

# State of Florida

## STATE EXPENDITURE PLAN



Submitted Pursuant to  
the Spill Impact Component  
of the RESTORE Act

33 U.S.C. § 1321(t)(3)

Prepared by the Gulf Consortium  
for the State of Florida



Prepared by the Gulf Consortium for the State of Florida.  
With assistance from Environmental Science Associates, Brown and Caldwell, Research  
Planning, Inc, and Langton Consulting

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# Executive Summary

[To Be Provided in Draft SEP]

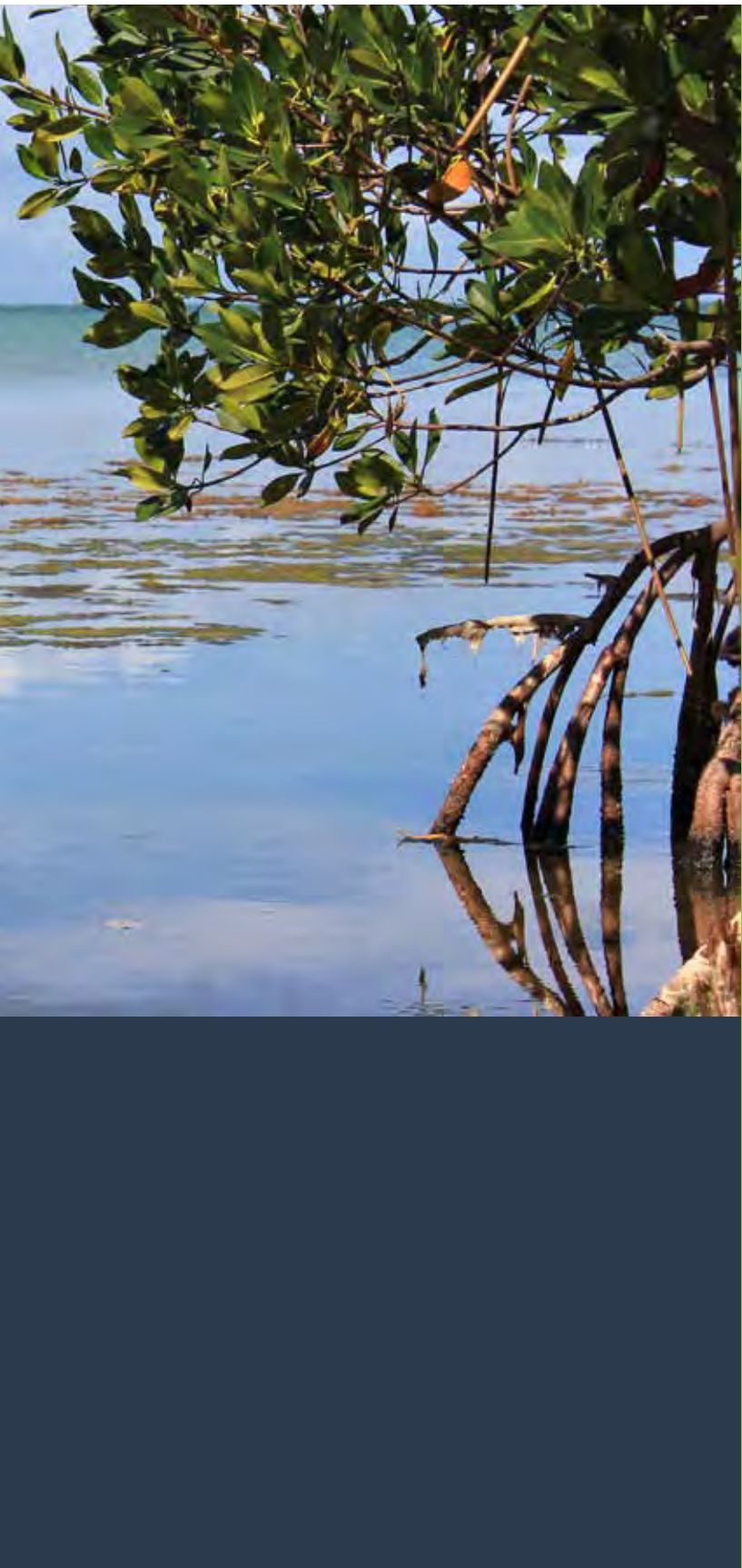






## SECTION I

# State Certification of RESTORE Act Compliance



RESTORE Act  
Compliance

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### A. Designated State Agency – The Gulf Consortium

The Gulf Consortium (Consortium) is the designated State agency responsible for the development of the Florida State Expenditure Plan (SEP), as recognized in the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act) and subsequent rulemaking.

The Consortium is a public entity created in October 2012 through an Interlocal Agreement between Florida's 23 Gulf Coast counties to meet the requirements of the RESTORE Act. The Florida Gulf Coast extends from Escambia County in the western panhandle bordering the State of Alabama, to Monroe County, including the Everglades and the Florida Keys on the southern tip of Florida. The Interlocal Agreement establishing the Gulf Consortium is provided herein as **Appendix 1**.



[www.gulfconsortium.org](http://www.gulfconsortium.org)

The Consortium's Board of Directors consists of one representative from each of the 23 county governments and six persons appointed by the Governor, for a total of 29 Board members. Since its inception, the Consortium has met more or less every other month and has held numerous Executive Committee meetings to stand up the organization, conduct business, and guide the development of the Florida SEP.

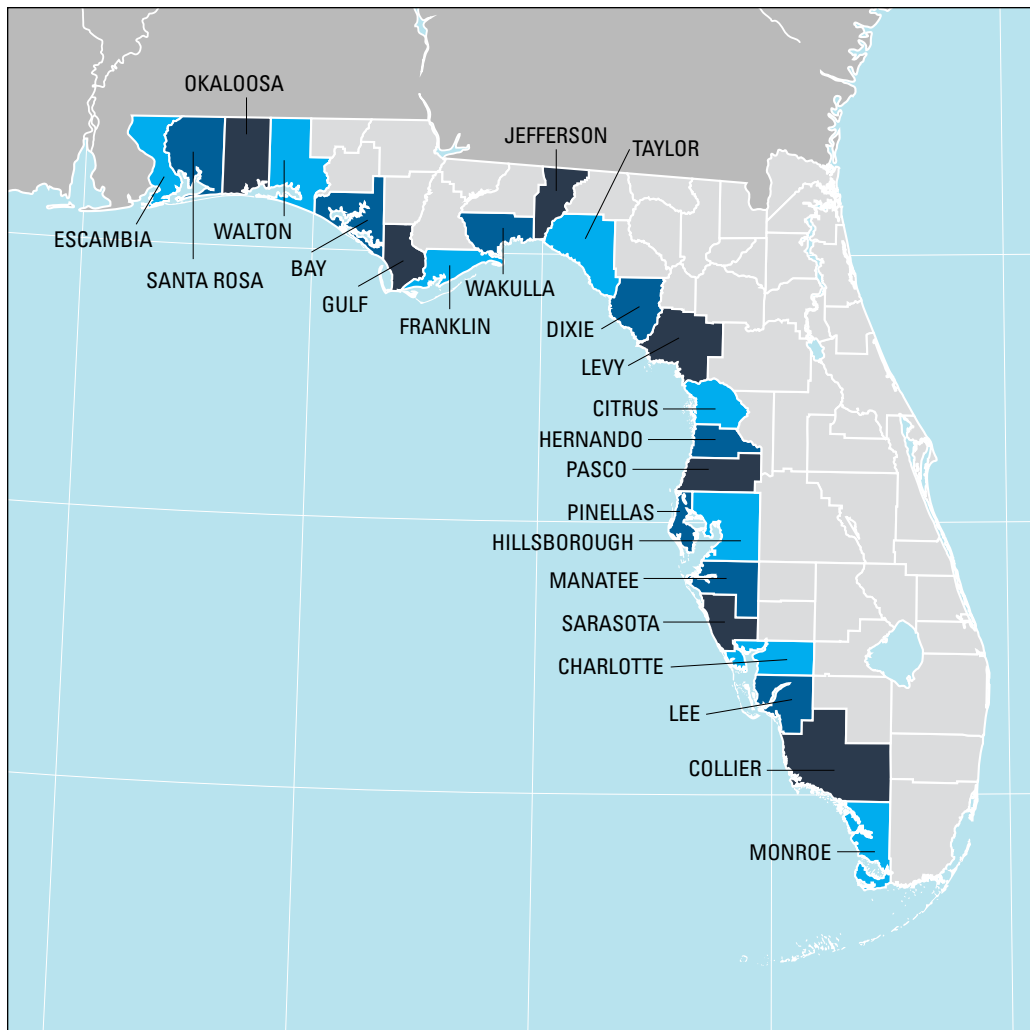
Pursuant to the RESTORE Act, Governor Rick Scott is Florida's appointed lead on the Gulf Coast Ecosystem Restoration Council. To formalize the role of the Consortium, the Governor and the Consortium entered into a Memorandum of Understanding (MOU) on June 12, 2013 to establish the Consortium's responsibilities in the development of the Florida SEP, and in coordinating with the Governor's office. The MOU between the Consortium and the State of Florida provided herein as **Appendix 2**.

The MOU recognizes that the RESTORE Act directs the Consortium to develop the Florida SEP. Furthermore, the MOU provides for the coordinated review and input by the Florida Department of Environmental Protection, the Water Management Districts, other applicable state agencies, and the Governor during the development of the Florida SEP. In addition, the MOU requires the Consortium to conduct its activities with full transparency and adhere to all legal requirements including, but not limited to, those relating to open meetings, public records, contracting, audits, and accountability. Finally, the MOU requires the Consortium to meet the following minimum requirements in selecting and prioritizing projects, programs, and other activities for inclusion in the Florida SEP:

- A review for consistency with the applicable laws and rules;
- Prioritization based on criteria established by the Consortium;
- Consideration of public comments; and
- Approval by an affirmative vote of at least a majority of the Consortium Directors present at a duly noticed public meeting of the Consortium.

Upon final review and approval by the Consortium, the Governor is responsible for the formal transmittal of the Florida SEP to the Council.





The Florida Gulf Coast extends from Escambia County in the western panhandle bordering the State of Alabama, to Monroe County, including the Everglades and the Florida Keys on the southern tip of Florida.

## B. State Certification

In addition to the above minimum requirements set forth in the MOU, the RESTORE Act, 33 U.S.C. § 1321(t)(3) (B), lists the requirements that each SEP must meet for the disbursement of Oil Spill Impact Allocation Funds, in accordance with the formula developed under § 1321(t)(3)(A). These requirements include:

1. Meets one or more of the eligible activities under § 1321(t)(1)(B)(i) and/or (ii) and administrative costs limitations under § 1321 (t)(1)(B)(iii);
2. Contributes to the overall economic and ecological recovery of the Gulf Coast;
3. Takes into consideration the Comprehensive Plan and is consistent with the goals and objectives of the Comprehensive Plan; and
4. Does not use more than 25% of the funds disbursed for eligible activities six and seven in the above Section 4.1.1, unless the infrastructure limitation exception is met.

## SECTION I: State Certification of RESTORE Act Compliance

In accordance with Section 5.2.2 of the Council's SEP Guidelines, the State of Florida hereby certifies the following:

- All projects, programs, and activities included in the Florida SEP are eligible activities as defined by the RESTORE Act;
- All projects, programs, and activities included in the Florida SEP contribute to the overall economic and/or ecological recovery of the Gulf Coast;
- The Florida SEP is consistent with the goals and objectives of the current Comprehensive Plan adopted by the Council;
- Issues crossing Gulf State boundaries have been evaluated to ensure that a comprehensive, collaborative ecological and economic recovery is furthered by the Florida SEP; and
- All projects, programs, and activities included in the SEP are based on and/or informed by the Best Available Science as defined in the RESTORE Act.

In preparing this Florida SEP the Consortium, through the direction of its consultant team, conducted a thorough process of project nomination, definition, evaluation, and refinement – resulting in the projects, programs, and activities proposed in Section V. Given the unique nature of the Consortium, the process was “county-driven” in that each of the 23 member counties had the ability to self-determine their priority projects. It was the role of the consultant team to screen proposed projects, and then to conduct detailed project evaluation and refinement as necessary to ensure that the criteria listed above were met. It should, however, be noted that the projects, programs, and activities described in Section V have not undergone a full Best Available Science review. Based on guidance provided by the Council, this level of review will be conducted as part of the implementation grant process.



## C. Compliance with the 25-Percent Infrastructure Limitation

In accordance with Section 4.2.2 of the Council's SEP Guidelines, the State of Florida hereby certifies that the proposed projects, programs, and activities described in Section V of this Florida SEP comply with the 25 percent infrastructure limitation. For SEP purposes, the term "infrastructure" has the same meaning as provided in 31 CFR § 34.2. The 25 percent infrastructure limitation is defined in the RESTORE Act, 33 U.S.C. § 1321(t)(3)(B)(iii). This provision states that not more than 25 percent of the allocated Spill Impact Component funds may be used by a State for infrastructure projects for RESTORE Act eligible activities six and seven which include:

- Activity 6 - Infrastructure projects benefiting the economy or ecological resources, including port infrastructure; and
- Activity 7 - Coastal flood protection and related infrastructure.

It should be noted that a large proportion of Florida's allocated Spill Impact Component funds are proposed for use on projects that involve the conversion of septic tanks to central sewer facilities to remediate legacy coastal water quality impairments. However, the Council has provided guidance that such projects would not qualify as "infrastructure" with respect to the 25 percent infrastructure limitation because their primary objective is to improve degraded water quality. Conversely, septic to sewer conversions to improve degraded water quality can be distinguished from the extension of central sewer facilities into undeveloped areas. The latter project type would qualify and "infrastructure" with respect to the 25 percent infrastructure limitation if the primary objective is to stimulate economic growth.







## SECTION II

# Public Participation Statement



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[PLACEHOLDER FOR GULF CONSORTIUM MEETING PHOTO]

### A. Public Participation Statement

This State Expenditure Plan (SEP) for the State of Florida fully conforms with, and exceeds, the public participation requirements outlined in 31 C.F.R. § 34.503(g). In accordance with these requirements, the Gulf Consortium made the Draft Florida SEP available for public review and comment for greater than the required minimum forty-five (45) days - from November 20, 2017 through January 5, 2018. This public review process was conducted in a manner designed to obtain broad-based participation from citizens, businesses, tribes, and non-profit organizations in accordance with 31 C.F.R. §§34.303(b)(8), 34.503(b)(4) and 34.503(g). The projects, programs and activities described in this Florida SEP were formally adopted after full consideration of public input in accordance with 31 C.F.R. §§34.303(b)(9) and 31 C.F.R. §34.802(c). A summary of public comments received on the Draft Florida SEP are is provided in **Appendix C** of this document.

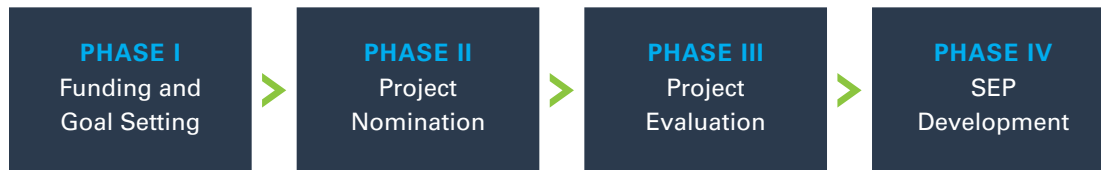
In addition to the formal public comment period on the Draft Florida SEP, it should be noted that the entire Florida SEP development process was transparent and open to the public at every step of the way. Throughout this process, the Gulf Consortium held a total of 34 full Board of Directors meetings, and 30 Executive Committee meetings. Each of these meetings were publicly noticed pursuant to the requirements of Florida Statutes, and at each meeting, a public comment agenda item was always included. Meeting minutes were recorded and posted on the Gulf Consortium website, along with all meeting materials, presentations, interim deliverables, etc.

Finally, if the proposed projects, programs, and activities described herein need to be modified, or new projects, programs, and activities become elevated in priority, this Florida SEP may be updated and/or amended over time. The Gulf Consortium is committed to providing the same level of public involvement and review for any and all future SEP amendments.



## B. Process for Selecting Proposed Projects, Programs and Activities

In November, 2014 the Gulf Consortium selected the Environmental Science Associates (ESA) consultant team to prepare the Florida SEP. The ESA consultant team proposed a scope of work broken down into four phases:



These phases and their respective tasks are described below.

### PHASE I – FUNDING AND GOAL SETTING

#### Task 1 – Prepare Planning State Expenditure Plan and Administrative Grant Application

This task involved the preparation of the Planning State Expenditure Plan (PSEP) for the State of Florida, submittal of the PSEP to the Council for review, and coordination with the Council to obtain approval of the PSEP. This task also included the preparation of the Administrative Grant Application (AGA) for a planning grant, submittal of the AGA to the Council for review, and subsequent responses to requests for clarification and additional information from the Council. The PSEP was approved by the Council in 2015, and the planning AGA was approved by the Council on June 23, 2016 for a total amount of \$4,640,675.

#### Task 2 – Conduct Consortium Goal Setting Workshop

This task involved the facilitation of a one-day goal setting workshop with the Gulf Consortium Board of Directors to deliberate on Florida-specific goals, objectives, and guiding principles for the Florida SEP. In addition, this workshop addressed two key questions: 1) should there be a pre-determined geographic allocation of funds; and 2) should there be a pre-determined allocation of funds for environmental vs. economic projects. The workshop was held on August 26, 2015 in St. Petersburg, Florida. This task also included: pre-workshop interviews with all Consortium Directors; the development and distribution of a pre-workshop survey and supporting informational materials; analysis of survey results; and development of summary workshop presentations. Finally, this task involved the development of a final summary report of the workshop proceedings, as well as an action item agenda for the subsequent Consortium meetings where formal decisions were voted on.

