Myakka, Charlotte Harbor, Caloosahatchee, Everglades West Coast, Everglades, and Florida Keys

HUC8 Watershed(s):
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Lower Conecuh)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)
South Atlantic-Gulf Region(St. Johns) - St. Johns(Oklawaha)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Everglades)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Florida Bay-Florida Keys)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Big Cypress Swamp)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Caloosahatchee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Peace)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Myakka)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Charlotte Harbor)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Sarasota Bay)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Manatee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Little Manatee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Alafia)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Hillsborough)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Tampa Bay)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Crystal-Pithlachascotee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Withlacoochee)

South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Waccasassa)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Econfina-Steinhatchee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Lower Suwannee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Santa Fe)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Lower Ochlockonee)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(New)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(St. Andrew-St. Joseph Bays)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Choctawhatchee Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Pensacola Bay)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Chipola)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Yellow)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Blackwater)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Pea)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Lower Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Escambia)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Aucilla)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Apalachee Bay-St. Marks)

State(s):
Florida

County/Parish(es):
FL - Broward
FL - Escambia
FL - Pasco
FL - Calhoun
FL - Pinellas
FL - Charlotte
FL - Citrus
FL - Collier
FL - Columbia
FL - Dixie
FL - Franklin
FL - Gadsden
FL - Gilchrist
FL - Polk
FL - Sarasota

FL - Sumter
FL - Suwannee
FL - Taylor
FL - Union
FL - Wakulla
FL - Alachua
FL - Bay
FL - Bradford
FL - Glades
FL - Gulf
FL - Hamilton
FL - Santa Rosa
FL - Walton
FL - Washington
FL - DeSoto
FL - Hardee
FL - Hernando
FL - Hillsborough
FL - Holmes
FL - Jackson
FL - Jefferson
FL - Lafayette
FL - Lake
FL - Lee
FL - Leon
FL - Levy
FL - Liberty
FL - Madison
FL - Manatee
FL - Marion
FL - Miami-Dade
FL - Monroe
FL - Okaloosa
FL - Palm Beach
FL - Hendry

Congressional District(s):
FL - 3
FL - 14
FL - 15
FL - 26
FL - 11
FL - 13

FL - 20
FL - 16
FL - 5
FL - 12
FL - 1
FL - 19
FL - 25
FL - 2
FL - 17
FL - 28

Narratives

Introduction and Overview:

The Florida Gulf Coast Tributaries Hydrologic Restoration Program (THRP) restores the hydrologic and salinity conditions along the Gulf Coast wetlands and estuaries by reconnecting natural drainage pathways and re-establishing historic sheet flows. Alteration in quantities and timing of freshwater flows has damaged estuaries and coastal habitats, harming water quality, benthic communities, oysters, seagrass, and juvenile fish, and encouraging the proliferation of invasive species, which decreases habitat, biodiversity and productivity. Alterations in hydrology can also affect the formation, magnitude, and persistence of blue-green algae blooms in Florida waters. See Figure 1 for map of Florida watersheds that flow to the Gulf of America.

Managing freshwater flows of both surface waters and groundwater is a priority in Florida to achieve MFLs for water resources (Figure 2), Total Maximum Daily Loads (TMDLs), and Numeric Nutrient Criteria (NNC) (FDEP 2019). Modified water deliveries and reconnecting flow paths and drainage networks are best practices for restoring the timing, frequency, and magnitude of freshwater to coastal ecosystems, thereby supporting the dynamic flow regimes important for fluvial geomorphology and subsurface groundwater exchanges that promote good water quality and ecological health (Forbes 2012). In addition, restoration of natural groundwater flow regimes and its interactions with surface water in hydrologic restoration are critical to achieving sustainable watershed/estuary hydrology in coastal areas (AGWT 2003, Sophocleous 2002, Woessner 2000 and Winter 1995). Multiple flow regimes are needed to maintain biotic and abiotic resources within river ecosystems. It is believed by water managers that maintenance of stream ecosystems rests on streamflow management practices that protect physical processes. Processes that mimic the natural hydrograph, to the extent feasible, will influence biological systems and achieve the ecological stability of the communities and species in the waterway/watershed (Hill et al. 1991, as cited in SWFWMD 2010).

Florida will underwrite intrinsically linked, high-priority projects using a watershed/estuary-based approach to provide regional benefits and guide the selection of projects best suited to address the hydrologic and salinity regime stressors within a watershed. THRP project selection prioritizes projects that have been identified in other state or federal restoration planning documents, such as MFLs, BMAPs, SWIM plans, the SEP, and FL TIG restoration plans, which identify both the need and benefits of such projects. Initial project planning and design, technical

review, stakeholder engagement, and identification of risks are typically part of the development of these restoration plans, therefore use of this approach to identify and prioritize projects for funding under the THRP promotes the use of Best Available Science (BAS) and improves the likelihood of project success. This helps to ensure that this program can be successfully implemented and will achieve synergies to effect large-scale ecosystem restoration. Collaboration with Natural Resource Damage Assessment (NRDA), National Fish and Wildlife Foundation (NFWF), or other state and federal funding programs will allow the THRP to fund more or larger scale projects and maximize funds to achieve large-scale restoration.

Florida plans to apply Best Available Science (BAS) reviews of THRP that were completed upon original application of the program in Funded Priorities List 3b. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing. For example, the Pugh Gulley Restoration Project in Santa Rosa County, funded through FPL3b, will apply the background science (e.g., baseline soil loss calculation, Natural Resource Conservation Service techniques, etc.) and activities related to feasibility (property owner outreach, planning, engineering, design, and permitting) to accomplish project goals. The next iteration of funding could be used to complete implementation (construction) of the project. The baseline soil loss estimates could be compared to post-construction conditions and confirm the estimated amount of sediment prevented from entering and being transported downstream. Likewise, more work has been done to site, design and construct tributary hydrologic restoration projects in Florida, only lending more credibility and experience to the practice of reconnecting streams with their floodplains. Finally, land acquisitions will continue to be accomplished in service of planning and completing THRP activities and projects, as described in the original program application.

Florida collaborated with the public and local entities to develop the original proposal for this program through numerous meetings with local governments, WMDs, National Estuary Programs (NEP), non-governmental organizations (NGO), and Florida's RESTORE Act Centers of Excellence (COE). FDEP will continue to collaborate with local entities and the public for their assistance in identifying potential program projects and activities. The public and stakeholders will be able to submit proposals for funding projects or activities under THRP. FDEP will hold a webinar to present project selection criteria and will make draft project lists available for public review and comment. The final projects list(s) and workplans will be submitted to Council staff for BAS external review and approval.

Partners: Through the Commitment and Planning Support award, Florida collaborated to develop the original proposal for this program. Florida held meetings with local governments, Water Management Districts, NEPs, NGOs, Florida’s COE, the Gulf Consortium, and other Council members. The THRP will rely on the relationships and partners already in place as part of the MFL identification process and SWIM and SEP plans, which relied on extensive stakeholder outreach and participation throughout their development and implementation.

Goals/Objectives: As upland, estuarine, and marine habitats are intrinsically connected, a program that reconnects natural drainage pathways to restore hydrologic and salinity regimes on Florida’s Gulf Coast, emphasizing projects with linked benefits in a watershed or region, will

maximize restoration to achieve cumulative benefits. In the Comprehensive Plan Update (Council 2022), the Council seeks to “optimize ecosystem restoration benefits by advancing large-scale solutions that take into account the environmental conditions of a given region of the Gulf.” The THRP focuses on addressing the stressors described and identified in MFLs, TMDLs/BMAPs, SWIM, and Florida SEP as well as any other approved restoration plans to achieve the Council’s goal of restoring water quality and quantity and Florida’s desired outcome of restoring hydrologic and salinity conditions of Gulf Coast wetlands and estuaries.

Commitments: FDEP’s overall mission is to protect, conserve and manage the state’s natural resources and enforce its environmental laws. (FDEP 2023). This makes FDEP well suited to manage the THRP and select projects that result in restoration of hydrologic and salinity regimes.

The Florida Legislature determined that the adoption of MFLs (along with recovery and prevention strategies where needed) required immediate action and directs FDEP and WMDs to adopt minimum flows and minimum water levels for waterbodies pursuant to Section 373.042, Florida Statues (F.S.). Comprehensive hydrologic restoration projects have been identified in adopted MFL recovery or prevention strategies, TMDLs/BMAPs, SWIM plans, and the Florida SEP (e.g., Lee County’s North East Caloosahatchee Tributaries Restoration Project). By leveraging priority projects developed through science-based planning processes and public engagement, the projects funded by this program will significantly benefit Florida’s Gulf Coast and leverage state investments (such as the state’s Alternative Water Supply grant funding).

Environmental Stressors:Streambank and shoreline erosion, channel migration, and alterations to hydrologic flow paths due to natural and anthropogenic sources are considered some of the stressors resulting in tributary and hydrologic stressors in coastal watersheds. These stressors can cause alterations in the natural connectivity of a wetland, estuary, or stream system and result in the loss of habitat biodiversity and ecosystem function. Alterations to natural water features can impact both freshwater flows and salinity regimes throughout Florida’s coastal streams and estuaries. Florida law requires state WMDs to set MFLs for priority water bodies and assess and document current conditions for significant harm associated with water withdrawals and certain alterations.

Environmental Benefits: Coastal habitats will benefit from THRP projects due to the restoration of natural hydrologic and salinity regimes that will result in healthier stream systems, wetlands and marshes (Leibowitz et al. 2023). The THRP is also expected to improve water quality; increase benthic communities, oysters, seagrass, and fish populations; and reduce populations of invasive species. THRP funding is affirmatively directed toward projects that provide cumulative benefits to the Florida Gulf Coast and link environmental benefits between selected and other restoration projects in a watershed or region. Linking restoration projects will contribute to large-scale hydrologic improvements. A successful program will restore and enhance ecosystem resilience, sustainability, and natural defenses by re-establishing natural hydrology and connectivity between freshwater and marine habitats.

FPL Planning Framework: The THRP emphasizes the use of priority techniques to re-establish

flows through hydrologic impediments and focus on allowing natural sheet flows across wetland areas (NRCS 2008, as cited in Council 2019). Efforts to restore natural salinity regimes may include plugging canals; restoring the natural dimensions of tidal passes and inlets; installing or enlarging culverts, gates, low water crossings and other structures to re-establish natural flows; strategic use of natural storage features or impoundments to capture and store flood waters for drier conditions, etc. These efforts will support the overarching THRP goals of restoring hydrology and salinity regimes. Selection criteria that support these overarching goals on a large scale is imperative to program success. Selection criteria described below in the Methods section are intended to select high-quality projects that maximize the extent and success of restoration under the THRP.

Costs: $12,605,000. Projects that leverage other funding sources will be prioritized under THRP selection criteria to maximize cost-benefit ratios and support large-scale restoration on Florida's Gulf Coast.

Timeline: The duration of program planning and implementation is expected to be 7 years.

Proposed Methods :

Florida will continue screen projects proposed for funding under the THRP based on selection criteria that have been presented to the public for review and comment. The THRP prioritizes large-scale hydrologic restoration projects that have been previously identified in adopted MFL recovery or prevention strategies, TMDL/BMAPs, SWIM plans, and the Florida SEP (e.g., Lee County's North East Caloosahatchee Tributaries Restoration Project). Selected projects will implement restoration techniques that restore hydrologic connectivity or restore natural salinity regimes. Restoring physical and chemical processes is key to successfully achieve desired restoration outcomes. Re-establishing normative rates and magnitudes of physical, chemical, and biological processes have been found to be more sustainable solutions for restoring healthy stream and estuary ecosystems (Beechie et al. 2010). Successful hydrologic restoration should be guided by sustainable actions: 1) address the root causes of degradation, 2) consider physical and biological potential of the site, 3) scale actions commensurate to problem(s), and 4) articulate expected outcomes for ecosystem dynamics.

Projects funded under the THRP are developed using BAS such as the water quality/quantity assessment currently used in TMDL development and Waters Not Attaining Standards, which helps identify water bodies with hydrologic or nutrient loading significance (FDEP 2024), MFLs, and water level monitoring data collected by each WMD, etc. Improved hydrologic connectivity, salinity, groundwater and surface water exchanges and water quality at these locations will positively influence the overall system. Estimated improvements for THRP restoration techniques (e.g., canal filling or wetland restoration) are derived from site-specific information and peer-reviewed sources. By establishing estimates of water quantity and quality improvements through quantitative means (e.g., changes freshwater low levels, restores natural salinities, etc.), individual projects can be evaluated together for cumulative benefits.

THRP selection criteria focuses on restoring the critical drivers and functions of the hydrologic regime. This approach promotes recovery of healthy ecosystems through flow regime dynamics,

balancing sediment and organic matter inputs, nutrient cycling, hyporheic exchanges, promoting Low Impact Development (LID) practices, conservation, and public-private partnerships that combine habitat creation and removal of human constraints to achieve ecological aims (Beechie et al. 2010). Effective selection criteria will lead to high-quality projects, enabling the THRP to significantly improve hydrologic connectivity of Gulf Coast watersheds and restore natural resources, ecosystems, fisheries, marine and wildlife (essential) habitats, and coastal wetlands. THRP success will translate into restored and enhanced ecosystems through the re-establishment of natural hydrology and restored connectivity between freshwater and marine habitats.

Florida selects projects based on frameworks used in other Florida financial assistance programs and state planning documents (e.g., NFWF's Gulf Environmental Benefit Fund Restoration Strategy, the State Expenditure Plan, etc.), and for funds distributed under other DWH restoration programs since 2013 (GEBF and NRDA) (FWC and FDEP 2018). Florida established various financial assistance programs and funding collaborations targeted at improving water quality and quantity, such as Nonpoint Source (NPS) (Section 319 and Water Quality Grants), State Revolving Fund, Water Quality Improvement Grant Program (formerly Wastewater Grant Program), Alternative Water Supply Grant Program , Springs Restoration Grant Program and WMD cooperative funding agreements, all of which utilize BAS selection criteria.

Florida will hold a webinar to present project selection criteria to the public. The selection criteria used for Funded Priorities List 3b (FPL3b) and summarized below will be made available for public review and comment. Similar to FPL3b, FDEP will initiate a call for projects with the final project selection criteria. Project proponents may submit a proposal for consideration using a publicly noticed project portal. A technical review panel of agency experts will assess project proposals using the reviewed and finalized project selection criteria and develop a draft list of proposed projects for funding. The draft project list will be published on the Florida DWH website for public review and comment. Florida will finalize the list after review of the public comments and submit the final project list(s) and workplans to Council staff for BAS external review and Council staff approval.

Selection criteria will ensure that selected projects collectively contribute to large-scale hydrologic and salinity improvements. The extent to which a proposed project meets individual selection criteria and overall program goals and objectives and contributes to large-scale restoration efforts across the Gulf Coast region will dictate how projects are prioritized for selection.

Selection Criteria 1: Eligibility Screening
Geographic Relevance: Projects must be geographically located within the 8-digit HUCs identified in this activity description.
Relevant Goals and Objectives: Projects, at a minimum, must address the primary Comprehensive Plan goal of restoring water quality and quantity and the primary objective of restoring, improving, and protecting water resources.

Management Capabilities: Project sponsors requesting funding will need to demonstrate strong operation and management capabilities, as well as financial resources, to assure the long-term success of the project. This screening criteria is not intended to prevent small or disadvantaged communities from participating in the program.

Selection Criteria 2: Technical Basis and Justification

Alignment with Planning Framework: Project proposals should demonstrate how the project aligns with restoration priorities, approaches, and techniques as listed in the Council's Planning Framework.

Proposed in Existing Plans: Projects already proposed in existing plans (e.g., BMAPs, MFLs, SWIM plans, GEBF Restoration Strategy, SEP, etc.) will be given greater consideration as these projects have typically been previously vetted for BAS, feasibility, cost effectiveness, multiple benefits, etc.

Benefits: Projects should have clear benefits to impaired or other priority water bodies, including those already identified in MFLs or SWIM plans to maximize benefits within a watershed. Priority will be given to projects that link environmental benefits between selected THRP projects and other restoration projects in a watershed or region. In addition, projects should clearly outline how their implementation will result in the environmental benefits outlined in the proposal (e.g., improved flow regime dynamics, nutrient cycling, salinity gradients, wildlife habitat and biodiversity, etc.).

Best Available Science: Project proposals should clearly explain how they address BAS and cite scientific literature.

Selection Criteria 3: Feasibility

Technical Efficacy and Constructability: Project proposals should demonstrate feasibility. Such demonstration can be achieved through modeling, completion of feasibility studies, examples of successful analogous projects, etc.

Resiliency: Projects should be designed to be resilient, taking into account sea level rise, hurricanes, other major storm events, etc., where possible. Projects with resilience considerations built into the designs/plans will be given greater consideration.

Cost-Effectiveness: Project proposals should outline their proposed funding needs and justification for cost effectiveness. Projects that show cost savings (or that have significant benefit-to-cost ratios) will be prioritized.

Schedule: Projects must demonstrate project readiness and indicate their proposed schedule through completion, with significant or critical project milestones clearly identified.

Risk: Project proposals must clearly identify any potential risk to project success and should discuss strategies to mitigate the identified risks.

Selection Criteria 4: Project Status and Leveragability

Project Status: Project proposals will indicate the state of readiness to proceed. Projects that have achieved higher levels of readiness will be given greater consideration.

Matching or Leveraged Funds: Project proposals will include a discussion on matching or leveraged funds (including in-kind contributions). Projects that include matching or leveraged funds from other sources will be given greater consideration.

Environmental Compliance: Project proposals should identify all required environmental

compliance approvals or associated permits needed for the project. Projects that have achieved higher levels of environmental compliance will be given greater consideration.

Environmental Benefits:

Healthy, functioning waterbodies along Florida's Gulf Coast provide a gradient of saltwater, estuarine, and freshwater environments critical to a variety of species and natural habitats. Linear infrastructure such as roads and levees traversing wetlands, floodplains, and other aquatic areas can block or impede surface flows essential to healthy ecosystem function (Sklar and Browder 1998 as cited in Council 2019). Projects funded under THRP address hydrologic impediments and contribute to restoring the multiple flow regimes on waterways flowing into Florida's Gulf Coast. Thus, projects funded under THRP provide benefits to biotic and abiotic resources within river/estuarine ecosystems. Federal and Florida laws recognize the need to regulate the influence of human activities affecting water quality and water quantity and ecosystem health. Artificial hydrologic modifications (levees, dams, and dikes) change the source, quality, or quantity of water and sediment that is available to coastal ecosystems. The THRP will focus on addressing these anthropogenic modifications and develop plans to restore saltwater gradients and hydrologic connectivity, which increase the health of the environments where unique organisms can survive and prosper. Coastal wetland loss is contributing to the vulnerability of coastal populations and wetlands conservation and restoration is often advocated as a means of reducing the impacts of coastal storms (Boutwell and Westra 2016). THRP restores and protects coastal wetlands which increases resilience in coastal areas. The THRP prioritizes the funding of hydrologic restoration projects identified in MFL recovery strategies. These projects help restore and protect the physical processes that influence biological systems and mimic the natural hydrograph (to the extent feasible). Mimicking the natural hydrograph leads to ecological stability of the communities and species in the waterway/watershed (Stalnaker (1990) and Hill et al. 1991 as cited in SWFWMD 2010). THRP-funded projects that implement streamflow management will result in reconnecting and/or restoring hydrologic connectivity and salinity gradients in thousands of acres of habitats along Florida's Gulf Coast. This strategy proved effective when used in a National Oceanic and Atmospheric (NOAA) Sea Grant-funded project in the Upper Apalachicola Bay. The project reconnected severed drainage pathways by implementing 16 low-water crossings, 37 ditch blocks and 19 culvert modifications (NWFWMD n.d.a). Freshwater flows in the project subbasins rehydrated wetlands draining to East Bay and improved estuarine habitat conditions. A total of 2,374 acres was restored for $324,306. Projects selected for the THRP will quantify environmental benefits identified in BMAPs/TMDLs, MFL recovery strategies, and SWIM plans to ensure that desired ecological quality is addressed with options to achieve overall water quality, health, and resiliency of the larger ecosystem. Successful implementation of the THRP will result in improved flow regime dynamics, nutrient cycling, salinity gradients, SAV and wildlife habitat, biodiversity, with the potential for reduced algal blooms and fish kills. Tying together projects with existing plans (e.g., the MFLs, RESTORE SEP, SWIM, GEBF) ensures sound planning for successful restoration as projects continually build upon and contribute to one another during the restoration strategy development process (FWC and FDEP, 2018).

Metrics:

Metric Title: HR009 : Restoring hydrology - Acres with restored hydrology

Target: 0.99

Narrative: Florida will use this as a program-wide metric to evaluate the success of the program. Target values or ranges of values will be provided as project activities are identified. Program success will be determined as the number of acres of coastal streams, estuaries, wetlands, and associated upland habitats with restored hydrology or salinity regimes. However, each project or activity funded under this program may not be captured by this metric. Additional metrics will be determined to capture the benefits of each technique utilized under this program; specifically, each project or activity selected under the THRP will have specific metrics aimed at evaluating the success of the individual activity.

Metric Title: HC003 : Land acquisition - Acres acquired in fee

Target: 0.99

Narrative: Florida will use this as a project or activity metric. The project or activity metrics may be adjusted as needed once projects or activities are funded. Metrics may be added, removed, or replaced as appropriate at the project work plan application stage. Once a project or activity is selected a target value will be established. Project or activity success will be determined as the total number of acres acquired in fee. The purpose of this metric will be to verify that acquisition has been completed, and the performance measure will be an executed and recorded deed. Upon transfer of the parcel to public ownership, this metric will be complete. The outcome will be an increase in protected acres.

Risk and Uncertainties:

Projects potential risks and uncertainties include cost overruns and public opposition. Risks will be minimized through public engagement and ongoing transparency, careful cost estimates and reasonable contingencies, effective planning and design, third-party construction oversight, and nimble adaptive management. Bad weather can also delay project completion, but adequate planning and construction management will minimize the impact. Operating entities that receive THRP funding need to provide documentation of strong operation and management capabilities and financial resources to assure long-term project success.

The Council has expressed its commitment to using BAS to consider relative sea level rise, increasing threats to water quality and water quantity and other risks as it makes coastal restoration funding decisions. Reconnecting natural drainage pathways and restoring natural sheet flows will improve coastal estuarine habitats that in turn provide added shoreline protection from hurricanes and flooding. Reconnecting natural drainage pathways and restoring

salinity regimes are critical processes that allow the system to respond to future perturbations through natural physical and biological adjustments, enabling riverine ecosystems to evolve and continue to function over variable climate conditions (Beechie et al. 2010).

As part of project selection and throughout the 7-year lifespan of the program, the THRP will encourage resilience and adaptation planning in the engineering and design (E&D), and implementation, for selected projects.

Monitoring and Adaptive Management:

Monitoring will be conducted on two levels: programmatic and project specific. Programmatic monitoring will focus on the programmatic metrics specified. At the project level, monitoring will be targeted toward the project metrics listed for each project and will be specific to resource outcomes. Project-specific monitoring will validate restoration techniques and best management practices used and will inform lessons learned applicable to future projects. Combined programmatic and project-level monitoring will be conducted to understand, document, and analyze how well projects perform compared to the expected outcomes and to provide lessons learned to help guide future project selection and adapt the THRP to ensure its goals and objectives are achieved. Monitoring at the project level will be guided by the project (e.g., acres with restored hydrology, acres with reduced impacts, acres acquired in fee, etc.). Hydrologic restoration can be monitored using a variety of techniques such as water level recorders, flow monitoring gauges, as-built drawing with surveys elevations, etc., depending on specific project objectives and site characteristics. Under the THRP, projects will be required to submit a monitoring and adaptive management plan. These plans should be based on existing, peer-reviewed guidance documents, such as the NRDA MAM Manual and Council Observational Data Plan Guidance (Council 2021; DWH NRDA Trustees 2017). The monitoring protocols outlined in these plans will apply to long- and short-term outcomes. Potential examples of these outcomes include:

Long-term outcomes:

Evaluation of long-term water quality and salinity trends. This requires multiple years of data collection following specific project implementation, including an evaluation of historical and baseline data for affected areas, as available.

Evaluation of long-term trends affecting key habitats and communities, including seagrass, tidal marshes, and shellfish.

Monitoring and evaluation of site stability and resilience. Coastal restoration sites will be monitored to evaluate effects of public use, seasonal conditions, erosion or accretion, and major storm events, as applicable.

Short-term outcomes:

Acres or miles restored. These metrics can be based on models or construction as-built surveys.

Data Management:

Florida will provide a central location to access data and other information related to the projects funded under the THRP and make it available to the Council, regional partners, stakeholders, and any person or entity upon request. FDEP will submit an Observational Data

Plan and Data Management Plan for the THRP as required by the Council.

FDEP will ensure that data is collected pursuant to approved Quality Assurance (QA) plans. Water quality grab sampling data collected, analyzed, and reported will comply with Chapter 62-160, Florida Administrative Code (F.A.C.) and will be documented using standardized project-specific datasheets, as appropriate. Handwritten hardcopy data will be scanned to PDF files and transcribed into a standard digital format. QA plans will specify minimum field and laboratory quality assurance, methodology, reporting, auditing, and data usability requirements. Grab sampling data will be input into WIN, the Watershed Information Network (https://floridadep.gov/dear/watershed-services-program/content/winstoret). WIN provides a platform for data providers to submit their data and perform data quality checking interactively prior to allowing the data to be migrated into the published WIN environment. WIN is used to store and manage data and to report data to interested users and the EPA). Data can be accessed through a web-based search program at http://prodenv.dep.state.fl.us/DearWin/public/welcomeGeneralPublic?calledBy=GENERALPUBLIC. Any applicable continuous monitoring data will also follow DEP protocols for calibration and installation.

Collaboration:

During initial development of the THRP under FPL3b, Florida collaborated with numerous State, regional, and local entities and stakeholders to develop and refine this program. FDEP held with local governments, WMDs, NEPs, NGOs, Florida's RESTORE Act COE, the Gulf Consortium, and other Council members. Additionally, SWIM plans and MFLs have extensive stakeholder outreach components during plan development and throughout implementation, including numerous public meetings and public education materials. THRP's project selection will consider each project's ability to leverage other funds to expand the impact of awards. Collaboration could include interactions with programs or projects funded with other DWH funds or other federal, state, or local government matching funds, including: Florida's State Revolving Fund loans and grants, annual springs funding, TMDL project funding, NPS grants, Florida legislature-directed project funding, WMD cooperative funding, the Gulf Consortium SEP, the Gulf Coast Counties' Multi Year Implementation Plans, Florida Gulf Coast NEPs' Comprehensive Conservation Management Plans (CCMP), estuary programs in the Panhandle future CCMPs, and potentially those projects and programs identified in the Governor's Executive Orders.

Public Engagement, Outreach, and Education:

Under Florida's SWIM and MFL programs, public engagement and education activities are routinely conducted as part of plan development, identification of watershed stressors and healthy flow requirements in water bodies, and potential solutions. These efforts have focused on restoration activities that address many of the stressors targeted by the THRP, allowing it to build on relationships forged with the public resulting from previous engagement and education efforts. MFL establishment requires data collection and technical analysis before draft MFLs are issued. Outreach materials are provided and public participation occurs during the draft MFL process, peer review, and rule adoption for a given waterway (Section 373.042 and .0421, F.S.).

Existing programs such as SWIM and MFLs have built a strong foundation for public engagement and education and will lead to encouragement for continued participation within the THRP and ensure that the value of selected projects reaches a large audience. Furthermore, the involvement of communities in SWIM and MFL programs increases the likelihood of meaningful public engagement and comments during the development of THRP project selection.

Additionally, FDEP has conducted public outreach as part of DWH NRDA restoration efforts since 2012, with over 80 projects in Florida to date. This includes FL TIG Restoration Plans 1 and 3, which directed NRDA funds to water quality, nutrient reduction, and recreational enhancements (FL TIG 2019, FL TIG 2024). NRDA's rigorous public engagement process provides stakeholders and other interested parties opportunities to submit project ideas via a Florida-maintained web portal, comment on projects at the draft Restoration Plan stage, and comment on proposed projects. Florida also embarked on a large public outreach campaign as part of its GEBF Gulf Restoration Strategy development (FWC and FDEP 2018). The THRP will utilize the existing successful DWH public engagement structure without expending a great deal of the THRP administrative budget on these efforts.

Leveraging:

Funds: $11,250.00

Type: Leveraging

Status: Received

Source Type: Other

Description: The THRP leveraged some funds within the CPS federal award to develop the project selection criteria for multiple FPL3b programs and present draft selection criteria in a public webinar. It is anticipated that the selection criteria and process will be adapted to future FPL programs. CPS funds are utilized for an array of activities that support planning and collaboration efforts to prepare grant applications prior to implementing specific projects through federal awards. The selection criteria put greater emphasis on projects that leverage other funding sources. Therefore, it is expected that individual projects will also leverage other federal funds and state funds. See Methods section for a description of selection criteria.

Funds: $7,000,000.00

Type: Leveraging

Status: Received

Source Type: Other

Description: THRP may leverage funds at the project level from other state and federal financial assistance programs and funding collaborations targeted at addressing similar issues such as legislative water projects. The amount received reflects statewide hydrologic restoration projects funded through FDEP over the last 3 years, FYs 22, 23, and 24.

Environmental Compliance:

Healthy, functioning waterbodies along Florida's Gulf Coast provide a gradient of saltwater, estuarine, and freshwater environments critical to a variety of species and natural habitats. Linear infrastructure such as roads and levees traversing wetlands, floodplains, and other aquatic areas can block or impede surface flows essential to healthy ecosystem function (Sklar and Browder 1998 as cited in Council 2019). Projects funded under THRP address hydrologic impediments and contribute to restoring the multiple flow regimes on waterways flowing into Florida's Gulf Coast. Thus, projects funded under THRP provide benefits to biotic and abiotic resources within river/estuarine ecosystems. Federal and Florida laws recognize the need to regulate the influence of human activities affecting water quality and water quantity and ecosystem health. Artificial hydrologic modifications (levees, dams, and dikes) change the source, quality, or quantity of water and sediment that is available to coastal ecosystems. The THRP will focus on addressing these anthropogenic modifications and develop plans to restore saltwater gradients and hydrologic connectivity which increase the health of the environments where unique organisms can survive and prosper. Coastal wetland loss is contributing to the vulnerability of coastal populations and wetlands conservation and restoration is often advocated as a means of reducing the impacts of coastal storms (Boutwell and Westra 2016). THRP restores and protects coastal wetlands which increases resiliency in coastal areas. The THRP prioritizes the funding of hydrologic restoration projects identified in MFL recovery strategies. These projects help restore and protect the physical processes that influence biological systems and mimic the natural hydrograph (to the extent feasible). Mimicking the natural hydrograph leads to ecological stability of the communities and species in the waterway/watershed (Stalnaker (1990) and Hill et al. 1991 as cited in SWFWMD 2010). THRP-funded projects that implement streamflow management will result in reconnecting and/or restoring hydrologic connectivity and salinity gradients in thousands of acres of habitats along Florida's Gulf Coast. This strategy proved effective when used in a National Oceanic and Atmospheric (NOAA) Sea Grant-funded project in the Upper Apalachicola Bay. The project reconnected severed drainage pathways by implementing 16 low-water crossings, 37 ditch blocks and 19 culvert modifications (NWFWMD n.d.a). Freshwater flows in the project subbasins rehydrated wetlands draining to East Bay and improved estuarine habitat conditions. A total of 2,374 acres was restored for $324,306. Projects selected for the THRP will quantify environmental benefits identified in MFL recovery strategies and SWIM plans to ensure that desired ecological quality is addressed with options to achieve overall water quality, health, and resiliency of the larger ecosystem. Successful implementation of the THRP will result in improved flow regime dynamics, nutrient cycling, salinity gradients, SAV and wildlife habitat, biodiversity, with the potential to reduce algal blooms and fish kills. Tying together projects with existing plans (e.g., the MFLs, RESTORE SEP, SWIM, GEBF) ensures sound planning for successful restoration as projects continually build upon and contribute to one another during

the restoration strategy development process (FWC and FDEP, 2018).

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Budget

Project Budget Narrative:

The budget for THRP is $12,605,000, of which the majority (approximately 90%) will be used for planning or implementation of projects or activities aimed at improving hydrology in coastal watersheds of the Gulf Coast. The total amount of funding requested for Category 1 is $5,042,000. Category 1 funds will be used for State of Florida program administration and project or activity specific planning, engineering, design and permitting. Program-level monitoring and adaptive management activities, and data management activities will also be funded with Category 1. Florida is requesting $7,563,000 in Category 2 funds to implement projects or activities such as construction of culverts, low water crossings, storage or recharge features, or land acquisition, and will include project- or activity- specific monitoring and adaptive management activities, and data management activities. More detailed budgets will be developed at the project or activity level when projects or activities are selected for funding under THRP, including appropriate contingencies for relevant projects. The percentages listed below apply to the entire $12,605,000 budget.

Total FPL Project/Program Budget Request:

$ 12,605,000.00

Estimated Percent Monitoring and Adaptive Management: 5 %

Estimated Percent Planning: 15 %

Estimated Percent Implementation: 80 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: 0 %

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
Yes, the program could be scaled to allow for more or less activities over a longer or shorter duration of time. Scaling down the program would reduce the number of miles or acres of tributaries and habitats restored.

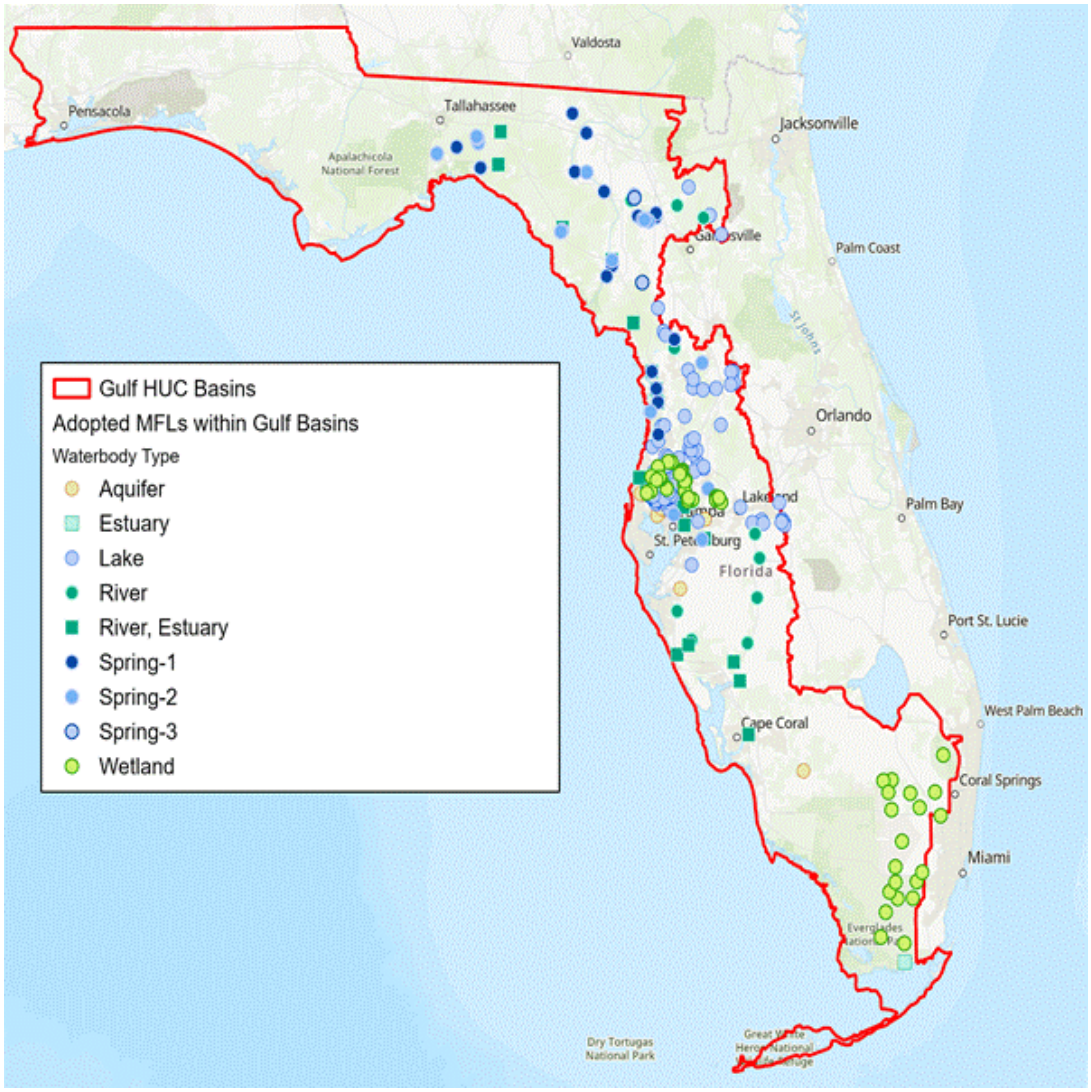
Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	N/A	Note not provided.
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.

Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	This activity is covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures).

Maps, Charts, Figures

Caption : Figure 1 depicts the THRP boundary which includes all 5-digit HUC8 watersheds that flow to the Gulf of America.



Caption : Figure 2 depicts the THRP boundary with all 5-digit HUC8 watersheds that flow to the Gulf of America shows designated MFLs for rivers, lakes, springs, wetlands and estuaries within the program boundaries.

Other Uploads

GIS Data_2:
Florida_Gulf_Coast_Tributaries_Hydrologic_Restoration_Program_V2.gdb.zip
Caption : N/A

Council Staff Review: Florida Gulf Coast Tributaries Hydrologic Restoration Program

FPL Internal Staff Review

Project/Program	Florida Gulf Coast Tributaries Hydrologic Restoration Program		
Primary Reviewer	Matt Love	Sponsor	Florida
EC Reviewer	John Ettinger	Co-Sponsor	N/A

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded program.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes
Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	Florida applied BAS reviews that were completed upon the original proposal in Funded Priorities List 3b. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing, but not decreasing.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	Implementation funds in FPL Category 2. (EC section does not describe Cat 2 to Cat 1 process, but it is sufficiently described in budget narrative.

Best Available Science Review: Florida Gulf Coast Tributaries Hydrologic Restoration Program

This program was reviewed for BAS under FPL 3b. Under FPL 4, Florida is proposing a continuation of the program.

The original BAS review as well as the state's response to the BAS comments can be found at **https://www.restorethegulf.gov/our-work/fpl/fpl-2026/.**

Florida Water Quality Improvement Program

RESTORE Council Proposal Document

General Information

Title:
Florida Water Quality Improvement Program

Project Abstract:
The State of Florida, through the Florida Department of Environmental Protection (FDEP) was awarded RESTORE Act Council-Selected Restoration Component funds to establish the Florida Water Quality Improvement Program (WQIP) in 2022. The WQIP supports the primary RESTORE Comprehensive Plan goal to restore water quality and quantity throughout the Florida Gulf Coast by underwriting a suite of linked, high-priority water quality improvement projects. Projects may include stormwater treatment, wastewater treatment enhancements, sediment reduction, and land acquisition. Planning and implementation projects in Florida watersheds that drain to the Gulf of America will be considered, see Figure 1 for a map of Florida watersheds that flow to the Gulf of America.

WQIP activities are intended to result in water quality restoration with anticipated environmental benefits that include fewer algal blooms, fish kills, beach closures, and fish and shellfish consumption restrictions as well as healthier seagrass and other submerged aquatic vegetation and wildlife habitat and improved recreational opportunities/experiences. The WQIP framework allows for administration of project funding to target projects that deliver cumulative benefits to the Gulf and link environmental benefits between WQIP projects and other restoration projects in a watershed or region. Combining or leveraging projects within a geographic area contributes to large-scale water resource improvements while maximizing each dollar. Program duration is 7 years.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: Florida Water Quality Improvement Program

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.
(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

Priority Criteria Justification:
Florida's WQIP addresses Priority Criteria II and Priority Criteria III described in the Gulf Coast region (Council 2022). The WQIP funds a suite of intrinsically linked restoration or conservation water resource improvement projects with the primary goal of reducing excess nutrients and other pollutants to the Gulf of America. Project selection criteria prioritize projects included in other state or federal restoration planning documents, such as Basin Management Action Plans (BMAPs), Alternative Restoration Plans (ARPs), Surface Water Improvement Management (SWIM) plans, the State Expenditure Plan (SEP), and Florida Trustee Implementation Group (FL TIG) restoration plans that identify both the need and benefits of such projects and which are based on strong science.

Deepwater Horizon (DWH) funds have been invested throughout Florida's Gulf Coast watersheds to improve water quality, hydrology, and habitats. DWH funds have leveraged state and local investments that develop total maximum daily loads (TMDLs), ARPs, BMAPs and SWIM plans. The WQIP builds upon numerous state and local efforts to assess and restore water quality. State environmental agencies, including FDEP, the Florida Fish and Wildlife Conservation Commission (FWC), and the state's Water Management Districts (WMDs) continue to collaborate with DWH funding partners to ensure that investments target priority water quality improvement restoration activities. The WQIP enables Florida to increase funding for critical projects that have significant, measurable improvements to water quality and help restore or maintain water quality to support natural resources, ecosystems, fisheries, beaches, and coastal wetlands. WQIP's project selection ensures collective contributions to large-scale water quality and habitat restoration by reducing excessive nutrients and other pollutants to impaired fresh, estuarine, and marine waters in the Gulf Coast ecosystem.