At its November 18, 2015 meeting, the Gulf Consortium formally voted to approve an even distribution of Florida's Spill Impact Component allocation amongst the 23 member counties. That is, each member county would receive an equal amount of the allocation, without consideration of factors such as miles of shoreline, distance from the spill, population, etc. The Consortium considered several alternative approaches to geographically distributing the funds for projects along the Florida Gulf coast, but it was determined that the most equitable solution was to divide the available Spill Impact Component funds equally so that each county could:

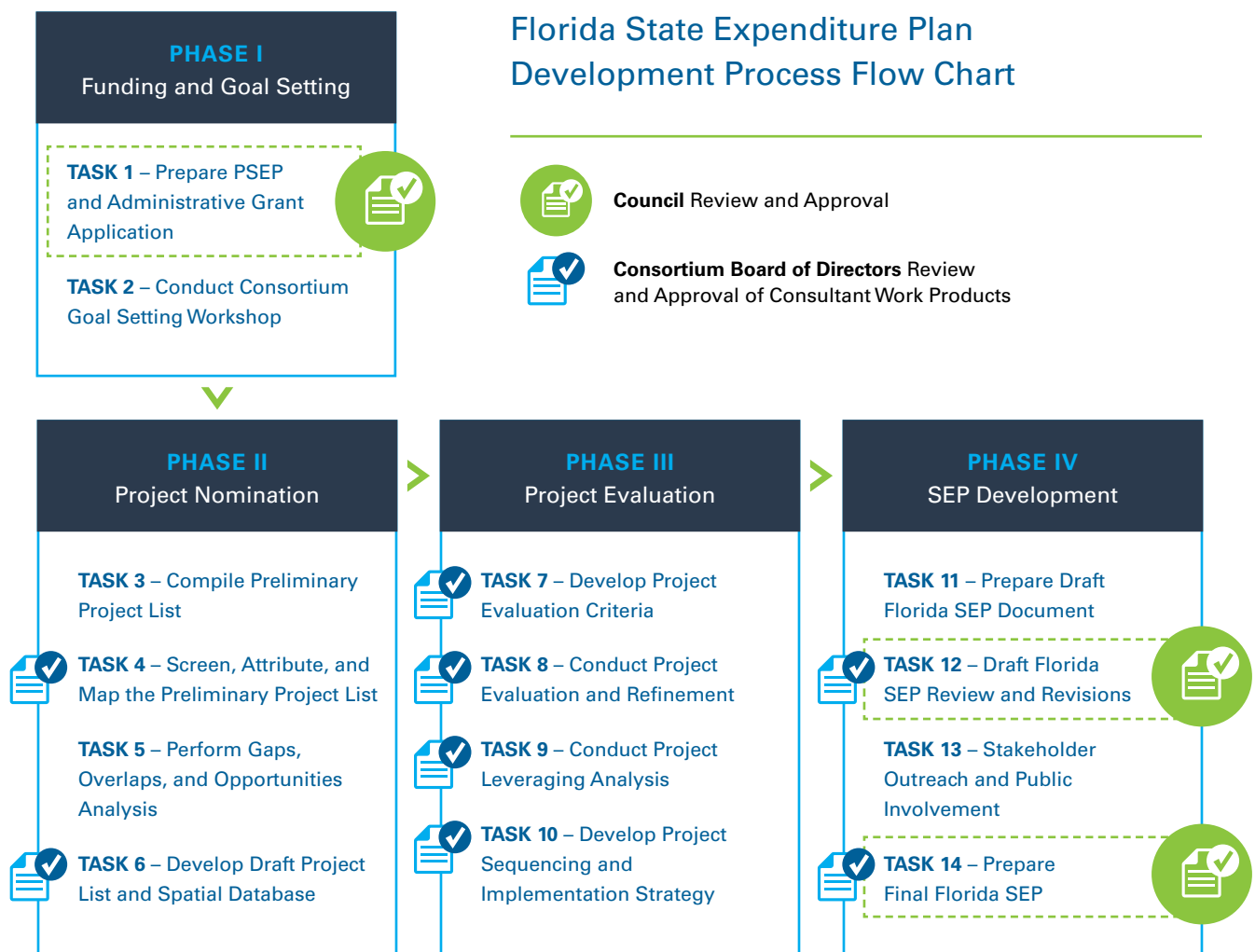
- Equally participate in Gulf restoration; and
- Self-determine their own projects.

Prior to this vote, the ESA consultant team had been working under the scope of work contained in the original Request for Proposal (RFP), Request for Best and Final Offer (RBAFO), and addressed in ESA's final RBAFO response. This original scope of work essentially defined a process whereby the selected consultant team would review the

## SECTION II: Public Participation Statement

universe of projects contained in the Deepwater Horizon (DWH) project portal developed by the Florida Department of Environmental Protection, conduct benefit/cost analysis of those project, and then select and rank a small subset (e.g., 6-12) regional projects that were determined to be most cost-effective and provide the greatest overall benefits to the State of Florida. However, early in the process the Gulf Consortium recognized that under this approach there would likely be some counties that would not participate in the implementation of the Florida SEP. Therefore, as the debate of the geographic distribution of funds advanced, a strong consensus began to evolve amongst the Gulf Consortium that each county should have the ability to sponsor projects and participate in Gulf restoration through the implementation of the SEP. Once this decision was made, the ESA consultant team was requested to revise their scope of work to implement a “county-driven” process to project nomination and evaluation whereby they would work closely with each county to identify and refine their proposed projects for inclusion in the Florida SEP.

The revised ESA scope of work is graphically depicted in the flow chart below. While the four phase remained the same, the task structure was modified to accommodate the “county-driven” process. The following text describes Phases II through Phase IV, and their respective tasks.



## PHASE II – PROJECT NOMINATION

### Task 3 - Compile Preliminary Project List

This task involved the development of general screening criteria, which were approved by the Gulf Consortium and used as the guiding criteria throughout the preliminary project list development process. A standard project nomination form was distributed to the 23 individual counties, along with the screening criteria and other guidance materials, to assist the counties in identifying potential project concepts and develop the preliminary project list. The counties utilized these materials to prepare and submit their preliminary project concepts to ESA for review. It is important to note that the submittal of project concepts at this stage was totally non-binding for the counties. Project concepts proposed by the individual counties included:

- Environmental and economic projects identified as part of County Direct Component activities through coordination with local RESTORE Act citizen and stakeholder committees.
- Environmental projects identified in existing coastal resource and watershed management plans (e.g., National Estuary Program Comprehensive Conservation and Management Plans (CCMPs); Water Management District Surface Water Improvement and Management (SWIM) Plans, etc.).
- Applicable County projects identified in Capital Improvement Programs or other County environmental and economic development initiatives.

The ESA consultant team reviewed the submitted materials and then met with each of the 23 counties to assist them in identifying and/or prioritizing their preliminary project concepts, and in finalizing their project nomination forms. In addition, if requested, the ESA consultant team facilitated regional discussions and assisted in identifying potential shared interests, goals, themes, and collaborative opportunities through the Spill Impact Component. These discussions included assistance and advice on the potential for leveraging and partnering in order to maximize the efficient use of dollars and the cumulative benefits of all projects ultimately included in the Florida SEP. Upon submittal of revised project nomination forms and project concepts from each of the counties, the ESA consultant compiled the preliminary project list which represented the first cut of project concepts for potential inclusion in the Florida SEP.

### Task 4 - Screen, Attribute, and Map the Preliminary Project List

The ESA consultant team applied the screening criteria to the preliminary project list which eliminated a few projects that were not eligible for RESTORE Act funding or otherwise inconsistent with the goals, objectives, and guiding principles adopted by the Consortium. The remaining projects were attributed and converted into a GIS spatial database. Attribution includes such parameters as: project type; area affected by the project; project benefits; project costs; leveraging potential; project partners; etc. In addition, the screened preliminary project list was digitized (e.g., project type; area affected; project cost; etc.) so that the full range and scope of the preliminary project list could be visually depicted in a map series. The screened preliminary project list was mapped and summarized in a Technical Memorandum, and presented to the Consortium for discussion.

### Task 5 - Perform Gaps, Overlaps, and Opportunities Analysis

The ESA consultant team conducted an analysis of the preliminary project list to determine if there were substantial gaps in geographic coverage or project type focus. This analysis also explored opportunities to combine similar nearby projects into larger single projects to improve cost-effectiveness, and/or find opportunities to modify or enhance projects in ways that would increase leveraging potential and/or streamline regulatory approvals. The ESA consultant continued to work closely with individual counties to update and/or revise their preliminary project concepts accordingly.

## SECTION II: Public Participation Statement

### Task 6 - Develop the Draft Project List and Spatial Database

Based on input from the Consortium and the individual counties received in Tasks 4 and 5, respectively, the ESA consultant team revised and updated the preliminary project list and developed the draft project list and associated GIS spatial database. The draft project list was mapped, summarized in a Technical Memorandum, and presented to the Consortium for review and approval. Based on input from the Consortium, the draft project list and spatial database were further revised. Upon Consortium approval, the draft project list will represent the universe of projects that were taken into Phase III – Project Evaluation.

### PHASE III – PROJECT EVALUATION

#### Task 7 - Develop Project Evaluation Criteria

Based on the range of projects represented in the draft project list, the ESA consultant team developed project evaluation criteria to comparatively assess each project. Detailed evaluation criteria for environmental projects focused on three key project attributes:

- Technical basis and justification: Evaluating the technical basis of proposed actions was based on best professional judgment. This attribute was assessed in terms of whether or not proposed projects were based on the best available science and/or engineering, as required by the Council, and whether they have a clearly defined technical rationale and justification (i.e., will the project address a demonstrated need).
- Feasibility: Evaluating the feasibility of proposed projects essentially constituted a “reality check” also based largely on best professional judgment. The feasibility attribute was assessed in terms of numerous factors including but not limited to: technical efficacy (both science and engineering) workability, permitability, constructability, cost-effectiveness, and public acceptance.
- Leveragability: Evaluating leveragability involved an assessment of the ability for the project to attract leveraged funds from a range of sources. Under this task, the primary focus was on funding streams associated with the Deepwater Horizon oil spill settlements.





Separate criteria were developed for economic projects. The recommended project evaluation criteria were summarized in a Technical Memorandum, and presented to the Consortium for review and approval.

It should be noted that the purpose of project evaluation under the County-driven process was not necessarily to eliminate projects, or to prioritize some projects over others, but rather to improve and refine each project included in the final project list to maximize its impact, cost-effectiveness, and grant readiness.

#### **Task 8 - Conduct Project Evaluation and Refinement**

To facilitate approval by the Council, all projects ultimately included in the Florida SEP were those that were determined by the ESA consultant team to be technically justifiable, feasible, and affordable within the budget limitations of the Spill Impact Component. Towards that end, the ESA consultant team applied the approved evaluation criteria to the draft project list to screen out those project concepts that did not meet the criteria, or modified them so that they did meet the criteria.

Furthermore, projects that can attract other funds through leveraging increase the overall value of the Florida SEP. Therefore, refining projects so that they can meet criteria for various leveraged funding sources was addressed in this task. Many project concepts submitted by the counties have significant information gaps, while other project submittals are well-developed as conceptual or even final designs with accompanying feasibility, engineering, and environmental studies. To fairly and objectively evaluate the various project concepts submitted by the counties, those that were lacking in basic details with regard to such factors as technical justification, project boundaries, anticipated benefits, technical approach, construction methods, cost estimates, etc., needed to be further developed. Therefore, in this task the ESA consultant team worked closely with individual counties, as needed, to further refine their project concepts.

Upon completion of project evaluation and refinement activities, a final project list will be developed. The methods and findings of the project evaluation/refinement process, and the recommended final project list will be summarized in a Technical Memorandum and presented to the Consortium for review and approval. The final project list served as the basis for the remaining tasks.



## SECTION II: Public Participation Statement

### Task 9 - Conduct Project Leveraging Analysis

In this task, the ESA consultant team develop an Other Grant Sources Inventory document that addressed potential leveraged funding sources applicable to the final suite of projects recommended in Task 8. This inventory included a wide range of federal, state, private, and NGO grant programs (e.g., National Fish & Wildlife Foundation) that could potentially be used to leverage projects to be included in the Florida SEP. This task also involved close coordination with the Florida Department of Environmental Protection (FDEP) with regard to the availability and applicability of leveraged funds from the Council Selected Restoration Component (RESTORE Act Pot 2) and the Florida portion of the Natural Resource Damages (NRD) settlement. The final suite of projects was individually linked to potential leveraging sources applicable to each, along with estimated dollar amounts. Upon completion of this task, the final project list, and the leveraging potential for each, was summarized in a Technical Memorandum, and presented to the Consortium for review and approval.

### Task 10 - Develop Project Sequencing and Implementation Strategy

The approximate funding levels available to each county from the Spill Impact Compact component have been estimated for the BP settlement. Furthermore, based on current knowledge of the settlement, funds will be paid out over a 15-year period, without the ability to use these funds for bonding and debt payments. Finally, Council implementation grants for all projects included in the Florida SEP must be project-specific, and be channeled through a single grant portal by the Gulf Consortium. Individual counties will not be able to engage with the Council independently with regard to implementation grant funds. To address these complexities, a project sequencing strategy was necessary to expedite and optimize the distribution of Council implementation grant funds over the payout period.

The final suite of projects ultimately included in the Florida SEP varied significantly with regard to their relative complexity and level of development and/or design. For example, some projects are ready to receive construction funds, while other projects may require conceptual planning or engineering design funds. The ESA consultant team developed a project sequencing schedule that optimizes the 15-year payout such that each county is annually making progress on their respective projects. In addition, this task involved the development of an overall implementation



strategy that considers multiple alternatives for managing the accounting of Spill Impact Component funds amongst the 23 counties over the 15-year payout schedule. A draft Project Sequencing and Implementation Strategy document was prepared and presented to the Consortium for review and approval. The approved final suite of projects along with the approved project sequencing and implementation strategy will served as the basis for Phase IV – Florida SEP Development.

## PHASE IV – FLORIDA SEP DEVELOPMENT

### Task 11 - Prepare Draft Florida SEP Document

Using the results of the previous tasks and the priority project rankings, the ESA consultant team prepared the draft Florida SEP document to comply with all informational requirements specified by the Council in applicable rules and guidance documents. Prior to release of the Draft SEP for formal review and public comment, the consultant team conducted a legal review of the document to ensure compliance and consistency with all applicable federal, state, and local laws, rules, and agreements. Revisions to the Draft SEP were made to address any legal noncompliance or inconsistencies.

### Task 12 - Draft Florida SEP Review and Revisions

The ESA consultant team made a summary presentation of the Draft Florida SEP to the Gulf Consortium on November 15, 2017. Upon approval by the Consortium, the Draft SEP was submitted to the FDEP for a coordinated review by FDEP and other appropriate state agencies, including: the Florida Fish & Wildlife Conservation Commission; the Department of Economic Opportunity; the Department of Transportation; the Department of Agriculture and Consumer Services; and Florida Water Management Districts with regulatory jurisdiction over projects, programs and activities included in the Draft SEP. Comments received from the FDEP coordinated review were summarized in a Technical Memorandum and presented to the Consortium Executive Committee. Upon approval by the Consortium, the ESA consultant team made recommended revisions to the Draft Florida SEP.





## SECTION II: Public Participation Statement

### **Task 13 - Stakeholder Outreach and Public Involvement**

Pursuant to the Memorandum of Understanding (MOU) between the Governor and the Consortium, the Consortium must formally adopt the Draft Florida SEP, and allow the opportunity for the public review and comment on the document, prior to submittal of the Draft Florida SEP to the Governor. The ESA consultant team developed and implemented a Stakeholder Outreach and Public Involvement program to facilitate stakeholder review, and to solicit public comments. This program was tailored to meet the specific requirements of the Consortium and the Governor, included the following components:

- Facilitation of two advertised public webinars with various stakeholder and citizen groups; and
- Development and maintenance of an online website and portal for the submittal and documentation of public comments received, as well as responses to those comments.

Comments received from stakeholders and the public were summarized in a Technical Memorandum, and presented to the Consortium. As directed by the Consortium, the ESA consultant team made further revisions to the Draft Florida SEP. Public comments received on the Draft Florida SEP are provided in Appendix C of this document.

### **Task 14 - Prepare Final Florida SEP**

Upon formal adoption by the Consortium at their November 15, 2017 meeting, the Draft Florida SEP was submitted to the Governor for review. Pursuant to the MOU between the Governor and the Consortium, the Draft Florida SEP was required to be submitted to the Governor at least 90 days prior to its transmittal to the Council. Upon receipt of the Draft Florida SEP, the Governor was required to provide comments back to the Consortium within 30 days. The Consortium in turn had 30 days from the date of receipt of the Governor's comments to revise the Draft Florida SEP in accordance with the Governor's comments and submit the revised Final Florida SEP back to the Governor for final approval and formal transmittal to the Council. To facilitate this review process, the ESA consultant team made presentations of the revised Draft Florida SEP to the Governor and the Council, as well as continued their close coordination with the Consortium and the FDEP. Upon receipt of comments on the revised Draft Florida SEP from the Council, the ESA consultant team prepared the final Florida SEP document for formal approval Governor and transmittal to the Council.

## C. Public Involvement

As described under Task 13 above, public comments on the Draft Florida SEP were solicited through the:

- Facilitation of two advertised public webinars with various stakeholder and citizen groups; and
- Development and maintenance of an online website and portal for the submittal and documentation of public comments received, as well as responses to those comments.

However, it should be noted that the entire Florida SEP development process was transparent and open to the public at every step of the way. Throughout this process, the Gulf Consortium held a total of 34 full Board of Directors meetings, and 30 Executive Committee meetings. Each of these meetings were publicly noticed pursuant to the requirements of Florida Statutes, and at each meeting, a public comment agenda item was always included. Meeting minutes were recorded and posted on the Gulf Consortium website, along with all meeting materials, presentations, interim deliverables, etc.



Although RESTORE Act funds are divided among the five Gulf coast states, Florida is unique in that the Gulf coast counties are the lead entities for two of the five RESTORE Act components – the Direct Component and the Spill Impact Component. For Direct Component funds, each of the 23 counties is responsible for developing their own Multi-Year Implementation Plan (MYIP), based on processes and projects developed locally, and through coordination with the Department of Treasury. For Spill Impact Component funds, all 23 counties have worked together as the Gulf Consortium to develop the Florida SEP, but pursuant to the process described above, each county acted more or less independently in nominating and selecting their own projects for inclusion in the SEP.

Some counties followed similar processes, but each county was slightly unique in their approach. For example, 20 of the 23 member counties formed some sort of local RESTORE Act advisory committee to recommend projects to their respective County Commissions. Others secured planning grants and relied on staff and/or hired consultants to identify needs and candidate projects. While still others used a combination of these approaches. As a result, there was little consistency and each county had to learn to navigate the various RESTORE Act processes independently.

To reduce redundancy and streamline efficiency so that more RESTORE Act funds could go into projects rather than learning to navigate new administrative processes, in April 2016, the National Wildlife Federation hosted a workshop of Florida's Gulf coast counties so they could share information and experiences related to implementing the RESTORE Act. The counties in attendance found the exchange productive and useful. As a result, the County RESTORE Act Coordinator (RAC) meetings have continued to be held several times a year, in conjunction with Gulf Consortium meetings (to maximize attendance since many County representatives also attend Consortium meetings).

The RAC meetings differ from the Gulf Consortium meetings in that they involve lead county staff who are responsible for writing planning grants, preparing MYIPs, writing implementation grants, and managing projects and monitoring programs. In addition, the primary focus of the RAC meetings is on Direct Component (Pot 1) funds, whereas the Consortium focuses exclusively on Spill Impact Component funds. However, in recent months, more counties have been pursuing synergies and leveraging opportunities across the two county-directed funding streams, as well as considering comparable and compatible projects with neighboring counties.

Although County RESTORE Coordinator meetings are not publically noticed, they are open to the public and have been regularly attended by diverse participants, including: U.S. Treasury staff, Florida's Deepwater Horizon Office, non-governmental organizations (NGOs), and other environmental organizations, RESTORE Council staff, representatives of the Florida Governor's office, consultants, and members of the public. This parallel process has added significantly to the overall transparency and public participation in the development of the Florida SEP.



## SECTION III

# Financial Integrity



RESTORE Act  
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Overall Consistency

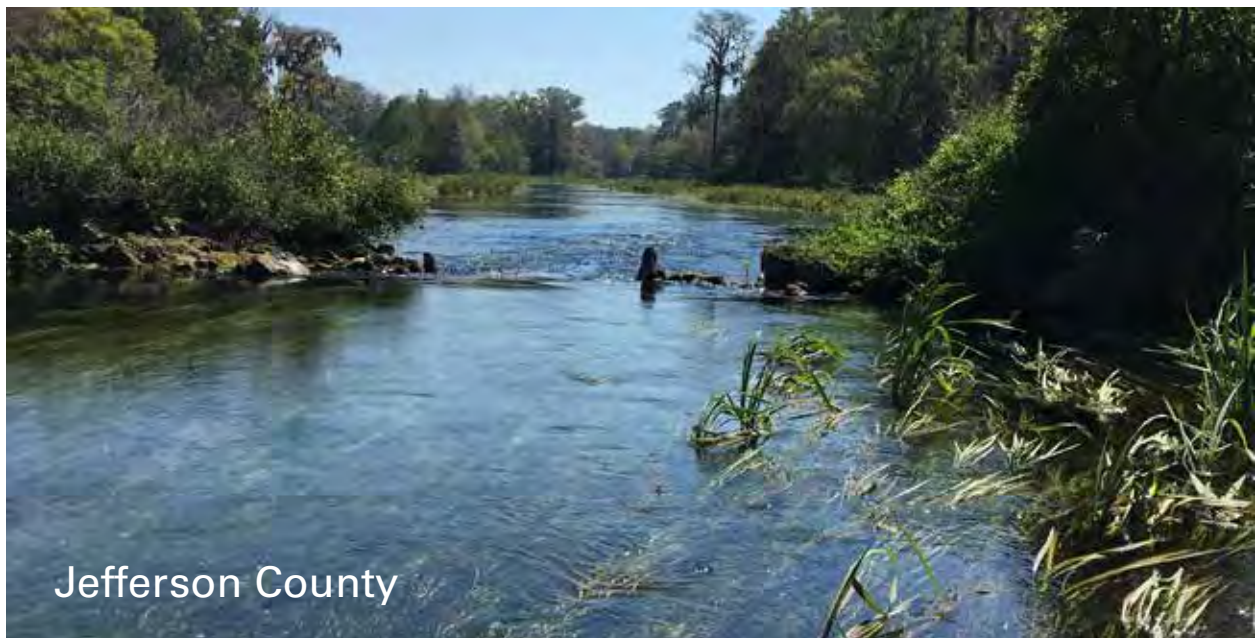
Proposed Projects

Appendices



## A. Financial Controls

[THIS SECTION TO BE PROVIDED BY THE BALMORAL GROUP AS EXCERPTED FROM THE STAND UP SEP DOCUMENT.]



## B. Conflict of Interest

[THIS SECTION TO BE PROVIDED BY NABORS, GIBLIN & NICKERSON CITING CONSORTIUM POLICIES FROM THE STAND UP SEP, AND APPLICABLE STATE AND FEDERAL LAW.]

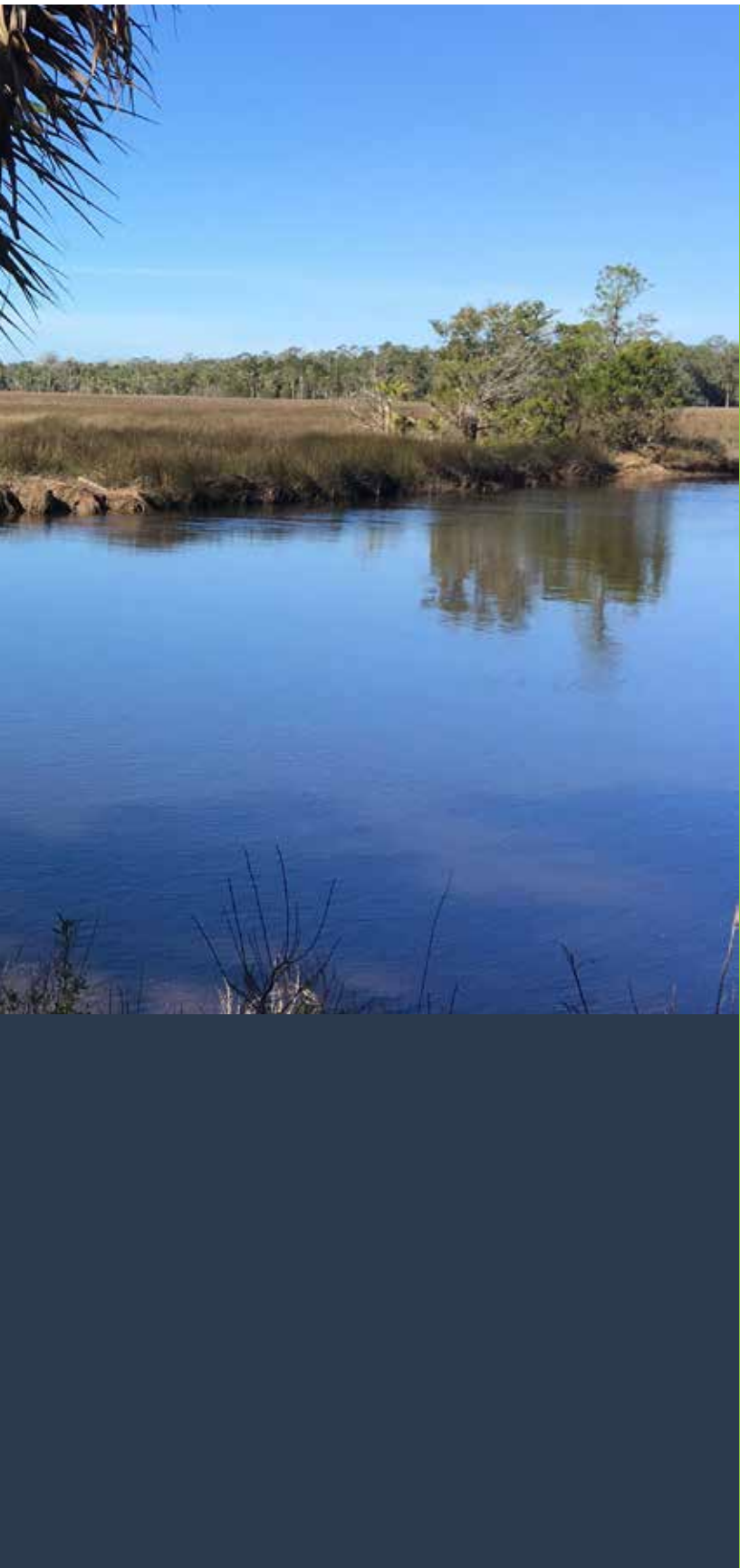




## SECTION IV

# Overall Consistency with the Goals and Objectives of the Comprehensive Plan





RESTORE Act Compliance	Public Participation	Financial Integrity	Overall Consistency	Proposed Projects	Appendices
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### A. Florida-Specific Goals and Objectives

Goals and objectives constitute the framework of all competent resource management plans, and the adoption of goals and objections are an important first step in the plan development process. As part of its Comprehensive Plan the Restoration Council has developed goals, objectives, and guiding principles to guide the selection of projects, programs and activities to be funded under the Council Funded Component and the Spill Impact Component of the RESTORE Act. While the Florida State Expenditure Plan must be consistent with the Council's goals and objectives, there is considerable flexibility to accommodate Florida-specific priorities. Therefore, the development of Florida-specific goals and objectives that represent the consensus of the Gulf Consortium was an important first step as these goals and objectives were used by the ESA consultant team as the framework for the development of the Florida State Expenditure Plan.

The Gulf Consortium convened its Goal Setting Workshop on August 26, 2015, early in the Florida State Expenditure Plan (SEP) development process. In the workshop, the ESA consultant team presented the Council's goals and objectives, as described in the Initial Comprehensive Plan, and led a discussion on verbiage and interpretation of each goal and objective. In addition, examples of the types of projects consistent with each goal and objective were presented.

There was broad-based support from the Gulf Consortium for adopting the Council's goals and objectives verbatim. The Consortium agreed that all of the Council's goals and objectives were applicable to Florida and appropriate for the Florida SEP. In addition, the Consortium wanted to maintain the maximum degree of flexibility in determining appropriate projects, programs and activities to be included in the Florida SEP, rather than focusing on one or a few priority eligible activities, goals and/or objectives. In a straw vote at the workshop, the Consortium voted to adopt the following goals and objectives for the Florida SEP:



## OBJECTIVES

1. Restore, Enhance, and Protect Habitat;
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.

In reviewing the Council's goals and objectives, the Consortium noted that there was not a Council objective that specifically related to Goal 4 – Restore and Revitalize the Gulf Economy. Therefore, the Consortium voted to adopt an eighth objective specifically addressing the relationship between environmental quality of the Gulf coast and the Florida economy:

8. Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects, and Promote Projects that Enhance the Synergy between the Environmental Quality of Florida's Gulf Coast and the Florida Economy.

In their deliberations, many Consortium Directors affirmed the importance of clean coastal waters and beaches, thriving marine and estuarine habitats, and healthy fish and shellfish populations to the overall economy of Florida. More than any other Gulf state, Florida's economy is dependent of tourism and coastal recreational opportunities, and it was important to the Gulf Consortium that this dependency be recognized in a separate objective.

At its November 18, 2015 meeting, the Gulf Consortium formally adopted the five goals and eight objectives listed above.

### B. Consistency with the Comprehensive Plan

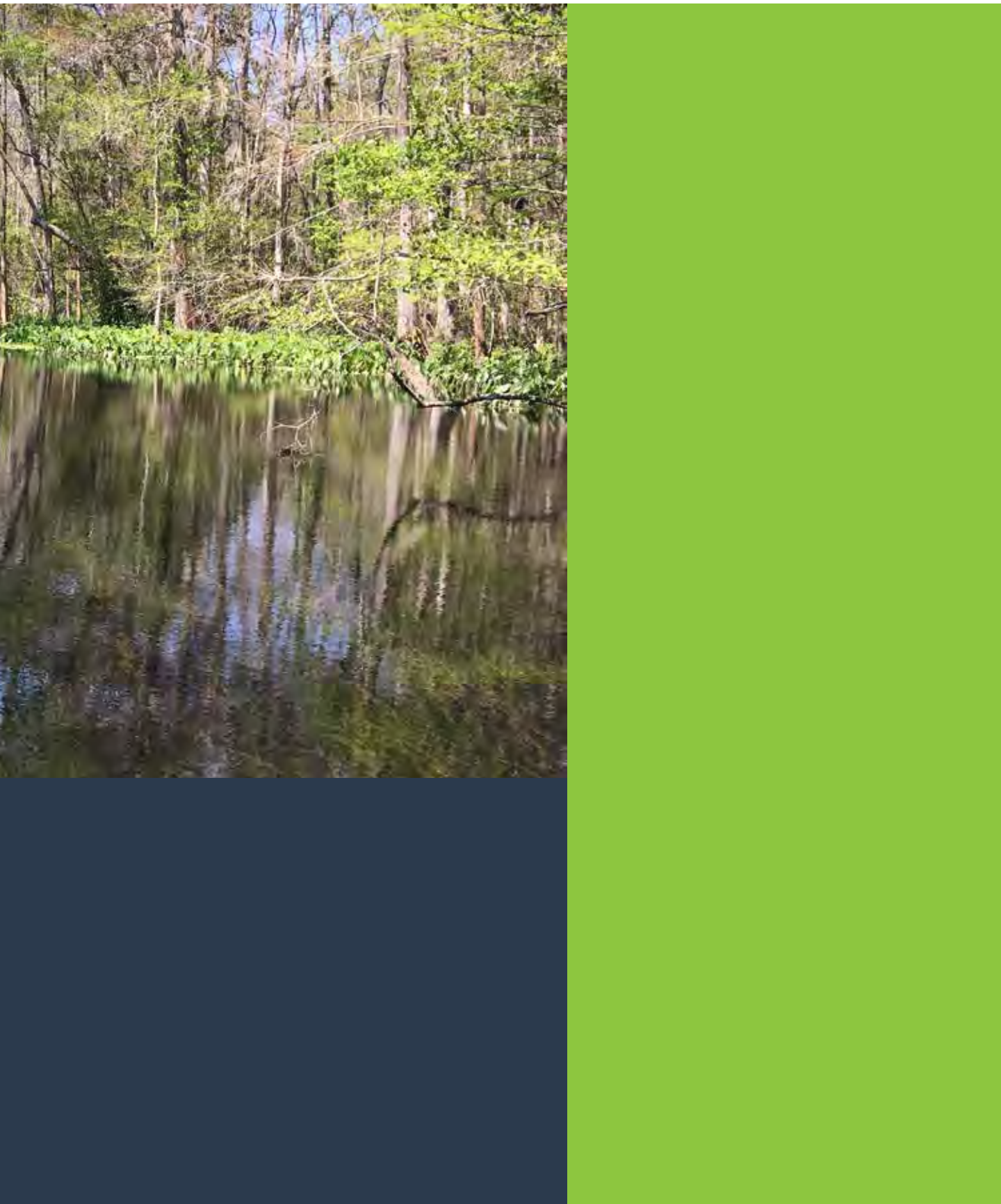
As discussed in Section II, the projects, programs, and activities proposed in this Florida SEP were developed through a county-driven process facilitated by the ESA consultant team. Given that the Consortium had adopted all of the Council goals and objectives verbatim, and added an eighth Florida-specific objective prior to the project nomination process, the counties were free to propose projects that covered the full breadth of the RESTORE Act, including a diverse range of both environmental and economic projects. Each county was free to address their own needs and priorities, without being restricted to any particular focus dictated by the Consortium. The resultant projects, programs, and activities described in Section V reflect this diversity by addressing multiple eligible activities, as well as all of the Comprehensive Plan goals and objectives.



## SECTION V

# Proposed Projects, Programs and Activities





RESTORE Act Compliance	Public Participation	Financial Integrity	Overall Consistency	Proposed Projects	Appendices
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### A. Overview of Proposed Project, Programs and Activities

As described in Section II.B of this document, the development of proposed projects, programs, and activities included in the Florida SEP was very much a “county-driven” process whereby each of the 23 Gulf Consortium member counties independently determined how they would use their allocation of Florida’s Spill Impact Component. The most current calculation of the Florida’s total Spill Impact Component allocation is \$294,338,815. Pursuant to the Gulf Consortium’s decision to split this amount evenly amongst the 23 counties, each county’s allocation is approximately \$12,660,789, which factors in the planning grant that Florida has received from the Restoration Council for SEP development.

In the process of assisting the counties, the ESA consultant team advised each county to develop project proposals that could be paid for using the following funding sources:

- Individual county Spill Impact Component allocation (\$12.7M);
- Any or all of the county’s Direct Component allocation;
- Other secured grants or co-funding; and
- Other committed county funding.