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:
Restore Water Quality and Quantity

Primary Comprehensive Plan Objective:
Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Objectives:
N/A

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Reduce excess nutrients and other pollutants to watersheds: Agriculture and forest management
Reduce excess nutrients and other pollutants to watersheds: Erosion and sediment control
Reduce excess nutrients and other pollutants to watersheds: Stormwater management
Reduce excess nutrients and other pollutants to watersheds: Wastewater system improvements

Location

Location:
Florida watersheds that drain to the Gulf of America, including Perdido, Pensacola, Choctawhatchee – St. Andrew, Apalachicola – Chipola, Ochlocknee – St. Marks, Suwannee, Springs Coast, Withlacoochee, Tampa Bay, Tampa Bay Tributaries, Sarasota-Peace-Myakka, Charlotte Harbor, Caloosahatchee, Everglades West Coast, Everglades, and Florida Keys

HUC8 Watershed(s):
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Lower Conecuh)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Florida Bay-Florida Keys)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Caloosahatchee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Peace)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Myakka)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Charlotte Harbor)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Sarasota Bay)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Manatee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Little Manatee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Alafia)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Hillsborough)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Tampa Bay)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Crystal-Pithlachascotee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Withlacoochee)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Waccasassa)

South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Econfina-Steinhatchee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Lower Suwannee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Santa Fe)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Lower Ochlockonee)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(New)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(St. Andrew-St. Joseph Bays)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Choctawhatchee Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Pensacola Bay)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Chipola)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Yellow)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Blackwater)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Pea)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Lower Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Escambia)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Aucilla)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Apalachee Bay-St. Marks)

State(s):
Florida

County/Parish(es):
FL - Escambia
FL - Pasco
FL - Calhoun
FL - Pinellas
FL - Charlotte
FL - Citrus
FL - Collier
FL - Columbia
FL - Dixie
FL - Franklin
FL - Gadsden
FL - Gilchrist
FL - Sarasota
FL - Sumter
FL - Suwannee
FL - Taylor
FL - Union

FL - Wakulla
FL - Alachua
FL - Bay
FL - Bradford
FL - Glades
FL - Gulf
FL - Hamilton
FL - Santa Rosa
FL - Walton
FL - Washington
FL - DeSoto
FL - Hardee
FL - Hernando
FL - Highlands
FL - Hillsborough
FL - Holmes
FL - Jackson
FL - Jefferson
FL - Lafayette
FL - Lee
FL - Leon
FL - Levy
FL - Liberty
FL - Madison
FL - Manatee
FL - Marion
FL - Monroe
FL - Okaloosa
FL - Hendry

Congressional District(s):
FL - 3
FL - 14
FL - 15
FL - 26
FL - 11
FL - 13
FL - 20
FL - 16
FL - 18
FL - 12
FL - 1
FL - 19
FL - 25
FL - 2

FL - 17
FL - 28

Narratives

Introduction and Overview:

The Florida Water Quality Improvement Program (WQIP) restores and protects water resources throughout the Florida Gulf Coast by underwriting intrinsically linked high-priority water quality improvement projects that reduce excess nutrients and other pollutants to watersheds (Council 2019). Nutrients and other pollutants that reach Florida's coastal waters can contribute to or exacerbate persistent harmful algal blooms, such as red tides, which can in turn deplete oxygen levels, result in fish kills and reduce the extent of submerged aquatic vegetation (SAV). Bacteria and pathogen problems can lead to beach and swimming closures and restrictions on fish and shellfish harvesting. RESTORE's 2019 Planning Framework document (Council 2019) presents stressors, approaches and techniques that underpin WQIP's primary objective to restore, improve, and protect water resources. Furthermore, Florida Governor Ron DeSantis' Executive Orders 19-12 and 23-06 directs immediate action toward the protection of Florida's environment and water quality by FDEP and other environmental agencies. State investments are used to develop and implement Basin Management Action Plans (BMAPs), Surface Water Improvement (SWIM) plans, and other restoration programs that target water resource protection and restoration of both surface waters and groundwater and coordinate multiagency responses, in coordination with local watershed stakeholders, to the most critical environmental issues facing Florida.

Section 303(d) of the Clean Water Act requires states and U.S. Territories to designate impaired waterbodies. Florida employs a watershed management approach to monitor and assess water quality using methodology set forth in FDEP's Impaired Waters Rule, Chapter 62-303, Florida Administrative Code (F.A.C.). The State works with stakeholders to identify solutions and management strategies to address impairments and improve water quality. Florida coordinates with stakeholders to develop and implement BMAPs, ARPs and SWIM plans, and implements the Nonpoint Source (NPS) program, which together guide implementation actions toward restoring impaired waters or waters not attaining standards in Florida. These programs focus on reducing nutrients and other pollutants to meet TMDLs or other priority water body goals (Figure 2).

The Florida Legislature created the SWIM Act in 1987 to protect, restore, and maintain Florida's highly threatened surface water bodies and directed the state's five water management districts (WMDs) identify a list of priority waterbodies within their authority, and implement plans to improve them. Each WMD prepares (and updates) SWIM Plans, which are based on water quality and other data collected within their district that is analyzed and used to make decisions based on best available science (BAS) before being finalized following extensive public involvement.

FDEP prepares an Integrated Water Quality Assessment every two years to provide a comprehensive snapshot of the quality of Florida's waters (FDEP 2024a). The report includes

lists of impaired waterbodies and waters not attaining standards (See Figure 2). Additionally, the Statewide Annual Report, required by section 403.0675, Florida Statutes (F.S.), reports on the status of protection and restoration actions through TMDLs, ARPs, BMAPs, Minimum Flow Levels (MFLs), and Recovery and Prevention Strategies (FDEP 2024).

Florida's watershed restoration process involves a multi-pronged approach that begins with setting standards, identifying impaired waterbodies using an FDEP and U.S. Environmental Protection Agency (EPA)-approved process to produce a scientifically defensible analysis, and prioritizing impaired waterbodies for development of restoration targets known as TMDLs that establish the maximum amount of a pollutant that a waterbody can absorb and still meet the water quality standards that protect human health and aquatic life. This comprehensive process involves collecting data from various sources to characterize the watershed, water quality, pollutant loads and responses. Load/concentration reductions are calculated for the watershed through watershed models or other scientific tools and analyses to meet the TMDL (Figure 3). TMDL reductions are allocated to categories of point sources and nonpoint sources, with a margin of safety incorporated into estimates to account for uncertainties in the analysis. TMDLs are adopted by rule, approved by the Environmental Protection Agency (EPA), and are enforceable under Florida law (FDEP 2023). Depending on the circumstances, a basin working group may be formed to develop a Basin Management Action Plan (BMAP) to guide TMDL implementation and restoration activities. FDEP works closely with watershed stakeholders to ensure they understand and support the approaches for developing and implementing the TMDLs and BMAPs (FDEP 2024 a).

A BMAP is a framework for water quality restoration that contains a comprehensive set of solutions to achieve the pollutant reductions established by a TMDL. Examples include permit limits on regulated facilities, urban and agricultural best management practices, wastewater and stormwater infrastructure, regional projects and conservation programs designed to achieve pollutant reductions established by the TMDL. A BMAP is developed with local stakeholders and relies on local input and commitment for successful implementation. BMAPs are adopted by Secretarial Order and are legally enforceable. BMAPs are updated every five (5) years and use an adaptive management approach that allows for incremental load reductions through the implementation of projects and management strategies, while simultaneously monitoring and conducting studies to better understand the water quality and hydrologic dynamics. The adaptive management process includes setting up mechanisms for making course corrections within the BMAP framework as new infromation is made available, such as additional data analysis and updated models, new environmental law requirments, stakeholder feedback, and other management strategies necessary to restore the waterbody. Progress is tracked by assessing project implementation, pollutant loads and water quality analyses. FDEP continues to work with local and regional partners to share information and identify additional projects necessary to meet reduction milestones established in BMAPs to achieve the TMDLs and inform funding priorities (FDEP 2024).

Watershed restoration plans that implement TMDLs can be achieved through the development of a BMAP, other restoration plan or regulatory requirements such as permit requirements, National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer

system (MS4) bacteria pollution control plans (BPCPs) or TMDL implementation plans. In addition, there are opportunities for stakeholders to develop plans that address impairments and improve water quality before TMDL development and adoption that are known as ARPs and are recognized by the U.S. Environmental Protection Agency (EPA) and by the state in the Impaired Waters Rule (FDEP 2023).

Local stakeholders may have completed, ongoing and/or planned (in the near future) restoration activities, or may have implemented management strategies that are expected to improve the water quality of an impaired waterbody. In such cases where restoration projects have been or will soon be completed, documentation provided to the department and U.S. EPA may be sufficient to show that the waterbody is reasonably expected to attain its applicable water quality standards. These waterbodies will be listed as category 4b (Reasonable Assurance Plan) or 4e (Ongoing Restoration Activities) (FDEP 2023).

After review of additional water quality data over time, FDEP may determine that progress is insufficient to restore an impaired waterbody listed as 4b or 4e. If so, developing a TMDL may be the next option for restoration (FDEP 2023).

Florida will use a watershed/estuary-based approach to guide project selection to ensure projects chosen for WQIP are the best suited to address the watershed stressors and provide the best regional benefits.

The public is involved with WQIP selection criteria and project selection. FDEP will hold a webinar for the public to review the project selection criteria and will make a draft list of projects available for public review and comment. The final projects list(s) and workplans will be submitted to Council staff for BAS external review and approval.

Partners: Florida will rely on existing relationships with local governments, WMDs, National Estuary Programs (NEP), Non-Governmental Organizations (NGO), Florida's RESTORE Act Centers of Excellence (COE), the Gulf Consortium, FL TIG, NFWF, and other Council members to advance water quality restoration through WQIP and around the state.

Goals/Objectives: Upland, estuarine, and marine habitats are intrinsically connected. The WQIP will continue to identify and select projects that link benefits between selected projects and with other restoration projects in a watershed or region to build upon one another and maximize benefits using Planning Framework (Council 2019) priority techniques to address pollution from existing sources. Infrastructure projects intended to support new development or growth are not eligible for funding under WQIP. The Council seeks to “optimize ecosystem restoration benefits by advancing large-scale solutions that take into account the environmental conditions of a given region of the Gulf” (Council 2022). WQIP focuses on addressing the stressors identified in TMDLs, BMAPs, ARPs, SWIM, and other approved restoration plans to achieve the Council’s goal of restoring water quality and quantity. Florida also relies on its robust, science-based assessment methodology for evaluating the attainment of applicable water quality standards and collaborates on management strategies to address the desired outcome of restoration, improvement, and protection of water quality and water quantity.

Commitments: Florida has some of the most comprehensive nutrient water quality standards in the nation (FDEP 2013). Of twenty-nine (29) coastal states, Florida is one of seventeen (17) to have a fully approved nonpoint pollution control program that satisfies all conditions in accordance with the Coastal Zone Management Act (FDEP 2021a). The protection and restoration of water resources and other natural resources is guided by comprehensive planning efforts, including SWIM plans; a NPS management program; the Florida Gulf Environmental Benefit Fund Restoration Strategy (GEBF), which is an overarching framework for restoring and conserving the natural resources of Florida's Gulf Coast (FWC and FDEP 2018) and key programs such as TMDLs, ARPs, BMAPs, MFLs and Recovery and Prevention Strategies. To date, thirty-three (33) BMAPs have been developed and adopted by Secretarial Order (although not cited in this activity description, links to BMAPs and SWIM Plans are provided in the Bibliography as non-cited literature). The majority of BMAPs address nutrient impairments, some also target fecal indicator bacteria contamination, and some specifically address pollution in springs areas. The watershed assessment and resultant BMAP process quantifies the nutrient and other pollutant loads within the watersheds, allocates responsibilities for reductions and provides management strategies and measured desirable outcomes in several Florida watersheds. For example, water quality improvement projects in the Caloosahatchee BMAP were identified in the BMAP and subsequent updates and strategically address stormwater, wastewater, septic and agricultural nutrient sources, with project review taking place annually. As of 2024 implementation of verified water quality projects have reduced 890,812 lbs./yr. of total nitrogen and 98,775 lbs./yr. of total phosphorus (FDEP, 2024) in the Caloosahatchee BMAP. The BMAP framework enables adaptive strategy refinement in response to empirical conditions and project progress and ensures sustained progress with focused actions as seen in the Caloosahatchee BMAP. The Governor's Executive Orders 19-12 and 23-06 also provide a clear indication of the state's commitment to improving water quality throughout the state.

Florida plans to apply Best Available Science (BAS) reviews of WQIP that were completed upon original application of the program in Funded Priorities List 3b. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing, but not decreasing. Florida is deeply engaged in water quality restoration on a statewide basis and lends significant credibility and experience to the practice of restoring water quality.

Environmental Stressors: Florida's planning efforts discussed above have identified stressors and threats such as nutrient pollution from a variety of sources such as densely clustered septic systems, urban and agricultural fertilizers, stormwater runoff, and wastewater and stormwater infrastructure (Badruzzman et al. 2012; Carey et al. 2010; Nagy et al. 2012). Florida's SWIM Act recognizes that reducing NPS loadings requires a comprehensive, long-term approach that relies on cooperative watershed management among all levels of government. SWIM plans, several of which were updated with DWH funds, evaluate and address water quality and quantity stressors at a watershed level. For example, the 2017 Apalachicola River and Bay SWIM plan update, funded through GEBF, recommended projects that address NPS pollution and septic system impacts (NWFWMD 2017a), and the Choctawhatchee River and Bay SWIM plan update recommended projects to address nutrients, Dissolved Oxygen, and bacteria from

erosion, wastewater, urban stormwater runoff, and septic tanks (NWFWMD 2017b).

Environmental Benefits: The WQIP is intended to reduce the potential for algal blooms, fish kills, beach closures, and fish and shellfish consumption restrictions while improving seagrass and other SAV health, wildlife habitat, and recreational opportunities. WQIP funding targets projects that provide cumulative benefits to the Florida Gulf Coast and link environmental benefits between selected projects and other restoration projects in a watershed or region to promote large-scale water quality improvements.

FPL Planning Framework: The WQIP emphasizes the use of priority techniques, including stormwater management, erosion and sediment control, land acquisition, wastewater system improvements and reuse, stormwater treatment, septic tank abatement, and sediment reduction to achieve the goal of restoring water quality and quantity with the objective of restoring, improving, and protecting water resources overall. Projects selected for WQIP support the overarching goal of restoring water quality, are identified in approved state and federal restoration plans, and leverage other funding sources for successful implementation.

Costs: $45,000,000. Projects that leverage other funding sources will be prioritized under WQIP selection criteria to maximize cost-benefits and support large-scale restoration.

Timeline: The duration of program planning and implementation is expected to be 7 years.

Proposed Methods :
WQIP relies on FDEP's statewide method for water resource management, called the watershed approach. This approach manages water resources based in hydrologic units rather than political or regulatory boundaries. FDEP assesses each basin as a system and evaluates aquatic resources from a basin-wide perspective that considers the cumulative effects of human activities, and addresses pollution accordingly. The watershed management approach is intended to improve the health of water resources by strengthening coordination among many activities, such as monitoring, stormwater management, wastewater treatment, wetland restoration, BMPs, land acquisition, and public involvement (FDEP 2024a). Florida screens projects with selection criteria presented to the public for review and comment for relevance to their specific water quality needs. WQIP focuses on stormwater treatment, wastewater treatment, septic tank abatement, sediment reduction, and land acquisition practices targeted at waterbodies that have been designated as impaired under the Clean Water Act (CWA) 303(d) impaired waters list and other waters not attaining nutrient standards. WQIP-funded Infrastructure projects address pollution from historic and existing sources such as wastewater, septic systems, stormwater runoff, and other nonpoint sources. WQIP is not intended to support new growth or development. Projects selected under the WQIP will significantly reduce pollutants impacting priority watersheds. Successful water quality improvements reduce the potential for algal blooms, fish kills, beach closures, and fish and shellfish consumption restrictions, and also improve seagrass and other SAV, habitat and wildlife, and recreational opportunities and experiences.

Projects that are selected to reduce pollutants will be evaluated using the water quality

assessment and modeling approaches similar to those used by FDEP under its Impaired Water Rule, BMAPs and ARPs to ensure improved water quality at these locations will also provide benefits to the overall system (FDEP 2024a). Water quality modeling will incorporate the data necessary to address project resilience to increased rainfall and sea level rise. Estimated water quality improvements for stormwater and wastewater project techniques (e.g., wastewater system improvements) will be derived from site-specific information and performance standards, where available, and peer-reviewed sources summarized in the Statewide Best BMP Efficiencies for Crediting Projects in BMAPs and ARPs (FDEP 2021b), such as Advanced Waste Treatment. By providing estimated water quality improvements through quantitative means (e.g., nutrient reduction in lbs.), individual projects can be evaluated together for combined effects and comprehensive restoration.

Project selection is based on similar considerations has been used in existing Florida financial assistance programs, in state planning documents (e.g., the GEBF Restoration Strategy, the SEP, etc.), and for funds distributed under other DWH restoration programs since 2013 (GEBF and NRDA) (FWC and FDEP 2018). Florida has already established various financial assistance programs and funding collaborations targeted at improving water quality, such as Nonpoint Source Management Grant Program (Section 319 and Water Quality Grants), State Revolving Fund, Water Quality Improvement Grant Program (formerly Wastewater Grant Program), Springs Restoration Grant Program and WMD cooperative funding agreements, all of which utilize BAS selection criteria.

FDEP will host a webinar to present project selection criteria for the public to review. A summary of selection criteria presented below will be refined according to priority and need. The criteria may be refined to address specific restoration techniques. Similar to NRDA restoration planning, FDEP will initiate a call for WQIP projects. Project proponents may submit a proposal for consideration using a project portal. A technical review panel of agency experts will assess the project proposals submitted against the selection criteria and develop a draft list of projects proposed for funding. The draft project list will be published on the Florida DWH website for public review and comment. Florida will finalize the list after review of the public comments and will submit the final project list(s) and workplans to Council staff for BAS external review and Council staff approval.

WQIP selection criteria will ensure that selected projects collectively contribute to large-scale water quality and habitat restoration by reducing excessive nutrients and other pollutants to fresh, estuarine, and marine waters. Projects will be selected in accordance with the extent to which they address overall program goals and objectives and contributes to large-scale restoration efforts across Florida's Gulf Coast region; can leverage other funding; incorporate BAS and best management practices (BMPs); are technically feasible and cost effective; have some aspects of planning, engineering and design, or permitting underway to show project readiness; and provide synergistic benefits with other restoration activities or projects. Selection criteria are intended to select high-quality projects that maximize the extent and success of restoration under the WQIP.

Selection Criteria 1: Eligibility Screening

Geographic Relevance: Projects must be geographically located within the 8-digit HUCs identified in this activity description.
Relevant Goals and Objectives: Projects, at a minimum, must meet the primary Comprehensive Plan goal of restoring water quality and quantity and the primary objective of restoring, improving, and protecting water resources.
Management Capabilities: Project sponsors receiving funding will need to demonstrate strong operation and management capabilities and financial resources to assure long-term success. This screening criteria is not intended to prevent small or disadvantaged communities from participating in the program.

Selection Criteria 2: Technical Basis and Justification
Alignment with Planning Framework: Projects should demonstrate alignment with the Council's Planning Framework, including restoration priorities, approaches, and techniques (i.e., stormwater management, septic tank removal, erosion and sediment control, etc.).
Proposed in Existing Plans: Projects already proposed in existing plans (e.g., BMAPs, SWIM plans, GEBF Restoration Strategy, SEP, etc.) will be given greater consideration as these projects have typically been previously vetted for BAS, feasibility, cost effectiveness, multiple benefits, etc.
Benefits: Projects should have clear benefits to impaired or other priority water bodies, including those already identified in BMAPs, ARPs, or SWIM plans to maximize benefits within a watershed. Priority will be given to projects that link environmental benefits between selected WQIP projects and other restoration projects in a watershed or region. In addition, projects should clearly outline how their implementation will result in the environmental benefits outlined in the proposal (e.g., nutrient or other pollutant reduction, etc.)
Best Available Science: Projects should clearly explain reliance on BAS.

Selection Criteria 3: Feasibility
Technical Efficacy and Constructability: Projects should demonstrate feasibility. Such demonstration can be achieved through modeling, completion of feasibility studies, examples of successful analogous projects, etc.
Resiliency: Projects should be designed to be resilient and account for factors such as hurricanes and flooding. Projects with resilience considerations built into the designs/plans will be given greater consideration.
Cost-effectiveness: Projects should outline their proposed funding needs and justification for cost effectiveness. Projects that show cost savings or that have significant benefit-to-cost ratios will be prioritized.
Schedule: Projects must demonstrate project readiness and indicate their proposed schedule through completion, with significant or critical project milestones clearly identified.
Risk: Projects must clearly identify any potential risk to project success. Projects should discuss strategies to mitigate the identified risks.

Selection Criteria 4: Project Status and Leveragability
Project Status: Projects will indicate the state of readiness to proceed. Projects showing a readiness to proceed will receive higher priority.
Matching or Leveraged Funds: Projects will include a discussion on matching or leveraged

funds (including in-kind contributions). Projects that include matching or leveraged funds from other sources will be given greater consideration. This screening criteria is not intended to prevent small or disadvantaged communities from participating in the program.
Environmental Compliance: Projects should identify all required environmental compliance approvals or permits needed for the project. Projects that will achieve greater levels of environmental benefits above the required compliance levels will be given greater consideration.

Use of BMAPs to improve water quality is recommended by Florida's Blue-Green Algae Task Force (FDEP 2019), and states "spatially focused suites of projects in areas likely to yield maximum pollutant reduction [should] be identified and prioritized in all BMAP areas. Integrated monitoring and modeling of implemented BMAP projects should be conducted to ensure that projects are working as expected. Such efforts are, in fact, key to the assessment process and allow for adjustments to be made if necessary." Florida uses its Harmful Algal Bloom (HAB) monitoring and coordinated multiagency HAB response to populate an Algal Bloom Dashboard. Information from the Algal Bloom Dashboard are incorporated into FDEP's Protecting Florida Together website, which communicates to the public a broad scope of information on Florida's water quality (FDEP 2024a).

Project selection for WQIP prioritizes projects identified in other state or federal restoration planning documents (e.g., BMAPs, ARPs, SWIM plans, the State Expenditure Plan (SEP), and Florida Trustee Implementation Group (FL TIG) restoration plans) that identify both the need and benefits of such projects. Because initial project planning, technical review, stakeholder engagement, and identification of risks are typically part of the development of these restoration plans, this approach promotes use of BAS and improve the likelihood of project success. Project selection will also account for proposals that address stressors associated with Waters Not Attaining Standards (WNAS) (see Figure 2), with an emphasis on those not attaining nutrient standards. The designation of WNAS is backed by strong science as required in Chapter 62-303, F.A.C. Project-level BAS review ensures that selected projects will meet the scientific rigor of WQIP. Collaboration with Natural Resource Damage Assessment (NRDA), National Fish and Wildlife Federation (NFWF)-Gulf Environmental Benefit Fund, or other state and federal funding programs allows the WQIP to fund more or larger projects more efficiently, maximizing investments to achieve large-scale restoration.

Environmental Benefits:
Water bodies along the Gulf make up a gradient of saltwater, estuarine, and freshwater environments. Florida's abundance of surface waters provides valuable habitat for fish and wildlife, and serve multiple uses for the people who live, work, and visit Florida. The CWA and Florida laws recognize the influence of human activities on ecosystem health and aim to develop policies and regulations to protect and improve water quality. In Florida, freshwater, estuarine, and coastal water quality impairments are associated primarily with nutrients, low Dissolved Oxygen (DO), and fecal indicator bacteria (FDEP 2024a). High concentrations of Total Nitrogen (TN) and Total Phosphorus (TP) can result in excessive algae growth, leading to low DO, inhibition of seagrass growth, negative aquatic food web impacts, and health threats to wildlife and humans (Badruzzman et al. 2012; Beck et al. 2019; Greening et al. 2014; Tomasko

et al. 1996). Fecal bacteria in waters results in beach closures, human health risks, and restrictions on fish and shellfish harvesting.

The WQIP will improve water quality and biological integrity by selecting projects that enhance or eliminate septic systems, upgrade wastewater treatment systems, improve stormwater treatment and reduce pollutant loading to Florida Gulf Coast waterways. Selected water quality improvement projects will eliminate significant sources of nutrients, bacteria, sediment, and other pollutants from entering waterways, which will have a positive impact on seagrass, fish and shellfish populations, and recreational uses. The WQIP goals align with goals identified in TMDLs, BMAPs, ARPs, SWIM plans, and other approved restoration plans that have led to implementation of projects that have successfully reduced pollutant loadings in multiple waterways along Florida's Gulf Coast. This provides assurances that the WQIP's anticipated benefits (e.g., reduced pollutant loads, improved surface water quality, improved habitat for seagrass and other aquatic species, etc.) can be achieved.

The WQIP will achieve the Council's Comprehensive Plan goal of restoring water quality and water quantity and its associated objective of restoring, improving, and protecting water resources through implementation of priority water quality improvement projects. A key difference between existing state programs and the WQIP is that the latter allows for the administration of funding that targets projects providing cumulative benefits to the Gulf and that links environmental benefits between selected projects and other restoration projects in a watershed or region. Linking projects in this way maximizes environmental benefits and contributes to large-scale water quality improvements.

Florida has a robust approach to sampling and monitoring waterbodies. It collects water quality data through multiple monitoring networks. FDEP's Strategic Monitoring Program ensures waters on Planning or Study Lists meet data sufficiency requirements for the determination of waterbody impairment following the Impaired Waters Rule. The Status Monitoring Network estimates the statewide resource condition of lakes, flowing waters and aquifers with a known statistical confidence through probabilistic sample surveys (FDEP 2024a). The Trend Monitoring Network examines long-term changes in Florida's ambient water quality. The network consists of 129 fixed stations. Each BMAP includes water quality monitoring stations to assist with the identification of source areas and understand progress towards water quality improvement. The data collected by FDEP, the WMDs, counties, and cities feed into these programs, which all use scientifically sound methodologies, techniques, and quality assurance (QA) protocols for data collection. This waterbody-specific data will be used, where appropriate, to document the benefits of projects implemented under the WQIP.

The WQIP will integrate quantification of environmental benefits into the selection of restoration projects using WQIP metrics (e.g., acres of lands acquired, or lbs. of nutrients reduced) so that projects are selected based in part on desired ecological quality with options to attain the desired conditions based on a broad spatial foundation to achieve overall water quality, health, and resilience of the larger ecosystem.

Success will be achieved through improved water quality; reduced potential for algal blooms,

fish kills, beach closures, and fish and shellfish consumption restrictions; and improved SAV health, wildlife habitat, and recreational experiences. Tying together projects with existing plans (e.g., BMAPs, ARP, SWIM plans, the NFWF GEBF Strategy) ensures thorough planning for successful tracking of restoration efforts as projects continually build upon and contribute to one another during the restoration strategy development process (FWC and FDEP 2018). These synergistic, watershed-level improvements are leading to positive water quality trends in other regions. In Tampa Bay, NEP Comprehensive Conservation Management Plan (CCMP) projects have resulted in improved water quality (Chlorophyll-a, Total Nitrogen, and DO) and seagrass coverage in the watershed approaching conditions observed in the 1950s (Greening et al. 2014). The success in Tampa Bay was achieved through the use of sound science, management plan development with identified projects, broad stakeholder engagement and support, and multiple funding partners, both government and business/industry, and work is ongoing. As of the **2024 assessment (TBNMC, 2025)**, all four Tampa Bay segments met their respective chlorophyll a criteria. The WQIP has been designed to build on the lessons learned in Florida restoration efforts.

Like Basin Management Action Plans, Reasonable Assurance Plans, such as Tampa Bay's, follows a structured adaptive management approach: monitoring, threshold assessment, targeted investigation, and assimilative capacity re-evaluation, and consideration of iterative load target updates (TBNMC 2002 and 2022). This framework enables adaptive strategy refinement in response to empirical conditions and ensures sustained progress with focused actions.

WQIP is designed to address needs in watersheds where water quality standards are not being attained. FDEP's efforts to address "priority" waterbodies does not mean that waters on the 303(d) list are the only priorities for restoration. Other impaired waters may be the subject for alterative restoration activities, such as ARPs. Others may have improving water quality trends or additional source identification information suggesting naturally high levels of the given pollutant. Therefore, waters labeled "priority" through the establishment of TMDLs are those that are favorable for developing site-specific TMDLs within the next two-year period. FDEP's robust assessment efforts also produce information that can allow for WQIP projects to address water quality issues before they rise to the level of being designated as impaired and listed on the state's 303(d) list.

Metrics:

Metric Title: RES002 : Watershed management - # upgrades to stormwater and/or wastewater systems

Target: 0.99

Narrative: Florida uses this metric as a program-wide metric to evaluate the success of the WQIP and its benefits toward watershed management and water quality by upgrading septic systems (or connecting to sewer systems); stormwater runoff treatment improvements; and upgrades to wastewater treatment and infrastructure, among others

as applicable. Target values or ranges of values will be provided, as project activities are identified. Not all projects or activities funded under this program will be captured by this metric. Additional metrics will be determined to capture the benefits of each technique utilized under this program; specifically, each project or activity selected under the WQIP will have specific metrics aimed at evaluating the success of the individual activity.

Metric Title: HM001 : Nutrient reduction - Lbs. N avoided or removed

Target: 0.99

Narrative: Florida uses this metric as a project or activity metric. The purpose of this metric will be to verify that a reduction or avoidance of nitrogen (N) loading has been completed, and the performance measure will be the project or activity's ability to reduce pounds (lbs.) of N. Once a project or activity is selected a target value will be established. Project or activity success will be evaluated and determined as the lbs. of N successfully removed using WQIP funding. The outcome will be a decrease in lbs. of N entering water bodies.

Metric Title: HM003 : Nutrient reduction - Lbs. P avoided or removed

Target: 0.99

Narrative: Florida uses this as a project or activity metric. The purpose of this metric will be to verify that a reduction of phosphorus (P) loading has been completed, and the performance measure will be the project or activity's ability to reduce pounds (lbs.) of P. Once a project or activity is selected a target value will be established. Project or activity success will be evaluated and determined as the lbs. of P successfully removed using program funding. The outcome will be a decrease in lbs. of P entering water bodies.

Metric Title: HM004 : Sediment reduction - Lbs. sediment avoided or removed

Target: 0.99

Narrative: Florida will use this as a project or activity metric. The purpose of this metric will be to verify that a reduction of sediment loading has been completed, and the performance measure will be the project or activity's ability to reduce lbs. of sediment loading. Once a project or activity is selected a target value will be established. Project or activity success will be evaluated and determined as the lbs. of sediment successfully removed using program funding. The outcome will be a decrease in lbs. of sediment entering water bodies.

Metric Title: HC003 : Land acquisition - Acres acquired in fee

Target: 0.99

Narrative: Florida will use this as a project or activity metric. The project or activity metrics may be adjusted as needed once projects or activities are funded. Metrics may be added, removed, or replaced as appropriate at the project work plan application stage. Once a project or activity is selected a target value will be established. Project or activity success will be determined as the total number of acres acquired in fee. The purpose of this metric will be to verify that acquisition has been completed, and the performance measure will be an executed and recorded deed. Upon transfer of the parcel to public ownership, this metric will be complete. The outcome will be an increase in protected acres.

Risk and Uncertainties:

Projects come with potential risks and uncertainties, including cost overruns and public controversy. Risks will be minimized through direct public engagement and ongoing transparency, careful cost estimates and reasonable contingencies, effective planning and design, third-party construction oversight, and nimble adaptive management. Bad weather can also delay project completion, but good planning and construction management will minimize the impact. Operating entities receiving funding will have to document strong operation and management capabilities and financial resources to assure long-term project success.

As part of project selection, the WQIP will encourage resilience and adaptation planning in the engineering and design (E&D) for selected projects. FDEP is committed to considering resilience for projects selected for funded through WQIP.

On a project-specific basis, Florida will require project sponsors to submit a monitoring and adaptive management plan that will address responses to unavoidable risk. Adaptive management strategies will be implemented as needed to improve project performance and achieve project and program success. Adaptive management is an iterative process that links project monitoring to management decisions; adjustments are made to management approaches based on observed outcomes (NRC 2004). These plans will outline the goals and objectives of the project, the uncertainties and risks associated with the project, the monitoring parameters and methods, and adaptive management strategies if the outcome of monitoring does not meet the project's success metrics.

Monitoring and Adaptive Management:

Monitoring is conducted on two levels: programmatic and project specific. Programmatic monitoring focuses on the programmatic metrics specified below. At the project level, monitoring specifies metrics for each project that are tied to natural resource outcomes and validate

restoration techniques and appropriate application of best management practices. Programmatic and project-level monitoring is conducted to understand, document, and analyze how well projects perform compared to the expected outcomes and to provide lessons learned. Monitoring will help guide future project selection and adapt the WQIP to ensure its goals and objectives are achieved. Water quality can be monitored on a project basis using a variety of techniques, including baseflow, storm flow, inflow vs. outflow, time series, and paired watersheds, depending on specific project objectives and site characteristics. With the general exception of inflow vs. outflow monitoring, most of these monitoring approaches generally require a sustained period to account for climatic and precipitation variability. To the extent feasible, both program and project monitoring will use FDEP's monitoring networks discussed above. Under the WQIP, project implementors will be required to submit a monitoring and adaptive management plan. These plans should be based on existing, peer-reviewed guidance documents, such as the NRDA MAM Manual and the Council Observational Data Plan Guidance (DWH NRDA Trustees 2021; Council 2021). The monitoring objectives outlined in project-specific plans are applicable to both long- and short-term outcomes, such as the following:

Long-term outcomes:
Evaluation of long-term water quality trends. This requires multiple years of data collection following specific project implementation, including an evaluation of historical and baseline data for affected areas, as available.

Short-term outcomes:
Specific facility performance (e.g., inflow vs. outflow pollutant concentration or load reduction monitoring).

Data Management:
FDEP will provide a central location to access data and other information related to the projects funded under the WQIP and make it available to the Council, regional partners, stakeholders, and any person or entity upon request. An Observational Data Plan and Data Management Plan for the WQIP will be submitted to the Council.

Data will be collected pursuant to approved QA plans. All grab sample data collected, analyzed, and reported will comply with Chapter 62-160, F.A.C., and will be documented using standardized project-specific datasheets, as appropriate. Handwritten hardcopy data will be scanned to PDF files and transcribed into a standard digital format. QA plans will specify minimum field and laboratory QA, methodology, reporting, auditing, and data usability requirements. Grab sample data will be input into WIN, the Watershed Information Network. WIN provides a platform for data providers to submit their data and perform data quality checking interactively prior to allowing the data to be migrated into the published WIN environment. WIN is used to store and manage data and to report data to interested users and the EPA). Data can be accessed through a web-based interface at http://prodenv.dep.state.fl.us/DearWin/public/welcomeGeneralPublic?calledBy=GENERALPUBLIC .

Collaboration:

Florida held meetings with local governments, WMDs, NEPs, NGOs, Florida's RESTORE Act COE, the Gulf Consortium, and other Council members through the Commitment and Planning Support (CPS) award. BMAPs, ARPs and SWIM plans have extensive stakeholder outreach during plan development and throughout implementation, including numerous public meetings and public education materials. Project selection will consider each project's ability to leverage other funds to expand the impact of awards. Leveraging could occur using DWH funds or federal, state, or local government matching funds, including Florida's State Revolving Fund loans and grants, annual springs funding, TMDL project funding, NPS grants, Florida legislative-directed project funding, the Gulf Consortium State Expenditure Plan, the Gulf Coast counties' Multi-Year Implementation Plans, Florida Gulf Coast NEP CCMPs, estuary programs in the Panhandle CCMPs, and potentially those projects and programs identified in the Governor's Executive Orders.

Public Engagement, Outreach, and Education:

Extensive stakeholder outreach is inherent to BMAP, ARP and SWIM plan development. WQIP leverages these efforts to engage the public. BMAPs and ARPs target ecosystem restoration activities and support community objectives (FDEP 2024a). As with BMAPs and ARPs, a defining characteristic of the SWIM program is that it is conducted primarily through cooperative projects that are prioritized with regional stakeholders and implemented, owned, operated, and maintained by local governments and other watershed partners to help ensure continuing success. Consequently, Florida's BMAP, ARPs and SWIM programs have established strong foundations for public engagement and education activities. Public engagement and education are integral for determining projects that contribute to the overall goal of improving water quality. These efforts have focused on many of the stressors targeted by the WQIP, allowing the program to readily connect with the public and build on previous engagement and education efforts. These efforts encourage participation in the WQIP, ensure that communication about the value of projects reaches a large audience, and promotes successful collaboration among watershed partners. Additionally, FDEP provides funding opportunities for public engagement and education through Clean Water Act 319(h) grants for nonpoint Source pollution education. FDEP has funded over 100 projects statewide that educate or engage with the public on topics such as non-point source pollution, low-impact development and green stormwater infrastructure, and on-site sewage treatment and disposals systems. Some of the projects are part of longstanding efforts to engage with the public, such as the Florida Friendly Landscaping™ Program which was established in 1993 in partnership with the University of Florida's Institute of Food and Agricultural Sciences. The program teaches environmentally friendly landscaping through nine (9) science-based principles with a goal of reducing nonpoint source pollution through proper fertilization, irrigation, and pesticide use on residential and commercial landscapes (UF 2024). Another example of an educational campaign and resource is FDEP's Green Stormwater Infrastructure webinar series, which promotes the preservation of local water quality through smart stormwater management (FDEP 2024b). These activities help gain stakeholder insight and buy-in and build capacity for communities to understand the direct

impacts of their choices on water resources and furthermore they provide resources to promote behavior change or implement best management practices for water quality.

Public outreach is ongoing with other DWH funding programs, such as NRDA, which began in restoration efforts 2012. The FL TIG has funded over 80 projects in Florida to date and developed three Restoration Plans, two of which direct NRDA funds to water quality, nutrient reduction, and recreational enhancements (FL TIG 2019, FL TIG 2024). The NRDA process incorporates a rigorous public engagement process that provides stakeholders and the public with opportunities to submit project ideas via state and federal web-based portals, comment on projects at the draft Restoration Plan stage, and comment on proposed projects. Florida also embarked on a comprehensive public outreach campaign as part of its NFWF GEBF Gulf Restoration Strategy development (FWC and FDEP 2018). The WQIP leverages successful DWH public engagement structures without expending much of the WQIP administrative budget to do so.

Leveraging:

Funds: $11,250.00

Type: Leveraging

Status: Received

Source Type: Other

Description: The WQIP leveraged some of its CPS federal award to develop the project selection criteria for multiple FPL3b programs and present draft selection criteria in a public webinar. It is anticipated that the selection criteria and process will be adapted to future FPL programs. CPS funds are utilized for an array of activities that support planning and collaboration efforts to prepare grant applications prior to implementing specific projects through federal awards. The selection criteria put greater emphasis on projects that leverage other funding sources. Therefore, it is expected that individual projects will also leverage other federal funds and state funds. See Methods section for a description of selection criteria.

Funds: $3,388,067,339

Type: Leveraging

Status: Received

Source Type: State

Description: The WQIP will potentially leverage other state funds including the Water Quality Improvement Grant Program (formerly Wastewater Grant Program), Springs Restoration Grant Program, and regional water quality grant programs. Additionally, Water Management Districts also fund projects through cooperative funding agreements (not reflected in this leveraging amount). The WQIP selection criteria emphasizes projects that leverage other funding sources, thus utilizing leverage opportunities at the project level. In the past 7 years, more than 1,174 community water quality projects have been funded statewide.

Funds: $425,000,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: American Rescue Plan Act funding for 68 Water Quality Improvement Grant Projects statewide.

Environmental Compliance:

Some aspects of the WQIP comply with National Environmental Policy Act (NEPA) using the Council's NEPA Categorical Exclusion (CE) for planning, research, or design activities (Section 4(d)(3) of the Council's NEPA procedures). Selected implementation projects will be required to comply with all applicable federal laws in the Council's Environmental Checklist as well as state and local laws. Because Council NEPA regulations allow the use of member NEPA CEs where appropriate (Section 4(d)(4) of the Council's NEPA Procedures), selected project NEPA compliance will occur using the appropriate documentation (Environmental Assessments, Environmental Impact Statements, or CEs). Some projects may be able to rely on existing member NEPA documents, including CEs (e.g., EPA §6.204 (a) (ii) ii).

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Budget

Project Budget Narrative:

The budget for this program consists of $45,000,000, of which the majority (approximately 90%) will be used for planning or implementation of projects or activities aimed at improving water quality in coastal watersheds of the Gulf Coast. The total amount of funding requested for Category 1 is $18,000,000. Category 1 funds will be used for State of Florida program administration and project or activity specific planning, engineering and design, and permitting. Program monitoring and adaptive management activities, and data management activities will also be funded with Category 1. Florida is requesting $27,000,000 in Category 2 funds to implement projects or activities such as construction of stormwater and wastewater facilities, septic to sewer projects, or land acquisition, and will include project or activity specific monitoring and adaptive management activities, and data management activities. More detailed budgets will be developed at the project or activity level when projects or activities are selected

for funding under this program, including an appropriate contingency. The percentages listed below apply to the entire $45,000,000.

Total FPL Project/Program Budget Request:
$ 45,000,000.00

Estimated Percent Monitoring and Adaptive Management: 5 %

Estimated Percent Planning: 15 %

Estimated Percent Implementation: 80 %

Estimated Percent Project Management: N/A

Estimated Percent Data Management: N/A

Estimated Percent Contingency: 0 %

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
Yes, the program could be scaled to allow for more or fewer activities over a longer or shorter duration of time, which would affect the overall pollutant load reductions accordingly. Pollutant load reductions would be based on an average rate per activity or cost per mass of pollutant removed.

Environmental

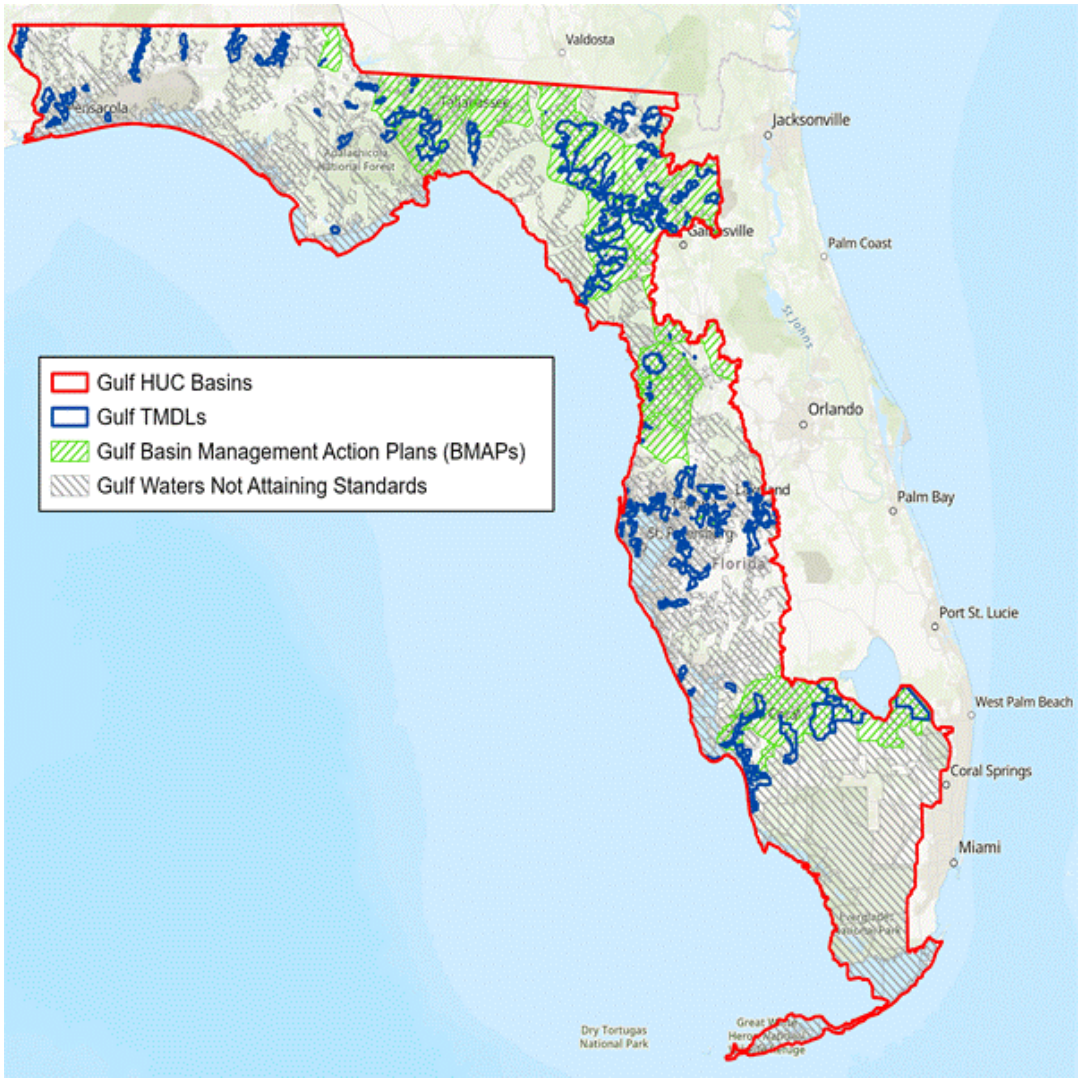
Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	N/A	Note not provided.
Endangered Species Act	N/A	Note not provided.

National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.

Other Applicable Environmental Compliance Laws or Regulations	N/A	This activity is covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures).

Maps, Charts, Figures

Caption : Figure 1 depicts the WQIP boundary which includes all 5-digit HUC8 watersheds that flow to the Gulf of America.



Caption : Figure 2 depicts the WQIP boundary with all 5-digit HUC8 watersheds that flow to the Gulf of America as well as waterways within the boundaries that have designated TMDLs, completed BMAPs and those that have not attained current water quality standards.

Other Uploads

GIS Data_2:
Florida_Water_Quality_Improvement_Program_V2.gdb.zip

Council Staff Review: Florida Water Quality Improvement Program

FPL Internal Staff Review

Project/Program	Florida Water Quality Improvement Program		
Primary Reviewer	Heather Young	Sponsor	Florida
EC Reviewer	John Ettinger	Co-Sponsor	N/A

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded program.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	More information needed
Notes	Should the two oyster restoration techniques be removed (Restore oyster habitat: Substrate placement, Restore oyster habitat: Living shorelines)? While oyster reef restoration can benefit water quality, there are no oyster restoration metrics included in the proposal, and oyster reef restoration is not described in the abstract, intro, or methods sections. Note: Restore Council staff worked with the state to resolve these comments.

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with	Yes

the proposed activity?	
Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	Florida applied BAS reviews that were completed upon the original proposal in Funded Priorities List 3b. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing, but not decreasing. Note: Restore Council staff worked with the state to resolve these comments.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	More information needed
Notes	Need to determine if oyster reef restoration is intended to be included as a restoration approach along with the corresponding techniques of sediment placement and living shorelines. If it is, then metrics for oyster reef restoration should be added, and the narrative should be revised to describe the oyster reef restoration methodology and how such restoration will result in water quality benefits. Note: Restore Council staff worked with the state to resolve these comments.

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	Implementation funds in FPL Category 2.

Best Available Science Review: Florida Water Quality Improvement Program

This program was reviewed for BAS under FPL 3b. Under FPL 4, Florida is proposing a continuation of the program.

The original BAS review as well as the state's response to the BAS comments can be found at **https://www.restorethegulf.gov/our-work/fpl/fpl-2026/.**

Appendix F: Environmental Protection Agency Proposal Packet

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Trash Free Waters Program Benefiting Communities in the Gulf Coast

RESTORE Council Proposal Document

General Information

Title:
Trash Free Waters Program Benefiting Communities in the Gulf Coast

Project Abstract:
EPA's FPL 4 project proposal is for a Trash Free Waters (TFW) Program which will benefit coastal communities across the five Gulf Coast states. Working together with all five Gulf state partners, EPA will develop competitive funding opportunities to prevent, remove, and/or recycle/upcycle trash from waters that drain to the Gulf coast and that also support each state's specific needs. Eligible projects will include prevention activities (sustainable replacement products, waste lifecycle, environmental stewardship), removal activities (in-situ trash capture devices, cleanup events, incentivized disposal), and/or circularity and life cycle activities or planning to provide positive outcomes at larger scale (generation to disposal) . In addition to the $9M requested from FPL 4, EPA will provide $10M in co-funding and hopes to include $1M from returned funds of closed RESTORE Interagency Agreements (IAAs) for a total budget of $20M. EPA intends to award $4M in grants per Gulf state with estimated project periods of up to 3 years. Additional lead time will be needed for the IAA and program establishment and for the IAA closeout after grants end. Estimated benefits are reducing pollutants such as trash from water bodies that flow to the Gulf, thereby improving water quality, and positively impacting ecosystems and local economies. TFW projects have proven records of diverting or recycling tens of thousands of pounds of trash, preventing future litter by community engagement, and informing future stewards of the environment.

FPL Category: Cat1: Implementation Only

Activity Type: Program

Program: Trash Free Waters Program Benefiting Communities in the Gulf Coast

Co-sponsoring Agency(ies):
TX
LA
MS
AL
FL

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.
(II) Large-scale projects and programs that are projected to substantially contribute to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast ecosystem.

Priority Criteria Justification:
(I) This was selected for this program because all communities and waterbodies across the Gulf coast are impacted by common and visible pollutants such as litter, trash and marine debris. Stormwater runoff from metropolitan and suburban environments concentrate these pollutants into tributaries of other water bodies which eventually impact communities downstream and into the Gulf. These pollutants negatively impact a community's ability to adapt to natural disasters and damage fragile ecosystems. If these pollutants can be captured and more importantly prevented from strategic locations, large scale protection and restoration of natural resources can be achieved at both the active sites and all the way downstream to the Gulf. Prevention through community engagement is the cornerstone of the TFW program as this provides sustainability long after projects end.

(II) This was also selected for this program because of the wide-scale impacts of these pollutants, as noted above, and because this program would be implemented across the Gulf. EPA intends to leverage experience and activities at other trash free and marine debris projects to provide far reaching impacts on land as well as in fresh, brackish, and marine water. Scaling up Trash Free Waters activities with a focus on sustaining long term will make this a successful large-scale program.

Project Duration (in years): 7

Goals

Primary Comprehensive Plan Goal:
Restore Water Quality and Quantity

Primary Comprehensive Plan Objective:
Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Objectives:
Promote Natural Resource Stewardship and Environmental Awareness

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Promote natural resource stewardship and environmental awareness: Promote natural resource stewardship and environmental awareness
Reduce excess nutrients and other pollutants to watersheds: Stormwater management

Location

Location:

All coastal counties within RESTORE boundary are eligible. Locations will be determined once projects are selected via competitive funding opportunities, but they are anticipated to be spread equally among the five Gulf states benefitting coastal communities.

HUC8 Watershed(s):

South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Upper Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Upper Conecuh)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Patsaliga)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Sepulga)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Lower Conecuh)
South Atlantic-Gulf Region(Alabama) - Coosa-Tallapoosa(Middle Coosa)
South Atlantic-Gulf Region(Alabama) - Coosa-Tallapoosa(Lower Coosa)
South Atlantic-Gulf Region(Alabama) - Coosa-Tallapoosa(Middle Tallapoosa)
South Atlantic-Gulf Region(Alabama) - Coosa-Tallapoosa(Lower Tallapoosa)
South Atlantic-Gulf Region(Alabama) - Alabama(Upper Alabama)
South Atlantic-Gulf Region(Alabama) - Alabama(Cahaba)
South Atlantic-Gulf Region(Alabama) - Alabama(Middle Alabama)
South Atlantic-Gulf Region(Alabama) - Alabama(Lower Alabama)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Luxapallila)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Sipsey)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Mulberry)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Sipsey Fork)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Locust)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Upper Black Warrior)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Lower Black Warrior)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Middle Tombigbee-Chickasaw)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Lower Tombigbee)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile-Tensaw)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Middle Tombigbee-Lubbub)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Noxubee)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Upper Chickasawhay)
Texas-Gulf Region(Sabine) - Sabine(Upper Sabine)
Texas-Gulf Region(Sabine) - Sabine(Middle Sabine)
Texas-Gulf Region(Sabine) - Sabine(Lake Fork)
Texas-Gulf Region(Neches) - Neches(Upper Neches)
Texas-Gulf Region(Neches) - Neches(Middle Neches)
Texas-Gulf Region(Neches) - Neches(Lower Neches)
Texas-Gulf Region(Neches) - Neches(Upper Angelina)
Texas-Gulf Region(Neches) - Neches(Lower Angelina)

Texas-Gulf Region(Neches) - Neches(Village)
Texas-Gulf Region(Neches) - Neches(Pine Island Bayou)
Texas-Gulf Region(Trinity) - Upper Trinity(Upper West Fork Trinity)
Texas-Gulf Region(Trinity) - Upper Trinity(Lower West Fork Trinity)
Texas-Gulf Region(Trinity) - Upper Trinity(Elm Fork Trinity)
Texas-Gulf Region(Trinity) - Upper Trinity(Denton)
Texas-Gulf Region(Trinity) - Upper Trinity(Upper Trinity)
Texas-Gulf Region(Trinity) - Upper Trinity(East Fork Trinity)
Texas-Gulf Region(Trinity) - Upper Trinity(Cedar)
Texas-Gulf Region(Trinity) - Upper Trinity(Richland)
Texas-Gulf Region(Trinity) - Upper Trinity(Chambers)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity-Tehuacana)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity-Kickapoo)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(West Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Spring)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(East Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Buffalo-San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(North Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(West Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Austin-Oyster)
Texas-Gulf Region(Brazos Headwaters) - Brazos Headwaters(North Fork Double Mountain Fork Brazos)
Texas-Gulf Region(Brazos Headwaters) - Brazos Headwaters(Double Mountain Fork Brazos)
Texas-Gulf Region(Brazos Headwaters) - Brazos Headwaters(White)
Texas-Gulf Region(Brazos Headwaters) - Brazos Headwaters(Salt Fork Brazos)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Clear Fork(Middle Brazos-Millers)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Clear Fork(Upper Clear Fork Brazos)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Clear Fork(Paint)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Clear Fork(Lower Clear Fork Brazos)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Clear Fork(Hubbard)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Bosque(Middle Brazos-Palo Pinto)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Bosque(Middle Brazos-Lake Whitney)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Bosque(Bosque)
Texas-Gulf Region(Middle Brazos) - Middle Brazos-Bosque(North Bosque)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Lower Brazos-Little Brazos)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Yegua)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Navasota)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Lower Brazos)
Texas-Gulf Region(Lower Brazos) - Little(Leon)
Texas-Gulf Region(Lower Brazos) - Little(Cowhouse)
Texas-Gulf Region(Lower Brazos) - Little(Lampasas)
Texas-Gulf Region(Lower Brazos) - Little(Little)
Texas-Gulf Region(Lower Brazos) - Little(San Gabriel)
Texas-Gulf Region(Upper Colorado) - Upper Colorado(Colorado Headwaters)

Texas-Gulf Region(Upper Colorado) - Upper Colorado(Johnson Draw)
Texas-Gulf Region(Upper Colorado) - Upper Colorado(Beals)
Texas-Gulf Region(Upper Colorado) - Upper Colorado(Upper Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(Middle Colorado-Elm)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(South Concho)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(Middle Concho)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(North Concho)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(Concho)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(Middle Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(Pecan Bayou)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(Jim Ned)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(San Saba)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Concho(Brady)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Llano(Buchanan-Lyndon B. Johnson Lakes)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Llano(North Llano)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Llano(Llano)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Llano(Austin-Travis Lakes)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Llano(Pedernales)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Lower Colorado(Lower Colorado-Cummins)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Lower Colorado(Lower Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(San Bernard)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Navidad)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(Upper Guadalupe)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(Middle Guadalupe)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(San Marcos)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(Lower Guadalupe)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Upper San Antonio)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Lower San Antonio)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Cibolo)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Mission)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Nueces Headwaters)

Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(West Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Upper Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Turkey)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Middle Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Upper Frio)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Hondo)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Lower Frio)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(San Miguel)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Atascosa)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Lower Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Palo Blanco)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Laguna Madre)
Rio Grande Region(Rio Grande-Amistad) - Rio Grande-Amistad(Alamito)
Rio Grande Region(Rio Grande-Amistad) - Rio Grande-Amistad(Terlingua)
Rio Grande Region(Rio Grande-Amistad) - Rio Grande-Amistad(Maravillas)
Rio Grande Region(Rio Grande-Amistad) - Rio Grande-Amistad(Santiago Draw)
Rio Grande Region(Rio Grande-Amistad) - Rio Grande-Amistad(San Francisco)
Rio Grande Region(Rio Grande-Amistad) - Rio Grande-Amistad(Lozier Canyon)
Rio Grande Region(Rio Grande-Amistad) - Rio Grande-Amistad(Big Canyon)
Rio Grande Region(Rio Grande-Amistad) - Devils(Upper Devils)
Rio Grande Region(Rio Grande-Amistad) - Devils(Lower Devils)
Rio Grande Region(Rio Grande-Amistad) - Devils(Dry Devils)
Rio Grande Region(Lower Pecos) - Lower Pecos(Toyah)
Rio Grande Region(Lower Pecos) - Lower Pecos(Salt Draw)
Rio Grande Region(Lower Pecos) - Lower Pecos(Barrilla Draw)
Rio Grande Region(Lower Pecos) - Lower Pecos(Coyanosa-Hackberry Draws)
Rio Grande Region(Lower Pecos) - Lower Pecos(Pecos)
Rio Grande Region(Lower Pecos) - Lower Pecos(Tunas)
Rio Grande Region(Lower Pecos) - Lower Pecos(Independence)
Rio Grande Region(Lower Pecos) - Lower Pecos(Howard Draw)
Rio Grande Region(Lower Pecos) - Lower Pecos(Lower Pecos)
Texas-Gulf Region(Sabine) - Sabine(Toledo Bend Reservoir)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Sabine Lake)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Middle Colorado-Llano(South Llano)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Lavaca)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Medina)
Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lake Maurepas(Tangipahoa)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Lower Leaf)
Lower Mississippi Region(Lower Mississippi-Yazoo) - Yazoo(Yocona)
South Atlantic-Gulf Region(Altamaha-St. Marys) - St. Marys-Satilla(Nassau)
South Atlantic-Gulf Region(St. Johns) - St. Johns(Upper St. Johns)
South Atlantic-Gulf Region(St. Johns) - St. Johns(Oklawaha)
South Atlantic-Gulf Region(St. Johns) - St. Johns(Lower St. Johns)

South Atlantic-Gulf Region(Southern Florida) - Kissimmee(Kissimmee)
South Atlantic-Gulf Region(Southern Florida) - Kissimmee(Northern Okeechobee Inflow)
South Atlantic-Gulf Region(Southern Florida) - Kissimmee(Western Okeechobee Inflow)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Lake Okeechobee)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Everglades)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Florida Bay-Florida Keys)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Big Cypress Swamp)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Caloosahatchee)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Florida Southeast Coast)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Peace)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Myakka)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Peace(Charlotte Harbor)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Sarasota Bay)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Manatee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Little Manatee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Alafia)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Hillsborough)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Tampa Bay)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Crystal-Pithlachascotee)
South Atlantic-Gulf Region(Peace-Tampa Bay) - Tampa Bay(Withlacoochee)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Waccasassa)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Econfina-Steinhatchee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Lower Suwannee)
South Atlantic-Gulf Region(Suwannee) - Suwannee(Santa Fe)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Lower Ochlockonee)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(New)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Apalachicola Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(St. Andrew-St. Joseph Bays)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Choctawhatchee Bay)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Pensacola Bay)
South Atlantic-Gulf Region(Apalachicola) - Apalachicola(Chipola)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Yellow)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Blackwater)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Pea)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Choctawhatchee(Lower Choctawhatchee)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Escambia)
South Atlantic-Gulf Region(Suwannee) - Aucilla-Waccasassa(Aucilla)
South Atlantic-Gulf Region(Ochlockonee) - Ochlockonee(Apalachee Bay-St. Marks)
Lower Mississippi Region(Lower Red-Ouachita) - Lower Ouachita(Lower Ouachita)
Lower Mississippi Region(Lower Red-Ouachita) - Lower Red(Lower Red)
Lower Mississippi Region(Lower Red-Ouachita) - Lower Red(Castor)
Lower Mississippi Region(Lower Red-Ouachita) - Lower Red(Dugdemona)
Lower Mississippi Region(Lower Red-Ouachita) - Lower Red(Little)

Lower Mississippi Region(Lower Red-Ouachita) - Lower Red(Black)
Lower Mississippi Region(Lower Red-Ouachita) - Lower Red(Bayou Cocodrie)
Lower Mississippi Region(Boeuf-Tensas) - Boeuf-Tensas(Tensas)
Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lower Mississippi-Baton Rouge(Lower Mississippi-Baton Rouge)
Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lake Maurepas(Tickfaw)
Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lake Maurepas(Lake Maurepas)
Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lower Grand(Lower Grand)
Lower Mississippi Region(Louisiana Coastal) - Atchafalaya-Vermillion(Atchafalaya)
Lower Mississippi Region(Louisiana Coastal) - Atchafalaya-Vermillion(Bayou Teche)
Lower Mississippi Region(Louisiana Coastal) - Atchafalaya-Vermillion(Vermilion)
Lower Mississippi Region(Louisiana Coastal) - Calcasieu-Mermentau(Mermentau Headwaters)
Lower Mississippi Region(Louisiana Coastal) - Calcasieu-Mermentau(Mermentau)
Lower Mississippi Region(Louisiana Coastal) - Calcasieu-Mermentau(Upper Calcasieu)
Lower Mississippi Region(Louisiana Coastal) - Calcasieu-Mermentau(Whisky Chitto)
Lower Mississippi Region(Louisiana Coastal) - Calcasieu-Mermentau(West Fork Calcasieu)
Lower Mississippi Region(Louisiana Coastal) - Calcasieu-Mermentau(Lower Calcasieu)
Lower Mississippi Region(Lower Mississippi) - Lower Mississippi-New Orleans(Lower Mississippi-New Orleans)
Lower Mississippi Region(Lower Mississippi) - Lake Pontchartrain(Liberty Bayou-Tchefuncta)
Lower Mississippi Region(Lower Mississippi) - Lake Pontchartrain(Lake Pontchartrain)
Lower Mississippi Region(Lower Mississippi) - Lake Pontchartrain(Eastern Louisiana Coastal)
Lower Mississippi Region(Lower Mississippi) - Central Louisiana Coastal(East Central Louisiana Coastal)
Lower Mississippi Region(Lower Mississippi) - Central Louisiana Coastal(West Central Louisiana Coastal)
Arkansas-White-Red Region(Red-Sulphur) - Red-Saline(Middle Red-Coushatta)
Arkansas-White-Red Region(Red-Sulphur) - Red-Saline(Red Chute)
Arkansas-White-Red Region(Red-Sulphur) - Red-Saline(Bayou Pierre)
Arkansas-White-Red Region(Red-Sulphur) - Red-Saline(Lower Red-Lake Iatt)
Arkansas-White-Red Region(Red-Sulphur) - Red-Saline(Saline Bayou)
Arkansas-White-Red Region(Red-Sulphur) - Red-Saline(Black Lake Bayou)
South Atlantic-Gulf Region(Pearl) - Pearl(Bogue Chitto)
Lower Mississippi Region(Lower Mississippi-Yazoo) - Yazoo(Lower Yazoo)
Lower Mississippi Region(Lower Mississippi-Yazoo) - Yazoo(Deer-Steele)
Lower Mississippi Region(Lower Mississippi-Big Black) - Lower Mississippi-Natchez(Lower Mississippi-Natchez)
Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lake Maurepas(Bayou Sara-Thompson)
Lower Mississippi Region(Lower Mississippi-Lake Maurepas) - Lake Maurepas(Amite)
Texas-Gulf Region(Sabine) - Sabine(Lower Sabine)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Town)
South Atlantic-Gulf Region(Mobile-Tombigbee) - Black Warrior-Tombigbee(Tibbee)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Chunky-Okatibbee)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Upper Leaf)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Pascagoula)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Black)
South Atlantic-Gulf Region(Pearl) - Pearl(Upper Pearl)
South Atlantic-Gulf Region(Pearl) - Pearl(Middle Pearl-Strong)

South Atlantic-Gulf Region(Pearl) - Pearl(Middle Pearl-Silver)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Lower Chickasawhay)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Escatawpa)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)
South Atlantic-Gulf Region(Pearl) - Pearl(Lower Pearl)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(San Fernando)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Baffin Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central Laguna Madre)

State(s):
Texas
Alabama
Mississippi
Louisiana
Florida

County/Parish(es):
AL - Baldwin
AL - Clarke
AL - Conecuh
AL - Covington
AL - Dale
AL - Escambia
AL - Henry
AL - Houston
AL - Mobile
AL - Monroe
AL - Washington
AL - Coffee
FL - Broward
FL - Escambia
FL - Pasco
AL - Geneva
FL - Calhoun
FL - Pinellas
FL - Charlotte
FL - Citrus
FL - Clay
FL - Collier
FL - Columbia
FL - Dixie
FL - Franklin
FL - Gadsden
FL - Gilchrist

FL - Polk
FL - Putnam
FL - Sarasota
FL - Sumter
FL - Suwannee
FL - Taylor
FL - Union
FL - Wakulla
FL - Alachua
FL - Baker
FL - Bay
FL - Bradford
FL - Glades
FL - Gulf
FL - Hamilton
FL - Santa Rosa
FL - Walton
FL - Washington
FL - DeSoto
FL - Hardee
FL - Hernando
FL - Highlands
FL - Hillsborough
FL - Holmes
FL - Jackson
FL - Jefferson
FL - Lafayette
FL - Lake
FL - Lee
FL - Leon
FL - Levy
FL - Liberty
FL - Madison
FL - Manatee
FL - Marion
FL - Miami-Dade
FL - Monroe
FL - Okaloosa
FL - Palm Beach
FL - Hendry
LA - Beauregard
LA - Calcasieu
LA - Cameron
LA - Iberia
LA - Jefferson
LA - Jefferson Davis
LA - Lafayette
LA - Lafourche
LA - Orleans

LA - Plaquemines
LA - St. Bernard
LA - St. Charles
LA - St. Martin
LA - St. Mary
LA - St. Tammany
LA - Tangipahoa
LA - Terrebonne
LA - Vermilion
LA - Washington
LA - Acadia
LA - Allen
LA - St. James
LA - St. John the Baptist
LA - St. Landry
MS - Hancock
MS - Harrison
MS - Forrest
MS - George
MS - Greene
MS - Jackson
MS - Lamar
MS - Pearl River
MS - Perry
MS - Stone
TX - Aransas
TX - Bee
TX - Brazoria
TX - Calhoun
TX - Brooks
TX - Cameron
TX - Chambers
TX - Colorado
TX - DeWitt
TX - Fort Bend
TX - Galveston
TX - Goliad
TX - Duval
TX - Hardin
TX - Harris
TX - Hidalgo
TX - Jackson
TX - Jasper
TX - Jefferson
TX - Jim Wells
TX - Kenedy
TX - Kleberg
TX - Lavaca
TX - Liberty

TX - Live Oak
TX - Matagorda
TX - Montgomery
TX - Newton
TX - Nueces
TX - Orange
TX - Refugio
TX - San Patricio
TX - Tyler
TX - Victoria
TX - Waller
TX - Wharton
TX - Willacy

Congressional District(s):
LA - 6
LA - 5
FL - 3
FL - 14
FL - 15
FL - 4
TX - 28
TX - 18
TX - 10
TX - 22
LA - 4
FL - 26
LA - 1
FL - 11
FL - 13
LA - 2
TX - 27
TX - 14
LA - 3
FL - 20
AL - 1
FL - 16
FL - 18
FL - 12
TX - 29
TX - 36
MS - 4
FL - 1
TX - 34
TX - 15
FL - 19
TX - 9
FL - 2
TX - 8

FL - 17
FL - 28

Narratives

Introduction and Overview:

EPA is proposing to continue its highly successful Trash Free Waters (TFW) Program in or directly benefiting communities across the coastal counties in the five Gulf states (see EPA's website https://www.epa.gov/trash-free-waters for more information on this program). This program intends to develop competitive funding opportunities for activities or plans to prevent, remove, and/or recycle/upcycle trash from waters that drain to the Gulf coast. If EPA is approved for FPL 4 funding for implementation, we will work with our five Gulf state partners to first determine the needs of the respective state and then focus any future funding opportunities to support state need. Projects will be chosen to provide the greatest impact, efficiency, and how well proposed project activities are likely to be successful. Eligible projects will include prevention activities (sustainable replacement products, waste lifecycle, environmental stewardship), removal activities (in-situ trash capture devices, cleanup events, incentivized disposal), and/or circularity and life cycle activities or planning to provide positive outcomes at larger scale (generation to disposal). In addition to the $9M requested from FPL 4, EPA will provide $10M in co-funding and hopes to include $1M from returned funds of closed RESTORE IAAs for a total budget of $20M. EPA intends to award $4M in grants per Gulf state with estimated project periods of up to 3 years. Additional lead time will be needed for the IAA and program establishment and for the IAA closeout after grants end. Depending on when funding opportunities are developed, released, and awarded, the IAA could be up to seven years. Estimated benefits are significantly reducing pollutants such as litter and trash from local water bodies that flow to the Gulf coast, thereby improving water quality, and positively impacting fragile ecosystems and local economies. Previous TFW projects have proven records of diverting or recycling tens of thousands of pounds of trash, preventing future litter by engagement, and informing future stewards of a trash free environment. Articles supporting these types of activities have been added to the bibliography.

Comprehensive Plan: Goal 2 to "Restore water quality and quantity" along with Objectives "Restore, improve, and protect water resources" and "Promote Natural Resource Stewardship and Environmental Awareness" were selected for this program because all communities and waterbodies are impacted by common and visible pollutants such as litter and trash. Stormwater runoff from metropolitan and suburban environments concentrate these pollutants into tributaries of other water bodies which eventually impact communities downstream and into the Gulf. These pollutants can, at high enough concentrations, negatively impact a community's ability to adapt to natural disasters such as flooding. Even at low concentrations or below visibility, these pollutants can damage fragile ecosystems, human health, and wildlife. Trash can also negatively impact tourism economies which can be significant since the GDP of the Gulf blue economy is an estimated $104B and supports close to 600K jobs[5] . If these pollutants can be captured and more importantly prevented from strategic locations, large-scale protection and restoration of natural resources can be achieved at project locations and downstream to the Gulf coast. Preventing pollutants through sustainable products, proper disposal, and/or lifecycle planning is the ultimate goal of the TFW program as this provides sustainability long after projects end. For all of the reasons noted above, this program aligns with the Planning Framework Restoration Techniques to "Reduce excess nutrients and other pollutants to watersheds" and "Promote natural resource stewardship and environmental awareness".

General risks are minimal and may involve ensuring grant funds are expediently and efficiently spent in which EPA has significant experience in overseeing TFW projects. Strategic planning will help ensure TFW activities are implemented in high impact locations to provide the greatest trash reductions. In-situ trash removal devices must be installed and maintained properly to prevent any impediments to natural flow of waterways.

Proposed Methods:
The primary objectives of this program will be to prevent, remove, or recirculate trash, and the success of this project will be assessed by the amount of trash diverted for each of these categories. As noted, prevention activities will likely include community engagement to local businesses, communities, and citizens/students in sustainable replacement products, waste lifecycle, and proper disposal. Removal activities will likely include in-situ collection devices (e.g., Litter Gitter, Seabin, trash wheel) that capture trash in rivers, streams and other fresh, brackish, or marine water bodies in strategic locations[1]; promotion of proper disposal (trash sculptures, incentives); and volunteer cleanup events. Novel removal methods may be incentivized in the funding opportunity. Circularity and life cycle activities and/or planning are anticipated activities to improve outcomes from generation, use, recycling/upcycling (upcycling is reuse or repurposing for value or more efficient use[2]) to disposal on a broader scale. Novel recycling and/or creative upcycling methods may be incentivized in the funding opportunity. EPA will encourage the recipient to support how their proposed activities will be most effective at trash reduction while also being cost effective.

Assessment of prevention activities would use modeling to estimate trash diverted, where appropriate. EPA will measure trash removal or recirculation activities using trackers (e.g., ETAP) or loggers for parameters such as volume/weight, location, type, and aging[9]. Both would be assessed against metrics established for the program. To ensure quality, consistency, and objectivity of modeling and/or measurements across the five Gulf States, EPA will require use of consistent modeling procedures and standardized training and protocols for removal tracking. Quality will be formalized in a program level Quality Assurance Project Plan (QAPP) which will address the QA requirements of project activities and establish a quality system to ensure results are of known and documented quality. A program QAPP would describe project tasks, organizational responsibilities, training and personnel requirements, objectives, protocols, tracking methods, and assessment methods. Modeling QAPPs further describe procedures for selection of information and estimation methods; acceptance or rejection of inputs/outputs used to estimate; and uncertainty of the results.

Environmental Benefits:
As previously discussed, no communities or waterbodies are immune from common and visible pollutants such as litter and trash especially trash output in the past 10 years has doubled from metropolitan areas[4] and increased ten-fold over the past century. Improperly managed trash can enter stormwater runoff from metropolitan and suburban environments, concentrating these pollutants into tributaries of other water bodies which impact communities downstream and eventually the Gulf. These pollutants can and do negatively impact fragile ecosystems. Trash can also negatively impact tourism and coastal economies which provide almost 37% of the total US ocean GDP5. A recent study funded by NOAA estimated that if marine debris was nearly eliminated in coastal Alabama, beach visits would increase by over 300,000 visitor days

and contribute an additional $35M in tourism spending[8]. The environmental benefits for this program would be to remove and prevent trash from strategic locations where they concentrate to provide large scale protection and restoration of natural resources from project locations all the way to the Gulf coast. Prevention has shown better overall outcomes in reducing mismanaged trash, especially upstream[6], and providing long-term results after activities cease; however, integration of multiple strategies (prevention, removal, and circularity) works best10 and will be encouraged by this program.

So why is this important? Mismanaged trash can have significant impacts not just here in the US but across the globe with plastic trash having the greatest potential to harm the environment, wildlife, and humans. Habitat alteration is caused by trash and debris in rivers and oceanic convergence (accumulation) zones, on beaches, and submerged benthic (at and near the bottom of rivers and oceans) habitats. As debris accumulates, habitat structure may be modified, light levels may be reduced in underlying waters, and oxygen levels may be depleted. These changes can undermine the ability of open water and benthic habitats to support aquatic life. Aquatic plastic debris has been found to accumulate contaminants at concentrations that are orders of magnitude (thousands to millions of times) greater than the surrounding environment. Based on a number of studies, including those conducted by EPA, plastics have the potential to adsorb chemicals of concern from the environment, and serve as a potential global transport mechanism for contaminants of concern into the food chain and potentially to humans who eat seafoods. There is a substantial body of evidence documenting the harmful effects of aquatic plastic debris on river and marine organisms. It has been estimated that plastic marine debris adversely affects at least 267 species globally, including 86% of sea turtles, 44% of seabirds, and 43% of marine mammals[9].

Because this is a program proposal, project activities and therefore anticipated environmental results are not easily estimated. EPA has managed many successful TFW projects which utilized similar activities to what is expected from this program, including:

Geauxing Green: Sustainable Festival Planning (Louisiana Universities Marine Consortium): >155,000 lbs diverted by using 100% sustainable products from 2 Louisiana festivals

Comprehensive Strategy to Create Trash Free Waters (Mobile Bay NEP): >33,000 lbs diverted by using in-situ litter removal devices at 16 locations around Mobile Bay; sustained after project end

Plastics and Trash Pollution Reduction and Prevention (American Bird Conservancy): 31,946 lbs removed from 95 beach cleanups and 11,941 people engaged

Steinhatchee Seagrass Protection and Restoration (FDEP): >8,400 lbs of derelict crab traps removed from Deadman Bay with >360 individuals reached through environmental awareness

Metrics:

Metric Title: Trash Diverted (pounds)
Target: 20000
Narrative: Trash removal is one of the anticipated activities from this program, which could be completed through volunteer trash removal events and trash removal/disposal

devices. This metric would track how much trash was prevented or diverted from land and water and properly disposed or upcycled/recycled.

Metric Title: PRM005 : Monitoring - # monitoring plans developed
Target: 1
Narrative: Monitoring, cataloguing, and reporting of trash removed is one of the anticipated activities from this program. One or more monitoring plans are anticipated and will provide the necessary information to catalog the trash in EPA's Escaped Trash Assessment Protocol (ETAP) and how potential sites were located.

Metric Title: COI002 : Community Engagement / Technical Assistance - # people reached
Target: 100
Narrative: Trash prevention is one of the anticipated activities from this program, which could be implemented through targeted community engagement to both citizens/students and local businesses. Environmental awareness programs can show trash prevention, lifecycle, and/or provide alternative, sustainable products. This metric would track number of individuals reached.

Metric Title: COI005 : Volunteer participation - # volunteers participating
Target: 100
Narrative: Trash removal is one of the anticipated activities from this program, which could be implemented through volunteer trash removal events along the Gulf Coast. This metric would track number of volunteers participating in cleanups as well as any other volunteer-based activity.

Risk and Uncertainties:
General risks are minimal and may involve ensuring grant funds are expediently and efficiently spent in which EPA has significant experience in overseeing TFW projects. Strategic planning will help ensure TFW activities are implemented in high impact locations to provide the greatest trash reductions. Lessons learned from prior projects will be evaluated and included, where appropriate, to improve outcomes for this program.

Some short-term risks and uncertainties can include finding the most effective means of preventing and removing trash, determining optimal locations and communities to implement activities, and using funding efficiently. EPA intends to leverage existing projects, work with knowledgeable and experienced personnel in each state prior to development of funding opportunities, and mirror/leverage hot spot management plans (Project Implementation TIG) or similar plans to mitigate risks associated with implementation. Prior projects have shown little negative impacts to the environment; removal of large trash such as white goods that could damage the environment is avoided or carefully planned to mitigate risk. Impacts from prior TFW activities include the variability in responsiveness and effectiveness of prevention and removal activities. Severe weather (hurricanes) has also impacted current and prior projects by causing delays in implementation.

Long term: TFW projects are unlikely to have vulnerabilities to long-term risks such as changing land use because projects typically have short term activities such as removals (volunteer cleanups) and prevention (community engagement, product substitution). Of suggested

activities, only in-situ collection devices and planning documents even have the potential for use beyond the project and be susceptible to such risks. If collection devices are left long term and not maintained, they are susceptible to damage from the environment. Planning documents will be required to consider short- and long-term risks. Funding opportunities can be written to ensure that these vulnerabilities are considered. No negative long-term risks were readily identified from previous projects. With trash generation increasing, loss of funding to continue these projects is likely the most important long-term risk.

Monitoring and Adaptive Management:
This program intends to utilize EPA's Escaped Trash Assessment Protocol (ETAP) to record the types and amounts of trash diverted (custom metric) throughout the life of the grants. ETAP was developed for use in Trash Free Waters programs and is a quantitative survey tool which provides a standard method for collecting and assessing collected trash and may be applied to a broad range of site types and environments. ETAP cataloguing will provide a consistent, comprehensive, and rigorous method for quantifying diverted trash. Trash age and level of fouling can be analyzed across material types and categories of trash collected. ETAP data can also be used to guide upstream source decisions and allow for adaptive management of projects as data are collected and analyzed. Litter profiles at cleanup sites provide insight on trends and patterns in the volume of litter collected and common item types and brands found. This information can lead to the development of a more targeted and effective community engagement campaign, be used to identify hot spots, and allow for adjustments to targeted prevention and removal activities[9].

EPA anticipates developing at least one plan that details monitoring and adaptive management activities for the program. The number of monitoring plans will depend upon the project activities selected for each state, i.e., if monitoring and adaptive management can be covered in one plan or if multiple plans are needed.

Data Management:
All data will be managed by EPA staff. Until project activities are selected, the universe of activities that will generate data is not known. Prevention and removal will be required activities of any competitive funding opportunity; therefore, anticipated data from the program are number of volunteers participating, number of people reached through community engagement, and pounds of trash diverted for proper disposal or recycle/upcycle. EPA will be responsible for the Observational Data Plan for the program. Number of volunteers and people reached will be tracked and reported by EPA. Information on the trash prevented or diverted will be entered into ETAP spreadsheets and/or the ETAP dashboard on the Debris Tracker application[9.] Data will be made publicly available by the end of the project grant periods. Mechanism for public availability of all data will be determined once projects are established and state requirements are considered. All data management activities will adhere to EPA record keeping policies for safe storage, retention, and accessibility.

Collaboration:
EPA anticipates collaborating with all five Gulf state member organizations to ensure that project activities meet the needs of the state and occur in the most impacted communities along the Gulf coast. EPA also anticipates leveraging work at current TFW projects across the Gulf coastal region. Opportunities may also arise from Marine Debris projects funded by NRDA Trust

Implementation Groups (TIGs) across the Gulf. All Gulf states in the Region-wide TIG funded Marine Debris project have created Hot Spot Management Plans that EPA hopes to leverage for determining locations to target for prevention and removal activities. EPA will incorporate the format used as the basis for these management plans, where applicable, in developing the TFW program monitoring plan(s). EPA will regularly communicate with the appropriate EPA TIG representatives as well as other TFW project managers to find leveraging opportunities and to collaborate on common goals across the Gulf coast. Working together should maximize efficiencies and afford the greatest opportunities for success.