In addition, the counties were advised to consider “stretching” their budgets to allow for potential additional funding secured through leveraging. This recommendation was based on strong positive feedback received from the Florida Department of Environmental Protection (FDEP) on the initial project list. The FDEP indicated that there were many projects on the initial project list that could potentially be supplemented with leveraged funds from the Florida’s Natural Resource Damages (NRDA) settlement, as well as funding to be secured by the State from the National Fish and Wildlife Foundation (NFWF) settlement. Economic projects also have the potential to attract leveraged funding from the Florida’s economic settlement being managed by Triumph Gulf, Inc.

The ESA consultant team worked with each county to develop their initial list of proposed projects, programs, and activities. Then, the consultant team evaluated each of the proposed projects with respect to: 1) technical basis (e.g., need and justification); 2) feasibility; and 3) risks and uncertainties. In addition, the counties were advised to prioritize fewer, larger projects as opposed to multiple smaller projects to maximize project benefits and minimize associated administrative costs. Furthermore, where appropriate, the counties were advised to consolidate smaller, similar projects (e.g., multiple canal restoration projects) as components under a single “program” to also simplify grant writing and minimize administrative costs.

The consultation process with each of the counties was iterative, and each county approached these challenges in different ways. The resulting list of proposed projects, programs, and activities included herein reflects the “county-driven” process in that the unique priorities of each county are represented. A total of 70 projects, programs and activities are proposed in this Florida SEP. What follows are a master summary table of the proposed project, programs and activities (Section V.b.), and narrative descriptions for each project and program (Section V.c.).

The format of the narrative project/program descriptions was developed in consultation with Restoration Council staff. Given the large number of projects in the Florida SEP, Council staff advised that narrative descriptions be briefly summarized and limited to five pages or less, but still address the topics specified in the Council’s SEP guidance document. The resulting narrative project/program description template that is used herein was verbally approved by Council staff. The template headings, and material to be addressed under each heading, are described below.

## PROJECT NUMBER

Projects are numbered sequentially by County, starting with Escambia County (1) and ending with Monroe County (23). For counties that have multiple projects, the projects are listed in order of decreasing priority. Example: Pinellas County's third priority project is listed as Project 16-3.

## PROJECT TITLE

Short project title. The term "program" is used if the project has multiple similar components.

## PROJECT DESCRIPTION

### Overview and Location

One to three sentences that succinctly describes the project or program. A GIS location map is included for each project.

### Need and Justification

One to three paragraphs describing the historical trends, problems, or issues that the project addresses (e.g., water quality degradation in Charlotte Harbor), and how the project will improve the situation. Project-specific graphics are included as appropriate.

### Purpose and Objectives

One or two paragraphs describing to specific ecological and/or economic objectives of the project (e.g., restore lost oyster reefs in Apalachicola Bay).

### Project Components

One to three paragraphs describing the various aspects or phases of the project. Project-specific graphics are included as appropriate.

## CONTRIBUTIONS TO THE OVERALL ECONOMIC AND ECOLOGICAL RECOVERY OF THE GULF

One paragraph describing the anticipated ecological and/or economic outcomes and benefits of the project.

## ELIGIBILITY AND STATUTORY REQUIREMENTS

The most applicable RESTORE Act eligible activities are listed. If more than one activity is applicable, then the primary eligible activity is identified.

## COMPREHENSIVE PLAN GOALS AND OBJECTIVES

The most applicable Comprehensive Plan goals and objectives are listed. If more than one goal and/or objective are applicable, then the primary goal and/or objective are identified.

## IMPLEMENTING ENTITIES

One or two sentences describing who the grant sub-recipient will be, and who will be primarily responsible for project implementation.

## BEST AVAILABLE SCIENCE AND FEASIBILITY ASSESSMENT

One or two sentences describing previous work that the project is based on. Where applicable, key references are cited. In addition, a statement is made regarding the feasibility of the project with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.



## SECTION V: Proposed Projects, Programs and Activities

### RISKS AND UNCERTAINTIES

One paragraph describing the risks and uncertainties (e.g., additional technical information needs, property availability, funding shortfalls, etc.).

### SUCCESS CRITERIA AND MONITORING

One paragraph describing the anticipated project benefits, and specific criteria/metrics that will be measured to determine success. Proposed monitoring criteria are listed as bullets.

### MILESTONES AND SCHEDULE

One introductory paragraph that defines the estimated time horizon of the project, from planning through implementation, including the estimated start year and end year for the entire project. In addition, a Gantt chart is provided showing high level milestones for the project, and anticipated start and end dates for each in years from SEP approval

MILESTONE	YEARS FROM SEP APPROVAL											
	1	2	3	4	5	6	7	8	9	10	11	12
Milestone 1												
Milestone 2												
Milestone 3												
Milestone 4												
Milestone 5												
Milestone 6												

### BUDGET AND FUNDING SOURCES

One paragraph that describes the total project cost estimate and how it was derived; and summarizes the various sources of secured funding, any budget shortfall, and potential sources of leveraged funding. In addition, a budget table is provided showing the following:

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		
Implementation		
Monitoring		
Total Cost		
SECURED FUNDING SOURCES		
Spill Impact Component		
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
Total Secured Funding		
Budget Shortfall		
POTENTIAL LEVERAGED FUNDING SOURCES		

## PARTNERSHIPS/COLLABORATION

One paragraph that describes any project partners and co-sponsors, as well as a bullet list of agencies and NGO's that have or are expected to participate in project planning or funding.



B. Project Summary Table

County	County Code	Project Number	Project	Total Cost	Pot 3 Request	Pot 3 CD/FS Request	Location (Lat)	Location (Long)	Description
Escambia	1	1	Bayou Chico Restoration	22,800,000	12,660,000	230,000	30.405276	-87.25711	Dredging and shoreline habitat enhancement along Bayou Chico to address sediment contamination, closes a gap in addressing legacy water quality issues
Santa Rosa	2	1	Santa Rosa Sound Water Quality Improvement Program	33,000,000	12,660,000	250,000	30.380907	-86.879336	WWTP upgrades, discharge relocation from Sound to Eglin RIBs, Holley By the Sea and Navarre Septic to Sewer Conversion, Gulf Breeze Septic to Sewer Conversion
Okaloosa	3	1	Veterans Park Living Shorelines Project	4,000,000	1,500,000	0	30.399515	-86.591618	Shoreline protection and habitat creation, enhancement of existing park with coastal lake
Okaloosa	3	2	Fish Aggregating Devices (FADs)	500,000	500,000	0	30.119484	-86.668199	Buoys offshore to attract pelagic species, incorporate weather data
Okaloosa	3	3	Stormwater Retrofit Program	5,700,000	4,516,000	110,000	30.429212	-86.610846	Installation of BMPs, centrifugal separators and pipeline replacement
Okaloosa	3	4	Choctawhatchee Bay Estuary Program, Microbial tracking program, Coastal sewer rehab	2,000,000	1,000,000	50,000	30.431397	-86.395749	Cooperative project with Walton County to preserve and restore the Choctawhatchee Bay by establishing a National Estuary Program, will include microbial tracking and coastal sewer rehabilitation as well
Okaloosa	3	5	Shoal River Headwaters Protection Program	6,300,000	5,144,000	80,000	30.763485	-86.508286	WWTP upgrades, Septic to Sewer, road paving, Shoal River Ranch new commercial/industrial development in an environmentally sensitive area with regional impact to Santa Rosa and Escambia
Okaloosa	3	6	Ft Walton Beach Access Points	2,400,000	0	0	30.397275	-86.621331	Three beach access points in Ft . Walton Beach with stabilized parking and amenities
Walton	4	1	US 331 Corridor Choctawhatchee Bay Area Sewer Expansion	16,100,000	12,660,000	125,000	30.433858	-86.15267	Wastewater Improvements, Lift Stations, pipelines, and connection of 4 subdivisions in the Freeport area, Convert approx. 655 septic tanks to sewer to address existing nitrogen and fecal coliform bacteria issues in Choctawhatchee Bay
Bay	5	1	North Bay Septic to Sewer Conversion & Water Quality Program	18,200,000	9,000,000	100,000	30.289003	-85.597877	Reuse Line for power plant cooling, WWTP upgrades, Septic to Sewer around Deerpoint Lake, roadway paving for sediment abatement
Bay	5	2	St Andrews Bay Water Quality Program	7,000,000	3,660,000	0	30.175905	-85.778261	Stormwater Treatment Facility on Grand Lagoon, Retrofit 5 outfalls to Bay with baffle boxes, WQ Monitoring Program, small habitat restoration projects
Gulf	6	1	Gulf County Water Quality Program	14,000,000	7,000,000	TBD	29.914487	-85.375139	Extend sewer to St. Joe Peninsula, areas along St. Joe Bay, in Wewahitchka to preserve water quality and protect shellfish harvesting.
Gulf	6	2	Gulf County Coastal Access Program	2,000,000	2,660,000	20,000	29.810368	-85.314544	Land acquisition for public access and increase tourism to the region, fishing and scalloping
Gulf	6	3	Gulf County Coastal Erosion Control Project	6,000,000	3,000,000	0	29.706033	-85.305473	Coastal structure erosion control project on St. Joe Peninsula near Stump Hole
Franklin	7	1	Franklin County Emergency Operations Center	1,000,000	1,000,000	0	29.74692	-84.881228	Would create a a new EOC out of the flood zone
Franklin	7	2	Apalachicola Bay Oyster Restoration Program	5,000,000	5,000,000	100,000	29.716752	-84.876794	Would include oyster research/hatchery, reshelling areas for wild bars, aquaculture, and a check point program with FWC
Franklin	7	3	Franklin County Cooperative Dredging Program	6,660,000	6,660,000	200,000	29.736976	-84.873115	USACE dredge project that will maintain channel and create a 20 acre marsh/living shoreline to protect Eastpoint shoreline, 2 mile Channel West of the Apalachicola River Mouth used by fisherman, feasibility needed.
Wakulla	8	1	Wakulla Springshed Water Quality Protection	21,000,000	9,142,750	TBD	30.060526	-84.291394	Coastal Sewer to Shell Point, Spring Creek, Live Oak Island upgrading lift stations, force mains, Expand central sewer service to Wakulla Gardens and Greiners Addition converting septic along the Wakulla Springshed to sewer, Purchase the privately operated WINCO WWTP to expand Central sewer service to and Panacea upgrading lift stations, force mains and converting septic along the Wakulla Springshed to sewer
Wakulla	8	2	Wakulla Coastal Access and Preservation Program	3,192,250	3,192,250	TBD	29.984864	-84.409528	Bayside Marina Acquisition and Improvements - Land acquisition for preservation and targeted marina improvements to protect Gulf Sturgeon Spawning habitat, Trail Head-Oaks Property - Trail head and public parking and restroom facilities for the Ochlocknee Bay Bike Trail (OBBT) and Capital City to the Sea trail (CC2ST), Skipper Bay Park and Boat Ramp - Purchase land to preserve and promote passive recreation, with improved boat ramp, Spring Creek Marina - Purchase land to preserve and promote passive recreation, amenities, Mashles Sands Beach County Park - Boardwalk to provide access to remote north, bathroom facilities, NRDA Boat Ramp Improvements
Wakulla	8	3	Wakulla Artificial Reefs/Oyster Restoration	325,000	325,000	50,000	29.977915	-84.282754	Nearshore Artificial Reefs
Jefferson	9	1	Wacissa River Headwaters Protection Plan	7,160,000	7,160,000	80,000	30.477424	-84.021835	Stormwater and Sewer expansion/upgrades and septic to sewer conversions. I-10 and Hwy 59 recharge area, City of Monticello/Lake Miccosukee Basin, Old Lloyd Road
Jefferson	9	2	Wacissa River Headwaters Park Masterplan	2,000,000	2,000,000	30,000	30.33958	-83.990946	Acquire Malloy Landing, add amenities to Wacissa Spring Park
Jefferson	9	3	Jefferson County Recreation/Public Access Program	3,500,000	3,500,000	30,000	30.202657	-83.968857	Negotiate with SRWMD for lease/sale, add multi-use trails and amenities at Goose Pasture and adjacent properties, Reclaim/restore portions of the County mine, multi-use recreation area, river buffer, Pinhook River Coastal Access, lateral parking, canoe/kayak launch, amenities, negotiate lease with SMNWR Historic structure (County) dam for flood and aquatic vegetation control
Taylor	10	1	Taylor County Recreation/Public Access Program	12,660,000	12,660,000	100,000	29.810114	-83.585152	Looking for additional boat ramps in Cedar Island, Dark Island, Spring Warrior Creek to alleviate congestion at Keaton Beach
Dixie	11	1	Dixie County Horseshoe Beach Working Waterfront Rehabilitation	6,500,000	3,000,000	90,000	29.435255	-83.291874	Horseshoe Beach Dredging, McGriff Channel Dredging partner with FWC??
Dixie	11	2	Shired Island Park Beach Restoration/Living Shoreline	2,000,000	2,000,000	60,000	29.39449	-83.203719	Shired Island Amenities and living shorelines, beach nourishment
Dixie	11	3	Dixie County Oyster Restoration	1,000,000	500,000	30,000	29.422669	-83.244674	Regional oyster reef projects, reshelling and aquaculture
Dixie	11	4	Dixie County Coastal Access Program	1,960,000	1,960,000	60,000	29.517812	-83.371253	Coastal access projects, boat ramps, Rocky Creek dirt to pave, Freeman Tract (FWC), Cow Creek Bridge
Dixie	11	5	Dixie County Sewer Program	10,000,000	5,200,000	60,000	29.6621	-83.374651	Horseshoe Beach, Suwannee (lateral needed has WWTP) and Jena stubbed to Taylor WWTP, using Cedar Key as a model
Levy	12	1	Levy County Sewer Program	30,000,000	6,700,000	200,000	29.029803	-82.670597	Septic to Sewer in Inglis,Yankeetown, Lake Rousseau - Camp Azalea, Fowlers Bluff
Levy	12	2	Levy County Oyster Restoration Program	4,000,000	4,000,000	50,000	29.157479	-82.900516	Oyster bar restoration in Suwannee Sound and Waccasassa Bay
Levy	12	3	Levy County Waccasassa River Land Acquisition	1,960,000	1,960,000	0	29.213559	-82.763344	Waccasassa Headwaters Land Acquisition
Citrus	13	1	Citrus County Barge Canal Boat Ramp	3,958,000	3,958,000	0	29.013892	-82.670099	Permits in place and regional letters of support, reduces number of boats in manatee habitat
Citrus	13	2	Citrus County Artificial Reef Program	850,000	850,000	0	28.797324	-82.593266	Deploy portions of the old US 19 Bridge offshore as part of the artificial reef program
Citrus	13	3	Citrus County Water Quality Treatment Program	4,352,000	4,352,000	0	28.897842	-82.464261	Water Treatment Areas, nutrient reduction (fertilizer and septic), stormwater and wastewater upgrades
Citrus	13	4	Citrus County NW Quadrant Septic Forcemain	3,500,000	3,500,000	240,000	28.915464	-82.60984	Provide Forcemain up US 19 to take 7 package plants offline
Hernando	14	1	Marine Habitat Enhancement Program	2,000,000	2,000,000	35,000	28.509104	-82.844099	Enhance existing artificial reefs, new reef balls, hardbottom mapping & monitoring, economic analysis on effect of offshore, nearshore and living shorelines
Hernando	14	2	Coastal Habitat Enhancement Program	950,000	950,000	50,000	28.504416	-82.752682	New inshore reef sites, oyster habitat and living shorelines
Hernando	14	3	Waterway/Gulf Access Program	4,610,000	4,610,000	200,000	28.479848	-82.829044	Boat ramp upgrades, fishing pier upgrades, amenities, blueways shelters, facilities for paddling trails, bathymetric surveying, channel improvements and canal aeration
Hernando	14	4	Water Quality Improvement Program	5,100,000	2,600,000	0	28.509104	-82.844099	Septic to Sewer upgrades in Weeki Wachee River Basin
Hernando	14	5	Coastal Stormwater Improvement	5,000,000	2,500,000	0	28.497803	-82.649902	Stormwater BMP Implementation to improve water quality
Pasco	15	1	Port Richey Watershed Stormwater Treatment and Flood Control Project	10,600,000	5,000,000	300,000	28.210409	-82.73388	Stormwater upgrades at Port Richey
Pasco	15	2	Hammock Creek/Sea Pines Stormwater Treatment and Flood Control Project	4,000,000	2,000,000	150,000	28.210409	-82.73388	Stormwater upgrades Hammock Creek/Sea Pines
Pasco	15	3	Pithlachascotee River Inshore Artificial Reef Program	500,000	500,000	0	28.364134	-82.773036	Inshore Artificial reefs for snorkleing and hardbottom protection
Pasco	15	4	Coastal Environmental Research Network (CERN)	2,100,000	2,100,000	0	28.315697	-82.719047	Coastal Environmental Research Network in conjunction with Pasco County Schools
Pasco	15	5	Offshore Artificial Reef Program Augmentation	400,000	100,000	0	28.364134	-82.773036	Offshore Artificial reefs, Hudson and county-wide
Pasco	15	6	New Port Richey Madison Street Stormwater Improvement Project	1,282,000	1,282,000	0	28.210409	-82.73388	Stormwater upgrades at Madison Street
Pasco	15	7	Crews Lake Restoration	7,731,770	1,400,000	0	28.376198	-82.524924	Rehydration and preservation of wetlands
Pasco	15	8	Ranch Road Park Improvements	2,810,000	278,000	0	28.210409	-82.73388	Park upgrades Ranch Road
Pinellas	16	1	Lake Seminole Sediment Removal	5,200,000	2,600,000	TBD	27.839886	-82.780266	Lake Seminole Dredging Project - remove nutrient laden sediment
Pinellas	16	2	Wastewater Collection System Improvements	18,200,000	5,680,000	150,000	27.814495	-82.687736	Joe's Creek/Lealman Sewer upgrades, Lake Seminole watershed, nutrient source evaluation specialized lab monitoring
Pinellas	16	3	Vulnerable Property Acquisition for Floodplain and Environmental Restoration	5,000,000	3,000,000	0	27.815631	-82.740606	Acquire vulnerable properties located in the Brooker Creek, Cross Bayou, Smith Bayou, Stevenson's Creek and Curlew Creek watersheds for habitat preservation, flood protection and public access
Pinellas	16	4	Public Access to Waterways	2,000,000	1,000,000	0	27.992968	-82.794965	Acquire strategically located properties for kayak launches, docks, fishing piers, educational kiosks, and complimentary amenities to promote passive recreation and stewardship
Pinellas	16	5	Artificial Reef Program	500,000	380,000	0	27.866957	-82.9069	Enhance existing artificial reef network for recreational fishing & diving
Hillsborough	17	1	Delaney Creek/Palm River Heights Septic to Sewer Conversion	35,000,000	7,660,000	100,000	27.92054	-82.38152	Septic to Sewer upgrades in Palm River Heights, improving water quality in Delaney Creek and Palm River
Hillsborough	17	2	Cockroach Bay Aquatic Preserve Land Acquisition and Ecosystem Restoration Project	21,000,000	5,000,000	0	27.656337	-82.512466	Land acquisition for restoration and preservation of critical coastal habitats in environmentally sensitive area
Manatee	18	1	Manatee River Restoration & Water Quality Improvement Program	3,000,000	2,000,000	50,000	27.504019	-82.53516	Restore historical oyster bars through reshelling, water quality monitoring
Manatee	18	2	Robinson Preserve Expansion of Coastal Uplands	1,250,000	960,000	0	27.516537	-82.66539	Robinson Preserve coastal upland planting
Manatee	18	3	Living Shoreline Restoration	1,000,000	1,000,000	0	27.503357	-82.602082	Living shorelines projects
Manatee	18	4	Preserve Management Plans	300,000	300,000	0	27.50018	-82.681836	Master plans for public conservation lands
Manatee	18	5	Artificial Reef Habitat Enhancement	1,000,000	1,000,000	0	27.496318	-82.883845	Enhance existing artificial reef 7 miles offshore
Manatee	18	6	Palmetto Greene Bridge Fishing Pier	5,000,000	3,000,000	30,000	27.504599	-82.572553	Fishing pier rehabilitation
Manatee	18	7	GSI Sunray Clam Aquaculture	300,000	300,000	30,000	27.547127	-82.591362	Sunray clams spat grown in Manatee County, grow aquaculture to promote fledgling industry and aquaculture program
Manatee	18	8	Boardwalk & Trail Easements	2,000,000	1,000,000	30,000	27.504599	-82.572553	Boardwalks and easements for trails
Manatee	18	9	Coastal Watershed Management Plans	3,600,000	1,500,000	50,000	27.456066	-82.49358	Coastal watershed management plans
Manatee	18	10	Urban Park Stormwater Improvements (GT Bray)	2,030,000	1,600,000	50,000	27.441223	-82.583548	Urban stormwater plans, best management practices implementation
Sarasota	19	1	Dona Bay Restoration Program	12,660,000	12,660,000	0	27.223764	-82.399513	Divert flows from Cow Pen Slough (canal) through lakes, and treatment wetlands to the Myakka River increasing aquifer recharge. To develop futre phases for replacemtn of Kings Gate, Weir on Blackburn canal, and rehydration of wetlands west of Cowpen slough.
Charlotte	20	1	Charlotte Harbor Septic to Sewer Conversion	405,000,000	12,660,000	0	26.9617	-82.145079	Convert three areas currently on septic to sewer on the shores of Charlotte Harbor to restore water quality in what was once shellfish harvesting areas
Lee	21	1	Bob Janes Preserve Restoration	20,000,000	12,660,000	200,000	26.744988	-81.653144	Habitat & hydrologic restoration of the Bob Janes Preserve
Collier	22	1	Collier County Comprehensive Watershed Improvement Plan	32,000,000	12,660,000	0	26.17012	-81.671207	Reoutlet freshwater from Golden Gate Canal through Picayune Strand/Belle Meade to Rookery Bay to restore historical flows in Rookery Bay and historical salinity in Naples Bay
Monroe	23	1	Florida Keys Canal Restoration	30,000,000	12,660,000	0	24.580889	-81.736068	Dredging and circulation improvements to County residential canals to address impairments in Florida Keys National Marine Sanctuary
				925,701,020	291,180,000	3,770,000			