Public Engagement:
Initially the five Gulf states will be engaged as described above in the collaboration section. Additional public engagement is anticipated from the subrecipients (grants) funded by this program. While specific projects are not known, it is anticipated that a significant portion of prevention will be accomplished through community engagement activities, which is a cornerstone of TFW projects. Awareness is the key to making trash free waters self-sustaining and developing future stewards of (trash free) environments. Key messages for this TFW program will be engaging the public, particularly students, on the health issues and ecosystem impacts associated with mismanaged trash; working with businesses to provide sustainable alternatives; informing the public on the lifecycle of trash and proper vs improper disposal (recycling); encouraging creative upcycling activities; and increasing overall awareness of how trash impacts our economies, our health, and the environment. Public engagement by subrecipients may also include collaboration with citizens and communities to determine the best locations to implement removal and prevention projects.

Leveraging:

Funds: $10,000,000.00
Type: Co-funding
Status: Proposed
Source Type: Other Federal
Description: EPA is proposing to add $10M in co-funding from the annual appropriation to augment the total budget for this program.

Environmental Compliance:
This proposed program includes prevention activities (sustainable replacement products, waste lifecycle, environmental stewardship), and removal activities, potentially including in-situ collection devices (e.g., Litter Gitter, Seabin, trash wheel) that capture trash in rivers, streams and other fresh, brackish, or marine water bodies. Some portions of this program (e.g., technical assistance, public affairs activities, and/or training) can be covered by the Council's Categorical Exclusion (CE) Section 4(d)(1)(vi). The trash removal activities (and possibly other components) may have environmental impacts not covered by that or any other Council CE.

Those activities that are not covered by a Council CE can be included in FPL Category 1 (funding approved) if EPA provides documentation demonstrating compliance with the National Environmental Policy Act, Endangered Species Act, Magnuson Stevens Act, National Historic Preservation Act and the Fish and Wildlife Coordination Act, as applicable. In the absence of such documentation, the implementation funding for the proposed removal activities will need to be placed in FPL Category 2, pending future FPL amendment. In that case, the proposal would need to be modified accordingly, indicating that a portion of the implementation budget is in FPL

Category 2.

Bibliography (All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

1Battawi, Abdullah et al. “In-Stream Marine Litter Collection Device Location Determination Using Bayesian Network.” Sustainability vol. 14,10 6147. 18 May. 2022, doi:10.3390/su14106147.

2Boonpracha, Jong, et al. “Upcycling for repurposing waste into Creative Products.” Creativity Studies, vol. 17, no. 1, 9 Apr. 2024, pp. 192–206, https://doi.org/10.3846/cs.2024.18128.

3EPA Trash Capture Projects, Environmental Protection Agency, www.epa.gov/trash-free-waters/trash-capture-projects#tmc. Accessed 16 Jan. 2025.

4Mueller, William. “The effectiveness of recycling policy options: Waste diversion or just diversions?” Waste Management, vol. 33, no. 3, Mar. 2013, pp. 508–518, https://doi.org/10.1016/j.wasman.2012.12.007.

5“Research for the Most Productive Blue Economy in the United States.” NOAA’s Atlantic Oceanographic and Meteorological Laboratory, 2020, www.aoml.noaa.gov/wp-content/uploads/2020/12/Omics.pdf.

6Sakai, Shin-ichi, et al. “Waste prevention for sustainable resource and waste management.” Journal of Material Cycles and Waste Management, vol. 19, no. 4, 21 Feb. 2017, pp. 1295–1313, https://doi.org/10.1007/s10163-017-0586-4.

7“State of the Science White Paper: A Summary of Literature on the Chemical Toxicity of Plastics Pollution to Aquatic Life and Aquatic-Dependent Wildlife.” EPA Trash Free Waters, Environmental Protection Agency, Dec. 2016, 19january2021snapshot.epa.gov/trash-free-waters/impacts-mismanaged-trash_.html.

8“The Effects of Marine Debris on Beach Recreation and Regional Economies in Four Coastal Communities: A Regional Pilot Study.” Abt Global, July 2019.

9“U.S. EPA Escaped Trash Assessment Protocol (ETAP) Reference Manual.” EPA Trash Free Waters, Apr. 2021, www.epa.gov/sites/default/files/2017-02/documents/tfw-trash_free_waters_plastics-aquatic-life-report-2016-12.pdf.

10Willis, Kathryn, et al. “How successful are waste abatement campaigns and government policies at reducing plastic waste into the marine environment?” Marine Policy, vol. 96, Oct. 2018, pp. 243–249, https://doi.org/10.1016/j.marpol.2017.11.037.

11Zelenika, Ivana, et al. “Toward Zero waste events: Reducing contamination in waste streams with Volunteer Assistance.” Waste Management, vol. 76, June 2018, pp. 39–45,

https://doi.org/10.1016/j.wasman.2018.03.030.

12Zhao, Xianhui, et al. “Plastic waste upcycling toward a circular economy.” Chemical Engineering Journal, vol. 428, Jan. 2022, p. 131928, https://doi.org/10.1016/j.cej.2021.131928.

13Zorpas, Antonis A et al. “Effectiveness of waste prevention program in primary students' schools.” Environmental science and pollution research international vol. 24,16 (2017): 14304-14311. doi:10.1007/s11356-017-8968-7

Budget

Project Budget Narrative:
EPA is asking for $9M from FPL 4. EPA is anticipating approximately $1M in returned funds from IAAs in FPL1. EPA will add $10M in co-funding to the estimated budget to have a total budget of $20M.

An IAA would be established between EPA and RESTORE Council to fund the program that EPA would manage. EPA anticipates that 1% of the $9M will go towards Project Management [EPA Personnel, Travel, and Indirect]. MAM and data management tasks are part of Project Management and are not broken out separately in the table below because of the low percentages expected. The remainder of the funds (99%) would go to subrecipients (to EPA managed grants) for implementation of projects.

Total FPL Project/Program Budget Request:
$ 9,000,000.00

Estimated Percent Monitoring and Adaptive Management: 0 %
Estimated Percent Planning: 0 %
Estimated Percent Implementation: 99 %
Estimated Percent Project Management: 1 %
Estimated Percent Data Management: 0 %
Estimated Percent Contingency: 0 %

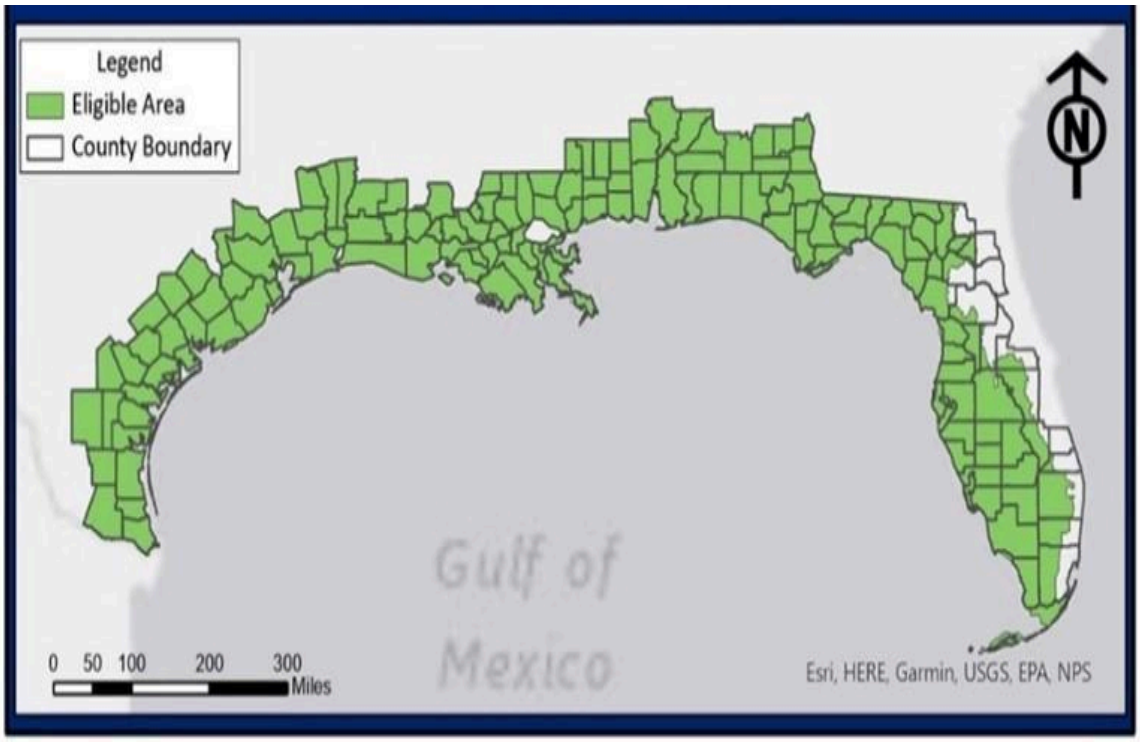
Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
EPA's original TFW grant to MBNEP was the genesis of trash collection devices currently used in 3 Mile Creek watershed, which drains into Mobile Bay. The TFW program has since expanded to add additional grants and 16 devices now paid for by local municipalities across both Alabama coastal counties. EPA wishes to replicate this success along the Gulf Coast and needs additional funding to expand the program.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	N/A	Note not provided.
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Eligible Coastal Counties

Other Uploads

GIS Data_1:
EPA_FPL01_GoMCEP.zip
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/4141/83

Council Staff Review: Trash Free Waters Program Benefiting Communities in the Gulf Coast

FPL Internal Staff Review

Project/ Program	Trash Free Waters Program Benefiting Communities in the Gulf		
Primary Reviewer	Amy Newbold	Sponsor	EPA
EC Reviewer	John Ettinger	Co-Sponsor	
			All States

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	
2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	
3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	
4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	
5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	
6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes
Notes	
7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.
8. Have appropriate metrics been proposed to support all primary and	Yes

secondary goals?	
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	More information needed
Notes	Some portions of this program (e.g., education and outreach) can be covered by the Council's CE Section 4(d)(1)(vi). An unknown portion of this implementation work may have impacts not covered by that CE. Unless EPA provides NEPA, ESA, MSA and NHPA documentation to cover this latter portion, this part of the program will need to be in FPL Cat 2. Note: Restore Council staff worked with the state to resolve these comments.

Summary of Best Available Science Review: Trash Free Waters Program Benefiting Communities in the Gulf Coast

The evaluation of the proposal for the Trash Free Waters (TFW) program reflects an appreciation for its strong foundation and history of success, particularly in the Gulf Coast region. Reviewers acknowledged the program's clear goals and alignment with public data and previous TFW achievements, emphasizing its potential to make a meaningful impact on waterway health.

The flexible structure of the proposal, which allows for future project selection, offers opportunities for innovation and responsiveness to local needs. This adaptive approach is seen as a strength, as it enables the program to evolve and incorporate new priorities and technologies over time.

While the proposal would benefit from additional detail—such as expanded discussions on methodologies, risk mitigation strategies, and the inclusion of peer-reviewed references—reviewers recognize that these gaps stem largely from the proposal's preliminary nature and the broad scope of its objectives. The mention of EPA's Escaped Trash Assessment Protocol (ETAP) demonstrates a commitment to using established tools for monitoring and evaluation, with room for refinement as specific projects are defined.

Importantly, the proposal highlights emerging concerns such as microplastics, showing an awareness of complex pollution challenges. Reviewers noted that the proposal needed clarification on the scope of the proposed removal activities, particularly whether they will target only visible pollutants like litter or also non-visible pollutants such as dissolved substances and micro-sized pollutants (e.g., sediments, phosphorus, nitrogen, microplastics). Some reviewers noted the absence of peer-reviewed support, particularly in areas like health impacts, economic costs, and risks. Additionally, the proposal does not address potential long-term environmental risks and lacks sufficient discussion on mitigating short-term implementation risks.

Overall, reviewers see the TFW proposal as an initiative with a strong legacy, and they encourage further elaboration and integration of recent research to fully realize its potential. Reviewers agree that the proposal would benefit from a more rigorous discussion of methodologies, peer-reviewed sources, and potential risks. With those enhancements, the EPA TFW program is well-positioned to deliver measurable environmental benefits.

Summary of EPA's Response to BAS Comments:

The Environmental Protection Agency's response to the BAS comments on the Trash Free Waters (TFW) program clarifies several points raised by reviewers. The program, developed by the EPA, primarily cites EPA sources due to its established nature and previous success in similar activities. The Gulf of America Division (GAD) acknowledges that a detailed BAS review is challenging given the unknown nature of specific projects and activities. However, GAD intends to incorporate peer-reviewed articles and further details to support the proposed categories of activities (prevention, removal, circularity), and update the proposal as needed. EPA GAD will also review risks and uncertainties based on prior experiences with similar TFW projects.

In response to concerns about the lack of specific metrics, GAD plans to revise the application to include more details on how EPA will ensure the quality and consistency of data through validated trackers like ETAP and Marine Debris. They also plan to provide more detailed information on assessment methods and metrics for success, focusing on trash diversion.

GAD clarified that the current focus of the program is on visible trash, though future funding opportunities may address microplastics and other pollutants. They plan to add discussions on long-term environmental risks and short-term risks associated with implementation. Additionally, the proposal will be updated to include more examples of successful projects and lessons learned from less successful ones. GAD intends to develop a monitoring plan for the program to track the efficiency and cost-effectiveness of trash removal activities and will ensure that funding recipients are required to submit comprehensive monitoring plans. Despite concerns about the scope of funding, GAD acknowledges the complexity of trash management and will review provided resources for potential inclusion in the proposal.

Best Available Science Review Forms: Trash Free Waters Program Benefiting Communities in the Gulf Coast

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Trash Free Waters Program Benefiting Communities in the Gulf Coast
Location (If Applicable): All coastal counties within RESTORE boundary are eligible. Locations will be determined once projects are selected via competitive funding opportunities, but they are anticipated to be spread equally among the five Gulf states benefitting communities.
Council Member Bureau or Agency: Environmental Protection Agency
Type of Funding Requested: Implementation

Reviewed by: In Gulf 2
Date of Review: 9/23/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	
The references listed in this proposal are, at best, a little light. There are seven cited works in the bibliography. Two of the references do not have details about the citation information, and instead include weblinks to archived pages. Of these two references, one was reviewable by searching for the title of the work, but the other was un-retrivable at the time of this review. I do believe that there is ample work that has been published citing the ETAP protocol, and	

perhaps my familiarity with this program is allowing for some bias in this statement, but the research teams citation of the protocol is probably sufficient.

What I do find lacking is the use of peer-reviewed or publicly available information to support the project justification. Only one reference could reseasonably discuss the health impacts of pollution; one reference provided economic impact. Of the seven sources, one (1) was unviewable due to it being an archived webpage with a broken link (snapshot.epa.gov), and two others were webpages that were landing places for considerable information provided with links.

Question 2.

If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes

Comments:

This proposal had references that included study areas in the proposed project area, such as the Alabama coast. Where there are not specific instances, the logic used in both the proposal narrative and the supporting literature reasonably support adaptation or scalability to other locales.

Question 3.

Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information

Comments:

The literature sources represented in this proposal are presented in a fair and unbiased manner. While the review instructions did not site a specific format to check the citations against (e.g. APA, MLA, Chicago, or the specific requirements of a scientific journal), the citations were at least inconsistent between references. For instance, one citation was written in a format of author, year (English et al, 2019), and in another instance only citing agency source (Source – EPA).

Question 4.

Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information

Comments:

More information should be used to expand on risks. Risk and uncertainties did not have a substantial narrative to address these concerns, merely noting "General risks are minimal and may involve ensuring grant funds are expediently and efficiently spent in which GMD has significant experience in overseeing TFW projects."

The authors did mention that the proposed project has future climate risks, but did not connect this identified risk to the project, or how the project planners were going to mitigate these risks in their planning efforts.

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A

Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes

Comments:

The EPA ETAP program and Trash Free Waters are well-respected and tested programs; there is reasonable justification that continuing these programs in the Gulf coast region are based on sound science.

Question B

Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes

Comments:

The EPA ETAP program and Trash Free Waters are well-respected and tested programs; there is reasonable justification that expanding these projects in this project area will further quality, objectivity and integrity of trash-reduction and data gathering of such programs. However, I feel that my assessment of these programs is because of some prior research into ETAP and TFW. The proposal would be better served by the authors if the application was clarified and boistered with additional supporting information and references.

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	No
Comments:	
No references or scientific basis was given in this proposal effort to address risks and uncertainties with science.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
Trash Free Waters is a successful program; this project will also be successful with similar planning.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Project narrative appears to have clearly defined goals and objectives.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
The proposal described the methods proposed and some justification of why the method was selected. However, I think the strength of the proposal would be better served by having a deeper dive into the methodology and the effectiveness of the protocol.	

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes

Comments:

This proposal appears to give justification to the benefits of the project. However, I do feel that the proposal effort would be better substantiated with additional references of available science.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes

Comments:

Cited measures/metrics appear to align with the Comprehensive Plan as defined by the RESTORE Act.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information

Comments:

This area of the proposal effort was significantly lacking. The proposal did not appear to look at prior best available science for mitigating measures of risk. The proposal would be much better served to evaluate these risks.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information

Comments:

No portion of the narrative addresses unanticipated adverse outcomes or socioeconomic impacts. As such, no effort was given to mention a plan or mitigation measures for such instances.

Question H

Does the project/program consider recent and/or relevant information in discussing the elements above?	No

Comments:

Because the impacts and risks were not addressed, nor plans developed for mitigation as mentioned above, there is no significant elements discussing the relevant or recent information.

Question I

Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information

Comments:

My interpretation of this proposal leaves the impression that the authors rely on the past successes of Trash Free Waters and ETAP program, and does not dive into explanation in the narrative. The proposal narrative certainly lacks in substantial discussion of risks and uncertainties.

Question J

Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes

Comments:

The authors did provide information related to developing a project data plan, as well as mentioning that volunteers will be tracked in the program, and will adhere to EPA record keeping policies.

The narrative stated, “Until project activities are selected, the universe of activities that will generate data is not known.” While this may be true, I do believe the proposal would have been strengthened if the authors mentioned the quality assurance and project planning that EPA usually requires for their projects, and how QAPP-development would address statistical information and quality control.

Please summarize any additional information needed below:

No further information at this time.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Trash Free Waters Program Benefiting Communities in the Gulf Coast
Location (If Applicable): All coastal counties within RESTORE boundary are eligible. Locations will be determined once projects are selected via competitive funding opportunities, but they are anticipated to be spread equally among the five Gulf states benefitting communities.
Council Member Bureau or Agency: Environmental Protection Agency
Type of Funding Requested: Implementation

Reviewed by: Out of Gulf
Date of Review: November 1, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	
As a program proposal, the methods have been deferred to a later, internal stage of project solicitation and review. In my judgment this is a shortcoming of the current proposal, because it separates the evaluation of Best Available Science by the RESTORE Council from the specific projects for which the funds will be expended. The objects of the program are well-supported and widely recognized.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Need more information
Comments:	
Please see above response. However, there is every reason to expect that selected methods would be largely or entirely relevant to the Gulf Coast region regardless of their origin.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
This is not a well-worded question for the proposal in question. The cited sources are correctly represented, but almost none of them are provided.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	No
Comments:	
I see no such acknowledgment. There is a “Risk and Uncertainty” narrative paragraph, for which “trust us” appears to be the primary message.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	No
Comments:	

The need for such a program is well-supported and entirely justifiable. The devil is in the details, however, since it will be individual projects that actually are or are not effective. There is no indication that BAS has been, or will be, applied to ensure that such projects will achieve their intended benefits. If this is an acceptable deference of BAS application, so be it—but RESTORE will have no role in those subsequent project decisions. Evidence of such a criterion in future project evaluation would not have been a difficult inclusion in the current program proposal.

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
To the extent that the proposal is for a problem of widely recognized importance, “yes.” See above for uncertainties about whether the funds as actually expended will meet this criterion.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	No
Comments:	
Please see above answers. The “Risk and Uncertainties” section of the proposal is inadequate.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	

Question B	
Does the project/program have clearly defined goals and objectives?	Need more information
Comments:	

Goals, yes. Objectives (i.e., quantifiable targets that would constitute “success”), none that are meaningful. There is a list of metrics, but the quantities specified are absurd for a proposaed 7-year, $20M program (1 monitoring plan, 100 volunteers).

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	No
Comments:	
Please see narrative comments at the end of this form.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Uncertain if this is a relevant criterion for a program. With due deference for the limitations of a programmatic proposal, “yes.”	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	No
Comments:	
I do not see these in any meaningful fashion. See Q.B., above.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	No
Comments:	
No—it asserts that the program will not be vulnerable to climate change but provides no justification.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	No
Comments:	
None of these are present in the proposal.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	No
Comments:	
No—recent literature and other sources is lacking. See comments below.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
Since the Trash Free Waters program has existed for 11 years, there is surely a compendium of “lessons learned” that would be available to the program managers and project evaluators. None of that has been shared as part of the present proposal, however.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is the appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
The proposal invokes EPA's Escaped Trash Assessment Protocol (ETAP) as the quantitative framework for data management and analysis. Its evaluation is beyond the scope of my review, but presumably it is a robust and appropriate framework for such activities.	

Please summarize any additional information needed below:

There is much to like about this proposal, but not a lot of substance to it. As noted in the RESTORE preamble, "the program proposal information may not include project-specific details." This proposal has taken that guidance to heart, but in so doing has missed some opportunities to show how best available science has, and will continue to, guide the selection of individual projects for inclusion in this program.

The focus of EPA on trash reduction is laudatory. Its program, "Trash Free Waters," was established in 2013, and the range and quantity of its activities since that time are impressive. Its webpage of sponsored project (https://www.epa.gov/trash-free-waters/trash-free-waters-projects) lists about two dozen projects, which is either "a lot" or "rather few," depending on whether this is or is not a comprehensive list of all program activities since its inception.

The Gulf States have been an early focus of the TFW Program, marked by publication of the "Atlas of Gulf States Litter Control Policies and Programs" in December 2016 (EPA 842-R-16-004). Most of that document is an inventory of existing state and local trash-reduction initiatives, noting "the great value of having basic information on actions that other public organizations are taking to reduce and prevent aquatic trash. Such information can help state and municipal governments and other interest groups learn about successful actions being taken elsewhere" (p.6). The document otherwise offers only broad descriptions of the problems of trash in waterways, provides limited references to support the value and relative efficacy of alternative trash-reduction strategies, and articulates the program's goal "of achieving zero loadings of trash entering large aquatic ecosystems by 2025." The current request to RESTORE for $9M suggests that this goal is still far from being achieved, and it raises some question as to whether the program's actions to date have been ineffective, or simply insufficient in the face of a truly massive and challenging problem.

What appears to be lacking in this proposal is any guidance on the types of measures that are likely to be most effective at trash reduction. Presumably this level of guidance has been deferred to later stages of project solicitation and review, but in my judgment this is a missed opportunity. Trash as an environmental pollutant has seen a great deal of research attention over the last five years, but little of that is evident in this program proposal, boding ill for any subsequent project solicitations. In the last 5 years, a quick search using the keywords "trash" and "pollution" yielded 262 research articles. Of course, such a broad search yields many results of irrelevance to the current proposal, but several stand out as potentially offering useful guidance for the most effective use of the program's resources, of which a few examples are listed below. No alternative basis that meets a threshold of Best Available Science for the program's past and current sponsored projects (e.g., the current open solicitation for the $3M "Trash Free Waters Art and Slogan Competition" [EPA-R4-GM-2024-TFWASC]) is evident.

Somer examples of recent papers with potential relevance to the current proposal, from a Web of Science search on "trash" and "pollution," 2020–2024:

Baechler, Britta R., De Frond, Hannah, Dropkin, Lisa, Leonard, George H., Proano, Leonardo, Mallos, Nicholas J. 2024. Public awareness and perceptions of ocean plastic pollution and support, for solutions in the United States. FRONTIERS IN MARINE SCIENCE 10, doi 10.3389/fmars.2023.1323477.

Badawi, Adel Nasser, Ahmed, Tarek Sayed Adelazim, Alotaibi, Eid Kaadan, Abbas, Ihab Saad, Ali, Ehab Rabee, Shaker, Eman Sarhan M. 2024. The Role of awareness of consequences in predicting the local tourists' plastic waste reduction behavioral intention: The extension of planned behavior theory. SUSTAINABILITY 16, doi 10.3390/su16010436.

Greeves, Scott. 2023. Tracking Trash: Understanding patterns of debris pollution in Knoxville's urban streams. SUSTAINABILITY 15, doi 10.3390/su152416747.

McLaughlin, Karen, Mazor, Raphael, Sutula, Martha, Schiff, Kenneth. 2023. Regional assessment of trash in Southern California coastal watersheds, United States. FRONTIERS IN ENVIRONMENTAL SCIENCE 11, doi 10.3389/fenvs.2023.1210201.

Nikiema, Josiane, Asiedu, Zipporah. 2022. A review of the cost and effectiveness of solutions to address plastic pollution. ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH 29, doi 10.1007/s11356-021-18038-5.

Bhuyan, Md. Simul, Venkatramanan, S., Selvam, S., Szabo, Sylvia, Hossain, Md. Maruf, Rashed-Un-Nabi, Md., Paramasivam, C. R., Jonathan, M. P., Islam, Md. Shafiqul. 2021. Plastics in marine ecosystem: A review of their sources and pollution conduits. REGIONAL STUDIES IN MARINE SCIENCE 41, doi 10.1016/j.rsma.2020.101539.

Appendix G: United States Department of Agriculture Proposal Package

Appendix G: United States Department of Agriculture Proposal Package.....1
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Gulf Coast Conservation Reserve Program

RESTORE Council Proposal Document

General Information

Title:
Gulf Coast Conservation Reserve Program

Project Abstract:
The GCCRP was established through the Council's 2015 Initial Funded Priorities List and continued in FPL 3b. USDA is currently implementing the program in Texas, Mississippi, Alabama, and Florida for the purpose of protecting and restoring critical wildlife habitat and improving water quality through the development of conservation and restoration plans.

The GCCRP for the 2026 FPL will build upon the restoration and conservation progress made through the initial and secondary program funding, and will support the primary RESTORE Comprehensive Plan goal to restore water quality and quantity through the implementation of conservation practices and restoration activities to address the priority resource concerns identified in the planning phase.

The health of the Gulf of America depends upon the health of its estuaries, and the health of those estuaries are influenced by what happens upstream along tributary rivers including the Mississippi.

GCCRP activities will allow for conservation planning on private lands including, but not limited to, ecosystem restoration by conducting soil and water conservation for the benefit of water quality to priority bays and estuaries. Program duration is 4 years.

This program will serve to assist willing private landowners with implementing conservation measures that improve water and wildlife habitat conditions. The project will result in incremental improvements to water quality with comprehensive conservation measures being implemented in the watershed.

FPL Category: Cat1: Planning Only
Activity Type: Program

Program: Gulf Coast Conservation Reserve Program

Co-sponsoring Agency(ies):
TX
AL

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

Priority Criteria Justification:
(1) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands
of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.
(3) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

The intent of the program is to allow for conservation planning on private lands including, but not limited to ecosystem restoration by conducting soil and water conservation for the benefit of water quality to priority bays and estuaries. The health of the Gulf depends upon the health of its estuaries, and the health of those estuaries is influenced by what happens upstream along tributary rivers including the Mississippi. USDA staff will engage state and local conservation partners in planning efforts to identify tracts of lands within the Gulf Coast Region that could benefit from conservation measures that would address natural resources and wildlife habitat degradation.

These tracts of lands will be prioritized by watersheds (or sub-watersheds) that provide the most conservation benefit for the dollar invested. Conservation, forest management, and wildlife habitat plans will be developed to address the private landowners' conservation goals. The plans will document the natural resource concerns and conservation practices that would address the resource concerns. The plans will be developed with a regional perspective that fully considers the restoration and conservation needs of the Gulf Coast. Conservation practices that address water quality, wildlife habitat restoration and protection, and farmland preservation will be considered during the planning process.

Project Duration (in years): 4

Goals
Primary Comprehensive Plan Goal:
Restore Water Quality and Quantity

Primary Comprehensive Plan Objective:
Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Objectives:
Restore, Improve, and Protect Water Resources

Secondary Comprehensive Plan Goals:
Restore and Conserve Habitat

PF Restoration Technique(s):
Reduce excess nutrients and other pollutants to watersheds: Agriculture and forest management
Reduce excess nutrients and other pollutants to watersheds: Erosion and sediment control

Location

Location:
Alabama and Texas

HUC8 Watershed(s):
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido Bay)

South Atlantic-Gulf Region(Alabama) - Alabama(Middle Alabama)
Texas-Gulf Region(Sabine) - Sabine(Upper Sabine)
Texas-Gulf Region(Sabine) - Sabine(Middle Sabine)
Texas-Gulf Region(Sabine) - Sabine(Lake Fork)
Texas-Gulf Region(Neches) - Neches(Upper Neches)
Texas-Gulf Region(Neches) - Neches(Middle Neches)
Texas-Gulf Region(Neches) - Neches(Lower Neches)
Texas-Gulf Region(Neches) - Neches(Village)
Texas-Gulf Region(Neches) - Neches(Pine Island Bayou)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(West Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Spring)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(East Fork San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Buffalo-San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(North Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(West Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Austin-Oyster)
Texas-Gulf Region(Brazos Headwaters) - Brazos Headwaters(Salt Fork Brazos)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Lower Brazos)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Lower Colorado(Lower Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(East Matagorda Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Nueces Headwaters)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(West Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(San Fernando)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Baffin Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central

Laguna Madre)

State(s):
Texas
Alabama

County/Parish(es):
AL - Baldwin
AL - Mobile
TX - Aransas
TX - Brazoria
TX - Calhoun
TX - Cameron
TX - Chambers
TX - Galveston
TX - Harris
TX - Jackson
TX - Jefferson
TX - Kenedy
TX - Kleberg
TX - Matagorda
TX - Nueces
TX - Refugio
TX - San Patricio
TX - Victoria
TX - Willacy

Congressional District(s):
TX - 22
TX - 27
TX - 14
AL - 1
TX - 34

Narratives

Introduction and Overview:
The GCCRP was established through the Council's 2015 Initial Funded Priorities List. USDA is currently implementing the program in Texas, Mississippi, Alabama, and Florida for the purpose of protecting and restoring critical wildlife habitat and improving water quality through the development of wildlife habitat, conservation, and forest management plans.

The GCCRP for FPL 4 will build upon the restoration and conservation progress made through the initial and secondary program funding and will support the primary RESTORE Comprehensive Plan goal to restore water quality and quantity through the implementation of conservation practices and restoration activities to address the priority resource concerns identified in the planning phase.

The health of the Gulf depends upon the health of its estuaries, and the health of those estuaries is influenced by what happens upstream along tributary rivers including the Mississippi. GCCRP activities will allow for conservation planning on private lands including, but not limited to,

ecosystem restoration by conducting soil and water conservation for the benefit of water quality to priority bays and estuaries. Program duration is 4 years.

Proposed Methods :
Projected to make the greatest contribution to restoring and protecting natural resources: The The future health of the region's ecosystem will be decided on private lands. The five states on the Gulf of America encompass more than 290 million acres. Private agricultural and forest lands account for 86 percent of those acres. Consequently, the management of private lands has a tremendous influence on the health of the region's industries and natural resources, including the quantity and quality of water flowing into the gulf's estuaries, fisheries and other wildlife. Through an incentive-based, voluntary approach, USDA partners with farmers, ranchers, and landowners on private lands to sustain and enhance natural resources across the region. This proposal is for the continuation of conservation/restoration implementation in Alabama and Texas.

Environmental Benefits:
This program will serve to assist willing private landowners with implementing conservation measures that improve water and wildlife habitat conditions. The project will result in incremental improvements to water quality with comprehensive conservation measures being implemented in the watershed. The conservation implementation will be conducted with the landowner's conservation goals in mind, enabling greater ownership in conservation and management activities that affect water quality and wildlife habitat conditions within the Gulf Coast Region. Outcomes will include direct improvements in water quality, wetland and upland wildlife habitat, and forest health. "ACT" principles to "Avoid, Control, and Trap" nutrients and sediments will be used. 1) avoiding excess nutrient loss; 2) utilizing conservation practices that control runoff losses in-field; and 3) trapping nutrient and sediment losses that cannot be avoided or controlled.

Metrics:

Metric Title: COI003 : Outreach/ Education/ Technical Assistance - # people enrolled - BMPs
Target: 50
Narrative: Enrollment of agricultural landowners (program enrollment).

Metric Title: COI002 : Outreach/ Education/ Technical Assistance - # people reached
Target: 100
Narrative: Outreach and Technical Assistance to agricultural landowners.

Metric Title: HC002 : Conservation easements - Miles of shoreline under long-term easement
Target: 5000
Narrative: Acres benefited by conservation/restoration.

Risk and Uncertainties:
The public is familiar with the restoration/conservation approach associated with this program. There are no anticipated long-term adverse impacts associated with the implementation of conservation and best management practices.

The proposed program is voluntary, and is therefore subject to the interest and capacity of

agricultural landowners to implement conservation/restoration practices.

Monitoring and Adaptive Management:
Practice implementation practices will be monitored for performance with respect to the NRCS conservation practice standards and planned conservation practice physical effect analysis. Corrective actions will be performed where deemed necessary to ensure that applied practice adequately address the natural resource concerns.

Data Management:
Data for this project will be managed according to RESTORE Council policy and procedures.

Collaboration:
USDA will continue to collaborate and coordinate through an extensive network of conservation partners, including DWH Trustees, other state and local agencies, and private for- and nonprofit organizations. More specifically, USDA will engage its network of public and private partnerships that work collaboratively with farmers, ranchers, and private landowners to plan and install an array
of conservation measures to address water quality and wildlife habitat concerns along the Gulf. This
network is well-suited to provide cost effective and timely assistance to benefit the Gulf ecosystem restoration effort. USDA will work closely with state and federal agencies in all states to
help guide the prioritization and planning of GCCRP implementation.

Public Engagement, Outreach, and Education:
USDA will engage private landowners to introduce and encourage the adoption of conservation practices.

Leveraging:
N/A
Environmental Compliance:
Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969.

In addition to the programmatic evaluations discussed above, NRCS undertakes site specific environmental evaluations (EE) to address NEPA requirements, other requirements for protection of
the environment, and NRCS regulations. This evaluation will be documented in the CPA-52 (the NRCS
EE form) before conservation/restoration implementation is initiated. The EE assesses the effects of
conservation alternatives and provides information for the purpose of determining the need for additional consultation.

In situations where a single conservation practice may result in increased risk to the condition of another resource, additional conservation practices are integrated into the conservation plan to

avoid creating new resource concerns. The EE process helps to ensure that all potential impacts to
natural resources are identified, and appropriate alternatives and practices are available to the landowner. Each conservation plan and contract/agreement will be accompanied by an EE.

Bibliography *(All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America)*:

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No. 27, February 2010 Rules and Regulations 7 CFR Part 650 RIN 0578–AA55
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Georgia, United States. Journal of Soil and Water Conservation May 2020, 75 (3) 376-386
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Fund
https://dnr.maryland.gov/streams/Documents/MeasuringEffectivenessOfBMPsWEB.pdf
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United States Department of Agriculture, Natural Resources Conservation Service
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/entsc/?cid=nrcs144p2_027212
Nine Step Conservation Planning Process
United States Department of Agriculture, Natural Resources Conservation Service
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=nrcs144p2_015695
Conservation Practices Standards and Information Sheet/Practice Overview United States Department of Agriculture, Natural Resources Conservation Service
https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849
Conservation Practices Physical Effects (CPPE) and Network Effects Diagram United States Department of Agriculture, Natural Resources Conservation Service
https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849
Conservation Effects Assessment Project
United States Department of Agriculture, Natural Resources Conservation Service
https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/
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Department of Agricultural and Consumer Economics, College of ACES, University of Illinois, Policy
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https://www.nfwf.org/gulf-environmental-benefit-fund/gulf-coast-ecosystemrestorationpartnership-five-year-report
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Evaluation of the Migratory Bird Habitat Initiative: Report of Findings
R. Kamiski and J. Brian Davis
Mississippi State University
Forest and Wildlife Research Center Mississippi State University Research Bulletin
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/initiatives/?cid=stelprdb1269772
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http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/home/?&cid=stelprdb1046039

Budget

Project Budget Narrative:

The United States Department of Agriculture is proposing $3 Million in Council-Selected Restoration Component funding for the Gulf Coast Conservation Reserve Program (GCCRP). The sponsor is the U.S. Department of Agriculture (USDA), through the Natural Resources Conservation Service (NRCS). This includes planning and implementation funds as FPL Category 1. The GCCRP was established through the Council's 2015 Initial Funded Priorities List. USDA is currently implementing the program in Texas, Mississippi, Alabama, and Florida for the purpose of protecting and restoring critical wildlife habitat and improving water quality through the development of wildlife habitat, conservation, and forest management plans.

The GCCRP for FPL4 (Alabama and Texas) will build upon the restoration and conservation progress made through the initial program funding, and will support the primary RESTORE Comprehensive Plan goal to restore water quality and quantity through the implementation of conservation practices and restoration activities to address the priority resource concerns identified in the planning phase.

Total FPL Project/Program Budget Request:
$ 3,000,000

Estimated Percent Monitoring and Adaptive Management: 5 %
Estimated Percent Planning: 10 %
Estimated Percent Implementation: 75 %
Estimated Percent Project Management: 5 %

Estimated Percent Data Management: 5 %
Estimated Percent Contingency: N/A

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
Program scalability is subject to acres to be treated and conservation/restoration practices to be applied.

This program is scalable; however, it may not be feasible to fund the project below the $1 million dollar threshold for a particular state. The demand for technical and financial assistance to implement conservation will exceed the available funding. The number of landowner contracts and acres treated will be a function of funds invested.

Environmental

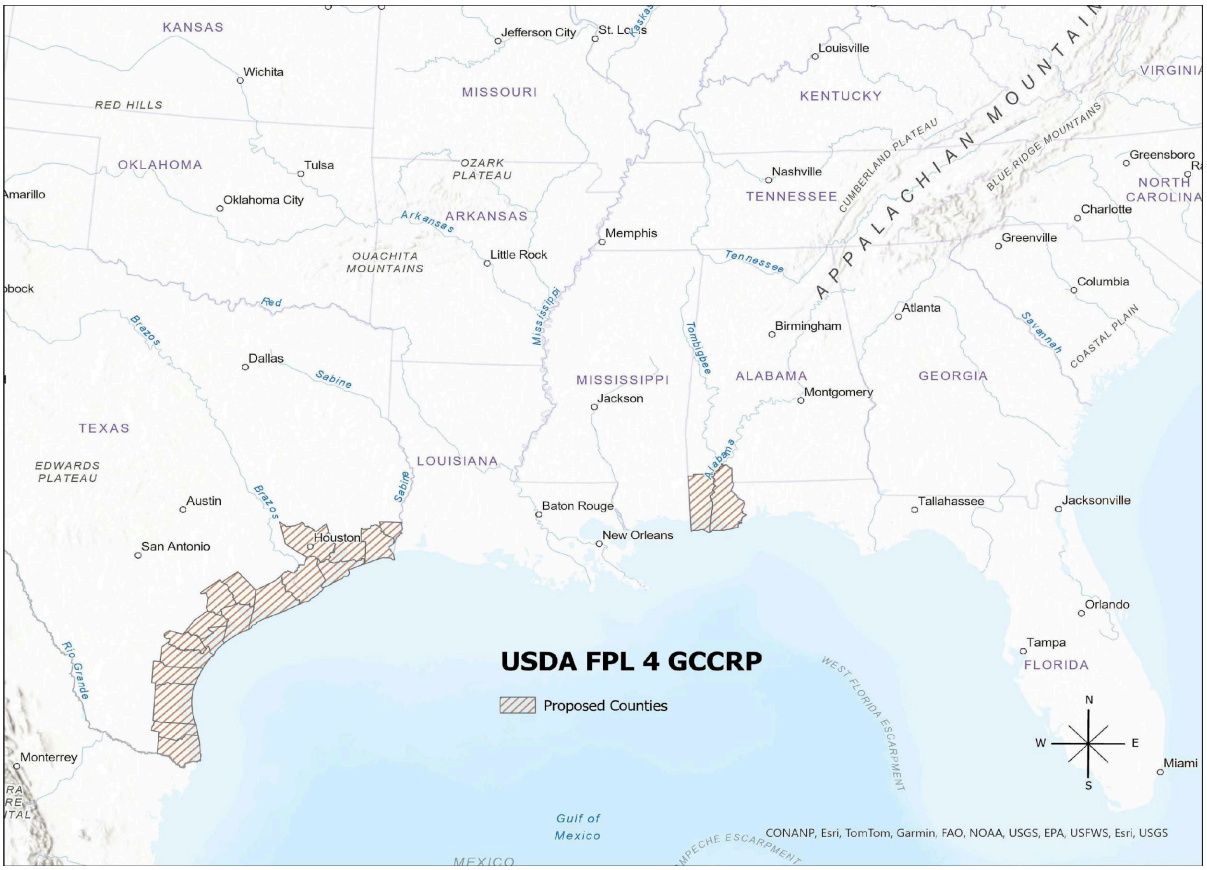
Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
Endangered Species Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
National Historic Preservation Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has

		categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
Coastal Zone Management Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
Coastal Barrier Resources Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.

Farmland Protection Policy Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
Clean Water Act (Section 404)	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
Bald and Golden Eagle Protection Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions

		that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
Clean Air Act	Yes	Continuation of the program from the initial FPL. The USDA - NRCS Service has categorical exclusions (CEs) which are actions that the Agency has determined do not individually or cumulatively have a significant effect on the human environment and, thus, should not require preparing an environmental assessment (EA) or environmental impact statement (EIS) under the National Environmental Policy Act of 1969. Site specific environmental evaluations (EE) to address NEPA requirements.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : GCCRP Map FPL4

Other Uploads

GIS Data_1:
RESTORE_GIS_Template.gdb.zip

Council Staff Review: Gulf Coast Conservation Reserve Program

FPL Internal Staff Review

Project/Program	Gulf Coast Conservation Reserve Program		
Primary Reviewer	Amy Newbold	Sponsor	USDA
EC Reviewer	John Ettinger	Co-Sponsor	TX and AL

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded program.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	More information needed
Notes	Please provide more information in the budget narrative regarding the breakdown of funding between AL and TX and how that funding will be utilized in each state.

	Note: Restore Council staff worked with the state to resolve these comments.

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	USDA applied BAS reviews that were completed upon proposal of the program in previous FPL. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	More information needed
Notes	More EC information needed. Proposal indicates USDA seeking Cat 2 status for implementation funds, but narrative and EC checklist indicates USDA proposes to use CE and associated EC documentation from FPL 3b. If the latter is the case, USDA needs to modify the proposal to indicate Cat 1 implementation funds are being sought and provide the CE and associated environmental documentation to support this status. If the FPL 3b documentation remains valid, then the Council can re-adopt that documentation. Note: Restore Council staff worked with the state to resolve these comments.

Summary of Best Available Science Review: Gulf Coast Conservation Reserve Program

This program was reviewed for BAS under FPL 3b. Under FPL 4, USDA is proposing a continuation of the program.

The original BAS review as well as USDA's response to the BAS comments can be found at https://www.restorethegulf.gov/our-work/fpl/fpl-2026/.

Appendix H: The Department of the Interior Proposal Package

Appendix H: The Department of the Interior Proposal Package **1**

Development of Indicators and Identification of Thresholds to Support Reef Restoration **4**

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Development of Indicators and Identification of Thresholds to Support Reef Restoration

RESTORE Council Proposal Document

General Information

Title:
Development of indicators and identification of thresholds to support reef restoration

Project Abstract:
Managing fisheries species of conservation, production and habitat value such as the eastern oyster remains challenging. Across the northern Gulf of America, restoration and management goals include ensuring resilience and sustainability of oysters, the reefs they create, and the services the reefs and oysters provide. In Texas, managers aim to balance oyster reef restoration and sustainable fisheries through the use of passive (i.e., harvest management), and active (i.e., material in the water) methods. Yet, little is known regarding the outcomes of these methods on either reef resilience or functions, or sustainable fisheries within or across estuaries of different environmental conditions. Here, we propose to build on recent and on-going work that has identified suitable sites for restoration and calculated restoration and aquaculture suitability indices in order to further elucidate, at a management relevant spatial scale (i.e., reef level), oyster population demography (size class distribution, reproductive output, sex ratio), and reef ecosystem function outcomes (i.e., habitat support) in relation to reef restoration activities, environmental conditions and management regime (i.e., closure areas). This proposed effort will provide critical data to inform management decisions by providing outcome indices based on proposed restoration management and environmental conditions related to oyster reef structure, population dynamics and biodiversity and food web support.

FPL Category: Category 1: Planning Only

Activity Type: Project

Program: N/A

Co-sponsoring Agency(ies):
Texas

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(IV) Projects that restore long-term resilience of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Priority Criteria Justification:
Oysters are ecologically and economically important habitats that are uniquely challenging to manage because they exist as both a habitat and a fishery. Oyster reefs have experienced severe declines in Texas and across the Gulf of America due to a number of factors, including oil spills, hurricanes, and unsustainable harvests. These impacts have reduced the size and complexity of oyster reefs and diminished key habitat for numerous fish, shrimp, and crab species. There is compelling science that restoration can ameliorate lost oyster habitat, particularly when coupled with protection from harvest, enhancing biodiversity, shoreline protection, water quality, recreational angling, and more (Peters et al. 2017; Rezek et al. 2017; Blomberg et al. 2018; La Peyre et al. 2019). This proposed effort seeks to collect field-based data to quantify how management actions available to oyster ecosystem and fishery managers (habitat restoration, harvest area closures) affect oyster populations, reef ecosystem functioning, and long-term resource sustainability.

The economics for enhanced resource management decision making for oysters are compelling: the estimated value of oysters in the water is $2,000 to $40,000 per acre, which includes benefits of increased biodiversity and fish production, protected shorelines, and improved water quality. Additional benefits of oyster reefs for recreational angling are estimated at $23,000 per acre. The value of oysters in the water is much greater than that generated from commercial harvest from degraded reefs, estimated at $880 per acre. In addition, over $200M were dedicated to support oyster management and restoration through the Deepwater Horizon settlement funding (Brooke and Alfasso 2022), with over $17M focused on restoration and management of Texas oysters.

Long-term resilience of oyster reefs depends on data-driven resource management. An increased understanding of the response of oysters to management actions will help ensure equitable access to a valued public resource and promote benefits that reefs provide to coastal communities, including enhancing physical and economic resilience. Findings will help support Texas Parks and Wildlife Department (TPWD) efforts, including the proposed “Oyster Reef Restoration Program”, with the goal to sustain oyster populations and reef habitat.

Project Duration (in years): 4

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore, Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
Improve Science-Based Decision-Making Processes

Secondary Comprehensive Plan Goals:
Enhance Community Resilience

PF Restoration Technique(s):
Improve science-based decision-making processes: Develop tools for planning and evaluation

Location

Location:
Texas Estuaries

HUC8 Watershed(s):
Texas-Gulf Region(Neches) - Neches(Lower Neches)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Buffalo-San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(North Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(West Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Austin-Oyster)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Lower Brazos)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Lower Colorado(Lower Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(San Bernard)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Navidad)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(Lower Guadalupe)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Lower San Antonio)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Mission)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Lower Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Laguna Madre)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Sabine Lake)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Lavaca)
Texas-Gulf Region(Sabine) - Sabine(Lower Sabine)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Baffin Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central Laguna Madre)

State(s):
Texas

County/Parish(es):
TX - Aransas
TX - Brazoria
TX - Calhoun
TX - Cameron
TX - Chambers
TX - Galveston
TX - Harris
TX - Jackson
TX - Jefferson
TX - Kenedy
TX - Kleberg
TX - Liberty
TX - Matagorda
TX - Newton
TX - Nueces
TX - Orange
TX - Refugio
TX - San Patricio
TX - Victoria
TX - Willacy

Congressional District(s):
TX - 2
TX - 38
TX - 18
TX - 22
TX - 27
TX - 14
TX - 29
TX - 36
TX - 34
TX - 7
TX - 9

Narrative

Introduction and Overview:
In recent years, oyster harvests in Texas have begun to focus disproportionately on specific bays, prompting alarm about deteriorating reef condition, and culminating in new regulations that prohibit oyster harvests in selected areas. At the same time, widespread support has emerged for rebuilding degraded oyster reefs, with oyster reef restoration being carried out by TPWD as well as several conservation and academic groups. To support ongoing resource management decisions, it is important to understand how oyster populations in closed areas respond after harvest pressures are removed, and how restoration actions in both open and closed waters can speed recovery.

Numerous studies have compared the oyster population, habitat provision and biodiversity support on natural and restored reefs with findings differing based on location, age of reef, and

material used (e.g., Coen et al. 2007; La Peyre et al. 2015; Humphries and La Peyre 2015; Rezek et al. 2017; Smith et al. 2022). Smith et al. (2022), in a meta-analysis of restored reefs, found that restored oyster reefs can match multiple ecological functions of natural reefs but require a 6+ year time frame. Martinez et al. (2022) compared the recovery of restored and natural reefs in Texas, finding similar or higher oyster density and size on restored reefs within 18 months. Only a few locations around the United States have explicitly compared the effects of harvest closures on oyster reefs. One study in North Carolina found larger oysters and populations on restored and natural reefs within reserve areas (Peters et al. 2017); while this finding is not surprising, what remains unclear is how quickly oyster populations would change in response to harvest closures and/or openings due to this study occurring in a long-term oyster reserve. This is important to note as many of the open and closed areas within Texas have been recently harvested.

This proposed effort aims to advance oyster restoration planning, design, and assessment in Texas by working in collaboration with TPWD and Texas General Land Office (TGLO) to evaluate sustainability of restored and natural oyster reefs, in closed and open harvest areas; to identify reef design elements that will enhance habitat use by both fish and wildlife; and to quantify reef biological response to chemical and physical variables. This effort will directly inform the proposed TPWD Oyster Reef Restoration Program to develop a prioritized approach to oyster reef restoration, and it will build on previous work funded by the TGLO to identify suitable sites and create publicly available maps to advance oyster reef restoration across the Texas coast (www.oyster-restoration.org; Beseres Pollack et al. 2012).

Recent work used a mechanistic energy-based model to predict oyster survival, growth, time to market, and reproductive output across key Texas estuaries (Lavaud et al. 2024). Model outputs (oyster survival, growth, time to market, reproduction) were used to generate maps showing suitable areas for restoration and aquaculture, which were defined by the ability of reefs in these areas to survive, grow and reproduce. Using outputs from the previous work, this effort proposes to further elucidate, at a management relevant spatial scale (i.e., reef level), oyster population demography (size class distribution, reproductive output, sex ratio), and reef ecosystem function (i.e., habitat support) in relation to active (restoration) and passive (closure) management.

Proposed Methods:

Study Design:

The proposed work will use six tasks to address environmental conditions, reef structure, oyster population dynamics, and ecosystem services. Tasks 1-3 focus on reefs across the Texas coast, while Tasks 4-5 concentrate on Coastal Bend reefs to address high-salinity conditions. This region is selected for intensive study due to its higher salinity and temperature conditions which represent future conditions in several Texas estuaries, limited data availability for modeling under these conditions, and relevance to other estuaries that may experience similar environmental conditions. Task 6 summarizes the outcomes and findings for resource management.

1. Environmental conditions and reef structure:

Task 1. Develop reef-specific temporal trends of environmental regime. The environmental regime across each reef selected for this study will be characterized based on means, variance, and extreme events over recent years; similarly, projected means, variance and extreme events

in the future will be summarized and used to assess future reef exposures. Lavaud et al. (2024) used available data from long-term collections of environmental data (temperature, salinity, chlorophyll a), including, but not limited to daily data from the Texas Commission on Environmental Quality, TPWD and the USGS as well as modeled data from the TxBLEND models from the Texas Water Development Board (Schoenbaechler et al. 2011), as well as remotely sensed temperature data (i.e., Hybrid Coordinate Ocean Model, HYCOM; GODAE 2021 and Landsat 8 Thermal Infrared Sensor data). We will use these data and future condition projections and explore the addition of chlorophyll a to provide improved resolution and insight into potential oyster reef population dynamics, and potential impacts of restoration management at each site.

Task 2. Quantify reef structure. Once during the study, reef size (ha), vertical relief and variability, habitat heterogeneity, and location adjacent to other habitats and features will be measured. Reef structure metrics will be developed at the reef scale (live and dead oyster volume, reef area, vertical relief, homogeneity), and the landscape scale (distance to adjacent structured habitats, location relative to inflow, location relative to protected potential spawner reefs).

2. Oyster population dynamics:

Task 3. Quantify reef-specific oyster population dynamics. Oyster demography will be assessed annually using diver quadrat surveys. Five haphazardly located samples will be taken on each reef during winter to capture population demography (size class distribution), and reef density estimates (ind m-2). The diver surveys will involve collecting all reef material within a 0.25 or 0.07 m2 quadrat, depending on density, at the surface of the reef, and sorting the material in the lab by live and dead. All live oysters will be sized (shell height SH, mm), and intact dead oysters (box shells) will also be sized and used as an estimate of recent mortality by size class. Live and dead shell density, and volume will be determined through water displacement. In addition, dredge samples will be conducted (in passes of 30 second duration) until 40 oysters (> 50 mm SH) have been collected, to assess condition index, histology, Perkinsus marinus infection intensity, sex ratio and reproductive potential.

Task 4. Quantify reef-specific individual oyster growth. Oyster growth and mortality will be assessed at two reef locations within the Coastal Bend locations to provide site-specific measures of oyster growth rates, and mortality events from environmental conditions. We specifically selected sites in the Coastal Bend as this area represents the high salinity scenario for Texas where these types of data are lacking. At each of the selected reefs, 6 aquaculture bags (30 cm x 60 cm x 30 cm; BST Oyster Supplies) will be placed and held off bottom by 30 cm PVC legs. These bags will be used for growth, mortality, Perkinsus marinus infection intensity, plasma osmolality and condition index following methods in La Peyre et al. (2013). At each site, three bags will be filled with 50 market oysters, and 3 bags with 50 seed oysters; oysters will be placed in the field in the fall of year 2 of the study. At each sample event, water samples will be collected for chlorophyll a (ug L-1). This task will provide explicit data on oyster demographic rates, dermo infection and reproductive potential to better calibrate oyster modeling and habitat suitability; population specific differences, phenotypic variability and water quality all impact oyster demographic rates (La Peyre et al. 2021, 2024).

3. Reef ecosystem functions:

Task 5. Assess macrofauna community and oyster reef trophic level support. Macrofauna

community analysis and biomass-weighted diversity indices, will be used to assess the reef ecosystem function and service provision of biodiversity and prey species, following methods in Rezek et al. (2017) and Blomberg et al. (2017). Trays will be used to sample oysters and macrofauna. Twenty-four sampling trays (45 x 30 x 11 cm) filled with reef substrate recovered from the reef being sampled, will be placed in a shallow excavated area within the existing reef, and affixed to the reef with rebar. At each sample event, six trays will be haphazardly sampled with trays used for biodiversity. Sampling will occur quarterly over a 12-month period. This task will quantify the effects of management (open, closed) on the provision of habitat and trophic level support of restored reefs. This information will also tie directly to the TX Oyster Reef Restoration proposal providing monitoring metrics and data to compare project outcomes and habitat support and identify areas for adaptive management.

4. Synthesis for resource management:

Task 6. Integrate findings from Tasks 1-5 to evaluate the effectiveness of restoration and closure strategies. Develop recommendations for adaptive management and prioritize future restoration efforts. Deliverables will include a “lessons learned” document and maps for stakeholders.

Site Selection and Sampling:

Reefs will represent diverse environmental regimes (high-salinity Coastal Bend and low-salinity Upper Coast) and management types (open vs. closed, restored vs. natural) (Table 1). We will sample one reef from each category across each of the coastal areas (2 areas x 2 management x 2 reef status = 8 reef areas) for Tasks 1, 2, and 3 sampling to document the range of oyster, reef and environmental data across which oyster reefs exist in Texas bays. Tasks 4-5 will focus on the Coastal Bend reefs only due to data gaps and relevance to future conditions following the outlined schedule in Table 2.

Table 1. Texas bays and estuaries supporting oyster reef management, categorized by restoration management. Open refers to open for harvest, closed indicates areas with harvest closure; restored reefs indicate active restoration actions have occurred; natural reefs have not had active restoration applied. We selected reefs distributed across the low and high salinity areas, and within each category for Tasks 1, 2, 3; for Task 4 and 5, we will focus on Coastal Bend/High reefs, selecting up to two locations where reefs thrive within each region. This region is selected for more in-depth comparison because this region is where Texas lacks the most data to inform models, and has higher salinity and temperatures (Lavaud et al. 2024), and likely represents future conditions.

	Management type			
	Open, Natural	**Open, Restored**	**Closed, Natural**	**Closed, Restored**
Region/ Salinity				
Coastal Bend/ High	Aransas	Aransas	St. Charles	St. Charles
Upper Coast/ Low	Galveston	Galveston	Sabine	Sabine

Final outputs:

1. Oyster population dynamics: Provide reef-specific data on oyster population trends and demographic metrics
2. Reef structure and environmental conditions: Quantify impacts of restoration and management on biodiversity and ecosystem services.
3. Biodiversity and trophic support: Develop indices to assess ecosystem health across reefs.
4. Water quality contribution: Estimate filtration potential (e.g., La Peyre et al. 2014) based on reef structure and oyster demographics.
5. Manager decision making: Create graphics and a “lessons learned” document for adaptive management.

Table 2. Proposed schedule by task; Tasks 1, 2, 3 would encompass a minimum of 8 reefs across coastal Texas; Tasks 4, 5 would focus on a subset of reefs to cover restoration management impacts within an environmental regime.

Quarter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Task 1	X	X	X	X	X											
Task 2					X	X	X	X	X							

Task 3					X	X	X	X	X	X	X					
Task 4					X	X	X	X	X							
Task 5					X	X	X	X	X	X	X					
Task 6									X	X	X	X	X	X	X	X
Outreach	X				X				X				X			X

Environmental Benefits:

This proposed project will 1) inform oyster population sustainability and ecosystem functioning in restored and natural reefs, 2) identify indicators and thresholds for monitoring and adaptive management, and 3) guide restoration priorities and decisions regarding harvest closures and reef designs. This project builds on previous work on oyster reefs and restoration in the northern Gulf of America, including recently developed suitability index models for restoration and aquaculture across three Texas estuaries. This work will help to address some of the uncertainties identified in building these models; specifically, this work will provide Texas-specific oyster growth, mortality under environmental conditions across the range of salinity and temperature regimes in Texas estuaries. This work also will tie into the on-going RESTORE proposal (DECORATE) exploring ecosystem services of reefs across natural reefs of Texas estuaries. Using outcomes from DECORATE, results of matching parameters collected in managed and restored reefs can be benchmarked to the ranges reported in the RESTORE proposal. Additionally, this work ties into the proposed Texas “Oyster Reef Restoration Program” by directly informing decision-making related to oyster reef restoration. By including management and restoration reefs in this project, the data will be useful in identifying differences with natural reefs and identify uncertainties that should be addressed in future projects. These could include for example, how management might impact oyster demography across and the reefs, thus impacting potential metapopulation dynamics, and ecosystem services provision.

Metrics:

Metric Title: PRM010 : Research - # studies used to inform management

Target: 1

Narrative: This work will provide a minimum of one study that will provide data and information to inform management decisions. This study and the information generated to inform management will be shared with management and stakeholders as described below under collaborations but will include an annual meeting with oyster reef managers to discuss the research, and how to integrate it into Texas management decisions and prioritization of oyster restoration and management.

Metric Title: PRM009 : Research - # studies reported to management

Target: 1

Narrative: This work will provide a minimum of one study, likely composed of sub-objectives and studies resulting in the provision of a minimum of one data product, one report and/or one peer-reviewed literature to inform oyster restoration and management specifically in Texas. We will publish data collected and provide other products that present and discuss the information collected detailing (1) broad scale view of oyster reef characteristics across salinity, restoration and management scenarios in Texas (tasks 1-3), (2) quantify estuary specific oyster demographic rates, disease risk, and reproductive potential (task 4) and (3) oyster reef support of ecosystem services, including biodiversity and habitat support (Tasks 5).

Metric Title: COI002 : Outreach/ Education/ Technical Assistance - # people reached

Target: 20

Narrative: Annually, we will hold a meeting with oyster reef managers to discuss the research, and how to integrate it into Texas management decisions and prioritization of oyster restoration and management; this will include key managers in Texas, numbering at least 10 individuals. Throughout the year, we will hold informal discussions and data sharing to ensure managers and stakeholders are kept up to date and have data available as it is generated to inform management. Dr. Pollack serves on several Texas Committees and working groups, including the Oyster Restoration Working Group, the Oyster Regulatory Working Group, and the Texas Oyster Advisory Committee, all of which are composed of stakeholder groups including the oyster industry, oyster farmers, TPWD resource management staff, and non-profit restoration focused groups. The Texas Oyster Advisory Committee advises the TPWD Commission on oyster management and will discuss the project findings with the Committee. These meetings and discussions will involve over 20 interactions, and a minimum of 20 unique individuals.

Risk and Uncertainties:

Potential risks and uncertainties include extreme weather events (e.g., hurricanes, flooding) and regional variability. Associated challenges may impact the proposed methods or findings, for example through damage to reefs, disruption of fieldwork, and challenges in interpreting results. However, leveraging data from these events can enhance understanding of reef resilience, for example by identifying key thresholds (i.e., Zabin et al. 2022). Additionally, because our study design involves bays across the Texas coast, it is unlikely all areas would be similarly impacted, giving us a range of conditions (average, extreme) to evaluate.

Other risks inherent in the project are those associated with field activities; we will address those by ensuring all personnel are trained on field safety protocols in the face of extreme events.

Additionally, there may be risks in stakeholder disagreement or misalignment of expectations. Proactive and regular stakeholder communication is built into this proposed work to address potential misinterpretation or implementation challenges early and as needed.

Risks associated with the proposed methods and design will be minimized by using sound statistical design, following previously published and well-established protocols where they exist, QA/QC, peer-review and public sharing of all data as required by the U.S. Geological Survey. In addition, all publications will adhere to the USGS Fundamental Science Practices.

Monitoring and Adaptive Management:
The information generated from this will tie directly into the implementation of monitoring and adaptive management for Texas. This project will provide data to inform management decisions in both open and closed, restored and natural systems across the coast. The information will be shared by Dr. Pollack during meetings with the Oyster Restoration Working Group, the Oyster Regulatory Working Group, and the Texas Oyster Advisory Committee.

Data Management:
All data will be maintained on computers in multiple locations. Data collected will be published in a data repository such as Sciencebase.gov after peer review, and approval in adherence with the U.S. Geological Survey's Fundamental Science Practices.

Collaboration:
This project involves collaboration with USGS, TPWD, and TGLO. Co-lead Pollack serves as an appointed member on the TPWD Coastal Resources Advisory Committee—which advises the Chairman and the TPWD Commission on issues that cross fishery and geographic boundaries on the coast of Texas—and on the TPWD Oyster Restoration and TPWD Oyster Regulations Workgroups. Existing collaborative relationships will be leveraged to provide relevant stakeholders with data to develop management strategies and policies to ensure sustainability of oyster resources in Texas.

Public Engagement, Outreach, and Education:
Public engagement, outreach and education will be achieved through annual formal meetings and quarterly informal discussions with resource managers. Dr. Pollack serves on several Texas Committees and working groups, including the Oyster Restoration Working Group, the Oyster Regulatory Working Group, and the Texas Oyster Advisory Committee, all of which are composed of stakeholder groups including the oyster industry, oyster farmers, TPWD resource management staff, and non-profit restoration focused groups. The Texas Oyster Advisory Committee advises the TPWD Commission on oyster management and will discuss the project findings with the Committee.

Leveraging:

Funds: $300,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: This project used an energetic budget model for oysters across three key Texas and Louisiana estuaries to assess potential restoration and aquaculture suitability under current and future projected environmental conditions. This project provides spatial maps identifying suitability.

Funds: $800,000.00

Type: Leveraging

Status: Received

Source Type: Other Federal

Description: This on-going RESTORE project, with Dr. Jennifer Pollack as a co-PI, is monitoring oyster reef health across Texas estuaries. This proposed work will build on this work by focusing explicitly on how active and passive restoration management impact the trajectory of reefs across the range of Texas estuarine conditions. This project's goal is to provide an ecosystem-scale monitoring framework exploring oyster reef functioning across natural reefs in Texas.

Environmental Compliance:

All activities proposed in this effort are considered Category 1 "planning" activities. Most do not require environmental compliance documentation for Council approval. The exception is the proposed data collection of oyster samples, reef structure and habitat samples, and corresponding water quality data. Such data collection is subject to environmental compliance laws including NEPA, ESA, MSA, NHPA, and FWCA.

We do not consider the data collection activities proposed herein to cause significant environmental impacts and are exempt based on the "Existing Department of Interior Categorical Exclusions" policy (43 CFR Part 46) (see attached). Specific language includes: 43 CFR Part 46.210 (E) "Nondestructive data collection, inventory (including field, aerial, and satellite surveying and mapping), study, research, and monitoring activities." In addition to actions listed in the Department of the Interior (DOI) categorical exclusions in 43 CFR Part 46.210, activities proposed are also exempt for the USGS based on the DOI Departmental Manual DM Part 516 Chapter 9.5 (B) "Collection of data and samples for geologic, paleontology, hydrologic, mineralogic, geochemical and surface or subsurface geophysical investigations, and resource evaluation, including contracts therefor."

For this specific activity, the DOI-USGS will address potential extraordinary circumstances (including listed species and cultural sites and artifacts).

Bibliography (All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

Beseres Pollack J, Palmer TA, Resinger AS, Montagna P. 2012. A restoration suitability index model for the eastern oyster (Crassostrea virginica) in the Mission-Aransas Estuary, TX, USA. PLOS One.

Brooke S, S. Alfasso. 2022. An accounting and summary of oyster restoration projects in the Gulf of Mexico funded by Deepwater Horizon Oil disaster funds. Florida State University Coastal and Marine Lab, https://marinelab.fsu.edu/media/5183

Blomberg BN, Lebreton B, Palmer T, Guillou G, Beseres Pollack J, Montagna P. 2017. Does reef structure affect oyster food resources? A stable isotope assessment. Marine Environmental Research doi:10.1016/j.marenvres.2017.03.003

Coen, Loren D., Robert D. Brumbaugh, David Bushek, Ray Grizzle, Mark W. Luckenbach, Martin H. Posey, Sean P. Powers, and S. Gregory Tolley. 2007. "Ecosystem services related to oyster restoration." Marine Ecology Progress Series 341 (July):303–7. 516.

DWH NRDA. 2017. Strategic Framework for Oyster Restoration Activities. June. http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan.

Humphries AT, La Peyre MK. 2015. Oyster reef restoration supports increased nekton biomass and potential commercial fishery value. PeerJ 3:e1111; DOI 10.7717/peerj.1111.

Lavaud R, La Peyre MK, Couvillion B, Pollack JB, Brown V, Palmer TA, Keim B. 2024. Predicting restoration and aquaculture potential of eastern oysters through an eco-physiological mechanistic model. Ecological Modelling. 489: 110603.

La Peyre MK, Humphries AT, Casas SM, La Peyre JF. 2014. Temporal variation in development of ecosystem services from oyster reef restoration. Ecological Engineering 63:34-44.

La Peyre MK, Eberline BS, Soniat T, La Peyre JF. 2015. Differences in extreme low salinity timing and duration differentially affect eastern oyster (Crassostrea virginica) size class growth and mortality in Breton Sound, LA. Estuarine Coastal and Shelf Science 135:146-157.

La Peyre MK, Marshall DA, Miller LS, Humphries AT. 2019. Oyster reefs in northern Gulf of Mexico estuaries harbor diverse fish and decapod crustacean assemblages: a meta-synthesis. Frontiers in Marine Science. Doi:10.3389/fmars.2019.00666.

La Peyre MK, Marshall DA, Sable SE. 2021. Oyster model inventory: identifying critical data and modeling approaches to support restoration of oyster reefs in coastal U.S. Gulf of Mexico waters. U.S. Geological Survey Open-File Report 2021-1063, 40 p. https://doi.org/10.3133/ofr20211063

La Peyre MK, Sable SE, Marshall DA, Irwin E, Hanson C. 2024. The use of conceptual ecological models to identify critical data and uncertainties to support numerical modeling: the northern Gulf of Mexico eastern oyster Crassostrea virginica example. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science; https://doi.org/10.1002/mcf2.10297

Marshall DA, Casas SM, Walton WC, Rikard FS, Palmer TA, Breaux N, La Peyre MK, Pollack JB, Kelly M, La Peyre JF. 2021b. Divergence in salinity tolerance of northern Gulf of Mexico eastern oysters under field and laboratory exposure. Conservation Physiology 9:coab065; doi:10.1093/conphys/coab065.

Peters JW, Eggleston DB, Puckett BJ, Theuerkauf SJ. 2017. Oyster demographics in harvested reefs vs no-take reserves: implications for larval spillover and restoration success. Frontiers in Marine Science. https://doi.org/10.3389/fmars.2017.00326

Rezek RJ, Lebreton B, Roark EB, Palmer TA, Beseres Pollack J. 2017. How does a restored oyster reef develop? An assessment based on stable isotopes and community metrics. Marine Biology 164:54-62.

Schoenbachler C, Guthrie CB, Matsumoto, J, LU Q. 2011. TxBLEND Model Calibration and Validation for the Laguna Madre Estuary. Texas Water Development Board. 60pp.

Smith RS, Lusk B, Castorani MCN. 2022. Restored oyster reefs match multiple functions of natural reefs within a decade. Conservation Letters. https://doi.org/10.1111/conl.12883

Zabin, Chela J, Laura J Jurgens, Jillian M Bible, Melissa V Patten, Andrew L Chang, Edwin D Grosholz, and Katharyn E Boyer. 2022. Increasing the Resilience of Ecological Restoration to Extreme Climatic Events. Frontiers in Ecology and the Environment 20 (5): 310–18. https://doi.org/10.1002/fee.2471.

Budget

Project Budget Narrative:
The overall budget for this project is $1,200,000. The bulk of the funds ($960,000) requested will be used for planning activities entailing data collection, analyses and visualization of the indicators and thresholds to inform oyster reef management, while the remaining funds ($240,000) will be used to support project and data management.

DOI anticipates a Cooperative Agreement with a university will be the primary method of obligation, in addition to some funding to support involvement from the Louisiana Cooperative Fish and Wildlife Research Unit.

Total FPL Project/Program Budget Request:
$ 1,200,000.00

Estimated Percent Monitoring and Adaptive Management: 0 %

Estimated Percent Planning: 80 %

Estimated Percent Implementation: 0 %

Estimated Percent Project Management: 0 %

Estimated Percent Data Management: 20 %

Estimated Percent Contingency: 0 %

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
This project can be increased over both spatial (number of areas) and temporal (frequency and duration of sampling) scales to meet the needs of Texas resource management.

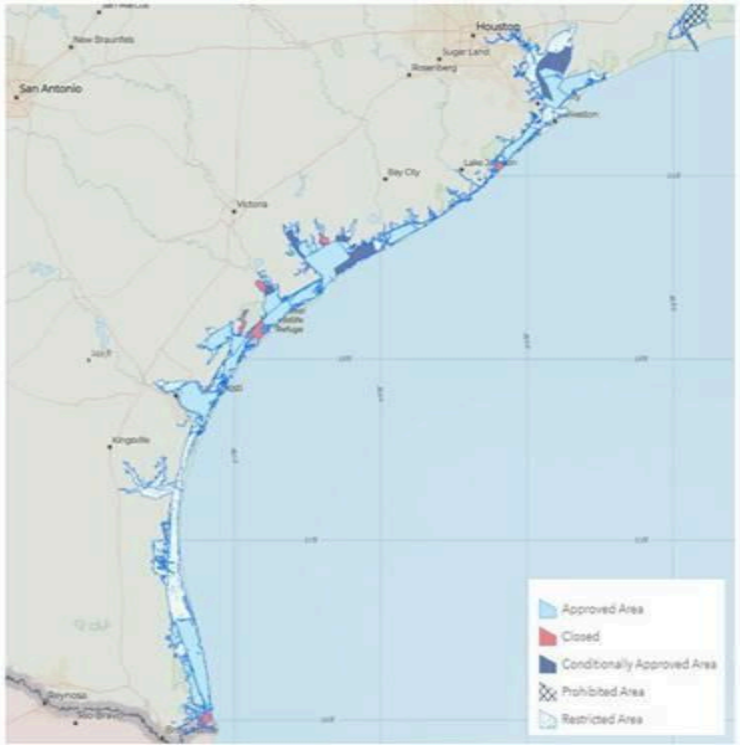
Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	See DOI “Existing Categorical Exclusions” document.

Endangered Species Act	Yes	See DOI “Existing Categorical Exclusions” document.
National Historic Preservation Act	Yes	See DOI “Existing Categorical Exclusions” document.
Magnuson-Stevens Act	Yes	See DOI “Existing Categorical Exclusions” document.
Fish and Wildlife Conservation Act	Yes	See DOI “Existing Categorical Exclusions” document.
Coastal Zone Management Act	N/A	
Coastal Barrier Resources Act	N/A	
Farmland Protection Policy Act	N/A	
Clean Water Act (Section 404)	N/A	
River and Harbors Act (Section 10)	N/A	
Marine Protection, Research and Sanctuaries Act	N/A	
Marine Mammal Protection Act	N/A	
National Marine Sanctuaries Act	N/A	
Migratory Bird Treaty Act	N/A	
Bald and Golden Eagle Protection Act	N/A	
Clean Air Act	N/A	

Other Applicable Environmental Compliance Laws or Regulations	Yes	Scientific collection permits acquired (TX)

Maps, Charts, Figures



Caption : Map of Texas coast. Areas within each bay are highlighted by their management status in relation to oyster harvest: approved (blue), closed (red), conditionally approved (indigo), prohibited (crosshatch), restricted (stippled).

Other Uploads

Tables_1:
Table 1 and 2.docx
Table 1. Texas bays and estuaries supporting oyster reef management, categorized by restoration management.

Table 2. Proposed schedule by task.

GIS Data_2:
RESTORE_GIS_Template.gdb.zip Caption : N/A

Council Staff Review:

Development of Indicators and Identification of Thresholds to Support Reef Restoration

Note: All comments indicated below were addressed in the proposal provided above.

FPL Internal Staff Review

Project/ Program	Development of indicators and identification of thresholds to support reef restoration		
Primary Reviewer	Amy Newbold	Sponsor	DOI
EC Reviewer	John Ettinger	Co-Sponsor	Texas
1. Is/Are the selected Priority Criteria supported by information in the proposal?			Yes
Notes			
2. Does the proposal meet the RESTORE Act geographic eligibility requirement?			Yes
Notes			
3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?			Yes
Notes			
4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?			Yes
Notes			
5. Does the proposal align with the applicable RESTORE Council definition of project or program?			Yes
Notes			
6. Does the budget narrative adequately describe the costs associated with the proposed activity?			Yes

Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	More information needed
Notes	Two metrics were selected (PRM010 - # studies and PRM012 - # tools), however, no targets were selected. Please select targets for both metrics. Note: Restore Council staff worked with the state to resolve these comments.

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	No
Notes	The FPL 4 proposal lists this project as planning only but the narrative portion describes implementation of physical sampling of oyster reefs. Funds for physical sampling can't be approved in FPL Category 1 until applicable laws have been addressed (NEPA, ESA, NHPA, MSA and FWCA, as applicable). Either the sampling portion should be listed as FPL Category 2 (and the proposal budget and narrative modified accordingly) or DOI needs to supply the needed environmental compliance documentation Note: Restore Council staff worked with the state to resolve these comments.

Summary of Best Available Science Review:

Development of Indicators and Identification of Thresholds to Support Reef Restoration

The DOI-USGS Oyster Indicators proposal received generally positive feedback from reviewers, particularly for its relevance to the Gulf Coast region, clear objectives, and the experience of the project team. The proposal is grounded in peer-reviewed and publicly available data, primarily drawn from Texas-based research, though some reviewers noted a limited use of broader literature on oyster reef restoration. Methods were clearly described, but concerns were raised about the statistical rigor and justification of sampling design and the development of the proposed index. Risks and uncertainties—especially regarding extreme weather events—were acknowledged but not fully addressed, with reviewers recommending more detailed discussion on how these would impact outcomes and modeling. Measures of success and specific target metrics were seen as lacking or underdeveloped, and the proposal's approach to adaptive management and data monitoring was criticized for being minimal or marked as not applicable. Reviewers agreed that the proposal would benefit from a clearer risk mitigation plan, detailed metrics, and better integration of lessons from past restoration efforts. Despite these shortcomings, the project's collaborative approach and potential impact on oyster reef management were highlighted as significant strengths.

Summary of DOI's Response to BAS Comments:

The DOI response to BAS comments outlines several planned improvements and clarifications for the proposal. The team will review and correct citations, including adding missing references such as Zabin et al. (2022) and Schoenbachler et al. (2011). They will also explicitly address the risk of extreme weather events, acknowledging that such conditions could bias data but may also provide valuable insights into restoration success, as highlighted in the literature. The team plans to expand the discussion on sampling design and clarify the methodology for index creation, ensuring it aligns with the statistical design and protocols that will ensure data integrity and quality control. They will elaborate on the project's success metrics, which include both the publication of peer-reviewed studies and the number of meetings held with resource managers. The proposal will also address long-term environmental risks and how the metrics will inform management practices, particularly in the face of extreme weather events. The team will clarify that adaptive management is not part of the project, as it is not focused on implementing a specific restoration project but rather assessing existing management strategies. Finally, the team will provide more detail on the project's success metrics, risks, and sampling design, and will add language to clarify how storm impacts on oyster reefs and uncertainties will be considered in the proposal.

Best Available Science Review Forms:

Development of Indicators and Identification of Thresholds to Support Reef Restoration

Proposal Title: Development of indicators and identification of thresholds to support reef restoration
Location (If Applicable): Texas Estuaries
Council Member Bureau or Agency: U.S. Department of the Interior
Type of Funding Requested: Planning

Reviewed by: In State
Date of Review: November 4, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
The applicant points to recent publications in which this proposal is built on, along with additional peer-reviewed articles that identify the problem and the need for this type of project.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The proposal directly pertains to the Texas Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information
Comments:	
Some in-text citations are not accurate, including www.oysterrestoration.org and U.S. Geological Survey, South Central Climate Adaptation Science Center Funding. Some citations are not listed in the bibliography, including Zabin et al. 2022 and Schoenbaechler et al. 2011. Sources seem to be represented in an unbiased manner to support the proposal and tasks.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	
The applicant briefly states risk related to extreme weather events, but does not go into depth about the ways that these risks would be incorporated into the models and predictions.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	

The citations build the base for this proposal and support the objectives listed. This proposal builds upon a recent study (Lavaud et al. 2024), using this citation in multiple areas of the proposal to justify the design.

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
Statistical information was not used to justify the background of the proposal, but these details are provided in the design to justify the sampling procedures and maximize the quality and integrity of information collected.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	No
Comments:	
Risk is mentioned briefly in this proposal, with no citations associated with this section.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
The applicant lists collaborators on this project and the background that the collaborators like Texas Parks and Wildlife Department have related restoration and resource management.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	

The applicant stated the goal to assess reef conditions at natural and restored oyster reefs and has clearly listed tasks to achieve this goal under the design section of the proposal.

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The methods are clearly written with sufficient detail and citations from peer-reviewed publications to justify the collection methods.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The proposed project will inform future management and restoration decisions by assessing restored and natural reefs. The environmental benefits resulting in better informed restoration and management decisions are clearly listed by the applicant.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information
Comments:	
The applicant lists final outputs expected from this project, but specific success measures including target metrics are not included.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	

The applicant briefly states risk, but does not provide a detailed discussion on how risk will be incorporated into the final models.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
Extreme weather is listed as a risk, which may happen during the project lifecycle, but does not provide detail on how these risks may impact project design and how the project managers intend to address these risks.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Nearly all publications are from the past decade, with many providing historical context to support the need for this proposed project. More recent publications within the last year are used to justify the project design.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
The applicant discusses publications and studies that have reviewed similar topics and produced similar models. The applicant provides detail on gaps within this data and states how this project will differ and expand upon this past work.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification	Need more information

provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	

Comments:

The applicant lists clear monitoring strategies with sufficient detail supported by peer-reviewed publications, but the specific measures of success are missing from this proposal. However, the applicant does state how monitoring will support the final outcomes.

Please summarize any additional information needed below:

The primary sections missing from this proposal are target success metrics and risk analysis. Target metrics may not be as applicable to planning projects like this one, but it would be helpful to understand what is expected regarding the number of studies and number of tools that the applicant hopes to develop. Weather risks are briefly stated, but not discussed thoroughly. The applicant should better describe how extreme weather will be considered in the final models and what plan is in place if weather impacts monitoring efforts. Additionally, all citations should be listed in the bibliography.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Development of indicators and identification of thresholds to support reef restoration
Location (If Applicable): Texas Estuaries
Council Member Bureau or Agency: U.S. Department of the Interior
Type of Funding Requested: Planning

Reviewed by: Out of State
Date of Review: September 26, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
The cited references support the proposed objectives, including methods, which have been widely used in oyster restoration and management throughout the Gulf.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The supporting information is relevant to the Gulf Coast region, including the coastal systems along the Texas Gulf Coast.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
It appears to me that the literature cited came primarily from Texas-based researchers and scientists, which is a good thing, indicating high relevance to what they are proposing.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Need more information
Comments:	
This was only minimally addressed. The authors limit the discussion to one sentence; they recognize extreme weather events and years, but indicate that such events would help build the models and predictions without saying how.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	

The applicant does provide justification that it is based on peer-reviewed publications.