## C. Individual Project Descriptions

The following pages include a narrative description for each project and program.

### 1. Escambia

- Bayou Chico Restoration

### 2. Santa Rosa

- Santa Rosa Sound Water Quality Improvement Program

### 3. Okaloosa

- Veterans Park Living Shorelines Project
- Fish Aggregating Devices (FADs)
- Stormwater Retrofit Program
- Choctawhatchee Bay Estuary Program, Microbial Tracking Program, Coastal Sewer Rehab
- Shoal River Headwaters Protection Program
- Ft Walton Beach Access Points

### 4. Walton

- US 331 Corridor Choctawhatchee Bay Area Sewer Expansion

### 5. Bay

- North Bay Septic to Sewer Conversion & Water Quality Program
- St Andrews Bay Water Quality Program

### 6. Gulf

- Gulf County Water Quality Program
- Gulf County Coastal Access Program
- Gulf County Coastal Erosion Control Project

### 7. Franklin

- Franklin County Emergency Operations Center
- Apalachicola Bay Oyster Restoration Program
- Franklin County Cooperative Dredging Program

### 8. Wakulla

- Wakulla Springshed Water Quality Protection
- Wakulla Coastal Access and Preservation Program
- Wakulla Artificial Reefs/Oyster Restoration

### 9. Jefferson

- Wacissa River Headwaters Protection Plan
- Wacissa River Headwaters Park Masterplan
- Jefferson County Recreation/Public Access Program

### 10. Taylor

- Taylor County Recreation/Public Access Program

### 11. Dixie

- Dixie County Horseshoe Beach Working Waterfront Rehabilitation
- Shired Island Park Beach Restoration/Living Shoreline
- Dixie County Oyster Restoration
- Dixie County Coastal Access Program
- Dixie County Sewer Program

### 12. Levy

- Levy County Sewer Program
- Levy County Oyster Restoration Program
- Levy County Waccasassa River Land Acquisition

### 13. Citrus

- Citrus County Barge Canal Boat Ramp
- Citrus County Artificial Reef Program

- Citrus County Water Quality Treatment Program
- Citrus County NW Quadrant Septic Forcemain

### 14. Hernando

- Marine Habitat Enhancement Program
- Coastal Habitat Enhancement Program
- Waterway/Gulf Access Program
- Water Quality Improvement Program
- Coastal Stormwater Improvement

### 15. Pasco

- Port Richey Watershed Stormwater Treatment & Flood Control Project
- Hammock Creek/Sea Pines Stormwater Treatment & Flood Control Project
- Pithlachascotee River Inshore Artificial Reef Program
- Coastal Environmental Research Network (CERN)
- Offshore Artificial Reef Program Augmentation
- New Port Richey Madison Street Stormwater Improvement Project
- Crews Lake Restoration
- Ranch Road Park Improvements

### 16. Pinellas

- Lake Seminole Sediment Removal
- Wastewater Collection System Improvements
- Vulnerable Property Acquisition for Floodplain and Environmental Restoration
- Public Access to Waterways
- Artificial Reef Program

### 17. Hillsborough

- Delaney Creek/Palm River Heights Septic to Sewer Conversion
- Cockroach Bay Aquatic Preserve Land Acquisition and Ecosystem Restoration Project

### 18. Manatee

- Manatee River Restoration & Water Quality Improvement Program
- Robinson Preserve Expansion of Coastal Uplands
- Living Shoreline Restoration
- Preserve Management Plans
- Artificial Reef Habitat Enhancement
- Palmetto Greene Bridge Fishing Pier
- GSI Sunray Clam Aquaculture
- Boardwalk & Trail Easements
- Coastal Watershed Management Plans
- Urban Park Stormwater Improvements (GT Bray)

### 19. Sarasota

- Dona Bay Restoration Program

### 20. Charlotte

- Charlotte Harbor Septic to Sewer Conversion

### 21. Lee

- Bob Janes Preserve Restoration

### 22. Collier

- Collier County Comprehensive Watershed Improvement Plan

### 23. Monroe

- Florida Keys Canal Restoration



## ESCAMBIA COUNTY

# Bayou Chico Contaminated Sediment Remediation Project

PROJECT NO. 1-1

## Project Description

### OVERVIEW AND LOCATION

The Bayou Chico Contaminated Sediment Remediation Project primarily involves the remediation of legacy contaminated sediments from Bayou Chico, a small embayment that flows to Pensacola Bay (see **Figure 1-1A**). The project will employ Best Available Science to determine appropriate methods of remediation for contaminated sediments, which may include hydraulic dredging and disposal. Additional project components may include restoration of both submerged and intertidal estuarine habitats following remediation.

### NEED AND JUSTIFICATION

Bayou Chico is a small urban bayou with a long history of industrial pollution. It is generally considered to be the most polluted of the three urban bayous in the Pensacola area. Bayou Chico has functioned as a working waterfront dating back to the early 1800's. During the response to the Deepwater Horizon oil spill, the Bayou served as a staging/decontamination location for the Vessels of Opportunity (VOO). The long history of point and non-point discharges to the Bayou have resulted in high accumulated levels of contaminants - including trace metals, PAHs, PCP, dioxins/furans and PCBs. The Bayou is also adjacent to the American Creosote Works site, a federal Priorities List hazardous materials site that may still be affecting the Bayou.

Sediment quality in Bayou Chico has been degraded by an assortment of pollutants (summarized by Mohrherr et al., 2006). In the 1970s organic pollutants were found to be many times the typical values for coastal sediments. PCBs and dioxins were first studied in the 1990s and detected at high levels. A recent University of West Florida study found elevated levels of PCBs and dioxins/furans in seafood from the Bayou (cite?). Trace metals were studied by a



**Figure 1-1A.** Project location in Escambia County.

series of investigations and invariably were found to be elevated in the main part of the Bayou and between two topographic constrictions in the northern half of the Bayou. Benthic organisms are very sensitive to sediment contamination, and studies have shown a diminished density and diversity of benthic invertebrates in Bayou Chico (cite?).

In addition to industrial contaminants, Bayou Chico has been impacted by legacy stormwater runoff and domestic wastewater discharges from urban land uses in its headwaters, resulting in excessive bacterial and nutrient loads. Bayou Chico is a 303(d) listed impaired water body for fecal coliform bacteria. In 2011, the Florida Department of Environmental

Protection (FDEP) along with local stakeholders developed a Basin Management Action Plan (BMAP) for Bayou Chico to address the Total Maximum Daily Load (TMDL) for fecal bacteria. In 2013, a TMDL was developed for Bayou Chico to address nutrient impairments and assigned numerical nutrient criteria to six Waterbody Identification Units (WBIDs) in the Bayou Chico Watershed. These WBIDs include two Class III fresh waterbodies (Jones Creek and Jackson Creek) and four Class III marine waterbodies (Bayou Chico, Bayou Chico Drain, Bayou Chico Beach, and Sanders Beach).

Escambia County and the City of Pensacola share jurisdiction of the Bayou Chico watershed. The County and the City, along with the Emerald Coast Utilities Authority (ECUA), have teamed up to address legacy stormwater and wastewater pollution by jointly implementing stormwater management controls including baffle boxes and centrifugal separation units in the upper watershed to alleviate contributing sources of nutrients, sediment, oils and grease. In addition, septic tanks in the watershed have been removed and replaced with central sewer collection systems. These programs have focused on identification, elimination, and prevention of existing sources of pollution. However, the legacy sediment contamination still exists.

As stated above, Bayou Chico has served as a working waterfront dating back to the early 1800's. Portions of the Bayou were dredged to allow for the navigation of deep draft vessels in the early 1900's, and these areas have been maintenance dredged several times since then. Most recently, the U.S. Army Corps (USACE) completed a maintenance dredge of the Bayou entrance channel, and along the northeastern shoreline where most of the industrial land uses are located (see **Figure 1-1B**). This project has resulted in the removal of some contaminated sediments, and has improved circulation and flushing in the Bayou. However, this and previous dredge projects have not removed accumulated sediments in the main body of the Bayou, or in its northern and western upper reaches. Sediment removal from these areas was recommended by the Northwest Florida Water Management District in the Surface Water Improvement Management (SWIM) Plan for Pensacola Bay and in the 2011 BMAP as a means to



**Figure 1-1B.** Recently completed and proposed dredging in Bayou Chico.

## SECTION V: Proposed Projects, Programs and Activities

reduce bacteria and nutrient concentrations, and is considered to be essential to the ecological restoration of Bayou Chico.

The Bayou Chico Restoration project builds upon and complements stormwater and wastewater remediation projects previously completed by Escambia County, City of Pensacola, and ECUA to improve conditions in the Bayou and its watershed. The removal of accumulated contaminated sediments is anticipated to eliminate toxic sediment/water column interactions and expose natural bottom substrates that support the recovery of benthic invertebrates and oysters in the Bayou and supports conditions suitable for submerged aquatic vegetation downstream of Bayou Chico in Pensacola Bay. This project is the critical keystone in the ecological restoration of Bayou Chico.

### PURPOSE AND OBJECTIVES

The purpose of this project is to remediate the contaminated sediments from Bayou Chico. The project is anticipated to meet the following objectives: 1) improve sediment and water quality; 2) restore benthic invertebrate habitat; and 3) enhance the economic and recreational opportunities along the working waterfront.

### PROJECT COMPONENTS

The removal of contaminated sediments from Bayou Chico has been considered by a number of investigators dating back to the 1970's; however, the assessment of existing conditions and the evaluation of various alternatives have not been fully vetted. Therefore, the first component of the project would be the implementation of a comprehensive conceptual design and feasibility study to determine the following: 1) the types and concentrations of the various contaminants; 2) the vertical and horizontal distribution of sediment contaminants ; 3) the grain size distribution and percent organic matter of targeted sediments; 4) available remediation methods and technologies; 5) available sediment handling and spoil disposal methods; 6) available remediation methods and technologies for spoil dewatering and decontamination; 7) post-implementation habitat restoration activities for both work and staging areas.

Previous studies and investigations have identified an extensive list of known sediment contaminants within the Bayou. The 2005 Pensacola Bay Watershed Management Plan compiled information from several regulatory agencies and local academic institutions that indicates contaminants in Bayou Chico may include heavy metals (cadmium, chromium, copper, lead, and mercury), polycyclic aromatic hydrocarbons (PAHs) (benzo(a)-pyrene, anthracene, acenaphthene), pesticides (chlordane, DDD, DDT, endrin, dieldrin, Mirex), and polychlorinated biphenyls (PCBs). (Bay Area Resource Council, 2005). In addition, Mohrher et al. (2006) conducted a thorough review of existing data on toxic contaminants. Project will confirm results of previous available studies.

The second component of the project will be engineering, design, and permitting. In August 2017, Escambia County's Water Quality and Land Management Division completed soft sediment mapping of Bayou Chico by probing 485 sample locations. The total volume of sediments to be removed will be dependent upon the results of the sediment mapping efforts conducted as part of the conceptual design and feasibility study. The goal is to remediate legacy contaminants, nutrients, and organics, down to a level that optimizes cost against the ecological goals of eliminating toxic sediment/water column interactions and exposing natural bottom substrates. The permitting complexity of the project will depend largely on contaminant concentrations and the physical handling characteristics of the sediments (e.g., grain size and percent organics).

The third component of the project will be implementation. Remediation may employ a hydraulic dredge mounted on a floating barge. Ideally the dredge will use a combination of RTK GPS and navigation software to control the cutterhead elevation and track where material was removed. In this scenario a pipeline will carry the dredge slurry



to a nearby upland location for dewatering. Depending on the types and levels of nutrients and contamination in the sediments the proper dewatering technique will be applied to determine proper disposal methods. Material may be separated, dried and tested to determine the final disposal location depending on contaminate level. Final post-construction surveys will determine successful sediment removal from remediated areas, as well as the restoration of the staging area and emergent and submerged vegetative communities. Finally, long-term success monitoring will assess the recovery of water quality, benthic invertebrates, oysters, and emergent and submerged vegetative communities.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

The Bayou Chico watershed is a mixed use community with industrial, commercial and residential owners along the shorelines. Cleaning up the Bayou will bolster the commercial and residential interests in the area by increasing residential property values and by attracting new businesses and industry. The removal of legacy pollution is expected to improve water quality within the Bayou. As contributing waters to Pensacola Bay, improving water quality in Bayou Chico will ultimately also improve water quality in the Bay as well. Improvements in water quality are expected to benefit the greater Pensacola Bay fishery.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region (primary); and
- Activity 2: Mitigation of damage to fish, wildlife, and natural resources.

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve and Protect Water Resources (primary);
- Objective 3: Protect and Restore Living Coastal and Marine Habitats.

## Implementing Entities

Escambia County will be the implementing entity and sole grant sub-recipient responsible for the design, permitting, implementation and monitoring of the program.