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
Although no quality assurance plan is mentioned in the proposal, it is assumed that one will be developed for any data collection activities, thus ensuring the quality and integrity of the information.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	
Again, while this consideration is recognized and mentioned in the proposal, the response does not adequately addressed the implications sufficiently.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
Both co-PIs have demonstrated previous experience in implementing and managing similar projects.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
Primary and secondary goals and objectives are clearly defined.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
The methodologies are fairly well-developed and relevant to assisting in the development of effective management strategies for coastal oyster reefs. I feel they could have elaborated more on rationale and justification for some of their design in terms of temporal and spatial replication in order to validate the statistical outcomes they will be able to implement. In other words, will their design be sufficiently rigorous to provide clear differences among reef management types that will guide future management decisions.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Environmental benefits (reef ecosystem function and service) are described and referenced. They do not, however, reference the underlying stressors.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information
Comments:	
The program has two measures of success: Research = # of studies used to inform management, and Tool development for decision-making = # of tools. It is difficult to determine if these metrics align with their goals and objectives as outlined in the proposal.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	No
Comments:	
Their focus is on characterizing reef structure and function among differently managed (passive or active) oyster reefs along three coastal regimes. There is little (climate) to no (pollution, land use) mention of these vulnerabilities in their proposal.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	No
Comments:	
The project only mentions extreme weather events (I assume tropical storms and hurricanes) and suggests that the uncertainties and risks would help build models and predictions that account for resilience without explaining how.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	No
Comments:	
The proposers offer no explanation or reference to previous storm impacts on oyster reefs that could support their contention that these uncertainties help with management plans and decisions. No mention of adaptive management is provided in the proposal.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No
Comments:	
No mention of past success or failures of similar efforts were mentioned in the proposal.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	No
Comments:	

The proposers responded that monitoring and adaptive management are not applicable. The only language in the proposal regarding data management is that “all data will be maintained on computers at Harte Research Institute and LSU Agricultural Center.”

Please summarize any additional information needed below:

While I believe there are deficiencies and shortcomings that aren’t adequately addressed in sections on risks and uncertainties, data management and metrics, I do think that this is a very worthy project that will have significant benefits to the management of Texas coastal oyster reefs.

Since this review is limited to an evaluation of best available science, I am confident they have a firm grasp, understanding and application of best methods described in this proposal, with particular reference to practices undertaked specifically in Texas.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Development of indicators and identification of thresholds to support reef restoration
Location (If Applicable): Texas Estuaries
Council Member Bureau or Agency: U.S. Department of the Interior
Type of Funding Requested: Planning

Reviewed by: Out of Gulf
Date of Review: October 9, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
The proposal objectives are supported by some peer reviewed and/or publicly available information, but to a limited extent. There is substantial literature on factors affecting oyster reef restoration success, and that literature is either not cited or, if cited, elaborated upon.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The proposal directly pertains to the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
The cited literature is presented fairly and completely.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
The proposal presents extreme events (e.g. weather) as potentially creating conditions that would lead to the collected data only being representative of unusual or extreme conditions.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The proposal cites peer reviewed and publicly available data, but to a limited extent. The proposal does not summarize what has been learned in other systems regarding the successes and failures of oyster reef restoration. The primary literature that the proposal builds upon is prior work the applicants have conducted in the region, but there is science from other regions that could be cited and used to strengthen the proposal's rationale.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	No
Comments:	
The study design involves sampling from reefs across different salinity and management regimes, but this inserts a lot of variation in the sampling design such that it will likely be difficult to attribute observed differences to either environmental conditions or management regimes. There is no discussion of how statistical methods may be used to account for these multiple sources of variation. A more straightforward study design would be to control for one factor (e.g., sample a passive restoration site, active restoration site, and combination of passive+active within a single salinity zone, or within each salinity zone). There is also little justification for the number of samples to be collected, and the proposed index (task 6) is not described in any statistical or mathematical detail. Constructing indices is quite challenging, as many decisions have to be made regarding the integration of factors. E.g., will factors be equally weighted? Exactly which factors will be included? There is also mention of thresholds and indicators in parts of the proposal, but these concepts are not elaborated upon in the methods.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	No
Comments:	
The only risk/uncertainty identified is that there may be extreme weather conditions during the sampling period, which could result in the data only being representative of extreme conditions, in which case the outputs of the project will be made specific to extreme events. However, there would likely be insufficient data to be representative of extreme conditions.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	

The team has already worked extensively in the area, and one of the co-PIs is already leading a project focused on monitoring oyster reef health across Texas estuaries. The team has also previously developed and applied a habitat suitability index, demonstrating their past experience with creating and applying indices.

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The primary goal is to develop an index and outputs that help managers understand the management conditions and environmental regimes in which oyster reef restoration is most successful in terms of reef condition, population dynamics, and provisioning. There are structured tasks supporting this goal.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	No
Comments:	
My primary concern with the proposal is in regard to its sampling design and plan for constructing an index (see response to question B in the prior section). In summary, there is insufficient justification for the sites to be sampled, and inadequate detail as to how all of the collected information will be synthesized into a usable metric.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Yes, environmental benefits are identified, and primarily consist of producing information to help regional managers improve the success of oyster reef restoration projects. The primary stressor is variation in management approaches and restoration design. There are no regional plans mentioned.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information

Comments:
There are two metrics listed, but the target is 0 for both, and no narrative is provided. So there is inadequate information with which to assess metrics.

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The proposal considers future conditions and will compile data on future reef exposures, though it is unclear how this information will feed into any project outputs.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The proposal highlights one source of risk/uncertainty, which is that there could be extreme conditions during the sampling such that the collected data are not broadly representative of typical environmental conditions. I feel the greatest risk is that the data will be too variable so as to produce an index, indicators, or management thresholds. To strengthen the risk/uncertainty section, it would help to see some description as to how the project would still produce beneficial insights even if there are no significant relationships identified.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Yes, but refer to prior comments on the discussion of prior literature being limited.	

Question I

Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No

Comments:

No, the proposal does not elaborate on past success and failures of similar efforts. The team has previously successfully created a habitat suitability index, but through modeling efforts, making this prior work quite distinct from the proposed work.

Question J

Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	No

Comments:

Unfortunately, the metrics were not elaborated upon, so it is challenging to assess whether the strategies support project success metrics. A brief data management summary is provided. No monitoring or adaptive management strategies are presented (listed as “not applicable”).

Please summarize any additional information needed below:

A strength of this proposal not touched upon in prior comments is its collaborations. The team spans federal and state agencies who are directly working on oyster reef restoration.

Enhance Coastal Resilience Through Beach and Dune Restoration

Escambia County, Florida

RESTORE Council Proposal Document

General Information

Title:
Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County

Project Abstract:
This proposal will complete compliance and planning requirements to extend county beach nourishment activities onto Gulf Islands National Seashore (GUIS; hereafter referred to as the Park), as well as plant native vegetation to stabilize dunes. Extending these beach nourishment efforts onto federal land will enhance infrastructure protection and combat coastal erosion exacerbated by reduced sediment supply and rising sea levels. While this proposal does not directly request funding for sediment placement, it will fund the essential compliance and planning requirements needed for this important work. This proposed effort also includes planting vegetation to stabilize dunes, utilizing materials propagated from existing plants within the Park. This effort is projected to span five years, encompassing two years for planning and compliance, followed by three years of planting and monitoring. Enhancing barrier island resilience through this effort will not only improve habitat but also support local communities by safeguarding critical evacuation routes and promoting tourism in the area, particularly following recent hurricane impacts.

FPL Category: Cat1: Planning/ Cat1: Implementation

Activity Type: Project

Program: N/A

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(IV) Projects that restore long-term resilience of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Priority Criteria Justification:
This effort will complete the planning and compliance necessary to allow for neighboring beach nourishment projects onto NPS lands, providing restoration and long-term resilience benefits to the Gulf Coast Region. This effort will not fund placement of sediment but will provide the environmental compliance necessary for these activities from neighboring communities. Replenishing sediment lost to erosion from hurricanes, other storms, and elevated sea rise will

provide wider beaches and higher elevation to reduce continued erosion as the areas receive a reduced natural sediment load caused by coastal interruptions in sediment supply. Stable beaches will provide enhanced shorebird foraging area and successful sea turtle nesting areas. Additionally, dune restoration through planting of native vegetation in and adjacent to sediment placement areas will enhance long-term resilience by stabilizing disturbed habitats and facilitating the natural development of island stabilizing dunes.

Project Duration (in years): 5

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore and Enhance Natural Processes and Shorelines

Secondary Comprehensive Plan Objectives:
Protect and Restore Living Coastal and Marine Resources

Secondary Comprehensive Plan Goals:
Replenish and Protect Living Coastal and Marine Resources

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement
Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship

Location

Location:
Project activities will be adjacent to the communities of Navarre Beach and Pensacola Beach, Escambia County, FL. Planned sediment placement projects and dune restoration will be extended west of each location within the boundaries of GUIS through completion of required planning and environmental compliance.

HUC8 Watershed(s):
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Pensacola Bay)

State(s):
Florida

County/Parish(es):
FL - Escambia
FL - Santa Rosa

Congressional District(s):
FL - 1

Narrative

Introduction and Overview:
The objective of this proposal is to complete compliance and planning to allow for neighboring beach nourishment projects to extend onto federal owned property, and to plant dune stabilizing native vegetation for multiple beneficial purposes. Beach nourishment projects are being planned for the public beaches adjacent to GUIS: Navarre Beach and Pensacola Beach. Project managers have approached GUIS with the request to taper their beach nourishment project templates onto adjacent GUIS beaches for approximately one mile at each location for increased protection of infrastructure close to the Park's boundary. Extending these projects will also benefit GUIS by providing sediment to areas where reduced sediment supply and elevated sea level rise are leading to higher rates of coastal erosion. Sediment placement has been shown to be effective in increasing resilience in local coastal areas (Brutsché, K et al., 2015). Preparation of an Environmental Assessment (EA) to evaluate benefits and analyze potential environmental impacts of beach nourishment actions extended into the Park will lead to better overall results. This proposal does not request funding for placement of sediment, only for the planning and compliance required to allow adjacent projects to extend into the Park.

Past successful projects specific to the Park and panhandle region of Florida include those related to restoration following previous hurricane events, public beach sediment placement, and native plantings for stabilization. The most recent cooperative project within the Park was an emergency sediment placement following Hurricane Sally to fill breached areas at Perdido Key, FL. Native revegetation efforts are currently underway in cooperation with the Florida Wildlife Conservation Commission and University of Florida. Other relevant research includes current, unpublished work by the USGS addressing sediment transport and deficiencies in sediment supply to Park lands mitigating erosion and elevated risk to natural systems and infrastructure. Monitoring data/reports from previous sediment placements adjacent to the Park (Escambia and Santa Rosa Counties) should show in the EA's impact analysis how previous sediment placements have provided benefit to limited areas of the Park, which we hope to expand through this proposal. By partnering with the neighboring counties, the Park will benefit from the analysis of environmental impacts through the EA leading to approval for expanding the county-funded projects into the Park.

To facilitate natural development of island stabilizing dunes, the proposed effort will include planting native vegetation to capture and hold sediment. Plant materials for dune restoration will be collected from existing native plants in the Park with an adequate amount propagated to provide necessary stabilization and dune development at key locations. This effort will include extensive planning and monitoring requirements. It is estimated that initial planning and collection of native plant materials will take approximately two years to implement with three years of planting and monitoring post-sediment placement for a total of five years. Native planting will primarily occur in dune and fore-dune areas adjacent to planned sediment placement templates. To reiterate, sediment placement will be completed outside of this proposed effort.

The proposed extension of neighboring nourishment projects onto GUIS property and planting of native vegetation will provide additional barrier island resilience and improved habitat. The areas under consideration have been impacted by hurricanes, most recently Hurricane Sally, and have been slow to recover. Hwy 399, adjacent to Navarre Beach, is an evacuation route for

the communities of Navarre and Pensacola Beaches. If one of the bridges were to be closed or damaged, the route through GUIS is the local residents' only means of leaving the island with their vehicle. Enhancing resilience in this area is important to the Park and neighboring communities to protect the road. Fort Pickens Road, adjacent to Pensacola Beach, is the access route to GUIS. The Fort Pickens area is important to the local community as a visitor destination and benefit to the local economy. Enhancing resilience in this area to protect the road and other infrastructure will not only benefit island stability and natural habitat but also tourism.

Proposed Methods:
The Park will undertake compliance and planning to permit sediment placement following NPS beach nourishment guidance (Hart K and Others, 2023). Partners will be responsible for required pre- and post-placement measurements and monitoring to ensure standards are achieved. Required topological and bathymetric monitoring will be completed by partners and resultant data will be publicly available. Native vegetation will be installed by GUIS staff. Vegetation will be monitored by running standard vegetation monitoring transects through the restored areas. These transects will track survivorship of plantings and changes in percent of vegetative cover. Non-native invasive plant species will be controlled through Park-based programs. The success of plantings in restoring dunes will be tracked in cooperation with the NPS Gulf Coast Inventory and Monitoring Network which conducts topological surveys on a routine basis within the Park and can assist with plant monitoring protocols. Planting locations will be determined through the planning process and will be dependent on final template for sediment placement in coordination with the county project planners.

The EA and planning process will be the mode of specifying implementation based on all available guidance documents and policies. The NPS Beach Renourishment Handbook (Dallas et al, 2012) and Coastal Adaptation Strategies Handbook (Beavers et al, 2016) will be referenced as well as adherence to applicable elements of the USACE Nationwide Permit.

Related to sediment placement, annual bathymetric and topographic surveys are standard components of a required USACE permit. LiDAR and transect surveys are conducted by contracted services, and additional transect surveys are conducted by the NPS Inventory & Monitoring Program every two years (National Park Service. 2009). Dune stabilization through native plant establishment will be planned either by contract or cooperative agreement with coastal subject matter experts yet to be determined. The Park has previously worked with The University of Florida for determination of planting blocks, seed collection, propagation, planting, and monitoring.

A data-driven Monitoring and Adaptive Management Plan will be created to specify monitoring parameters with indicators to guide follow up actions and determine success and possible inclusion of some general measures that are fairly standard for this type of action. This will include a data management plan that will be integrated into the NPS Inventory and Monitoring Network's long term data set for the Park.

Environmental Benefits:
Direct benefits from this effort include stabilization through use of native vegetation plantings and increased resilience to storms for critical coastal areas. Areas targeted for native plantings have been significantly impacted by storm damage and interrupted sediment supply. Connecting vegetation habitat allows for native wildlife, such as beach mice, to maintain travel corridors as well as access to expanded food sources.

Expansion of beach area provides for increased nesting habitat for both shorebirds and marine turtles. Due to explosive growth in coastal development in recent decades, primary nesting areas have been negatively impacted. The Gulf Islands National Seashore partners with state and federal agencies to monitor and protect some of the more productive remaining habitat for nesting in the region. Dune enhancement and beach restoration will provide needed conditions for multiple imperiled species.

The NPS is well-experienced in Dune Renourishment and Beach Replenishment projects including: 1) involvement in the Panhandle Dune Restoration Program, 2) Perdido Key Beneficial Use of Dredge Material Project - recently completed and now monitoring, 3) 22 million cubic yard sediment placement at Ship Island, MS as part of the Mississippi Coastal Improvement Program, and 4) partner in developing the Pensacola Pass Inlet Management Plan.

Metrics:

Metric Title: PRM013 : Restoration planning/design/permitting - # environmental compliance documents completed
Target: 2
Narrative: Completed planning and compliance will allow Park to permit expansion of county projects to occur at two locations. Each location will extend one mile into the Park for a total of two project miles. One EA will be completed to accompany permitting of partner sediment placement projects, and one programmatic CE will be reviewed and modified if needed for native plantings.

Metric Title: HR013 : Wetland restoration - Acres restored
Target: 85
Narrative: Native vegetation planted adjacent to areas where sediment is projected to be placed will cover approximately 85 acres. Vegetation will have the immediate effect of providing food sources and cover for species such as beach mice. Plantings will also trap moving sand and initiate stabilizing dunes that have been impacted from storms and lack of sediment supply.

Risk and Uncertainties:
The proposed effort will increase resilience and improve habitat. However, the areas under consideration are in a highly dynamic coastal system. Vegetation requires time to establish, and timing of planting will provide for best results, but a major storm action in the first growing year could be devastating to success.

Given the highly dynamic coastal system addressed in this proposal, considerable risks exist. This proposal is itself a mitigation plan for past and ongoing environmental impacts from reduced sediment transport and storms. The Park is in a continual cycle of restoration-impact-restoration. So, the mitigation plan to follow impacts to this effort will be to work with coastal partners to continue the cycle. The EA compliance will enable the Park to initiate restoration efforts with partner assistance in areas that the Park has not previously been able to due to lack of planning and compliance.

Park-specific data and previous analysis will be used to assess the potential long-term challenges of the proposed action. Gulf Islands National Seashore Coastal Hazards & Climate Change Asset Vulnerability Assessment Protocol (Peek, 2015), Coastal Vulnerability Assessment of Gulf Islands National Seashore (GUIS) to Sea Level Rise (Pendelton, 2004),

and Gulf Islands National Seashore climate futures summary (Climate Change Response Program, 2024) are primary sources of information.

Monitoring and Adaptive Management:
This proposal will complete compliance and planning to permit sediment placement by neighboring county partners to continue onto federal lands. Partners will be responsible for required pre- and post-placement measurements and monitoring. Required topological and bathymetric monitoring will be completed by partners and resultant data will be publicly available.

Native vegetation planting will be the responsibility of Gulf Islands National Seashore. Success of planted vegetation will be monitored by running standard vegetation monitoring transects through the restored areas to track survivorship of plantings and changes in percent of vegetative cover. Non-native invasive plant species will be controlled through Park-based programs. The success of plantings in restoring dunes will be tracked in cooperation with the NPS Gulf Coast Inventory and Monitoring Network which conducts topological surveys on a routine basis within the Park.

A final sediment placement template will be needed for "beach restored", or erosional loss related to reduced sediment transport recovered. For plantings, an 80% survivorship is commonly desired as a standard and percent cover will be identified using LIDAR surveys.

Data Management:
All data, maps, and project related reports will be filed at the Park and provided upon request.

Collaboration:
Extending the actions onto NPS lands will enhance both resilience of county owned lands and NPS resources and infrastructure. There are also multiple studies currently in action, planned, or proposed to monitor sediment budget for these areas that will provide additional data for planning, analysis, and monitoring.

Public Engagement, Outreach, and Education:
Public engagement is a requirement of the NPS NEPA process. Public meetings will be conducted with stakeholder during development of project alternatives and final plan provided for public comment. Park interpretive staff educate the public on coastal dynamics and the importance of vegetated dunes on an ongoing basis as part of the environmental protection education component of Park operations.

Leveraging:

Funds: $500,000.00
Type: Leveraging
Status: Proposed
Source Type: Local Funder (e.g., city, county, parish)
Description: The preferred alternative selected during completion of compliance and planning will define actions. The two neighboring Counties (Escambia and Santa Rosa) plan to invest substantial funds to implement the chosen alternative. However, the amounts are unknown until final project design. The number provided here is just an estimate.

Environmental Compliance:
Both activities proposed in this effort are considered Category 1 “planning” and/or “implementation” activities. The first activity will be to complete planning and EA compliance for our partner’s beach restoration actions. NPS has specific requirements for all federal actions, and GUIS staff includes a full time Environmental Protection Specialist that coordinates all project actions. We consult with all appropriate regulatory agencies and stakeholders on a frequent basis and are confident, having completed recent beneficial use of dredge material sediment placement projects, that we will be able to successfully complete planning and EA compliance in a timely manner.

The second proposed activity will be to plant native vegetation in selected locations within the Park. We do not consider the planting activities proposed to cause significant environmental impacts to the Park. The planting activity may be covered by Park or DOI categorical exclusions. For example, NEPA and NHPA compliance requirements for the native planting components of this proposed effort are covered by a Park programmatic categorical exclusion (GUIS Dune Restoration Plantings 2023-2028) and also by the “Existing Department of Interior Categorical Exclusions” (43 CFR Part 46). However, aspects of the native planting components may be additionally reviewed as part of the EA process, which could include potential extraordinary circumstances such as listed species, cultural sites, and artifacts.

Bibliography(All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

Beavers R, Babson A, Schupp C (ed). 2016. Coastal Adaptation Strategies Handbook. 134009. National Park Service. Washington, DC.

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Budget

Project Budget Narrative:
Approximately $230,000 of the project budget will be required for environmental compliance and planning. Propagating sufficient native plants utilizing material collected within the Park will utilize $400,000. Establishing native plant plots, monitoring, and adaptively replanting areas required for success will utilize $270,000.
The overall budget for this project is $900,000.

Total FPL Project/Program Budget Request:
$ 900,000.00

Estimated Percent Monitoring and Adaptive Management: 25 %
Estimated Percent Planning: 25 %
Estimated Percent Implementation: 40 %
Estimated Percent Project Management: N/A
Estimated Percent Data Management: N/A
Estimated Percent Contingency: 10 %

Is the Project Scalable?:
Yes

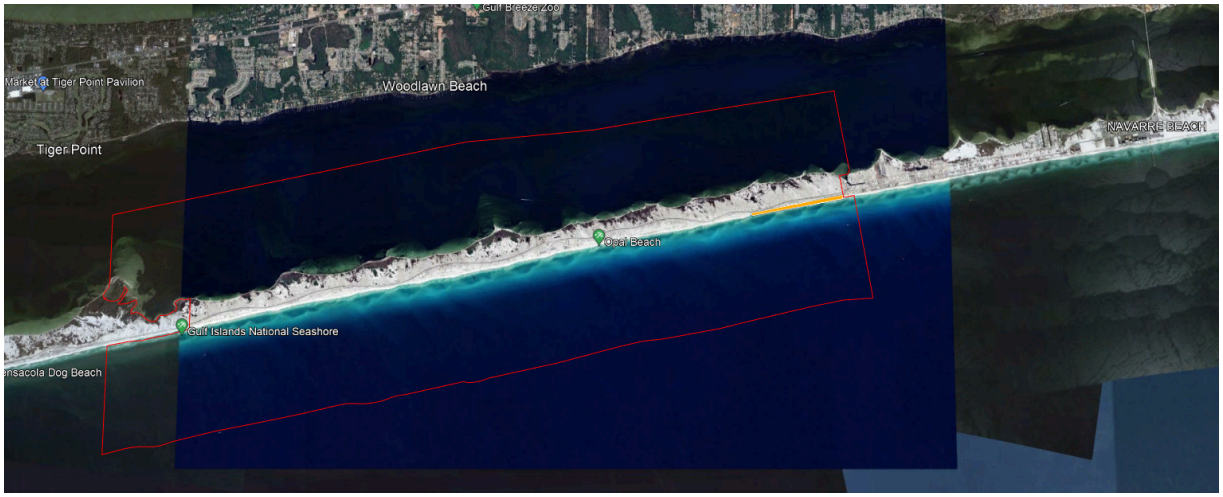
If yes, provide a short description regarding scalability.:
Project could be scaled down to only accomplish the planning and compliance components to allow for future sediment placement. Conversely, project could be scaled down to only accomplish dune restoration through native vegetation planting.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g., title and date of document, permit number, weblink etc.)
National Environmental Policy Act	No	To be completed as part of the project
Endangered Species Act	No	To be completed as part of the project
National Historic Preservation Act	No	To be completed as part of the project
Magnuson-Stevens Act	No	To be completed as part of the project
Fish and Wildlife Conservation Act	No	To be completed as part of the project
Coastal Zone Management Act	No	To be completed as part of the project
Coastal Barrier Resources Act	No	To be completed as part of the project

Farmland Protection Policy Act	No	To be completed as part of the project
Clean Water Act (Section 404)	No	To be completed as part of the project
River and Harbors Act (Section 10)	No	To be completed as part of the project
Marine Protection, Research and Sanctuaries Act	No	To be completed as part of the project
Marine Mammal Protection Act	No	To be completed as part of the project
National Marine Sanctuaries Act	No	To be completed as part of the project
Migratory Bird Treaty Act	No	To be completed as part of the project
Bald and Golden Eagle Protection Act	No	To be completed as part of the project
Clean Air Act	No	To be completed as part of the project
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Proposed Sediment Placement and Dunes Restoration Project Area – Navarre Beach Extension

Caption : Proposed Sediment Placement and Dunes Restoration Project Area – Pensacola Beach Extension

Other Uploads

Main Uploads_0:
Revised Proposal_NPS_FPL4_Beach and Dune Restoration Proposal_011725.docx
Caption : N/A

GIS Data_3:
GUIS_RESTORE_GIS_Template.gdb.zip
Caption : N/A

Council Staff Review:

Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County

Note: All comments indicated below were addressed in the proposal provided above.

FPL Internal Staff Review

Project/Program	Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County		
Primary Reviewer	Amy Newbold	Sponsor	DOI
EC Reviewer	John Ettinger	Co-Sponsor	NA
1. Is/Are the selected Priority Criteria supported by information in the proposal?			Yes
Notes			
2. Does the proposal meet the RESTORE Act geographic eligibility requirement?			Yes
Notes			
3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?			Yes
Notes			
4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?			Yes
Notes			
5. Does the proposal align with the applicable RESTORE Council definition of project or program?			Yes
Notes	Project		

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes
Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	No
Notes	The FPL 4 proposal indicates that implementation funds (for planting) are Cat 1, yet also indicates that environmental compliance is yet to be completed. Therefore, the implementation component should be listed as Category 2 unless DOI can provide documentation of compliance with all applicable environmental laws (e.g., NEPA, ESA, NHPA) or the budget for this activity should be revised accordingly to show the sub-amounts in FPL Category 1 and Category 2, with corresponding edits to the narrative and environmental compliance section. Note: Restore Council staff worked with the state to resolve these comments.

Summary of Best Available Science Review:

Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County

The review of the DOI - NPS Dune Restoration proposal highlighted several strengths and weaknesses across various aspects. While the proposal is generally aligned with the Gulf Coast region, it lacks sufficient peer-reviewed sources to justify the proposed methods and monitoring protocols. Some reviewers indicated that the justification for the methods and their adaptability to the Gulf Coast is unclear, and more peer-reviewed literature should have been cited, especially for dune restoration and planting success. Although the environmental benefits, such as habitat creation and erosion prevention, are outlined, some reviewers noted the absence of detailed metrics and methods, particularly for plant survival and vegetative cover monitoring. Concerns were raised about the lack of discussion on sea level rise, storm frequency, and other long-term environmental risks, with one reviewer criticizing the proposal for not adequately addressing these factors. In addition, the proposal's lack of detail regarding past successes or failures of similar efforts and the insufficient description of adaptive management strategies were pointed out. Some reviewers called for more information on how the monitoring data would be used and how alternative actions would be handled in case of unforeseen issues, such as low plant survival or negative impacts from storms. Additionally, the need for clarification regarding the project's implementation details, including whether work will be done in-house or contracted out, and a clearer map of the project location, was noted. Overall, the proposal was seen as relevant and generally aligned with the objectives of the RESTORE Act but would benefit from more specific, detailed information on methods, monitoring, and risk management.

Summary of DOI's Response to BAS Comments:

In response to BAS comments, DOI revised the proposal to outline several plans and updates to address feedback on sediment placement, dune stabilization, and monitoring. Sediment placement will include annual bathymetric and topographic surveys, conducted via contracted services and supported by the NPS Inventory & Monitoring Program. The restoration process will rely on collaboration with coastal experts, including the University of Florida, for seed collection, planting, and monitoring. Citations for previous successful projects, such as the Panhandle Dune Restoration Program, will be added to bolster the literature supporting the proposal. The proposal also commits to adding publicly available literature and references to local and regional restoration efforts, including USGS research on sediment transport and coastal vulnerability assessments related to sea level rise. Plans for monitoring and adaptive management will be further developed, with monitoring parameters integrated into the NPS Inventory & Monitoring Network. The proposal also highlights the Park's experience in similar projects, such as the Panhandle Dune Restoration and the Perdido Key Beneficial Use of Dredge Material Project. The final planting locations will be determined during the planning phase, and methods will be based on established best practices, including the NPS Beach Renourishment Handbook. The proposal acknowledges the risks posed by sea level rise and intends to incorporate relevant documents and data from NOAA and USGS to address these

concerns. Metrics for success, including plant survivorship and vegetative cover, will be defined, with a standard of 80% plant survivorship. The proposal also outlines plans for continued collaboration with coastal partners to mitigate environmental impacts and address the dynamic nature of the coastal system.

Best Available Science Review Forms:

Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County

Proposal Title: Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County
Location (If Applicable): Project activities will be adjacent to the communities of Navarre Beach and Pensacola Beach, Escambia County, FL. Planned sediment placement projects and dune restoration would be extended west of each location within the boundaries of Gulf Islands National Seashore through completion of required planning and environmental compliance.
Council Member Bureau or Agency: U.S. Department of the Interior
Type of Funding Requested: Planning / Implementation

Reviewed by: In State
Date of Review: 10/1/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information

Comments:
Peer reviewed information has been cited to justify the proposed objectives but little peer reviewed information is provided to justify methods. Specifically, the literature that addresses methods to monitor success of plantings is not cited. Sources could be cited as these objectives and methods are common in peer reviewed literature. The objectives and proposed methods are standard practices to provide for coastal resilience and habitat for at risk coastal species. This information is commonly available to the public.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
This proposal directly pertains to the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Literature sources are accurately and completely cited. The literature sources represent an unbiased view. Again, additional sources could have been cited but additional sources would be in agreement with the sources cited and much of the information is common practice.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Additional risk pertain to future tropical storm activity and this risk has been identified. The only addition risk obtusely identified would be any objections to the project presented during the compliance phase.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
A minimal amount of peer-reviewed and publicly available information has been identified.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The justification provided identifies the most current science and reliable information.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
The risk identified in the proposal are commonly documented and communicated in the scientific literature.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
The sponsor and project partners have considerable experience in implementing this type of project. However, I don't see this stated implicitly in the proposal.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The overall goal and objective is clearly defined and this project is similar to other projects undertaken in this region.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
Methods are appropriate. Additional details should be outlined when the protocol for the actual dune restoration plantings. Because the National Park Service (National Seashore) is responsible for the planting and this type of project is commonly implemented by the agency, I believe these details will be adequately considered by the National Park Service (NPS). National Seashore (NPS) is experienced in the planning and compliance activities that make up a large part of this project.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The proposal does a good job of identifying the environmental benefits including development of island stabilizing dunes, providing habitats for multiple at risk coastal species and protection of infrastructure. Several environmental stressors are identified including sea level rise, sediment deficiencies and human infrastructure development.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	

This project has outlined the measures of success for the dune planting although literature where these measures are outlined was not identified. I assume the measure of success for the compliance and planning would be the issuance of permits.

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The proposal discusses long term environment risk which includes sea level rise and increased, intense tropical storm activity.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
The proposal does not provide alternative actions if proposed plans are not agreed on by all concerned groups i.e. shorebirds and sea turtle biologist e.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
The project considers current information.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No

Comments:
The project does not include information on past successes and failure of similar efforts. This information is available but not included.

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is the appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information
Comments:	
The monitoring strategy for the project is outlined but how the information will be used is not outlined sufficiently.	

Please summarize any additional information needed below:
The project meets the goals of the Restore Act. The proposal could have been expanded to include more details on some of the methods for monitoring and indicators of success that would be used determine the success of the project. Additional available refereed articles or manuals should be referenced.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County
Location (If Applicable): Project activities will be adjacent to the communities of Navarre Beach and Pensacola Beach, Escambia County, FL. Planned sediment placement projects and dune restoration would be extended west of each location within the boundaries of Gulf Islands National Seashore through completion of required planning and environmental compliance.
Council Member Bureau or Agency: U.S. Department of the Interior
Type of Funding Requested: Planning / Implementation

Reviewed by: In Gulf
Date of Review: 9/20/2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	

This is a planning and compliance proposal, so full peer review is limited. This proposal is well supported by identification of an environmental assessment in the planning process which will provide and support a more robust inclusion of peer reviewed and/or publicly available information and methodologies. This proposal is further supported by the use of municipal information and planning, given that it is an extension of work already in process by those municipalities.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
This proposal directly pertains to the Gulf Coast region. The actions and methods proposed are reasonable and relevant to this geography.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
There are some strange constructs for citations in the text (e.g. stating “and Others” vs. the standard et. Al), but the references are relevant and included, and will only be expanded as compliance documents are completed in the first 2 years. The expanded literature sources will be helpful.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
The uncertainties of storm and climate impact are identified. Storms are not evaluated as these are unforeseen and unplanned events of varying magnitude and intensity. Climate impacts are addressed through native planting actions to secure sediment.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Need more information
Comments:	
The proposal refers to, but does not cite, municipal planning underway. The environmental assessment and compliance for work on federal lands should fill this gap in existing information as that is developed in the first 2 years.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
The applicant does a good job of linking the local and federal actions for broader impact. Additional information mined through the planning and compliance aspects in the first 2 years will further strengthen the justification.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	
The applicant repeatedly mentioned risk aspects associated with storms and climate change. One item that wasn't clear was what funding source was being used for sediment placement and if these were fully secured. The mention was that this project was not asking for those funds and they would come through the local partners.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	

This was evident through the NPS Inventory and Monitoring Network referenced as part of data management and associated ongoing surveys for invasive species. The proposal also references recent similar beneficial use of dredge sediment projects the applicant has completed, including associated compliance and planning components.

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The project identifies two straightforward goals: (1) planning and compliance for sediment placement on federal lands, and (2) native propagation, planting, and monitoring of dune species to stabilize the sediment.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The proposal identifies native plant propagation and installation as the primary action component. Plant material will be gathered from within the existing area, thus limiting issues with potential contamination by alternate species and genotypes/phenotypes. It does not describe the detail of seeds, cuttings, etc., nor where the propagation will occur. The cost effectiveness and budget items seem appropriate, but it was unclear whether all work would occur in-house or if some would be contracted out.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The underlying stressors, especially sediment supply and storm-related impacts, are more experiential than formal references. The formal references may be more present once the compliance documents are completed, including sediment budgets which are referenced and should help inform long-term strategies. Environmental benefits for both the beach/dune system with planting, for wildlife, including the beach mouse, and for people through resilience and infrastructure protection are well identified.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives?	Yes

(Captures the statistical information requirement as defined by RESTORE Act)	

Comments:

The project will evaluate the native planting success using through plant survival and percent vegetative cover. These are standard, consistent, and acceptable methods for this work. Invasive species will also be tracked and managed.

Metrics identified include land acquisition at 85 acres. I was confused if this was the proposed additional area boosted by the sediment placement. Since there is no land actually being acquired, but rather, it is being created/restored, is that a better metric for this effort? Beach area restored?

I would think there would be a Metric for the planted area, specifically for acres restored as well.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:

The proposal highlights how this project will add resilience for emergency and evacuation routes for residents, as well as boosting environmental resilience of the habitats supported and enhanced through the project itself. The proposal also highlights the issue of timing of plant establishment and potential storm impacts which could limit the project's success. Those are impossible to control.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information

Comments:

Sediment supply limitations are discussed and sediment budgets are identified as being developed. The proposed native plantings will help address this by stabilizing the new sediment being added. The addition of actions for low plant survival or % vegetative cover, such as additional plantings (i.e. storm impacts) or some protection method (i.e. herbivore impacts), would be helpful. Adaptively replanting was briefly mentioned in the project budget, but not described I the proposal.

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Impacts from Hurricane Sally to the area are referenced with discussion on how this project will aid in alleviating some of the impacts incurred.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
Reference to their existing NPA Inventory and Monitoring Network implies past experience with these methods and they state ongoing routine surveys for long-term tracking which helps with sustainability of the project. They also mention past beneficial dredge projects where a similar approach was successful.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
The proposal includes monitoring up to three years post installation of the native plants. This will help define success. Partners will also be helping with data collection relative to bathymetry, etc. for sediment placement and the proposal states that data collected for both will be publicly available, but the location of the public data was not identified..	

Please summarize any additional information needed below:
The public engagement component has the potential through those education efforts to amplify impacts by educating and influencing private landowners on nature-based strategies to protect their own habitat and lands. In the budget narrative, is the compliance/planning, propagation, planting, and monitoring all occurring in-house, or will it be contracted out? Some additional detail would be helpful. The two location maps provided were extremely blurry and there was no overall location map to show the area relative to the FL panhandle. This assumes reviewer familiarity with the area, which is not always the case.

Proposal Title: Enhance Coastal Resilience Through Beach and Dune Restoration, Escambia County
Location (If Applicable): Project activities will be adjacent to the communities of Navarre Beach and Pensacola Beach, Escambia County, FL. Planned sediment placement projects and dune restoration would be extended west of each location within the boundaries of Gulf Islands National Seashore through completion of required planning and environmental compliance.
Council Member Bureau or Agency: U.S. Department of the Interior
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of Gulf
Date of Review: 6 October 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	No
Comments:	
Proposed methods and justification are not adequately described. Area in which plantings will be performed is not identified. There is no discussion of monitoring protocols to be used, nor how plants will be propagated, or by whom.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Need more information
Comments:	
Information supporting the proposed methods are not sufficient to determine the appropriateness of the techniques to be used.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	No
Comments:	
There are only two citations in this proposal – far fewer than should be present to justify a $900K budget. Proposed methods and justification are from a paper looking at nearshore submerged berms and are not applicable to this study area.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	

Proponents suggest plantings may not survive, particular if a storm is experienced in the first year of the planting cycle. But they propose adaptive management of plantings, so should be prepared to replant should such occur. This is necessary for this project to succeed.

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	No
Comments:	
There is a mountain of literature on dune building and beach restoration available. None of it is cited here, only a paper about nearshore berms, as described above. Further, if this literature had been cited, it would show that allowing the proposed project to occur would only move areas of erosion and island thinning from the boundary between the private and Park lands where it is a joint problem, into the middle of the Park, basically exporting the whole problem to the federal government, while garnering all the benefits to the private property owners.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	No
Comments:	
There was no discussion of how any data would be treated, statistically or otherwise, to assess success in plantings or in dune building.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	No
Comments:	
This is not addressed, although it should be.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
Only along the privately owned property. Not on NPS lands.	

Question B	
Does the project/program have clearly defined goals and objectives?	Need more information
Comments:	
There is inadequate information provided as to where the vegetated planting sill occur.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	No
Comments:	
Absolutely not. This proposal has no description of methods at all, and whoever wrote it should be referred to the NPS beach renourishment handbook, where methods are laid out. There are errors in it as well, showing that this is a reuse of a template for another site.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
It describes the benefits of planting vegetation to stabilize dunes and create habitat, but in the most rudimentary way. It also mentions creating wider beaches by trapping sand, and nesting habitat for birds and turtles: these are all statements that any member of the public could espouse.	

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	No

Comments:

This proposal has basic quantitative metrics for success: survivorship of plantings and % vegetative cover. Also, topography and bathymetric changes, but these metrics are not described in the text.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	No

Comments:

Most concerning is that this project does not address any risk associated with sea level rise. Much data is available, and has a direct impact on erosion, planting success and long-term barrier island viability.

Question G

Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	No

Comments:

NO – only lack of planting success.

Question H

Does the project/program consider recent and/or relevant information in discussing the elements above?	No

Comments:

Ignoring sea level rise and increased storm strength (and potentially frequency) is a severe oversight in use of the best available science.

Question I

Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and	No

uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	
Comments:	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is the appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	No
Comments:	
There is a decided lack of any of these considerations.	

Please summarize any additional information needed below:

Colonial Waterbird Rookery Island Restoration

RESTORE Council Proposal Document

General Information

Title:
Colonial Waterbird Rookery Island Restoration

Project Abstract:
Many coastal breeding colonial waterbirds are in decline. Restoration of their nesting sites is needed to slow and reverse declines in these waterbird species. Recently, the National Oceanic and Atmospheric Administration (NOAA) RESTORE Science Program funded a project to develop a planning tool to guide rookery island restoration based on bird biology, nesting productivity, and food resources. This tool, called "Colony Island Network Design and Implementation (CINDI)," is being designed and co-produced by the Harte Research Institute (HRI) and will help managers plan a network of colony islands where rehabilitation and management opportunities are balanced by cost effectiveness and target the geographies and bird species to yield the greatest benefit.

This proposal will leverage the CINDI tool to support restoration actions on islands of the Texas coast. Actions and associated monitoring will be conducted when funds are available (expected 2026) and carried out over 5 years. Actions may include restoration through sediment placement, erosion protection, vegetation manipulation, invasive species control, and/or disturbance abatement. The Department of the Interior (DOI) U.S. Fish and Wildlife Service (USFWS) will work with the Texas Parks and Wildlife Department (TPWD), the Texas General Land Office (GLO), the Texas Commission on Environmental Quality (TCEQ), HRI and non-governmental organization (NGO) partners to implement the projects in support of waterbird rookery island restoration actions.

The goal of this proposal is to maintain or increase breeding waterbird use by restoring, enhancing, or managing island habitat in places that have the highest potential for success on the Texas coast. The objectives are to implement restoration/management actions on a minimum of 5 island locations, restoring/enhancing or managing at least 10 acres of habitat for breeding colonial waterbirds. Success will be measured by stable or increasing numbers of waterbirds nesting at locations where actions are carried out.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Project

Program: N/A

Co-sponsoring Agency(ies):
DOI/FWS

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(IV) Projects that restore long-term resilience of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

Priority Criteria Justification:
Coastal breeding waterbirds were significantly affected by the Deepwater Horizon disaster. This proposal meets RESTORE Priority Criteria 4 (Projects that restore long-term resilience of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill) by carrying out projects to improve island nesting habitat for waterbirds. A Project Advisory Committee using the CINDI tool will help ensure that projects carried out are in geographic locations and for targeted species that will yield the most effective benefits with the resources available.

Project Duration (in years): 5

Goals

Primary Comprehensive Plan Goal:
Replenish and Protect Living Coastal and Marine Resources

Primary Comprehensive Plan Objective:
Restore, Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
N/A

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Protect

natural shorelines
Create, restore, and enhance coastal wetlands, islands, shorelines and headlands: Sediment placement
Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship

Location

Location:
Texas coastal bays and estuaries from the east side of Galveston Bay south to the Rio Grande River. This is the CINDI project boundary.

HUC8 Watershed(s):
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity)
Texas-Gulf Region(Galveston Bay-San Jacinto) - San Jacinto(Buffalo-San Jacinto)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(North Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(West Galveston Bay)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Austin-Oyster)
Texas-Gulf Region(Lower Brazos) - Lower Brazos(Lower Brazos)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - Lower Colorado(Lower Colorado)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(San Bernard)
Texas-Gulf Region(Lower Colorado-San Bernard Coastal) - San Bernard Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Lavaca(Navidad)
Texas-Gulf Region(Central Texas Coastal) - Guadalupe(Lower Guadalupe)
Texas-Gulf Region(Central Texas Coastal) - San Antonio(Lower San Antonio)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West Matagorda Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(West San Antonio Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Mission)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(Aransas)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Nueces(Lower Nueces)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Corpus Christi Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Corpus Christi Bay)

Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Baffin Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central Laguna Madre)

State(s):
Texas

County/Parish(es):
TX - Aransas
TX - Brazoria
TX - Calhoun
TX - Cameron
TX - Chambers
TX - Galveston
TX - Harris
TX - Jackson
TX - Kenedy
TX - Kleberg
TX - Liberty
TX - Matagorda
TX - Nueces
TX - Refugio
TX - San Patricio
TX - Victoria
TX - Willacy

Congressional District(s):
TX - 22
TX - 27
TX - 14
TX - 36
TX - 34

Narrative

Introduction and Overview:
Many coastal breeding colonial waterbirds are in decline (Kushlan et al 2002). For example, black skimmers have declined by approximately 70% in Texas over the past 50 years (Heath

and Hackney 2013, Newstead, 2024). These declines are related to the loss of islands to erosion and sea-level rise, improper vegetation, invasive species, predators, and disturbance during the breeding season (Hackney 2016). Direct experience in habitat restoration/enhancement and management on islands has demonstrated success in creating favorable conditions for breeding waterbirds in Texas bays. The USFWS and its partners have used various approaches to restore and enhance rookery islands. These include complete island creation and/or restoration, e.g., Dickinson Bay Bird Islands I and II, Evia Island, West Bay Bird Island II, Nueces Bay Bird Island, etc. Enhancement of existing islands includes vegetation management, disturbance intervention, supplemental sediment addition, and predator control. Through the years, adaptive management including vegetation control, invasive species control and post storm event maintenance have insured the long-term success of the islands for breeding waterbirds. Funding is needed to support restoration actions to slow and reverse declines in waterbirds.

Funding through the Deepwater Horizon Natural Resource Damage Assessment (NRDA) Trustees, the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund (NFWF-GEBF) and other sources has been directed for island creation, restoration, and management (Deepwater Horizon NRDA Trustees, 2016, and NFWF-GEBF, 2024); however, more is needed to effectively restore coastal waterbird populations. The Texas GLO produces a Coastal Resilience Master Plan to identify coastal projects that are needed to make coastal communities and natural resources more resilient to natural disasters. The 2019 and 2023 plans included waterbird colony projects in every region in the Tier-1 (highest) category with a total funding needed estimated to be over $50 million in the 2019 plan and over $90 million in the 2023 plan (Texas GLO, 2019 and 2023). The need to restore waterbird habitat is great and well documented (Deepwater Horizon NRDA Trustees 2016, Hackney et al., 2016, Hardegree 2014, Kushlan et al 2002). Because it is not possible from a funding perspective to restore/manage all potential waterbird nesting habitat on the Texas coast, conservation efforts must be targeted at locations that have the highest probability for success to reverse waterbird population declines. The Service employs the Strategic Habitat Conservation Framework in our efforts to ensure conservation is carried out based on biological science (USGS and USFWS 2006).

The NOAA RESTORE Science program provided $2,000,453 in funding to develop the CINDI tool to prioritize rookery island restoration based on bird biology, nesting productivity and food resources (https://restoreactscienceprogram.noaa.gov/projects/rehabilitation-of-waterbird-nesting-islands). The CINDI tool will help managers prioritize a network of colony islands where rehabilitation and management are cost effective and the potential for enhancing waterbird populations is high. The tool is an expansion of a pilot project that was carried out in the upper Laguna Madre (Gawlik 2024). While the CINDI tool will be finalized in September 2027, users will have access to preliminary products in 2026, which can support the success of this restoration project in the long term. Incorporating the results from the CINDI tool into this proposal provides the conservation community with a tool designed to guide more effective actions based on geography and avian biology. It also provides the opportunity to test and possibly refine the

island design tool. While best professional judgement has been used by the conservation community to target funds in the past, an objective tool was not available to support decision making.

The CINDI tool is based on a multi-criteria decision-making (MCDM) process using five focal species that represent the broader group of waterbirds that use islands for nesting in Texas. The focal species represent guilds that nest in trees, shrubs, low vegetation, and bare ground. These include the reddish egret, great egret, tricolored heron, black skimmer, and Caspian tern (https://www.birdislands.org/). The criteria used will be species-specific and will include number of breeding pairs, nest survival rates, and habitat suitability within the foraging range of a colony. Use of MCDM in the process helps reduce uncertainty and establishes shared understanding for the decision makers (Shao et al 2020). This approach has been used to create resource allocation methods for wetland management identifying effective and efficient strategies that are robust to uncertainty with respect to sea level rise (Lyons et al 2020).

The MCDM process includes 6 steps: 1) selection of alternative sites for rehabilitation, 2) estimation of performance measure (PM) metrics, 3) normalization of the metrics, 4) application of expert-elicited weights to PMs, 5) scoring alternative sites based on summed PM values, and 6) validation of island rankings by experts (Essian, D., Personal Communication January 5, 2025).

This proposal will leverage the CINDI tool by providing funds for restoration actions on islands in coastal Texas. Using CINDI as a guide, the goal of this proposal is to maintain or increase breeding waterbird use by restoring, enhancing, or managing island habitat in places that have the highest potential for success on the Texas coast. The objectives are to implement restoration/management actions at a minimum of 5 island locations, restoring/enhancing or managing at least 10 acres of habitat for breeding colonial waterbirds as funding allows (actual site locations are currently unknown– see Proposed Methods section below). The success will be measured by stable or increasing numbers of waterbirds nesting at locations where actions are carried out. Actions and associated monitoring will be conducted when funds are available (expected in 2026) and carried out over 5 years. Other potential sources of leveraged funding to carry out restoration projects include Deepwater Horizon NRDA, Texas GLO through the Coastal Resiliency Master Plan, and also the proposed program “Protecting and Restoring Waterbird Rookery Habitat Program.” It is expected that this DOI proposal will provide TCEQ with needed information as they implement projects under their program area.

The USFWS has been restoring, enhancing, managing, and monitoring waterbird populations in Texas for more than 30 years. With partners such as the Coastal Bend Bays and Estuaries Program, Galveston Bay Foundation, TPWD, Texas GLO, Texas Colonial Waterbird Society, and Deepwater Horizon NRDA trustees, we have provided funding and technical support for waterbird island restoration/management and monitoring in every bay system in Texas. USFWS staff have extensive experience in providing financial and technical assistance to project partners in all phases of waterbird colony restoration/enhancement and management. Staff provide input on project designs, regulatory permitting assistance, construction oversight,

vegetation establishment or management, invasive species control, disturbance abatement, and monitoring of birds and habitat.

Proposed Methods:
A Project Advisory Committee (PAC) will be established to help guide the restoration project ideas through site identification, actions to be taken, development of restoration/monitoring plans and selection of contractors. The PAC will include state and federal agencies, HRI, and other conservation partners. Within the first 6 months, the PAC will identify potential sites along coastal Texas where restoration/enhancement actions could be carried out. The PAC will build a list of potential habitat restoration/enhancement projects by using their knowledge of previously proposed projects, projects identified in existing plans, and new potential projects. The PAC will use the CINDI tool to help prioritize locations and projects that have the highest benefit for either specific species of colonial nesting waterbirds or guilds based on nesting habitat (nesting in trees, shrubs, low vegetation, or bare ground). The CINDI tool and non-biological factors related to feasibility and budget will be used by the PAC to identify the projects that will be carried out. Actions could include island creation/restoration through sediment placement, erosion protection, vegetation manipulation, invasive species control, and/or disturbance abatement. Disturbance abatement could include public outreach and education efforts.

This proposal allows for the possibility for island creation or restoration through sediment placement and armoring shorelines. Island restoration or enhancement must balance multiple factors to achieve the desired goal including longevity, water depth, targeted species, site natural resource values, and others. Because island restoration costs are expensive (approximated to be $1M/acre) and can take more than 2 years to permit, implementation of restoration projects in the timeframe outlined in this proposal will not be possible unless already well into planning stages with permits received and other significant funding sources identified. In that case, the PAC will need to leverage RESTORE funding with additional funds from other sources such as NRDA to complete restoration projects. It is also likely that most projects funded by this proposal will enhance existing sites through vegetation manipulation, invasive species control, and/or disturbance abatement or sediment placement using lower cost alternative means. Those actions are more economical and will likely result in more acres of habitat improvement overall helping to achieve the 10-acre goal.

Once site specific actions are identified and monitoring and adaptive management plans developed, cooperative agreements or contracts will be implemented with organizations to carry out restoration/management or monitoring plans. Monitoring plans will include data on numbers of breeding waterbird pairs collected 3 times from each site during the breeding season. Success will be assessed at the species or guild response level on a site-by-site basis. Site improvements (restoration actions, vegetation manipulations/plantings or other management actions) will be monitored outside the nesting season.

Environmental Benefits:
The environmental benefits of this proposed effort include:

- Improving colonial waterbird nesting habitat on no less than 10 acres,
- Improving the resilience of restoration actions across at least 5 island sites,
- Testing the process and functionality of using the CINDI tool,
- Testing the restoration actions by monitoring their effectiveness,
- Improving our knowledge and experience levels shared across the Gulf of America, and
- Stabilizing or increasing numbers of waterbirds nesting at locations where actions were implemented.

Metrics:

Metric Title: HR004 : Habitat restoration - Acres restored

Target: 10

Narrative: The objectives are to implement restoration/management actions on a minimum of 5 island locations, restoring/enhancing or managing at least 10 acres of habitat for breeding colonial waterbirds. Actions could include island creation/restoration through sediment placement, erosion protection, vegetation manipulation, invasive species control, and/or disturbance abatement. Area of islands affected will be reported in acreage of the island.

Risk and Uncertainties:
Short-term Risk: Island creation, erosion protection and placement of material is not only very costly but also takes much more environmental permitting than other potential aspects of this proposed effort. The financial cost and time required to plan potential restoration projects could limit the ability to have more spatially robust outcomes. Recent bird rookery island creation projects have cost approximately $1 Million/acre and can take more than two years to plan and permit. Therefore, without additional funding, the restoration actions described in this proposal could be limited.

Short-term Risk: Island restoration that requires sediment placement or armoring of shorelines has uncertainty related to supply. Sediment can be a limiting factor and cost prohibitive for many projects. Often sediment that comes from channel maintenance activities is not suitable for island restoration. Armoring requires sufficient water depth to transport stone or other materials to the site. These elements will be evaluated in the multi-criteria decision-making process used by the PAC.

Short-term Uncertainty: The CINDI tool has not been completed and therefore the robustness of its outcomes has not yet been evaluated. This introduces some uncertainty into the process. The tool is not the only factor in decision process. This proposed effort will have a PAC to help

guide site identification, actions to be taken, development of restoration/monitoring plans and selection of contractors. This process has proven successful and the use of the tool should only strengthen that process.

There is always short-term risk and uncertainty that actions carried out on islands to increase bird nesting could fail to produce the desired result. The use of a MCDM tool like CINDI should help reduce that risk. Even with an experienced PAC using the CINDI tool, there is potential that birds do not respond as anticipated. Having a robust site-specific monitoring plan can help reduce uncertainty, identify issues, and help to adapt or modify the treatments to have the desired outcome.

Long-term Risk and Uncertainty: Projects that enhance habitat on existing sites through management actions such as predator control, vegetation manipulation or disturbance abatement are processes that are usually not permanent and must be repeated for the accrued benefits for waterbirds to persist. Therefore, there is risk that, post-project, a restored area could revert to its previous state and lose waterbird use, resulting in uncertainty about how to maintain objectives. Projects carried out where there is a strong partner base (National Estuary Programs or others) who have a continued interest in maintaining restoration efforts helps reduce this risk.

Long-term Uncertainty: Climatic events, such as hurricanes, extreme storms, and tide surges from such events pose a threat to actions carried out under this proposal in the short and long-term. Planning to construct for such events comes at a financial cost and reduces the area of project benefits. This calculated risk could be impacted by more frequent or more severe storm events (Balguru et al., 2023). A severe storm and prolonged high tides could remove any improvements carried out. Carrying out projects along the whole coast and not concentrated in one bay system could help reduce this risk.

Long-term Uncertainty: Various factors influence the population structure of birds. These include outbreaks of avian disease, economic investment in conservation, changes in foraging habitat and fisheries resources, etc. These can change in as little as a year's time or take decades to have effects on bird populations.

Monitoring and Adaptive Management:

A site-specific Monitoring and Adaptive Management (MAM) Plan will be developed for each location prior to implementing actions to restore or enhance island habitat for nesting waterbirds. Monitoring could include island habitat pre/post action implementation as well as numbers and species of waterbirds nesting over the last decades (if available). The duration of monitoring will depend on the action carried out and could range from one to three years post-implementation. The numbers of waterbirds which are nesting will be determined by 3 surveys of colonies during the breeding season. One of the surveys will be carried out as part of the Texas Colonial Waterbird Society Annual Survey. Since 1973, the Society has been surveying all coastal waterbird colonies in May or early June in each year.

Implemented actions (island structural component integrity, vegetation plantings or manipulations or other management actions) will be monitored at least twice each year pre and post nesting season. This will ensure that the action has resulted in the desired habitat outcome. Should monitoring show the action did not result in the desired habitat outcome, then the approach will be modified as needed to meet the objective. This monitoring will increase understanding of the effects of management actions on breeding bird abundance at specific locations, helping reduce uncertainty related to management and furthering the goals of the Gulf Avian Monitoring Network Strategic Bird Monitoring Guidelines (Wilson et al., 2019).

Success will be evaluated by the response of the species or guild targeted at each site on an annual basis.

Data Management:

A Data Management Plan will be developed for the proposed effort. Data will be collected using standard monitoring practices based on restoration actions taken at a site. Data will be collected in the field on predesigned datasheets and notes taken in field notebooks. Data will be entered into appropriate databases or spreadsheets for analysis. Data will be housed on USFWS secure servers. The completion of this effort will include a final report that once approved will be provided to the public through emails and through partners.

Collaboration:

The USFWS will work with TPWD, Texas GLO, TCEQ, HRI, and NGO partners to implement projects in support of waterbird rookery island restoration actions. HRI will be a key partner as they are developing the CINDI tool. USFWS will set up a PAC with the partners to help lead and guide this effort. The TCEQ has submitted a proposal to fund the “Protecting and Restoring Waterbird Rookery Habitat Program.” In their proposal, they have emphasized the need to use habitat suitability assessments (like CINDI) to assess the potential for long-term success or failure of proposed restoration projects. Having TCEQ as a PAC member will aid and inform their program area when they move to implementation.

Public Engagement, Outreach, and Education:

Results of this proposed effort will be shared with various conservation community organizations that include the Gulf of America Alliance, Trustee Implementation Groups, Gulf Coast Joint Venture, The Waterbird Society, Estuary Programs, and National Estuarine Research Reserves. Outreach to local resource and recreational organizations will also be undertaken to support the recognition that coastal resources influence and benefit multiple stakeholders.

Leveraging:

Funds: $2,000,453

Type:

Status:

Source Type: Other Federal

Description: The NOAA RESTORE Science Program has provided $2,000,453 in funding to develop the CINDI tool to prioritize rookery island restoration based on bird biology, nesting productivity and food resources. The CINDI tool is being designed and co-produced by the HRI and will help managers prioritize colony islands rehabilitation and management work. This proposal will leverage the CINDI project by providing funds for restoration actions on islands in coastal Texas. Funding will be used to implement actions using this tool as a guide. Actions and associated monitoring will be conducted when funds are available (expected in 2026) and carried out over five years.

Environmental Compliance:
Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site-specific details are needed prior to completing all environmental compliance documentation.

Bibliography (All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

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Newstead, David. 2024. Black Skimmer Project Update – Coastal Collaborations. What's Happening Around the Bend Newsletter. Coastal Bend Bays and Estuary Program.

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Strategic Habitat Conservation (SHC) framework (U.S. Geological Survey and the U.S. Fish and Wildlife Service, 2006).

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Budget

Project Budget Narrative:
Total project budget is $2,000,000 to carry out restoration actions on at least five island sites in Coastal Texas. It is expected that $200,000 will be used to develop site specific restoration plans for five locations. These plans will include all actions necessary for the site including monitoring plans. Another $200,000 will be used for project oversight and management of individual funding agreements with cooperators to carry out actions on the islands, including up to 5 sub-recipient cooperative agreements for actions. Finally, $200,000 will be used in cooperative agreements to implement monitoring and adaptive management plans, and $1,400,000 will be used in cooperative agreements with partners to carry out site specific actions identified in the restoration plans on at least five island sites. Actions could include island creation/restoration through sediment placement, erosion protection, vegetation manipulation, invasive species control, and/or disturbance abatement.

Total FPL Project/Program Budget Request:
$ 2,000,000.00

Estimated Percent Monitoring and Adaptive Management: 10 %

Estimated Percent Planning: 10 %

Estimated Percent Implementation: 70 %

Estimated Percent Project Management: 10 %

Estimated Percent Data Management: 0 %

Estimated Percent Contingency: 0 %

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
The project is scalable. If more funding is provided or if funds can be leveraged with other partners, the accomplishments can be expanded beyond the goal of five islands. If funding is reduced by half, then half of the projected accomplishments can be achieved.

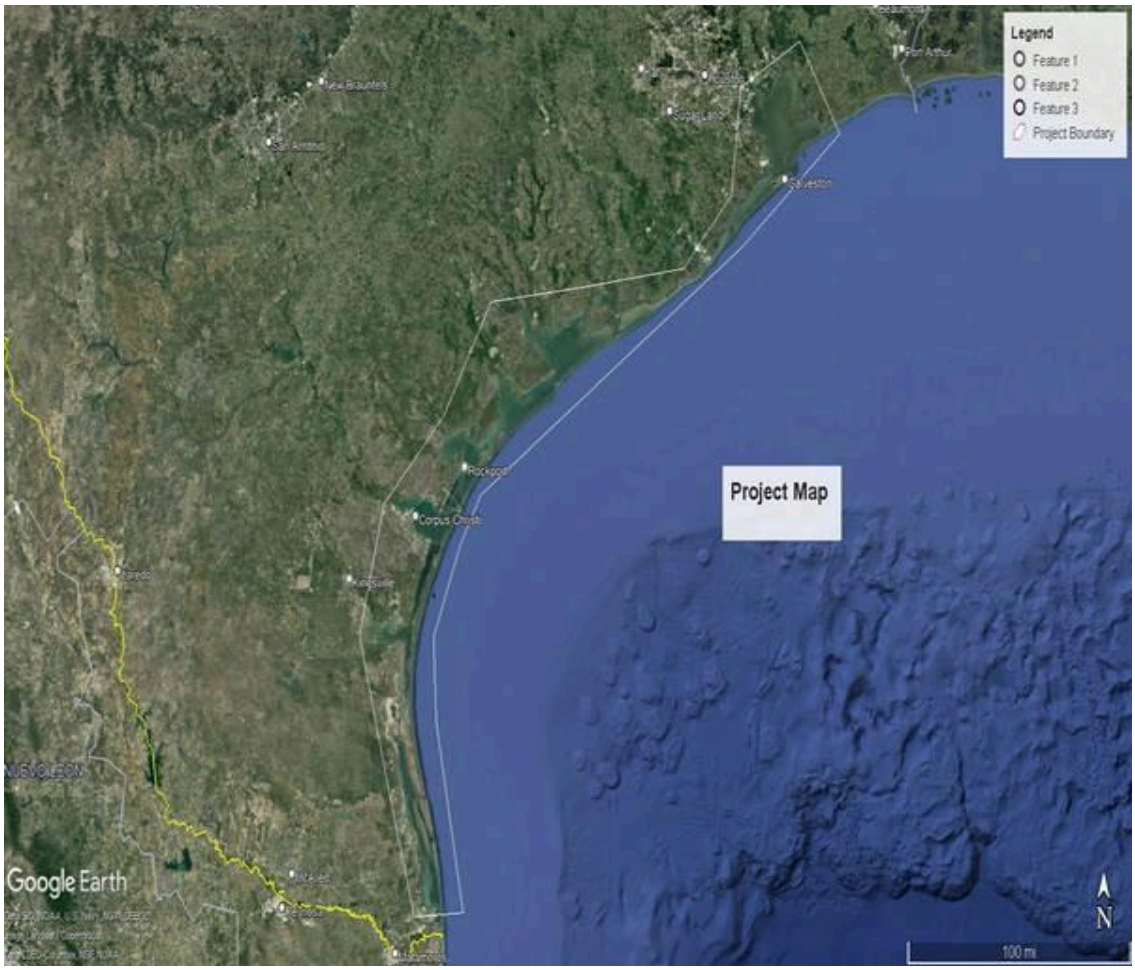
Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Endangered Species Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
National Historic Preservation Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Magnuson-Stevens Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Fish and Wildlife Conservation Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Coastal Zone Management Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Coastal Barrier Resources Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.

Farmland Protection Policy Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Clean Water Act (Section 404)	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
River and Harbors Act (Section 10)	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Marine Protection, Research and Sanctuaries Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Marine Mammal Protection Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
National Marine Sanctuaries Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Migratory Bird Treaty Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Bald and Golden Eagle Protection Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.
Clean Air Act	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.

Other Applicable Environmental Compliance Laws or Regulations	No	Environmental Compliance will be completed on a site-by-site basis at the time of project identification. Site specific details are needed prior to completing all environmental compliance documentation.

Maps, Charts, Figures



Caption : Texas bays where the project will be carried out.

Other Uploads

GIS Data_1:
RESTORE_GIS_Template.gdb.zip
Caption : N/A

Council Staff Review:

Colonial Waterbird Rookery Island Restoration

Note: All comments indicated below were addressed in the proposal provided above.

FPL Internal Staff Review

Project/Program	Colonial Waterbird Rookery Island Restoration		
Primary Reviewer	Amy Newbold	Sponsor	DOI
EC Reviewer	John Ettinger	Co-Sponsor	
1. Is/Are the selected Priority Criteria supported by information in the proposal?			Yes
Notes			
2. Does the proposal meet the RESTORE Act geographic eligibility requirement?			Yes
Notes			
3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?			Yes
Notes			
4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?			Yes
Notes			
5. Does the proposal align with the applicable RESTORE Council definition of project or program?			Yes
Notes			
6. Does the budget narrative adequately describe the costs associated with			Yes

the proposed activity?	
Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	More information needed
Notes	The proposal indicated work is spread over 5 islands. The target is set at 10 acres? Please provide more details about the restoration goals for each island and why 10 acres was selected. Note: Restore Council staff worked with the state to resolve these comments.

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	The implementation portion of the project is in FPL Cat 2.

Summary of Best Available Science Review:
Colonial Waterbird Rookery Island Restoration

The proposal for the rookery restoration project has received significant feedback from multiple reviewers, highlighting several key areas of concern. The objectives and methods are seen as vague, with insufficient justification based on peer-reviewed or publicly available data. The reliance on the CINDI tool, which is still under development, has raised doubts about the project's foundation, as it lacks a solid, peer-reviewed scientific basis. Reviewers also emphasized the need for more comprehensive literature to support the project, as only two references were cited, both of which are insufficient to justify the project's methods and objectives. While the proposal generally pertains to the Gulf Coast region, reviewers noted the lack of detailed evaluation on risks and uncertainties, particularly regarding the long-term viability of rookery restoration in the face of challenges like sea level rise. The project's goals and methods were seen as insufficiently defined, with a general lack of clarity on how success would be measured, beyond a vague goal of restoring 10 acres of habitat. Furthermore, there was little discussion on past successes or failures of similar projects, and the adaptive management strategy was underdeveloped. Although the proposal does mention the involvement of experienced collaborators, the lack of detailed information regarding past projects leaves reviewers uncertain about the team's capability. In conclusion, while the proposal aligns with the broader goals of habitat restoration, its current form is too vague and lacks critical details on methods, monitoring, risk assessment, and implementation to instill confidence in its success.

Summary of DOI's Response to BAS Comments:

The proposal will undergo revisions to address feedback from the BAS, incorporating more detail and scientific justification regarding the goals, objectives, and methods. References such as the North American Waterbird Conservation Plan, Texas Waterbird Society data, and the NRDA Deepwater Horizon Programmatic Damage Assessment and Restoration Plan will be included to support the need for restoration actions. Specific examples of past successful island restoration projects in Texas will also be added. The CINDI tool, a multi-criteria decision-making process designed to rank the most effective restoration actions for waterbird populations, will be more thoroughly referenced, including its use with five focal species that represent different nesting guilds. The methods section will also describe the establishment of a Project Advisory Committee (PAC), which will guide the project through site identification, restoration actions, and monitoring plan development. The PAC will utilize the CINDI tool to prioritize sites for restoration, incorporating both biological and non-biological factors.

The proposal will outline the specific restoration actions that could include island creation, erosion protection, vegetation manipulation, and invasive species control. Success will be evaluated based on stable or increasing waterbird populations. Short-term risks such as the high costs and permitting requirements for island creation will be acknowledged, as well as the uncertainties related to sediment supply and the completion of the CINDI project. Long-term risks, including sea-level rise, will also be addressed. Furthermore, the proposal will emphasize

the importance of a robust monitoring and adaptive management plan for each site, which will include pre- and post-action habitat assessments and annual waterbird surveys. The revisions will provide detailed descriptions of past projects, success factors, and lessons learned to ensure the highest potential for success in the proposed restoration efforts.

The proposal will be revised to include a site-specific Monitoring and Adaptive Management Plan for each location before implementing restoration actions for waterbird nesting habitats. Monitoring will include pre- and post-action assessments of both habitat conditions and waterbird nesting numbers, with monitoring occurring at least twice annually. The duration of monitoring will vary based on the action taken, ranging from one to three years post-implementation, and success will be evaluated annually by assessing the species response at each site or at the guild level. If monitoring reveals that the actions do not achieve the desired habitat outcome, the approach will be modified accordingly. The revised proposal will also clarify the project's objectives, methods, and associated costs. While island creation or restoration through sediment placement is an option, these projects are expensive and require over two years for permitting, making them unlikely to be completed within the proposal's timeline unless already well into the planning stage. Instead, the proposal will focus on enhancing existing sites through more cost-effective methods like vegetation manipulation, invasive species control, and disturbance abatement, which will likely result in broader habitat improvements.

Best Available Science Review Forms:

Colonial Waterbird Rookery Island Restoration

Proposal Title: Colonial Waterbird Rookery Island Restoration
Location (If Applicable): Texas coastal bays and estuaries from the east side of Galveston Bay south to the Rio Grande River. This is the CINDI project boundary.
Council Member Bureau or Agency: U.S. Department of the Interior United States Fish and Wildlife Service
Type of Funding Requested: Planning / Implementation

Reviewed by: In State
Date of Review: October 2, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	No
Comments:	

The proposal objectives and methods are quite vague. I realize that CINDI is not expected to be a finished product until 2026-2027, but there is no literature review included in the narrative and methods other than the Hackney 2016 Rookery Conservation Plan. It was mentioned in the priority justification about particular species (e.g., brown pelican) that were affected by Deepwater Horizon but there is nothing in the narrative or methods about what species and or areas might be considered in island creation/restoration. This project seems premature in timing due to the progress of CINDI is still very much beginning.

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
This proposal is focused on Texas coastal rookeries within the Gulf of America.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	No
Comments:	
As stated before, there is no use of literature other than reference to funded CINDI project and Hackney et al 2016 paper. There is no use of published or unpublished data, information about past or current restoration projects and how sediment deposition, erosion protection, vegetation management, predator/disturbance mitigation has benefitted nesting waterbirds.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	No
Comments:	
The only risk/uncertainty that the proposal discusses is the need for more funding, which I do understand and agree with. But there is no discussion about risks and uncertainties on whether rookery restoration would lead to increased bird use, increased nesting productivity, etc. Furthermore, there is no discussion about long-term success (and conversely risks/uncertainties) in terms of sea level rise, increased storm intensity/frequency.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	No
Comments:	
The entire proposal is based on the success of CINDI and does not provide any other justification. While I think CINDI is going to be a very useful tool, the proposal is entirely dependent on the success and utility of CINDI, which at this point in time, is unclear.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	No
Comments:	
No. As stated earlier, the proposal hinges on successful development of CINDI.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	No
Comments:	

Future funding is a real and stated uncertainty and the proposal's justification of this is sound. But as mentioned above, there are many other risks associated with this project. I have addressed some but an additional risk/uncertainty that has not been discussed is U.S. Army Corps of Engineers' availability, use, placement of beneficial dredge materials. Also, there is no discussion on the risk of success – if we build it, will they come? Will birds respond positively to the creation/restoration of rookeries and how will that be evaluated. What are the risks associated with rookery restoration where birds do not respond. Additionally, sea level rise is not discussed in risks and uncertainties section. CINDI will include SLR in its prioritization tool but SLR should be at least discussed in this proposal.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
It is unclear but based on the collaboration section, I think the expertise and experience is there as collaborators include DOI, TPWD, TX GLO, HRI and NGO partners.	

Question B	
Does the project/program have clearly defined goals and objectives?	No
Comments:	
The project goals are clearly stated but there does not appear to be any associated objectives with the stated goals.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	No
Comments:	
As discussed earlier, the methods are very brief (1 sentence) and do not provide any justification other than use of CINDI.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The proposal plans to implement actions on at least 5 waterbird rookeries but there is not further justification or explanation about environmental benefits. CINDI is gathering telemetry data from specific species but there is no mention in this proposal how those species might be considered in the 5 waterbird rookeries selected for conservation action. Additionally, it is unclear if this funding will have meaningful impact since as stated in proposal, costs have been approximately $1M/acre and this proposal plans on actions on 5 islands for target 10 acres.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
The proposal states that metric is acres restored with a target of 10. This is in alignment with primary conservation plan goal. It is unclear if requested $2M in funding will achieve that goal for 10 acres restored based on stated estimate of $1M/acre but metric is stated and in alignment.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
As stated earlier, more information is needed as potential long-term environmental risks are not clearly stated other than potential lack of funding which is not an environmental risk. CINDI incorporates environmental risks (e.g., SLR) but it is not stated in this proposal.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio- economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
The monitoring and adaptive management section does address how monitoring would be conducted but there is not really any discussion about adaptive management and how mitigating actions may be undertaken to deal with risks and uncertainties.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	No
Comments:	
As stated earlier, the proposal is lacking in recent and relevant information other than use of CINDI and Hackney 2016 rookery plan.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No
Comments:	
There is no discussion about other restoration efforts for rookery islands nor provision of examples on successes and failures in rookery island restoration. There are rookeries that have been restored (e.g., erosion control, sediment deposition, control of invasive plants, etc.) but this information/data is not discussed or presented in this proposal.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is the appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement as defined by the RESTORE Act)	Yes
Comments:	
The data management plan appears to be sound and the proposal does discuss how monitoring would be implemented. As mentioned earlier, no real discussion on adaptive management and how it could be implemented to adjust to results from monitoring.	

Overall, this project is very vague on methods, risks and uncertainties, adaptive management and seems to very much hinge on the potential success of CINDI. While I think rookery island restoration is very much needed and is in alignment with RESTORE Act Priority Criteria, the current proposal lacks details in many areas and therefore makes it more difficult to effectively evaluate the potential success of the proposed project(s).

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Colonial Waterbird Rookery Island Restoration
Location (If Applicable): Texas coastal bays and estuaries from the east side of Galveston Bay south to the Rio Grande River. This is the CINDI project boundary.
Council Member Bureau or Agency: U.S. Department of the Interior United States Fish and Wildlife Service
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of State
Date of Review: Sept. 23, 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
In general, yes. The objectives and methods are justified but the depth of evaluation and support is limited. To define the bird populations as declining is logical but fairly cursory without more specifics. Some of the project material leaves open for flexibility but there also needs to be some parameterization of what will be achieved.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The material presented does pertain to the Texas coast and has the ability to make changes in proposed area.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information
Comments:	
There are only two references provided. Given the potential ramifications of this proposed work and the foundations on which it is prefaced, I think inclusion of additional references would be beneficial.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Yes, there is an evaluation of uncertainty and an understanding of risk. The proposed work though seems to carry a premise of flexibility through which there is less a definitive framework and more a pattern of what will be evaluated as it is determined at the time of the project being carried out.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	

Yes, there is reference to using an existing tool to identify areas best suitable for this project to be carried out. This said, the references included in the proposal and the associated map do not provide specifics. The map shows the Texas coast with some proposed sections but does not indicate specific areas where the project will be carried out.

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	No
Comments:	
In some ways the proposal does provide some information on the project but specific details are largely lacking as it reads more of an evaluation of where things could be possibly done. The framework of using the tool (CINDOI) to identify possible project sites is good but there are not diagnostics presented on how benefits to waterbirds will be evaluated.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
The proposal lists risks associated with the methods but also indicates that the costs of the proposed work could significantly inhibit much conservation activity.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
Perhaps the project participants have engaged in similar work but it is not explicitly clear in the proposal as presented. There is mention of the different groups involved in the project but there is not detail to how similar projects have been implemented by this collaboration.	

Question B	
Does the project/program have clearly defined goals and objectives?	No

Comments:

There are goals but there is also a lack of specificity to what will be carried out, in part owing to present uncertainty of how the objectives will be met, where, when, and how.

Question C

Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	No

Comments:

Methods are noted but there is also note of the need for flexibility in these methods as the ability to carry out the objectives in particular places will depend on targets that are currently uncertain.

Question D

Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	No

Comments:

There is mention of what could benefit from this project but there are not clearly defined targets to illustrate achievement. For instance, if Black Skimmer populations are declining, and this project would assist these populations then I think there should be some details to how the project will benefit this species and what metrics will illustrate that these goals are being met.

Question E

Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Need more information

Comments:

What is noted towards measurements of success are acres of islands that are restored. However, what defines ‘restored’ is not clear nor how the intended audience of this restoration will benefit.

Question F

Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes

Comments:
There is note of risk in the objectives or restoration in that what is restored could ultimately be lost to unforeseen processes. However, the basis of this project and the methods involved seems to rely on flexibility around the unforeseen and methods that must be adapted during project implementation. Less speculation would likely benefit the objectives and goals for this project.

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
See comment to question F, above. I did not see specifics to potential socioeconomic issues that could arise through this project.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
Yes, there is mention of financial costs associated with some restoration programs and that these costs could exceed $1 million/acre. This cost, if relevant to the proposed work, would significantly inhibit the amount of restoration that could occur. There is note that a cost of $1 million/acre for restoration would limit objectives on at least five island locations but it is not clear what specific five these are nor if these costs would curtail efforts on other islands beyond these five.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
Additional detail on similar projects carried out by the applicants would assist this evaluation. As it is written it is unclear if similar project have been completed and what the outcome of these efforts have been.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is the appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information

Comments:

A data management plan has been included that lists how relevant data will be stored and who will archive these data. However, evaluations of milestones for this proposed work and what will be used in gauging success or failure are unclear.

Please summarize any additional information needed below:

I understand the the length of the proposal limits much of what can be included but generally, it seems that the proposal does not afford much insight into the objectives nor are specific means to carry out and monitor project performance explicitly noted. I have some reservations about this project, the implementation, evaluation of potential benefits that will be derived from the allocation of support, if given.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Colonial Waterbird Rookery Island Restoration
Location (If Applicable): Texas coastal bays and estuaries from the east side of Galveston Bay south to the Rio Grande River. This is the CINDI project boundary.
Council Member Bureau or Agency: U.S. Department of the Interior United States Fish and Wildlife Service
Type of Funding Requested: Planning / Implementation

Reviewed by: Out of Gulf
Date of Review: 31 October 2024

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Need more information
Comments:	
With only two sources listed in the Bibliography this is a difficult question to answer. Understood that both sources are almost certainly drawing from peer-reviewed literature, but I would have appreciated a more thorough and diverse sourcing of material to justify both the need and selection criteria for rookery restoration.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	
Comments:	
Not applicable; project is along the Texas coast.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Need more information
Comments:	
I would have appreciated a more thorough and diverse sourcing of material to justify both the need and selection criteria for rookery restoration.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	No
Comments:	
A surprisingly short paragraph dedicated to this is insufficient, and it seems to address the question only in terms or permitting and planning.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Need more information
Comments:	
Again, the entire application is backed by only two references. I have to assume that the CINDI tool is based on extensive peer-reviewed and other relevant literature.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Need more information
Comments:	
There's not enough information here to assess this. It seems this proposal is leveraging the CINDI tool, which is still in development, and therefore I don't know how well CINDI will use scientific information to maximize the quality, objectivity, and integrity of information.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	No
Comments:	
The proposal does not adequately address these issues.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
It would appear that the applicants are familiar with how these kinds of projects are implemented.	

Question B	
Does the project/program have clearly defined goals and objectives?	Yes
Comments:	
The goal is to restore at least 10 acres of waterbird nesting habitat. Details regarding what constitutes "success" for projects are not provided.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
I think the goal is to use CINDI, but that doesn't help me understand specific methods to be used. Also difficult to address this question because the projects to implemented have not yet been selected.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
The goal is to restore waterbird nesting habitat (HR004).	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	No
Comments:	
This is not addressed in the proposal.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a	No

mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	
Comments:	
Inadequately addressed. Applicants only discuss risks/uncertainties in terms of the permitting and planning process.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	No
Comments:	
I have to assume the CINDI tool takes current data on storm risks and sea level rise into account, but this is not addressed directly in this proposal.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No
Comments:	
Applicants mention that past projects have cost ca. $1 Million/acre, but no discussion of success vs failure. Encouraging that applicants describe some aspects of Adaptive Management, which—if implemented well—can help mitigate imminent failures.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is the appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information
Comments:	
Applicants don't describe any Data Management Plan other than using "predesigned datasheets" and entering data into spreadsheets or databases. This by itself does not constitute a Data Management Plan. There is no specific connection drawn between data collection (Texas Colonial Waterbird Society Annual Survey) and how those data would feed into an adaptive management framework.	

Please summarize any additional information needed below:
Understood that the goal of this proposal is to use a newly-developed tool (CINDI) for selecting restoration projects for funding, and that exactly which projects would be chosen for funding is not yet known. The funding requested ($2 million) would seem to be inadequate for the goal of 10 acres of restored habitat when the average cost of this type of restoration is stated to be $1 million/acre. The proposal is frustratingly vague in a number of details with respect to site selection, planning and implementation, and data collection and management.

Wind-Tidal Flat Restoration Pilot, Phase 2

RESTORE Council Proposal Document

General Information

Title:
Wind-Tidal Flat Restoration Pilot, Phase 2

Project Abstract:
This project builds upon the $321K FPL3b funded Wind-Tidal Flat Restoration Pilot project. The sponsor is the U.S. Department of the Interior/ National Park Service. That project and the 2026 FPL proposal both support the primary RESTORE Comprehensive Plan goal to restore and conserve habitat in coastal Texas, including Padre Island National Seashore. This project will characterize broad scale distribution and conditions of wind tidal flat habitats at Padre Island National Seashore and conduct on-the-ground restoration targeting areas with vehicle track damages from previous exploration activities. A cost-benefit analysis will be conducted to estimate costs of using the selected restoration approach over a large scale. The wind-tidal flat areas at Padre Island National Seashore are significant in that they protect portions of the largest freshwater wetland in Texas, conserve protected species, and provide wintering habitat for millions of migratory birds. However, impacts from previous activities have impaired these important habitats. This project aims to refine and expand upon FPL3b accomplishments by 1) at the broad scale, using drones with advanced multispectral imaging technology to improve the accuracy of wind-tidal flat mapping; and 2) at the local scale, conducting on-the-ground restoration using “best practices” from FPL 3b. A document of lessons-learned will be created to share with resource managers across the Gulf of America and to inform future management decisions regarding conservation and restoration of wind-tidal flat habitats. Project duration is three years.

FPL Category: Cat1: Planning/ Cat1: Implementation

Activity Type: Project

Program: N/A

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

Priority Criteria Justification:
This project will result in the characterization and restoration of coastal resources and habitats with the goal of achieving pre-disturbance levels. Techniques developed as part of this project

will be used by state and federal land management agencies to provide accurate cost estimates for tidal flat restoration and reduced uncertainty about restoration success. The pilot project will occur within Padre Island National Seashore.

This project will lead to permanent results, including critical maps regarding distribution, condition, and damage to extensive wind tidal flat habitat, and improved resilience by selecting a 5-acre area of wind tidal flats and target areas for restoration of vehicle track damages. Restored natural processes will sustain habitats and enhance the overall health, availability, and diversity of natural resources that include migratory and protected species. The restoration of important wind-tidal flats will create habitat that supports 22 species of shorebirds and wading birds. This habitat creation will enhance bird populations that contribute to restored areas being designated as Globally Important Bird Areas by the American Bird Conservancy and Sites of International Importance by the Western Hemisphere Shorebird Reserve Network.