## Best Available Science and Feasibility Assessment

Studies on the conditions in Bayou Chico have been researched by state and local agencies as well as local academic institutions for the last 40 years. Key documents that make up the basis for this project are included below:

## SECTION V: Proposed Projects, Programs and Activities

- Bayou Chico Basin Management Action Plan (BMAP). Florida Department of Environmental Protection. August 2011.
- Fecal Coliform TMDL for Bayou Chico Watershed, WBIDS 846, 846A, 846B, 846CB, and 848DA. Florida Department of Environmental Protection. February 2008.
- Glassen R., Armstrong J., Calder J., Carter R., La Rock P., Pilotte J., Winchester J. Bayou Chico Restoration Study. Florida Department of Environmental Regulation. 1977.
- Mohrherr C., Liebens J., Rao K. Sediment and water pollution in Bayou Chico, Pensacola, FL. University of West Florida. August 2006.
- Pensacola Bay: Community Based Watershed Plan. The Nature Conservancy. December 2014.
- Pensacola Bay Surface Water Improvement Management Plan Draft. Northwest Florida Water Management District. August 2017.
- Pensacola Bay Water Management Plan. Bay Area Resource Council. 2005.

As discussed above, the need and justification for the project are well established; however, the feasibility of the project must be further addressed by the implementation of a comprehensive conceptual design and feasibility study. The permitting complexity and construction feasibility of the project will depend largely on contaminant concentrations and the physical handling characteristics of the sediments (e.g., grain size and percent organics).

### Risks and Uncertainties

At this time volume, contaminant concentrations, distribution of contaminants, and physical characteristics of the sediments to be removed are largely unknown. Therefore, viable remediation alternatives have not yet been defined. Consequently, the total project budget cannot be accurately determined prior to the completion of a comprehensive conceptual design and feasibility study.

There are several upland areas nearby adequate for implementation staging, but the timing for use of these areas will need to be further addressed in the conceptual design and feasibility study. Currently, the Florida Department of Transportation is using both existing staging sites in Bayou Chico for the construction of the new Pensacola Bay Bridge.

### Success Criteria and Monitoring

Escambia County will perform post-remediation surveys to ensure compliance with the project plans and specifications. Successful implementation of this project is anticipated to result in the following ecological goals: 1) improve sediment and water quality; and 2) restore benthic invertebrate communities. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in water quality such as dissolved oxygen, nutrient, and bacteria concentrations, and total suspended solids from existing conditions in Bayou Chico;

- Changes in the abundance and distribution of benthic invertebrates and oysters from existing conditions in Bayou Chico; and
- Changes in the abundance and distribution of emergent and submerged vegetative communities.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Escambia County is committed to conducting the success monitoring necessary to quantify project benefits.

## Milestones and Schedule

This planning, implementation, and success monitoring of this project is anticipated to be spread over a 11-year period, as shown in the milestone chart below.

MILESTONE	YEARS FROM SEP APPROVAL											
	1	2	3	4	5	6	7	8	9	10	11	12
Conceptual Design & Feasibility Study												
Engineering Design & Permitting												
Implementation												
Success Monitoring												

## Budget and Funding Sources

A total cost estimate has been developed by Escambia County based on the best available information and a number of assumptions. This preliminary cost estimate is shown in the budget table below. The completion of the comprehensive conceptual design and feasibility study is expected to result in a detailed cost estimate.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$600,000
Implementation		\$22,000,000
Monitoring		\$300,000
<b>Total Cost</b>		<b>\$22,900,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$12,700,000
Other Grants or Co-Funding (POT 2)		\$335,510
City of Pensacola		\$800,000
<b>Total Secured Funding</b>		<b>\$13,835,510</b>
<b>Budget Shortfall</b>		<b>\$9,064,490</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA		
NFWF		
Pot 2/FDEP		
Direct Component		

Escambia County is seeking other funding opportunities to leverage Spill Impact Component funds to make up the overall project budget shortfall. However, the project will be phased in a manner that will allow for completion of portions of the project based on the amount of funding available.

### Partnerships/Collaboration

The Gulf Coast Ecosystem Restoration Council (GCERC) has funded a portion of the planning, design, and permitting of the Bayou Chico Contaminated Sediment Removal Project. Other stakeholders include the City of Pensacola, Bayou Chico Association, Bay Area Resource Council (BARC) in conjunction with West Florida Regional Planning Council, Emerald Coast Utilities Authority, Escambia County Health Department – Florida Department of Health, Florida Department of Environmental Protection (FDEP), Northwest Florida Water Management District (NFWFMD), University West Florida (UWF), and Environmental Protection Agency (EPA).



# SANTA ROSA COUNTY Sound Water Quality Improvement Program

PROJECT NO. 2-1

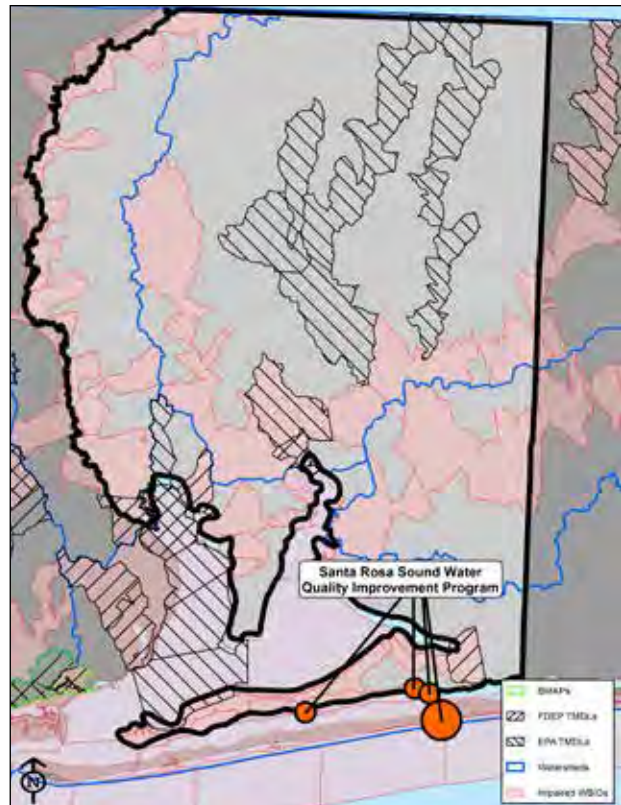
## Project Description

### OVERVIEW AND LOCATION

The Santa Rosa Sound Water Quality Improvement Program is comprised of four projects. Three of the projects will directly contribute to the restoration of Santa Rosa Sound water quality by reducing loads of nutrients, bacteria, and heavy metals being delivered into the Sound. These projects will expand the existing sewer system and eliminate 758 septic tanks in two areas on the Fairpoint Peninsula and relocate the effluent of the Navarre Beach Waste Water Treatment Facility (NBWWTF) to end the discharge of up to 900,000 gallons of treated effluent into the Santa Rosa Sound. The final project is an in-depth study of the Sound that will identify the sources of nutrients sources and an implement a real-time water quality monitoring system. These projects will be implemented in southeastern Santa Rosa County (see **Figure 2-1A**).

### NEED AND JUSTIFICATION

Santa Rosa Sound connects the Pensacola Bay estuary to Choctawhatchee Bay, is about 35 miles long, bordered along much of its northern edge by Fairpoint Peninsula and separated from the Gulf of Mexico by Santa Rosa Island to the south. Santa Rosa Island is part of the Gulf Islands National Seashore and the associated waters of the sound are designated Outstanding Florida Waters (OFW). Santa Rosa Sound supports seagrass beds, which are important habitat and foraging areas for numerous fish and invertebrate species, including many of commercial and recreational significance. The sound is currently listed as an impaired waterbody for bacteria by FDEP under section 303(d) of the Federal Clean Water Act. Although the Sound is not listed as impaired for nutrients, a recent review of water quality data from a portion of Santa Rosa Sound shows that nutrient and chlorophyll-a concentrations regulatory exceed established threshold values. Recent declines in seagrass coverage have been documented in the Sound and may be linked to these water quality issues.



**Figure 2-1A.** Project location in Santa Rosa County.

## SECTION V: Proposed Projects, Programs and Activities



**Figure 2-1B.** Soundside Septic to Sewer Conversion Area. Soundside B area is the easternmost area.

This program will address two sources of pollutant loading affecting the Santa Rosa Sound: elimination of old septic tanks and the effluent from the NBWWTF. Two areas on Fairpoint Peninsula that use septic tanks have been prioritized for expansion of an existing sewer system and removal of septic tanks. The NBWWTF was originally constructed in the early 1970s and has a capacity to treat 900,000 gallons of wastewater per day (GPD); although actual flows range from 200,000 to 500,000 GPD depending on the season. The County has been working toward the goal of removing the discharge of NBWWTF's effluent from the Sound since the late 1990s. After assessing various alternative discharge options, the Board of County Commissioners (BOCC) approved a plan to eliminate the NBWWTF discharge into the Sound by conveying the effluent to a land application disposal site located on Eglin AFB property. The proposed study and associated monitoring of the sound will quantify and verify the program's performance.

### PURPOSE AND OBJECTIVES

These projects would improve water quality and the biological integrity of Santa Rosa Sound and the Pensacola Bay Watershed by eliminating 758 septic tanks in two areas and the effluent discharge into the Bay from the NBWWTF. This will result in the elimination of significant sources of nutrients, solids, and heavy metals. These efforts are in line with many of the State and Federal agencies actions to protect surface and ground water, listed species, important habitat and to decrease risk of exposing residents and tourists to harmful pathogens in the near shore area. The implementation of these projects will contribute significantly towards the Santa Rosa County BOCC's stated priority of the Restoration of Santa Rosa Sound.

### PROJECT COMPONENTS

This program has four components: install a sanitary sewer system and remove existing septic tanks in two areas on Fairpoint Peninsula, relocate NBWWTF's existing effluent discharge to a land application disposal site located on Eglin AFB property and develop a Santa Rosa Sound-specific water quality monitoring program.

**Program Component 1:** Currently Soundside does not have a sewer system and uses septic tanks to handle its wastewater needs. This proposed program component will expand the existing sewer system, initially into the Soundside B area, and convert the residences from septic tanks to sewer (see **Figure 2-1B**). This project will convert approximately 163 septic tanks to a low-pressure sewer system. System design is in the beginning stages.

**Program Component 2:** Holley by the Sea (HBTS) only has existing sewer in some areas (see **Figure 2-1C**). The proposed program component includes expanding the existing sewer system and converting 595 existing septic tanks to the sewer. The HBTS project still needs to be evaluated to determine the best suitable sewer system for the area (low pressure system or gravity system).

**Program Component 3:** The proposed program component will permanently relocate the effluent discharge of the NBWWTF from Santa Rosa Sound to a land application site located on 200 acres of Eglin AFB property. The project will include the construction of 35 2.5-acre, rapid-rate infiltration basins (RIBs) for groundwater recharge; upgrades to the WWTF so the effluent meets Florida Department of Environmental Protection (FDEP) requirements for public reuse; installation of new effluent filters and effluent pump station; approximately 9 miles of force main ranging in size from 6 inches in diameter to 18 inches in diameter to convey the effluent from the WWTF to the RIB site; and an intermediate pump station. In addition, to discharging the effluent to a dedicated land application site, the project will also include provisions for distributing reuse water to various residential and commercial customers in the area. It will also include provisions to accept treated effluent from the other utilities in the area. See **Figure 2-1D** for a map of project features.



**Figure 2-1C.** HBTS Subdivision Septic to Sewer Conversion Project Area



**Figure 2-1D.** Santa Rosa Regional Reuse System Program Map



## SECTION V: Proposed Projects, Programs and Activities

**Program Component 4:** The proposed program component has two phases to be conducted concurrently: a study and a real-time water quality monitoring system. The study will be a comprehensive report on the current conditions, activities, and threats, to the Sound. It will also determine the regional connection between the bodies of water in the panhandle and provide an in-depth analysis of the Santa Rosa Sound. The report will also provide recommendations. The water quality monitoring system that will provide real-time data to county, state, and federal resource managers and the public. The goals of this project are to provide information about the sources of nutrients, turbidity, *Enterococcus* species, and chlorophyll-a within Santa Rosa Sound. A comprehensive water quality monitoring program over a period of at least 5 years will also be used for benchmarking purposes.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The implementation of these projects will have a significant benefit to the water quality of the Santa Rosa Sound and the Pensacola Bay Watershed by removing pollutant loads from aging septic tanks and a point source wastewater discharge. There will be an overall improvement in the water quality in Santa Rosa Sound, which will have a positive impact on seagrass, enhance fish and wildlife habitat, and encourage increased recreational use of the surrounding area.

The expansion of sewer system and relocation of the NBWWTF will contribute to economic growth in the county. These projects will help the county improve its economy and grow the tax base. This work will provide job opportunities. The proposed projects will increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts. The proposed projects require experienced and technically skilled positions often associated with a full-time salary, higher wage and benefits.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat; and
- Goal 2: Restore Water Quality and Quantity; and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.



## Implementing Entities

Santa Rosa County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project. Santa Rosa County has coordinated with numerous agencies Holley Navarre Water System, South Santa Rosa Utility and Eglin Air Force Base in the development of these waste water projects and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

## Best Available Science and Feasibility Assessment

Significant work has been done to monitor and characterize water quality in Santa Rosa Sound and to implement water quality improvement and protection programs. The following report (and referenced cited therein) provides a review of the environmental status of Santa Rosa Sound:

- Lewis, M. J. et al., 2016. Environmental Quality of the Pensacola Bay System: A Retrospective Review for Future Resource Management and Rehabilitation. USEPA.

This program is consistent with the goals of NFWFMD's latest draft update to the watershed management plan:

- Northwest Florida Water Management District (NFWFMD), 2017. Draft Pensacola Bay System Surface Water Improvement and Management (SWIM) Plan.\

These projects are considered to be feasible. However, Only the NBWWTF has a complete preliminary design report but is not at the 30% design level. The other projects are only in the conceptual phase. The projects cannot be fully evaluated for feasibility until the 30% design is completed.

## Risks and Uncertainties

The expansion of the sanitary sewer system is just beyond the conceptual phase; there has not been a conceptual study performed on this project. The risks will be identified during the preliminary and final design phases.

The relocation of the effluent discharge of the NBWWTF is in the preliminary design phase. The project appears feasible and the risks will be fully evaluated upon the completion of the preliminary design.

## Success Criteria and Monitoring

This program will affect water quality in an estuarine system. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in ambient water quality (nutrient and bacterial concentrations) in Santa Rosa Sound;
- Changes in nutrient and bacterial loads to Santa Rosa Sound from wastewater sources; and
- Changes in seagrass distribution in Santa Rosa Sound.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Santa Rosa County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this program, if all program components begin in Year One is approximately seven years. The Soundside and HBTS program components are expected to require approximately three years from design through construction. The NBWWTF effluent relocation is estimated to require a preliminary design of six months, a final design and construction period that will each be 16- to 24-month long for a total of five years. The final design and construction durations are longer due to right of way concerns, the need for interagency agreements and the need to construct several project components. The study of the Sound is slated to take two years for the initial work, then an additional five years of monitoring, which will last two years after the projects have been constructed. Implementation of this program has been broken down into the four projects, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
<i>Soundside B Septic to Sewer</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												
<i>HBTS Septic to Sewer</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												
<i>NBWWTF Effluent Relocation</i>												
Preliminary Design												
Final Design												
Construction												
<i>Santa Rosa Sound Studies and Monitoring</i>												
Santa Rosa Sound Study												
Water Quality Monitoring Program												

## Budget and Funding Sources

The preliminary budget is indicated in the table below. The estimated cost of the water quality monitoring project is expected to cost \$640,000 (\$200,000 for the study, \$300,000 start up and \$20,000 per year for 7 years for the monitoring component). Preliminary design is estimated at 3% of the project cost. The total cost of the program is \$46.3 million dollars. The cost of removal of the existing septic tanks is counted in the cost of the septic tank to sewer projects. The county has not secured any grants for these projects. The cost of the NBWWTF may be shared by the Holley Navarre Water System (HNWS) and South Santa Rosa Utility (SSRU). The final cost sharing depends

upon the alignment selected. The source of funding for the remaining balance is yet to be determined.

PROJECT BUDGET	ESTIMATED DOLLARS
<i>Soundside B Septic to Sewer</i>	
Planning	\$90,930
Implementation	\$3,010,000
<b>Total</b>	<b>\$3,121,930</b>
<i>Holly by the Sea Septic to Sewer</i>	
Planning	\$380,000
Implementation	\$12,175,000
<b>Total</b>	<b>\$12,555,000</b>
<i>NBWWTF Effluent Relocation</i>	
Planning	\$903,000
Implementation	\$29,197,000
<b>Total</b>	<b>\$30,100,000</b>
<i>Santa Rosa Sound Study and Water Quality Program</i>	\$640,000
<b>Total</b>	<b>\$640,000</b>
<b>Total Cost</b>	<b>\$46,416,930</b>
<b>SECURED FUNDING SOURCES</b>	
Spill Impact Component	\$12,660,000
Direct Component	
Other County Funds	
TBD	
<b>Total Secured Funding</b>	<b>\$12,660,000</b>
<b>Budget Shortfall</b>	<b>\$33,756,930</b>
<b>POTENTIAL LEVERAGED FUNDING SOURCES</b>	
Florida Department of Environmental Protection (FDEP)	
Local Options Sales Tax	
General County funds	
Natural Resource Damage Assessment (NRDA)	
Cost sharing with HNWS, SSRU (up to 50% or NBWWTF effluent relocation. Final cost sharing depends upon the alignment selected)	
Cost sharing with utilities for Soundside/HBTS	
Pot 1 Funds	
Pot 2 Funds	
University of Florida	
University of West Florida	
National Fish and Wildlife Federation	
<b>Total Funding</b>	
<b>Budget Shortfall</b>	

### Partnerships/Collaboration

The elimination of the septic tanks Fairpoint Peninsula will require collaboration with Holley Navarre Water System and South Santa Rosa Utility who will be required to identify priority areas. Both utility systems have expressed interest in a partnership with Santa Rosa County. There are opportunities for cost sharing, although specific budgets will be identified during the planning phase of this project.

The relocation of the NBWWTF effluent is proposed to include partnering with the other wastewater utilities within the region because of their need for reliable, long-term effluent disposal and a source of reuse water for summer irrigation. Although Santa Rosa County has been in discussions with local utilities for many years regarding partnering opportunities, the extent of the utilities interest and financial commitment remains to be determined.

There are several entities willing to partner on the water quality program. Some of the entities expressing interest are the University of Florida and the University of West Florida. Additionally, Gulf Islands Research and Education Center, a partnership between UWF and Gulf Islands National Seashore, has staff that can work with team members to recruit, train and supervise student and community volunteer grab sampling teams. Other opportunities include collaboration with FDEP and existing monitoring efforts.



## OKALOOSA COUNTY

Veterans Park  
Living Shoreline Project

PROJECT NO. 3-1

## Project Description

## OVERVIEW AND LOCATION

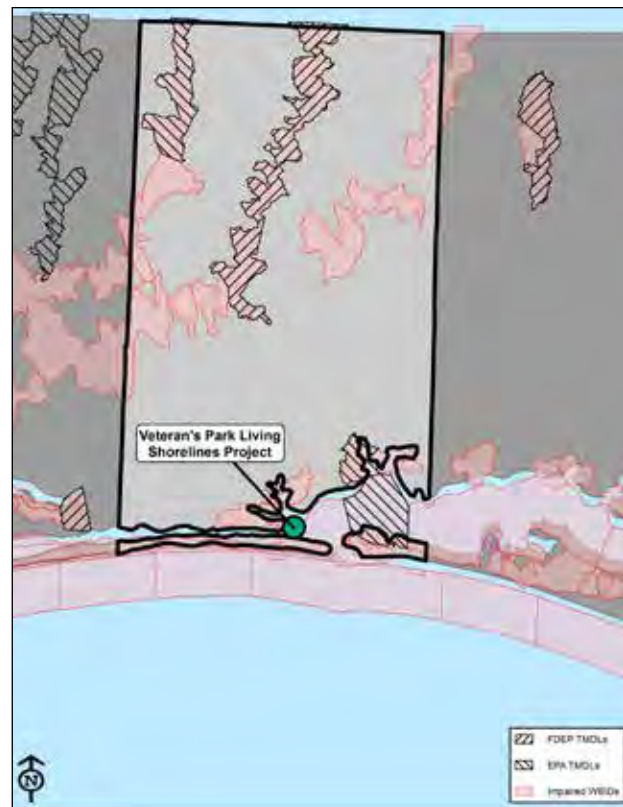
The project sits on the southwest shore of Choctawhatchee Bay just north of the Miracle Strip Parkway/SR 30/US 98 in Ft. Walton Beach. This living shorelines project includes the restoration and enhancement of shoreline features throughout Veterans Park to provide foraging habitat for wading birds and fisheries. The general location of the project is shown in **Figure 3-1A**.

## NEED AND JUSTIFICATION

As Ft. Walton Beach became a popular vacation destination many of the unique habitat in the coastal strand became developed. Veterans Park includes a coastal lake and park amenities which are at risk if the shoreline continues to recede. A nearby navigation channel creates boat wakes and the northeast facing shoreline is susceptible to a long fetch producing waves during winter northeaster storms. The decrease in erosion will lessen sediment transport from onshore to offshore and eliminate the smothering of nearshore seagrasses. The placement of oyster reef breakwaters will create quiescent areas for seagrass recruitment.

## PURPOSE AND OBJECTIVES

The proposed project will stabilize the shoreline, protect upland public property and natural resources, and increase natural habitat for both terrestrial and aquatic species. The County proposes to use a blend of natural materials and vegetation to reduce erosion and create sustainable habitat for a myriad of shorebirds, wading birds, fish, crustaceans and shellfish.



**Figure 3-1A.** Project location in Okaloosa County.

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

The project site is very unique and the proposed improvements will help to restore the natural shoreline, while protecting the upland coastal strand. The location will allow for increased public access, public involvement with plantings during construction and future educational opportunities for schools and non-profit/volunteer groups.

The living shoreline will include low and high saltwater marsh creation areas, seagrass recruitment areas, and segmented, nearshore oyster-reef breakwaters to attenuate wave energy and provide habitat for fish and wildlife. (See Figure 3-1B)

The oyster breakwaters will consist of clean re-purposed concrete rubble, limestone, or prefabricated concrete units and will serve as suitable substrate, or “cultch,” for oyster colonization. There will be gaps in the oyster reef to preserve flushing and the location of the breakwaters will avoid existing nearby seagrass beds. The close proximity to the seagrass beds will aid in natural recruitment of seagrass seed source or rhizomes. The project is consistent with the Choctawhatchee River and Bay System Surface Water Improvement and Management (SWIM) Plan. Park amenities like kayak launches, improve boat ramp access and staging and a fixed fishing pier would be constructed after the living shorelines work is complete.



**Figure 3-1B. Proposed Veterans Park Living Shoreline with Oyster Reef Breakwaters and Marsh/Seagrass Enhancement (Taylor Engineering, 2016)**

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This program will enhance fish and wildlife habitat, support existing and augment future recreational uses of the coastal zone, and improve water quality and shoreline erosion protection in vulnerable areas. In addition, the program will provide opportunities for public environmental access and education through participation in project implementation and monitoring. The project is also expected to provide economic benefits to Okaloosa County in the form of increased eco-tourism.

Finally, the construction and enhancement of nearshore oyster reefs and living shorelines will provide a number of ecological benefits including the provision of: 1) substrate for oyster spat settlement and new oyster larval production; and 2) micro-benthic habitats for numerous small organisms such as amphipods, isopods, burrowing shrimp, crabs, oyster dwelling fish. These organisms in turn support recreational important fish species including redfish, snapper, sheepshead and black drum.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat;
- Goal 3: Replenish and Protect Living Coastal and Marine Resources (primary).

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 3: Protect and Restore Living Coastal and Marine Resources;
- Objective 4: Restore and Enhance Natural Processes and Shorelines (primary).

## Implementing Entities

Okaloosa County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, and success monitoring of the program.

## Best Available Science and Feasibility Assessment

Oyster reef restoration and living shoreline construction have been well studied, and a range of best siting practices and successful construction methods have been developed. This program has been informed by key literature in this field including the following references.

- Baggett, L.P., S.P. Powers, R. Brumbaugh, L.D. Coen, B. DeAngelis, J. Greene, B. Hancock, and S. Morlock, 2014. Oyster Habitat Restoration Monitoring and Assessment Handbook. The Nature Conservancy, Arlington, VA, USA., 96pp.
- Glancy, T.P., T.K. Frazer, C.E. Cichra, and W.J. Lindberg. 2003. Comparative Patterns of Occupancy by Decapod Crustaceans in Seagrass, Oyster, and Marsh-edge Habitats in a Northeast Gulf of Mexico Estuary. *Estuaries* 26(5):1291-1201.
- Nordstrom, K. F. 2014. Living with Shore Protection Structures: A Review. *Estuarine, Coastal and Shelf Science* 150: 11-23.

This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) effectively operate and maintain the project components over the long term.

### Risks and Uncertainties

In the evaluation of this program, no significant risks have been identified that would preclude implementation. There is some risk that constructed oyster reefs and living shorelines could be damaged during tropical storm events; however, potential damage from storm surge and high waves will be factored into the siting and construction methods. This project has already completed design and is currently pursuing permits.

### Success Criteria and Monitoring

The oyster reef and living shoreline site will be monitored bi-annually, with a yearly monitoring report. Pre and post construction monitoring will be completed of the oyster reefs and living shorelines to evaluate the ecological benefits and ecosystem services gained from these projects, and to provide recommendations for future similar projects.

Bi-annual and quantitative sampling of along pre-determined transects with HD video

- Fish/shellfish/crustacean populations
- Invertebrates

### Milestones and Schedule

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Phase 1 – Oyster Reef Breakwaters												
Phase 2 - Vegetation												
Phase 3 – Park Amenities												
Success Monitoring & Reporting												

### Budget and Funding Sources

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$0
Implementation		\$3,750,000
Monitoring		\$250,000
<b>Total Cost</b>		<b>\$4,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,500,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds – Tourist Development Tax (Planning Complete)		\$150,000
<b>Total Secured Funding</b>		<b>\$1,500,000</b>
<b>Budget Shortfall</b>		<b>\$2,500,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FDEP		
SWFWMD		
NRDA		
NFWF		



## Partnerships/Collaboration

Okaloosa County has partnered with the Choctawhatchee Bay Alliance and the Northwest Florida Water Management District for development of this project.

RESTORE Act  
Compliance

Public Participation

Financial Integrity

Overall Consistency

Proposed Projects

Appendices

## OKALOOSA COUNTY

# Offshore Fish Aggregating Devices (FADs)

PROJECT NO. 3-2

## Project Description

### OVERVIEW AND LOCATION

Okaloosa County will deploy six to eight floating fish aggregating devices (FADs) from 30 to 90 miles offshore to attract pelagic fish species and provide opportunities for recreational and commercial fishing for residents and tourists (see **Figure 3-1A**).

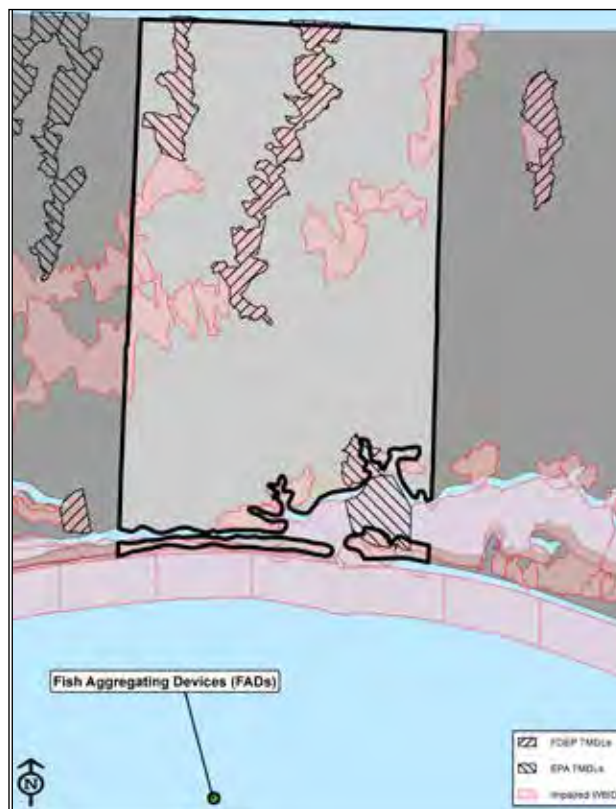
### NEED AND JUSTIFICATION

Okaloosa County has historically benefitted from active and decommissioned NOAA weather buoys in the Gulf of Mexico that act as FADs to attract and concentrate pelagic fish, such as tuna, dolphin fish, and billfish, and make fish catch more efficient for both recreational and commercial fishers. There is a continuing need to augment and maintain a network of FADs in Okaloosa County's offshore waters to meet the increasing demand for recreational and commercial fishing opportunities and increase tourism related economy in the county. Hard substrate and vertical structure are limited habitats in the Gulf of Mexico (Fikes, 2013) and the FAD structures, like artificial reefs, also provide: 1) hard substrate to support encrusting and colonial benthic organisms such as sponges and corals; 2) niche space for small marine invertebrates; and 3) shelter for larval and juvenile fishes.

The project is justified by the demonstrated economic benefits of saltwater fishing in coastal communities.

### PURPOSE AND OBJECTIVES

The purpose of the proposed project is to acquire and deploy FADs in offshore waters of Okaloosa County to provide greater recreational and commercial opportunities for residents and tourists and improve the local economy (see **Figure 3-2B**). Specific objectives include: 1) increasing the concentration of pelagic fish at known locations



**Figure 3-2A.** Project location in Okaloosa County.

in offshore waters; 2) increasing recreational and commercial fishing opportunities; and 3) increasing tourism and economic opportunities.

### PROJECT COMPONENTS

The FADs will be deployed and anchored at six to eight locations approximately 30 to 90 miles in offshore waters, at depths of 200 to 1,000 feet. Project components include planning, site selection, installation, and maintenance. The reef locations will be available for public use for recreational and commercial fishing.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

Okaloosa County is the second most popular drive-to destination in Florida and relies on coastal tourism and resources. The proposed project will support individual recreational fishing, as well as fishing charters and headboats, and commercial fisheries, benefiting the local economy. This project will support the increasing demand for offshore fishing opportunities by both residents and tourists by attracting and concentrating fish such as tuna, dolphin fish, and billfish at known locations in Okaloosa County's offshore waters. As artificial reefs, the FADs will support encrusting and colonial benthic organisms such as sponges and corals and shelter for larval and juvenile fishes.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 10: Promotion of tourism in the Gulf Coast Region, including recreational fishing (primary); and
- Eligible Activity 8: Planning assistance.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 5: Restore and Revitalize the Gulf Economy (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.



**Figure 3-2B.** FADs would recruit more pelagic species like tuna, supporting individual recreational fishing, as well as fishing charters and headboats, and commercial fisheries, benefiting the local economy.

## SECTION V: Proposed Projects, Programs and Activities

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 8 (Consortium Objective): Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

### Implementing Entities

Okaloosa County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, and success monitoring of the program.

### Best Available Science and Feasibility Assessment

The economic benefits to a Florida's coastal communities from fishing are undeniable. Of the entire U.S., the effects of saltwater recreational fishing were greatest (sales impacts and jobs effects) in west Florida (\$4.9 billion, 47,000 jobs), followed by east Florida (\$3.3 billion, 29,000 jobs) (NOAA 2011). The economic benefits of FADs include increased sport fishing, reduced fuel consumption, commercial and cottage industry development, and potential reductions in pressure on reef resources (Sharp 2011). FADs attract and concentrate fish for more efficient catching, either by line or seine, although the reasons are unknown (FAO 2017). There is little research indicating direct impacts on pelagic fisheries as a result of FADs, although they can affect tuna movements due to their pervasiveness (Wang et al. 2014), increase impacts of bycatch of species, and result in entanglement/drowning of sea turtles and marine mammals if not properly maintained (NOAA 2017). The following resources provide relevant information on FADs.

- FAO (Food and Agriculture Organization of the United Nations). 2005-2017. Fish Aggregating Device (FAD). Technology Fact Sheets. Text by J. Prado. In: FAO Fisheries and Aquaculture, Rome. <http://www.fao.org/fishery/equipment/fad/en>
- NOAA. Accessed 24 August 2017. Fish Aggregating Devices (FADs): Fishing Gear and Risks to Protected Species. <http://www.nmfs.noaa.gov/pr/interactions/gear/fads.htm>
- NOAA Fisheries. 2011. Fisheries Economics of the United States 2011.
- Sharp, M. 2011. Economic Benefits of Fish Aggregating Devices in the South Pacific. <https://fads2011.sciencesconf.org/1307/document>.
- Wang, X., Chen, Y., Truesdell, S., Xu, L., Cao, J., & Guan, W. (2014). The Large-Scale Deployment of Fish Aggregation Devices Alters Environmentally-Based Migratory Behavior of Skipjack Tuna in the Western Pacific Ocean. PLoS ONE, 9(5).

This project is feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long-term. Additional planning assistance will be required for permitting, design, and implementation of the proposed project.

### Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this project that would preclude project implementation. Okaloosa County will ensure design to limit damage from tropical storms. Regulatory constraints will address issues such as spatial boundaries for navigation, channels, marine habitat resources, historic areas, sand borrow areas, existing structures and leases, ownership, etc. User conflicts related to crowding and misuse will need to be addressed. Regular monitoring and maintenance along with fisher training and public education will reduce the potential impacts of FADs on marine debris, sea turtles, and marine mammals.



## Success Criteria and Monitoring

The proposed project includes placement structures to support recreational demand for offshore fishing and success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Proper operation and maintenance of FAD structures;
- Metrics on the recruitment of benthic encrusting organisms and fish; and
- Increase in recreational use.

Okaloosa County is committed to conducting the monitoring necessary to quantify project benefits. Regulations on FADs are few and limited to commercial fisheries.

## Milestones and Schedule

The total estimated time horizon of this project is approximately six years. The expected start date is 2018, and the expected end date is 2023. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Permitting & Design												
Construction of Buoys												
Deployment												
Success Monitoring & Reporting												

## Budget and Funding Sources

Okaloosa County has estimated the total cost of this project to be approximately \$500,000. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$50,000
Implementation		\$300,000
Monitoring		\$150,000
<b>Total Cost</b>		<b>\$500,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$500,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Oter County Funds – Tourist Development Tax (Planning Complete)		\$80,000
<b>Total Secured Funding</b>		<b>\$580,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA		

### Partnerships/Collaboration

Potential project partners include University of West Florida, University of Florida/Institute of Food and Agricultural Sciences, Florida State University, Florida Fish and Wildlife Conservation Commission, and The Nature Conservancy. Coordination with the following agencies is anticipated: Florida Department of Agriculture & Consumer Services, Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, Northwest Florida Water Management District, National Marine Fisheries Service, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service.