Project Duration (in years): 3

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Improve Science-Based Decision-Making Processes

Secondary Comprehensive Plan Objectives:
N/A

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Improve science-based decision-making processes: Develop tools for planning and evaluation
Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship

Location

Location:
This project would occur in Texas at Padre Island National Seashore.

HUC8 Watershed(s):
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central Laguna Madre)

State(s):
Texas

County/Parish(es):
TX - Kenedy
TX - Kleberg
TX - Willacy

Congressional District(s):
TX - 34

Narrative

Introduction and Overview:
Public lands managed by the National Park Service (NPS) have impaired coastal habitat with impacts from previous exploration activities. Seismic surveys conducted along the western shoreline at Padre Island resulted in compacted vehicle tracks that altered wind-driven inundation by Laguna Madre waters--thus affecting algal growth and degrading foraging habitat for migratory birds.

Wind-tidal flats are low, relatively flat areas inundated when high water conditions are created by northerly winds and left uncovered when low-water conditions are created by southerly winds (hence the term "wind-tidal flats"). The Laguna Madre is the largest hypersaline system in the world. These mats account for approximately 42% of the lagoon's area. These mudflats form an almost continuous band along the Laguna Madre side of Padre Island National Seashore (PAIS). Tidal flat elevation changes range from sea level to 0.8 feet and change on the order of only 0.2 feet per mile (Watson 1979). In the southern areas of the park, wind-tidal flats may extend to high wind-tide levels. They are generally covered with a blue-green algal mat that ranges between a thin layer up to 0.4 inches (2 cm) thick. Forty-five (45) cyanobacterial taxa have been identified in Laguna Madre tidal flats using morphological analysis. These taxa are distributed in zones with large filamentous forms on the surface and smaller, motile filamentous and coccoid forms in subsurface mat layers. These mats of algae are quite distinct from the harmful algal blooms that have been increasing in frequency and extent in recent years in the Gulf of America.

The Laguna Madre is located along the Texas Gulf Coast on the Central Flyway for migratory birds and is a significant feeding area during the winter and migration seasons for many endangered avian species. Wind-tidal flats in the Laguna Madre support extensive mats of blue-green algae, and include essential habitat for the piping plover, offer significant feeding areas for aquatic bird life, and play a crucial role in the life history of some of Texas' most important commercial fish and shellfish industries (Withers 1993). They provide abundant amounts of blue-green microalgae, which contribute to the primary productivity of estuarine systems. Their productivity is comparable to seagrass beds and to approximately 20-40 percent of a typical marsh-hay cordgrass (Spartina patens) marsh. These mats form the critical base of the food chain supporting the ecology and economy of the Gulf.

Macrobenthic invertebrates inhabit the wind-tidal flats in the Laguna Madre and create an abundant and diverse benthic community that exists throughout most of the year (Withers 1994). Detritus from other estuarine habitats such as seagrass beds is deposited in large quantities on the flats, and combined with the large algal biomass, contribute to the high productivity found in this area. As a result of the high productivity, the wind-tidal flats are

inhabited by a diverse set of benthic invertebrates, which are then preyed upon by demersal fish and crabs.

Anthropogenic disturbances such as tracks left behind from seismic exploration, addition of fill materials, and soil compaction adversely affect blue-green algal mat production. Approximately 3,038 acres of these flats have been damaged by past seismic surveys that have altered surface hydrology and resulted in the loss of algal mats. Extensive blue-green algal mat production is dependent on flats that are alternately emergent and submerged in regular cycles. Vehicle tracks create depressions and channelization that disrupt the natural hydrology of the wind-blown tides. The use of fill in the wind-tidal flat areas not only converts the flats to an elevated landform, but also disrupts the hydrological cycle. Both the tracks and the filled areas could act as a barrier to inundation or allow water to be retained behind. Irregular inundation and excessive water retention both adversely affect blue-green algal mat production. Soil compaction by vehicular traffic in wind-tidal flats disturbs the hydrological regime by allowing compacted areas to remain submerged. Wind-tidal flats that are submerged too frequently do not have extensive algal mats (Weise and White 1980).

Proposed Methods:
The project at Padre Island National Seashore will refine and expand upon FLP3b project accomplishments by: (1) at the broad scale, using drones with advanced multispectral imaging technology to improve accurate wind tidal flat restoration mapping; and (2) at the local scale, conducting on-the-ground restoration using “best practices” from FLP3b. Over 3,000 total acres of wind tidal flats habitat is available. First, small uncrewed aircraft systems (UAS or drones) will be used to employ a multispectral sensor to produce detail-rich mapping of the land cover, including cyanobacterial mats distribution, within exposed wind tidal flats. These maps will estimate the percent ground cover and productivity of cyanobacteria mats based on repeat multispectral surveys. These results will be compared to larger geographic extents using newly available high resolution multispectral satellite data. This approach has the potential to extend the mapping of damaged and undamaged areas of the wind tidal flats to regional scales (e.g., the entire breadth of exposed wind tidal flat habitat within PAIS).

On the ground, restoration areas will be selected to target areas with vehicle track damages from previous activities. Restoration will occur using an adaptive management approach, with a cost-benefit analysis conducted to estimate the costs of using the selected approach over a large scale. A document of lessons-learned will be created to guide future management decisions regarding conservation and restoration of wind tidal flat habitat.

The project proponents acknowledge, however, that restoration of wind-tidal flats has not previously been attempted within Padre Island National Seashore, and restoration of wind-tidal flats in the surrounding area has never been attempted. A literature search revealed that very few restoration projects of wind-tidal flats have been conducted in the United States, Canada, and Japan. Those projects that were undertaken focused on man-made habitats, rather than natural habitats. Though there are no established or standard methods to restore this type of wetland, National Park Service (NPS) has considerable knowledge and tools that have been used for similar restoration. The NPS has substantial experience in beach restoration, including but not limited to: 1) Cape Hatteras National Seashore where 2.6 million cubic yards of beach quality sand was placed along approximately 2.2 miles of shoreline (USACE & DOI 2015), 2) Cape Lookout National Seashore where 3,850 linear feet of beach was restored (Schupp 2017), 3) several projects at Gulf Islands National Seashore where approximately 4.9 miles of shoreline was restored along the eastern end of Perdido Key (Gibson and Looney 1994), and 4)

a beach nourishment project where approximately 500,000 cubic yards of beach quality sand was placed along 10,000 feet of the northern shoreline of West Ship Island, within the Mississippi District of Gulf Islands National Seashore (USACE & DOI 2016). Though tidal mudflat restoration is somewhat different, the basic principles are the same: establish a proper slope in the tidal range, restore with similar grain sized sediments, and plant with appropriate flora. The NPS also has considerable experience restoring tracks from seismic exploration at Big Cypress National Preserve in Florida, where 111 miles of exploration trails have been re-graded by hand to the natural contours.

Suzuki (2004) and Lee and Lee (2000) show that newly groomed sediments can be a successful platform for tidal flat restoration. In general, restoration will involve grooming of the tracks with the use of hand tools and ambient soils to prevent further impacts, removing fill, establishing the proper slope within the tidal range, and inoculating the soils with a mixture of the 12 dominant algal species-all of which can easily be grown in controlled conditions in roughly 30 days (Zimba, pers. comm. 6/3/2020). Only 0.2 grams of algal material has been shown to reestablish one square meter (1m2) of tidal flat. Salinity concentrations will be monitored using salinity recorders at low, medium and highest elevations. Up to 41-1.0 cm cores will be obtained monthly to determine the developing algal community structure. This information will help to determine how best to approach large-scaled restoration efforts.

Because of the experimental nature of this wind-tidal flat restoration pilot, our plan is to initiate an experimental design and test phase undertaken via a Cooperative Ecosystems Studies Unit (CESU) agreement with Texas A&M University-Corpus Christi, which has experience studying and researching wind-tidal flats. Because the only known restoration work of wind-tidal flats in the park or surrounding area was done as part of the FPL3b project, we have no successful large-scale restoration project to base an assured method to restore the wind-tidal flats. We plan to leverage the existing expert team including National Park Service staff from the park, region, and Washington offices, US Fish and Wildlife Service experts, and wetland scientists with local expertise. Experts include Dr. Kim Withers from Texas A&M Corpus Christi (TAMUCC) as well as wetlands restoration technical specialists from private industry and nongovernmental organizations. The team will use the information learned from FPL3b and develop and test restoration methods on small plots. Upon completing the experimental phase, the team will recommend how to proceed with restoration on the remaining area.

Environmental Benefits:
These wind-tidal flat areas are significant in that they protect portions of the largest freshwater wetland in Texas, conserve protected species, and provide wintering habitat for millions of migratory birds. This program ultimately provides for public safety and restores important habitat on public lands along coastal Texas, while building upon investments made in FPL1.

Specific benefits to state resources and values include:
- Protection and restoration of water resources, water quality and hydrology restoring surface and subsurface habitats and ecological functions.
- Restoration and improvements of wildlife habitat, ecological health, and primary productivity in priority Texas landscapes where significant investment has been made. Increased public recreation at Padre Island National Seashore through restoration and transformation of native coastal habitat that support species of interest to visitors such as migratory and coastal birds.
- Wind-tidal flat habitat is a very limited and specialized environment. Wind-tidal flats are low, flat areas inundated when high water conditions are created by northerly winds and left

uncovered when low-water conditions are created by southerly winds. Tidal flat elevation ranges from sea level to 0.8 feet and change on the order of 0.2 feet per mile (Watson 1979).

- Wind-tidal flats provide winter and migration foraging habitats for 22 species of shorebirds and waterbirds, including the federally threatened piping plover and red knot (Withers 1994) and when flooded, are used by State-listed threatened reddish egrets (Koczur et al. 2018). Padre Island National Seashore is designated a Globally Important Bird Area by the American Bird Conservancy and a Site of International Importance by the Western Hemisphere Shorebird Reserve Network. Forty-five (45) species of algae have been identified in Laguna Madre tidal flats, with cyanobacteria representing the dominant taxa (Fisk 1959, Sorenson and Conover 1962, Zimba et al. 2017, Shalygin et al. 2019).

Metrics:

Metric Title: PRM010 : Research - # studies used to inform mgmt.
Target: 1
Narrative: A technical report will be published for the Wind-Tidal Flat Restoration Pilot which will be used to evaluate the efficacy of alternative restoration practices and guide recommendations on future restoration method applications.

Metric Title: HR013 : Wetland restoration - Acres restored
Target: 5
Narrative: An objective of this project is to restore tidal flats as part of a pilot project. The natural resources restored and protected by this project include 5 acres of tidal flats.

Risk and Uncertainties:
The major component of this program that presents risk is the project to reclaim vehicle tracks in wind-tidal flats caused by past seismic surveys. The project will mitigate these risks by only implementing a small trial to assess restoration techniques. If that trial proved successful, the project proponent could later seek funding for the extensive tidal flat restoration that is needed. Although there are no established or standard methods to restore wind-tidal flats, the National Park Service (NPS) will test potential techniques on a relatively small portion of Padre Island National Seashore, based upon its experience in Big Cypress National Preserve reclaiming and restoring vehicle tracks in sensitive habitats. To reduce uncertainty, the NPS will assemble an expert team including National Park Service staff from the park, region, and Washington offices, US Fish and Wildlife Service experts, and wetland scientists with local expertise.

A hurricane or other large storm could jeopardize revegetation success, particularly for projects along shorelines; however, risk could be avoided or minimized by scheduling reclamation outside of hurricane season or by applying mitigation techniques to reduce damage by wave action. Additionally, timing restrictions will be defined to avoid impacting wildlife use of the flats and to maximize restoration success.

Monitoring and Adaptive Management:
The initial phases for reclamation of wind-tidal flats at Padre Island National Seashore will likely be conducted via an existing CESU agreement with Texas A&M University-Corpus Christi. Cooperative Agreements provide one method for tracking project status and budget.

Monitoring of the experimental design for reclaiming the vehicle tracks and/or removing the fill in wind-tidal flats at Padre Island National Seashore will be conducted by graduate and possibly

undergraduate students with guidance of a university professor under a scope of work developed by National Park Service and the professor. This project will be administered and managed by the National Park Service.

Data Management:
Data on the locations treated and monitoring results will be collected and maintained by NPS or its partners. Progress and accomplishment reports will include site data and will be shared with the RESTORE Council staff and Steering committee.

Collaboration:
Collaboration will occur among the various members of the study pilot team, and results will be shared with other land managers including the Texas Parks & Wildlife Department, Texas General Land Office, the US Fish and Wildlife Service, and others (e.g., National Audubon Society, Coastal Bend Bays & Estuaries Program, American Bird Conservancy, and The Nature Conservancy). Except the Principal Investigators and any contractors, most team members will be contributing their time as in-kind contributions.

Public Engagement, Outreach, and Education:
In addition to public engagement through the NEPA process, where necessary, public outreach will also be achieved by National Park Service posting updates on the agencies' public websites, in visitor centers and in entrance stations where projects will be implemented. During project implementation, particularly near park or refuge visitor use areas, interpretive information such as brochures, exhibits, social media postings, websites, interpretive programs, a banner or large sign, or similar items will be posted notifying visitors that the project is restoring the Gulf Coast. The initial phase of the project to restore wind-tidal flats at Padre Island National Seashore will be undertaken with local experts at Texas A&M University-Corpus Christi. The initial phase will enable students to participate in the development of experimental reclamation method(s) and conduct the test phase and monitoring on a small plot. The students could earn credit while learning how to design wetland restoration methods. Monitoring the restoration of tidal flats will likely involve students who will conduct field assessments, gather scientific information, implement actions to modify restoration efforts if needed, and report and publish findings. There will be opportunities for students to learn about habitat restoration and work on revegetation projects.

Leveraging:

Funds: $321,000.00
Type: Leveraging
Status: Committed
Source Type: Other Federal
Description: This project is a continuation of the FPL3b project "The Wind-Tidal Flat Restoration Pilot" and addresses additional sites on the Seashore. This project also complements other FPL1-funded projects including the "Bahia Grande Coastal Corridor" and "Plug Abandoned Oil and Gas Wells on Padre Island National Seashore"

Environmental Compliance:
The planning component of this project is covered by the Council's National Environmental Policy Act (NEPA) Categorical Exclusion (CE) for planning and related activities. DOI has advised the Council that the implementation component of this project is covered by a National Park Service CE. The Council is using this CE and the associated environmental compliance

documentation to support the funding approval of this project, consistent with Section 4(d)(4) of the Council's NEPA Procedures, which enables the Council to use member CEs, where appropriate. In making this decision, the Council considered potential extraordinary circumstances, including potential negative effects to threatened and endangered species, essential fish habitat, tribal interests, and historic properties, where applicable.

Bibliography (All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

Fisk, H.N. 1959. Padre Island and the Laguna Madre flats, coastal South Texas. Louisiana State University, 2nd Coastal Geography Conference 6-9:103-151.

Gibson, D. J. and P. B. Looney. 1994. Vegetation colonization of dredge spoil on Perdido Key, Florida. Journal of Coastal Research 10(1):133-143.

Koczur, L.M., G.M. Kent, B.M. Ballard, K.D. Meyer, and M.C. Green. 2018. Space use and movements of adult Reddish Egrets (Egretta rufescens) during winter. Waterbirds 41:1-15.

Lee, J. and N. Lee. 2000. An experimental study on the restoration creation of tidal flats. Journal of the Korea Organic Resources Recycling Association 8(1):77-82.

Schupp, C. 2017. Cape Lookout National Seashore: Geologic resources inventory report. Natural Resource Report NPS/NRSS/GRD/NRR—2017/1491. National Park Service, Fort Collins, Colorado.

Shalygin S., K.J. Kavulic, N. Pietrasiak, M. Bohunická, M.A. Vaccarino, N.M. Chesarino, and J.R. Johansen. 2019. Neotypification of Pleurocapsa fuliginosa and epitypification of P. minor (Pleurocapsales): resolving a polyphyletic cyanobacterial genus. Phytotaxa 392:245–263.

Sorensen, L.O. and J.T. Conover. 1962. Algal mat communities of Lyngbya confervoides (C.Agardh) Gomont. Publications of the Institute of Marine Science, University of Texas 8:237-249.

Suzuki, T. 2004. Large-scale restoration of tidal flats and shallows to suppress the development of oxygen deficient water masses in Mikawa Bay, Japan. Bulletin of Fisheries Research Agency. Supplement 1:111-121.

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US Army Corps of Engineers, Mobile District. 2016. Mississippi Coastal Improvements Program (MsCIP): Comprehensive Barrier Island Restoration, Hancock, Harrison, and Jackson Counties, Mississippi. Final Supplemental Environmental Impact Statement. 400 pages.

Watson, R.L. 1979. Geological history of South Padre Island wind-tidal flats. Unpublished paper, Port Aransas, Texas.

Weise, B.R. and W.A. White. 1980. Padre Island National Seashore: A Guide to the Geology,

Natural Environments, and History of a Texas Barrier Island. Bureau of Economic Geology. Reprinted 1981.

Withers, K. 1993. Study to determine the abundance and distribution of benthic invertebrates and shorebirds on a North Padre Island blue-green algal flat. Unpublished paper, National Park Service, Corpus Christi, Texas.

Withers, K. 1994. The Relationship of Macrobenthic Prey Availability to Shorebird Use of Blue-Green Algal Flats in the Upper Laguna Madre. Published Ph.D. Thesis. Texas A&M University, College Station, Texas.

Zimba P.V., I.S. Huang, J.E. Fole, and E.W. Linton. 2017. Identification of a new-to-science cyanobacterium, Toxifilum mysidocida gen. nov. & sp. nov. (Cyanobacteria, Cyanophyceae). Journal of Phycology 53:188–197.

Zimba P.V. 6/3/2020. Texas A&M University, College Station, Texas. Personal communication with author(s).

Budget

Project Budget Narrative:
The overall budget for this project is $1,200,000. Approximately $25,000 will be used for planning. The bulk of the funds ($1,200,000) requested will be used for implementation of the tidal flat restoration project, including project management, monitoring and adaptive management (MAM).

DOI anticipates a Cooperative Agreement with a university will be the primary method of obligation, although we might use an existing Cooperative Agreement with the Railroad Commission of Texas, another small contract, or hire temporary staff.

Total FPL Project/Program Budget Request:
$ 1,200,000.00

Estimated Percent Monitoring and Adaptive Management: 4 %
Estimated Percent Planning: 7 %
Estimated Percent Implementation: 86 %
Estimated Percent Project Management: 3 %
Estimated Percent Data Management: N/A
Estimated Percent Contingency: 0 %

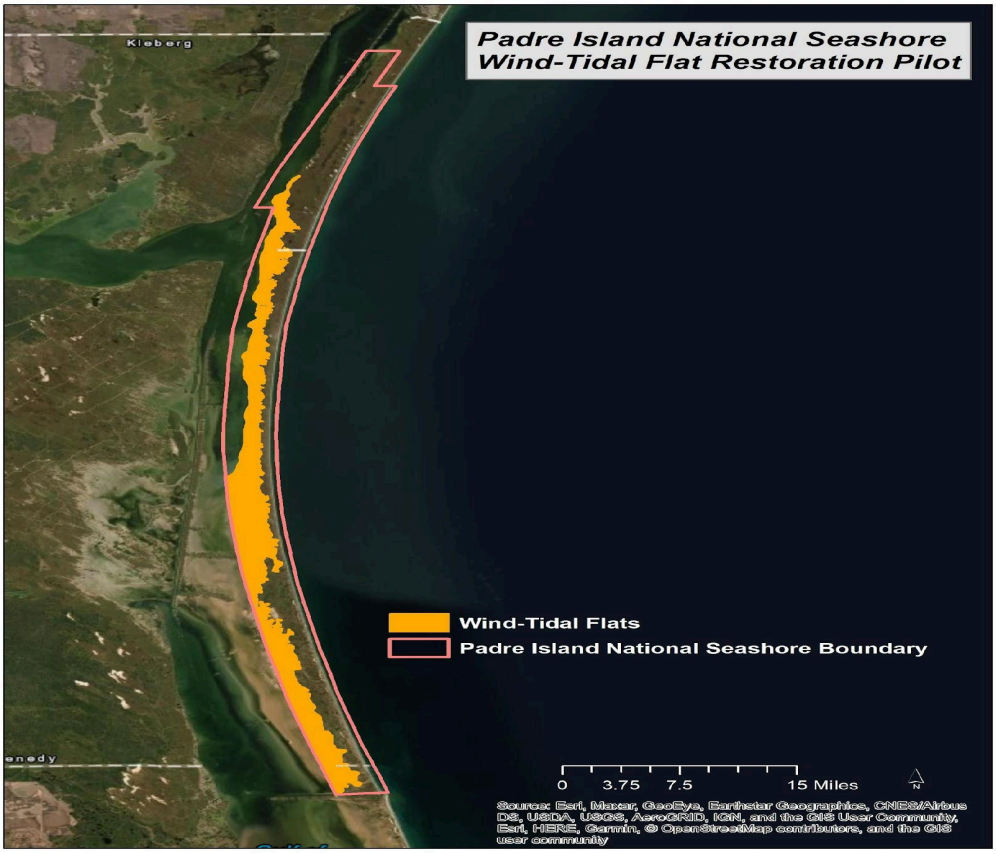
Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
The extent of area treated by each individual method and the number of methods tested could be increased to cover a larger number of sites, tested techniques, or replication of trial areas.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g., title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	Council's Planning CE; NPS CE for implementation component (9/22/20).
Endangered Species Act	Yes	USFWS letter (9/23/20).
National Historic Preservation Act	Yes	THPO letter (9/15/20); THC email (#202016495).
Magnuson-Stevens Act	Yes	NOAA email (9/16/20).
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	Yes	TGLO letter (8/17/20).
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	Yes	Covered by NWP 27 (2/25/2022 letter).
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

Maps, Charts, Figures



Caption : Wind-Tidal Flat Restoration Pilot, Phase 2

Other Uploads

GIS Data_1:
PAIS_RESTORE_GIS_Template.gdb.zip
Caption : N/A

Council Staff Review:
Wind-Tidal Flat Restoration Pilot, Phase 2

Note: All comments indicated below were addressed in the proposal provided above.

FPL Internal Staff Review

Project/Program	Wind-Tidal Flat Restoration Pilot, Phase 2		
Primary Reviewer	Amy Newbold	Sponsor	DOI
EC Reviewer	John Ettinger	Co-Sponsor	NA

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded project.
2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	
3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	
5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes
Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	DOI applied BAS reviews that were completed upon the original proposal in previous FPL. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	More information needed
Notes	DOI is proposing that Council adopt the EC documentation used for the first phase in FPL 3b. It is appropriate and efficient to use FPL 3 environmental compliance documentation for FPL 4 activities provided that the existing documentation either: (1) Fully covers the potential effects of the FPL 4 activity and requires no updates, or (2) Fully covers the potential effects of the FPL 4 activity including any needed updates to address changes in environmental conditions or the expected effects of the FPL 4 activity. Staff requests that sponsors seeking to continue use of FPL 3 environmental compliance documentation for an FPL 4 activity provide, in writing, a statement and any additional documentation or analysis that might be needed to address changes in environmental conditions or the expected effects of the FPL 4 activity Note: Restore Council staff worked with the state to resolve these comments.

Best Available Science Review:

Wind-Tidal Flat Restoration Pilot, Phase 2

This project was reviewed for BAS under FPL 3b. Under the 2026 FPL, DOI is proposing a continuation, Phase 2 of the project.

The original BAS review as well as the DOI's response to the BAS comments can be found at **https://www.restorethegulf.gov/our-work/fpl/fpl-2026/.**

Tribal Youth Conservation Corps (TYCC)

RESTORE Council Proposal Document

General Information

Title:
Tribal Youth Conservation Corps (TYCC)

Project Abstract:
The Tribal Youth Conservation Corps (TYCC) is an ongoing program funded by the Council in both the Initial FPL and FPL 3b. This program is active in six federally recognized Tribes: the Seminole, Miccosukee, Poarch Band of Creek Indians, Mississippi Band of Choctaw, Chitimacha and Alabama-Coushatta, Each Tribe has developed and conducted restoration and educational activities in a manner that best benefits their Tribal community's unique needs.

The program helps Tribes to restore the Gulf while providing meaningful job opportunities for youth, creating powerful connections to nature, and helping prepare the next generation of environmental stewards. This request to the RESTORE Council is to seek funding for continued program support.

FPL Category: Cat1: Planning/ Cat1: Implementation

Activity Type: Program

Program: Tribal Youth Coastal Restoration Program (DOI/BIA)

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
No

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

Priority Criteria Justification:
Each Tribe designs its own projects for their youth. Through this program, Tribal youth will undertake efforts to learn to protect, restore, and manage natural resources and the environment through activities such as native plant restoration, site cleanup, sampling of water and soil, as well as environmental and cultural education of Tribal youth. This program will train youth in long-term stewardship of the Gulf Coast environment. The impact of this education and training should continue for many generations to come. Some Tribes will place emphasis on understanding and using technologies (e.g., drones, GIS, other software packages) to better recruit and teach students. Tribal leaders design specific projects, i.e., teaching and experiential learning, to prepare students to understand and respect the natural environment. Tribal leadership encourages Tribal youth to engage in activities that will enable them to assume

future roles in the community and gain self-reliance. The activities also provide training to work on restoration throughout the Gulf and engage the indigenous communities of the Gulf in the larger restoration effort.

Project Duration (in years): 3

Goals

Primary Comprehensive Plan Goal:
Enhance Community Resilience

Primary Comprehensive Plan Objective:
Promote Natural Resource Stewardship and Environmental Education

Secondary Comprehensive Plan Objectives:
Promote Community Resilience

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Promote natural resource stewardship and environmental education: Promote natural resource stewardship and environmental education
Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship

Location

Location:
The location of the six Tribes described in the program include two in Florida, one in Alabama, one in Mississippi, one in Louisiana, and one in Texas.

HUC8 Watershed(s):
South Atlantic-Gulf Region(Alabama) - Coosa-Tallapoosa(Lower Coosa)
South Atlantic-Gulf Region(Alabama) - Coosa-Tallapoosa(Lower Tallapoosa)
South Atlantic-Gulf Region(Alabama) - Alabama(Lower Alabama)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Florida Panhandle Coastal(Perdido)
Texas-Gulf Region(Neches) - Neches(Lower Neches)
Texas-Gulf Region(Neches) - Neches(Village)
Texas-Gulf Region(Neches) - Neches(Pine Island Bayou)
Texas-Gulf Region(Trinity) - Lower Trinity(Lower Trinity-Kickapoo)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Lower Leaf)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Everglades)

South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Big Cypress Swamp)
South Atlantic-Gulf Region(Southern Florida) - Southern Florida(Florida Southeast Coast)
South Atlantic-Gulf Region(Choctawhatchee-Escambia) - Escambia(Escambia)
Lower Mississippi Region(Louisiana Coastal) - Atchafalaya-Vermillion(Bayou Teche)
Lower Mississippi Region(Louisiana Coastal) - Atchafalaya-Vermillion(Vermilion)
South Atlantic-Gulf Region(Pearl) - Pearl(Upper Pearl)
South Atlantic-Gulf Region(Pascagoula) - Pascagoula(Mississippi Coastal)

State(s):
Texas
Alabama
Mississippi
Louisiana
Florida

County/Parish(es):
AL - Elmore
AL - Escambia
AL - Monroe
AL - Montgomery
FL - Broward
FL - Escambia
FL - Miami-Dade
FL - Hendry
LA - St. Mary
MS - Attala
MS - Jackson
MS - Jones
MS - Kemper
MS - Leake
MS - Neshoba
MS - Newton
MS - Scott
MS - Winston
TX - Hardin
TX - Jefferson
TX - Orange
TX - Polk

Congressional District(s):
AL - 2
AL - 6
MS - 2
FL - 26
TX - 14
LA - 3
FL - 20
MS - 3
AL - 1
FL - 18
TX - 36

MS - 4
FL - 1
TX - 8
FL - 28

Narrative

Introduction and Overview:
The overarching goal of this program is to educate and train Tribal youth through the implementation of restoration projects that benefit the Gulf Coast. This work builds on the success of previous Tribal Youth Conservation Corps activities, which anticipates restoration of about 2000 acres by the conclusion of FPL3b. These efforts included a number of restoration activities that have improved coastal habitat, reduced beach erosion, preserved cultural resources, and removed invasive species. Activities will again be selected and designed to benefit the Gulf coast region through direct restoration and training that would educate youth on the importance of these natural habitats, as well as the development of skills to restore and conserve coastal habitats throughout the region.

The program will support the primary RESTORE Comprehensive Plan goal to enhance community resilience through planning and implementation activities. This proposal will allow the program to build on the successes of the FPL1 and FPL3b initiatives and will fund Tribal Youth programming with the following Federally recognized Tribes: Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, Poarch Band of Creek Indians, Mississippi Band of Choctaw Indians, Chitimacha Tribe of Louisiana, and Alabama-Coushatta Tribe of Texas.

Proposed Methods:
Cultural, historic preservation and environmental training will include off-site visits for learning, data collection activities, and experiencing activities and events. The Tribes will arrange for transportation of youth to engage in local restoration programs and collaborative events at other Tribal sites. At some sites, Tribal members will donate identified mother plants to transplant, as warranted, to allow youth to place them in appropriate locations. Propagation will be at the identified sites. Restoring sites are important educational conservation tools for teaching youth that they are the next generation of stewards of Tribal lands and surrounding habitats. In several project locations, the primary projects are focused on planting native plants and trees. Planting can be both cost effective and easily achievable.

Environmental Benefits:
Anticipated environmental benefits include disrupting the process of shoreline erosion, mitigating the impacts of sea level rise, restoring a critical environmental balance in a threatened area, as well as building in Tribal youth a knowledge and commitment to protecting the environment, and the preliminary skills to work in or appreciate the restoration field in the future. Completion of the work could help mitigate future risks to the Gulf ecosystem associated with sea level rise.

Metrics:

Metric Title: PRM004 : Monitoring - # monitoring programs implemented
Target: 3

Narrative: Success will be measured by the number of monitoring projects (e.g., water quality monitoring, species surveys) implemented through the program.

Metric Title: COI007 : Building institutional capacity - # of participants that successfully completed training
Target: 20
Narrative: Success will be measured by the total number of student interns successfully completing the TYCC program.

Metric Title: HR004 : Habitat restoration - Acres restored
Target: 250
Narrative: Success will be measured in total acres restored because of TYCC program implementation.

Risk and Uncertainties:
This program began in 2016 and has been successfully implemented since then. From prior RESTORE Council awards, 239 students participated in the program and restored 995 acres of habitat between 2016 and 2019. The program was largely placed on hold during the COVID 19 pandemic, though certain educational events were held virtually, and some limited restoration and trainings were held when social distancing and other safety measures could be accommodated. Thus, risk and uncertainty can be generated through random, stochastic events (e.g., pandemic) and similar when managing a youth program (e.g., finding enough participants, overcoming barriers to participation). Each of the participating Tribes have developed public engagement and outreach events to mitigate for risk and uncertainties when running a youth program.

Monitoring and Adaptive Management:
n/a

Data Management:
Data generated are largely the number of participations, and qualitative documentation of activities implemented. These data are included in annual reporting.

Collaboration:
With the addition of the Alabama-Coushatta Tribe of Texas, the program will integrate projects within NPS lands in the Big Thicket National Preserve.

Across all Gulf Tribes the program utilizes in-house knowledge and staff from each Tribe and expertise in various Federal agencies (e.g., NRCS) to develop the planned activities of the Tribe. All of this collaboration is in-kind leveraging.

Public Engagement, Outreach, and Education:
This is a continuation of an existing program. Each year, each participating Tribe conducts public engagement and outreach activities to maximize information sharing in the local communities to obtain applications from interested students. The program is focused on providing environmental and cultural education to students such that they could pursue a degree or job in a natural resources related field or gain an appreciation of the resources.

Leveraging:

Funds: $10,000.00

Type: Leveraging
Status: Committed
Source Type: Other Federal
Description: Across all Gulf Tribes, the Tribes leverage their in-house knowledge and staff to develop the individual Tribal programs. All these leveraging opportunities are in-kind. In addition, BIA will use in-kind appropriations for the salaries of BIA employees' time spent in monitoring, management, and mandatory compliance activities.

Environmental Compliance:
Existing Categorical Exclusion documents have been created for each of the six Tribal projects. DOI has also provided an EA for the Council to evaluate and adopt to cover certain activities in Texas. DOI has indicated that these Categorical Exclusions and the EA fully cover the activities described in this document. The Council may adopt these Categorical Exclusions and EA for the approval of this activity. In addition to this type of National Environmental Policy Act (NEPA) analysis, this program was also evaluated and found to be in compliance with the following statutes and Executive Orders: Endangered Species Act; National Historic Preservation Act; Magnuson-Stevens Act; Fish and Wildlife Coordination Act; Executive Order 11988; Executive Order 11990; Executive Order 13898; Coastal Zone Management Act; Coastal Barrier Resources Act; Farmland Protection Policy Act; Section 404 of the Clean Water Act; Section 10 of the Rivers and Harbors Act; Marine Protection, Research and Sanctuaries Act; Marine Mammal Protection Act; National Marine Sanctuaries Act; Migratory Bird Treaty Act; Bald and Golden Eagle Protection Act; and Clean Air Act.

Bibliography (All references listed below that were published prior to 2025 may reference the Gulf of Mexico. This nomenclature has been retained to maintain the integrity of the referenced material. The Council recognizes the name change Gulf of America):

Akers, D. L., 1999: Removing the heart of the Choctaw people: Indian removal from a Native American perspective. American Indian Culture and Research Journal, 23 (3), 63-76, https://doi.org/10.17953/aicr.23.3.p52341016666h822.

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Bernard, S. K., 2016: Teche: a history of Louisiana's most famous bayou. University Press of Mississippi, 272 pp.

Brown, J. D., Benson, T. J., Bednarz, J. C., 2009: Vegetation charateristics of Swainson's Warbler habitat at the White River National Wildlife Refuge, Arkansas. Wetlands, 29, 586, https://doi.org/10.1672/08-54.1.

Clark, R., 1971: The woody plants of Alabama. Annals of the Missouri Botanical Garden, 58(2), 99-242, doi:10.2307/2394932.

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Larsen, L. G., Choi, J., Nungesser, M. K., Harvey, J. W., 2012: Directional connectivity in hydrology and ecology. Ecological Applications, 22(8), 2204-2220.

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Rodgers, J. C., Murrah, A. W., Cooke, W. H., 2009: The impact of Hurricane Katrina on the coastal vegetation of the Weeks Bay Reserve, Alabama from NDVI data. Estuaries and Coasts, 32, 496-507, https://doi.org/10.1007/s12237-009-9138-z.

Budget

Project Budget Narrative:
Each participating Tribe would receive $79,100 annually to Plan, Implement, and Provide Program Oversight.; Eastern Region of BIA would receive $7,000 annually (oversight of 5 agreements); Southern Plains Region of BIA would receive $1,400 annually (oversight of 1 agreement).

Total FPL Project/Program Budget Request:
$ 1,449,000.00

Estimated Percent Monitoring and Adaptive Management: N/A
Estimated Percent Planning: 10 %
Estimated Percent Implementation: 85 %
Estimated Percent Project Management: N/A
Estimated Percent Data Management: 3 %
Estimated Percent Contingency: 2 %

Is the Project Scalable?:
Yes

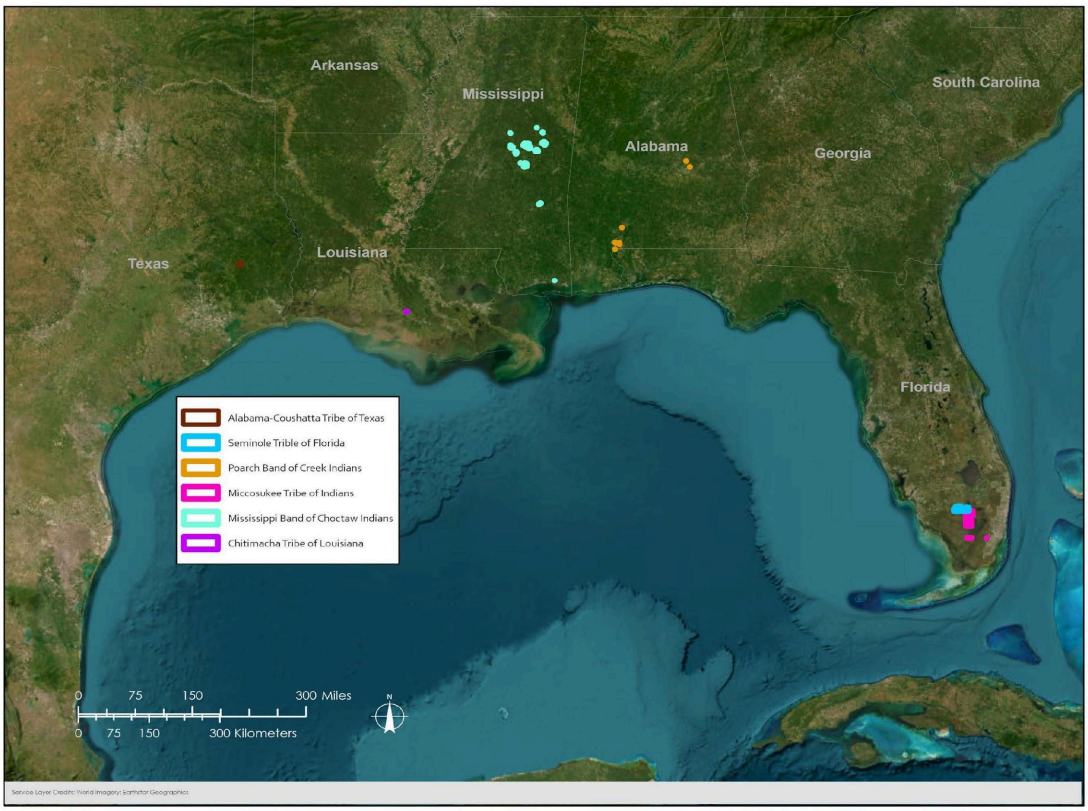
If yes, provide a short description regarding scalability.:
Project will be scalable by the number of years.

Environmental

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	Each Tribal project was reviewed individually in accordance with NEPA and a categorical exclusion review has been completed for each project.
Endangered Species Act	Yes	ESA reviews were completed for each project and supporting documentation has been included with the NEPA categorical exclusion review for each project.
National Historic Preservation Act	Yes	NHPA reviews were completed for each project and supporting documentation has been included with the NEPA categorical exclusion review for each project.
Magnuson-Stevens Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Fish and Wildlife Conservation Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Coastal Zone Management Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Coastal Barrier Resources Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Farmland Protection Policy Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Clean Water Act (Section 404)	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
River and Harbors Act (Section 10)	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Marine Protection, Research and Sanctuaries Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.

Marine Mammal Protection Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
National Marine Sanctuaries Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Migratory Bird Treaty Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Bald and Golden Eagle Protection Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Clean Air Act	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Although determined to not be applicable, the requirements of this act were considered as part of the compliance review conducted by BIA.

Maps, Charts, Figures



Caption : Tribal Youth Conservation Corps Program

Other Uploads

Main Uploads_0:
Miccosukee RESTORE CE signed.pdf
Caption : N/A

Main Uploads_1:
Seminole RESTORE signed CE.pdf
Caption : N/A

Main Uploads_2:
MBCI RESTORE signed CE.pdf
Caption : N/A

Main Uploads_3:
Chitimacha RESTORE signed CE.pdf
Caption : N/A

Main Uploads_4:
Poarch Creek RESTORE CE signed.pdf
Caption : N/A

GIS Data_6:
TribalData.gdb.zip
Caption : N/A

Council Staff Review:

Tribal Youth Conservation Corps (TYCC)

Note: All comments indicated below were addressed in the proposal provided above.

FPL Internal Staff Review

Project/Program	Tribal Youth Conservation Corps		
Primary Reviewer	Amy Newbold	Sponsor	DOI
EC Reviewer	John Ettinger	Co-Sponsor	NA

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	This is a continuation of an existing FPL funded program.

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	Yes
Notes	

7. Have three external BAS reviews been completed and has the proposal sponsor provided their response?	Yes
Notes	DOI applied BAS reviews that were completed upon proposal in previous FPL. This is justified due to the methods remaining largely the same and the scientific integrity of the program potentially increasing.

8. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

9. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	More information needed
Notes	DOI is proposing that Council use/adopt the EC documentation used for the first phase in FPL 3b. It is appropriate and efficient to use FPL 3 environmental compliance documentation for FPL 4 activities provided that the existing documentation either: (1) Fully covers the potential effects of the FPL 4 activity and requires no updates, or (2) Fully covers the potential effects of the FPL 4 activity including any needed updates to address changes in environmental conditions or the expected effects of the FPL 4 activity. Note: Restore Council staff worked with the state to resolve these comments.

Best Available Science Review:
Tribal Youth Conservation Corps (TYCC)

This program was reviewed for BAS under FPL 3b. Under the 2026 FPL, DOI is proposing a continuation of this program.

The original BAS review as well as the DOI's response to the BAS comments can be found at **https://www.restorethegulf.gov/our-work/fpl/fpl-2026/.**