## OKALOOSA COUNTY

## Stormwater Retrofit Program

PROJECT NO. 3-3

## Project Description

## OVERVIEW AND LOCATION

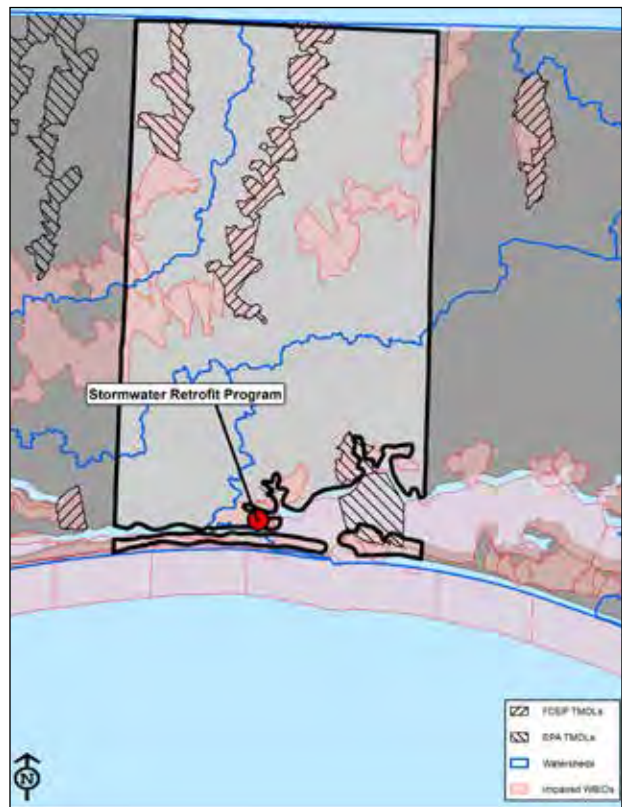
Cinco Bayou, Gap Creek and Lake Lorraine are contributing waterbodies to Choctawhatchee Bay which is an impaired waterbody. It is crucial to implement stormwater best-management practices (BMPs) throughout these watersheds to reduce sediment and nutrient loading to Choctawhatchee Bay. The general location of the projects that make up the Okaloosa County Stormwater Retrofit Program is shown in **Figure 3-3A**.

## NEED AND JUSTIFICATION

Currently Cinco Bayou is listed as impaired for nutrients (FDEP, 1998) the tributaries identified in the program are not on the 303(d) impaired water bodies list, but the goal is to keep these waterbodies off the impaired list by taking proactive actions to address known issues with sediment infiltration, floatables, and excess nutrients which all effect water quality. As the sediment exits the stormwater system into the bay the flows slow and sediments fall out of suspension. This process has smothered oysters, seagrass, while causing stormwater conveyance and navigation issues near the outfalls. (See **Figure 3-3B**)

## PURPOSE AND OBJECTIVES

The objective is to maintain clean, fresh water flows to Choctawhatchee Bay by removing and minimizing pollution from stormwater runoff as well as nonpoint sources. The County will also focus on removal of accumulated sediment and restoring areas near the outfalls to their natural state, promoting oyster and seagrass growth.



**Figure 3-3A.** Project location in Okaloosa County.

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

The Okaloosa County Stormwater Retrofit Program will create stormwater retention areas, repair broken/aging pipes, install hydrodynamic separators, and remove sediment deltas from outfall locations. The proposed projects would reduce total nitrogen (TN), total phosphorus (TP), total suspended solids (TSS) and the biological oxygen demand (BOD) on the contributing waterbodies and Choctawhatchee Bay. The program will include 4 main parts 1) Install a wet stormwater detention facility along the northern side of Lake Lorraine to reduce phosphorus and nitrogen and remove floatables prior to discharge into the stormwater system to the south. 2) The location of the hydrodynamic separators is shown in **Figure 3-3C**.

While not part of the Choctawhatchee River and Bay System Surface Water Improvement and Management (SWIM) Plan the proposed projects are consistent with the type of projects that are in the SWIM Plan. Some of the preliminary studies on these project areas have been cooperatively funded by the Northwest Florida Water Management District.



**Figure 3-3B.** Photo of sedimentation at an outfall in Cinco Bayou.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Much of Okaloosa County's economy is tourism based. The improvements to Choctawhatchee Bay will preserve the emerald green water the area is known for and sustain the health of this important estuary to the recreational, charter commercial fishing industries. This program will improve water quality as well as benthic and shoreline habitat near the stormwater outfall areas.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat;
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.



This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 2: Restore, Improve and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources

## Implementing Entities

Okaloosa County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, and success monitoring of the program. Okaloosa County has in-house design and construction capabilities.

## Best Available Science and Feasibility Assessment

There have been several studies on the effects stormwater has on pollution loading in Florida Estuaries and a range of best management practices and successful construction methods have been developed. This program has been informed by key literature in this field including the following references.

This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) effectively design and construct the project elements; 3) Monitor the success.

## Risks and Uncertainties

In the evaluation of this program, no significant risks have been identified that would preclude implementation. There is some risk seagrass or oysters may have colonized the fringes of the sediment deltas and therefore buffers may need to be observed when removing sediment near some outfalls.

## Success Criteria and Monitoring

The outfalls will be monitored monthly, with a yearly monitoring report. Pre and post construction monitoring will be completed in the vicinity of the projects to evaluate the water quality and ecological benefits gained from these projects, and to provide feedback for future similar projects.

Monthly sampling of along pre-determined transects with photo/video documentation

- Water quality parameters (TN, TP, TSS and BOD)
- Oyster/seagrass/marsh grass recruitment

## Milestones and Schedule

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Design & Permitting												
Phase 1 – Bayou Cinco												
Phase 2 – Gap Creek												
Phase 3 – Lake Lorraine												
Success Monitoring & Reporting												

## Budget and Funding Sources

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$110,000
Implementation		\$5,350,000
Monitoring		\$240,000
<b>Total Cost</b>		<b>\$5,700,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$4,700,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds – (In-kind, In-house Engineering Design)		\$300,000
<b>Total Secured Funding</b>		<b>\$5,000,000</b>
<b>Budget Shortfall</b>		<b>\$700,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FDEP		
NWFWMD		
NRDA		
NFWF		

## Partnerships/Collaboration

Okaloosa County has partnered with the Choctawhatchee Bay Alliance and the Northwest Florida Water Management District for development of this project.

## OKALOOSA COUNTY

Choctawhatchee Bay  
Water Quality Improvement Program

PROJECT NO. 3-4

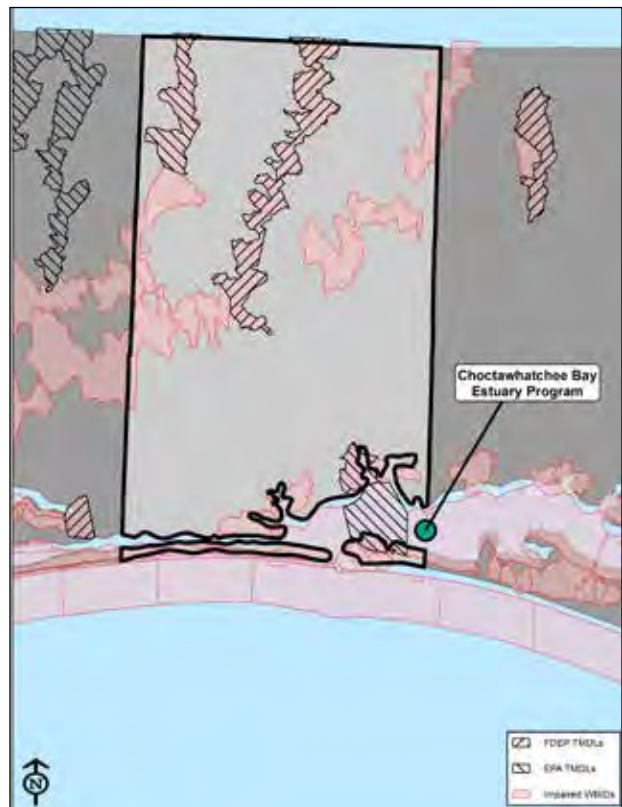
## Project Description

## OVERVIEW AND LOCATION

Okaloosa County, Walton County and the neighboring municipalities jointly requested funding for formal recognition under the Environmental Protection Agency's National Estuary Program to establish the Choctawhatchee Bay Estuary Program (CBEP). Funding was not obtained through the EPA, so Okaloosa County would use SEP funds to stand-up and administer a County led effort to create a local Estuary Program. (see **Figure 3-4A**).

## NEED AND JUSTIFICATION

Choctawhatchee Bay is a critically important estuary to the economy, community and way of life of Okaloosa County and neighboring Walton County as well. It provides fish and wildlife resources, including seagrass habitat, which supports numerous fish and invertebrate species. In addition, it is a popular place for recreational activities and tourism. Choctawhatchee Bay and several of its adjacent beaches are listed as impaired for nutrients and/or bacteria by FDEP under section 303(d) of the Federal Clean Water Act. These impairments negatively impact the health of the Bay's seagrasses and limit its recreational value. It is for these reasons that the residents of Okaloosa County, Walton County, Eglin Air Force Base and the surrounding municipalities have banded together to coordinate efforts in support of the establishing an estuary program to protect this valuable natural resource.



**Figure 3-4A.** Project location in Okaloosa County.

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The Estuary Program would coordinate local and regional stakeholders to maximize investments for habitat restoration, water quality projects, outreach and education efforts. The program would build off of the Choctawhatchee Bay Estuary Coalition effort to get national recognition and federal funding for this same program. The Program specific goals would be:

1. Fund a planning conference
2. Hire a director and staff
3. Establish a program budget
4. Set up grants/auditing protocols
5. Commission a CCMP Report

### PROJECT COMPONENTS

The Choctawhatchee Bay Estuary Program will be a non-regulatory program that would work to improve the waters, habitats, living resources, and economy of the Choctawhatchee Bay watershed. The initial funds would be used to “stand up” the Estuary Program, hire staff, and develop a Comprehensive Conservation and Management Plan (CCMP). This plan would identify critical need projects throughout the estuary and begin funding coordination on those projects which could include stormwater improvements, water quality improvements, restoration initiatives, and dirt road paving among others.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The Choctawhatchee Bay Estuary Program will establish a coordinated effort to restore and protect the watershed's and estuary's water quality and habitat. Reducing nutrients to concentrations that meet state and federal water quality standards will decrease the frequency and magnitude of algal blooms in the water column, thereby increasing water clarity and the amount of sunlight that reaches seagrass on the seafloor. Increased water clarity will improve seagrass health.

Preserving the emerald green waters the region has become known for, will contribute to economic growth in the County and adjacent areas, especially its fishery and ecotourism. The proposed CBEP program and subsequent wastewater rehabilitation projects will increase workforce development and job creation in both public and private sectors. Local consultants efforts will be required for the CCMP.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.



## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat; and
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.



**Figure 3-4B.** Gravity Mains Proposed for Lining – Ocean City (upper) and Okaloosa Island (lower).

## Implementing Entities

Okaloosa County would be the sole sub-recipient responsible for “standing-up” the Estuary Program

## Best Available Science and Feasibility Assessment

This project is consistent with the following natural resource management plans:

- Northwest Florida Water Management District (NFWFMD), 2017. Draft Choctawhatchee River and Bay System Surface Water Improvement and Management (SWIM) Plan.
- Northwest Florida Water Management District (NFWFMD), 2017. Draft Pensacola Bay System Surface Water Improvement and Management (SWIM) Plan.

This project is considered to be feasible with respect to the ability to: 1) start up the Estuary Program; 2) select a board and executive director to administer the program within the proposed budget; 3) bid out the CCMP and 4) effectively operate and maintain the program components over the long term.

## Risks and Uncertainties

In the evaluation of this program, it was determined that the County has successfully laid out the steps necessary to facilitate this program long term and has a lot of stakeholder support. No significant risks or uncertainties have been identified that would preclude implementation.

### Success Criteria and Monitoring

Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for

- Standing up the Program;
- Administration; and
- Effectively managing the CCMP.

In the implementation grant request, a detailed monitoring program design will be described that addresses assessment methodologies for the above listed criteria. Okaloosa County is committed to implementing the program and quantifying project benefits.

### Milestones and Schedule

The total estimated time horizon of this project from program initiation through CCMP completion is approximately 3 years. Implementation of this project will be as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning												
CB National Estuary Program Stand-up												
Comprehensive Conservation Management Plan (CCMP)												
Success Monitoring												

### Budget and Funding Sources

The overall program request is \$2M that will be used to create the CBEP, including the initial planning money to stand-up the estuary program and develop the CCMP.

PROJECT BUDGET	ESTIMATED DOLLARS
<i>Choctawhatchee Bay National Estuary Program</i>	
Planning	\$250,000
Implementation	\$1,500,000
Monitoring	\$250,000
<b>Total Cost</b>	<b>\$2,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$1,000,000
Direct Component	
Other Grants or Co-Funding	
Other County Funds	
<b>Total Secured Funding</b>	<b>\$1,000,000</b>
<b>Budget Shortfall</b>	<b>\$1,000,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
<b>FDEP – POT2</b>	
NRDA	
NFWF	
NWFWMD	

## Partnerships/Collaboration

The CBEP project will be coordinated between Okaloosa County, Walton County, and Eglin Air Force Base.

## OKALOOSA COUNTY

# Shoal River Headwaters Protection Program

PROJECT NO. 3-5

## Project Description

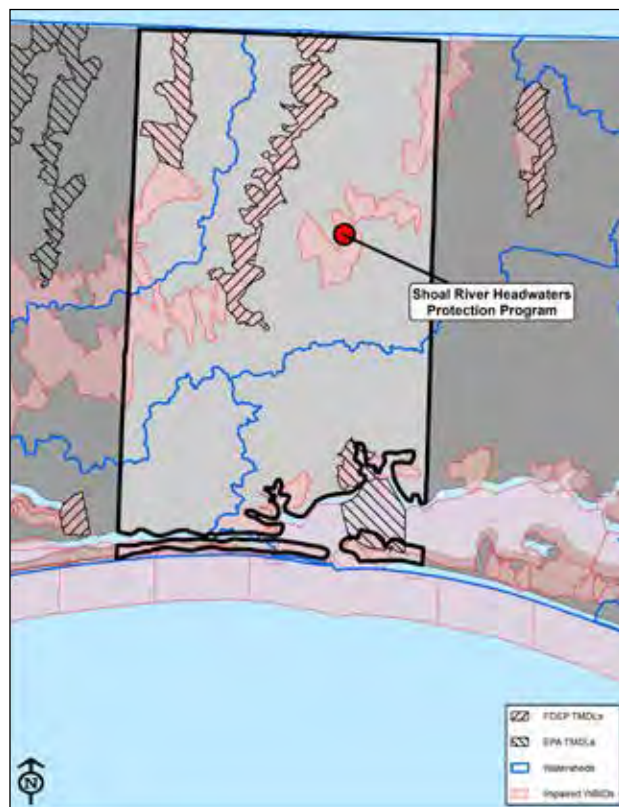
### OVERVIEW AND LOCATION

The Shoal River Headwaters Protection Program consists of three projects that will protect water quality in the headwaters of the Shoal River and its tributaries. The first project will expand the sewer service to residential, commercial, and industrial developments along Highway 90 east of Crestview. The second project will expand the capacity of the Water Reclamation Facility located near the Bob Sikes Airport to provide the needed capacity to accommodate the sewer system growth. The third project will reduce sedimentation in the Shoal River system by modernizing an existing, well-traveled dirt road. This program will be implemented in central Okaloosa County, near Bob Sikes Airport and in the area east of Crestview (see **Figure 3-5A**).

### NEED AND JUSTIFICATION

Northern Okaloosa County is a rural area with high growth rates over the past 10 years, especially to the east of Crestview and around the Bob Sikes Airport Industrial Park (BSAIP), with the potential to impact the sensitive Shoal River ecosystem. The rural areas outside of Crestview lack public wastewater infrastructure and unpaved roads are common. While impairments do not exist now, as the area grows and more traffic disturbs the dirt roadbeds, the potential for local impairments due to nutrients, bacteria and sedimentation increases significantly. In addition, increased groundwater withdrawals for potable water have the potential to reduce local aquifer recharge and replenishments of shallow groundwater lenses that feed local streams in the Shoal River system.

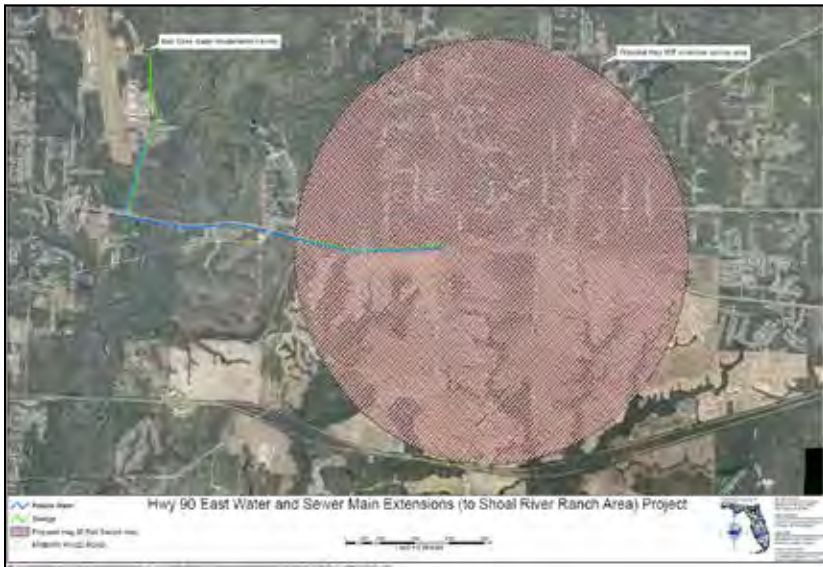
The future growth includes industrial and residential properties in an area zoned for agricultural, industrial and residential uses. New developments or buildings will install small package plants or septic tanks and water wells if



**Figure 3-5A.** Project location in Okaloosa County.



sewer infrastructure is not installed. If sewer service is provided to this area, it would provide the opportunity to recruit high tech industries to the property around the airport that would bring better paying jobs to the residents of Okaloosa County. The installation and continued usage of septic tanks will continue to contribute sources of water pollution to the Shoal River system. Finally, the program will also address ongoing sedimentation issues east of Crestview, in the Shoal River's Pond Creek tributary. Dorcas Road is a dirt-surface and is frequently used by Walton and Okaloosa County residents commuting to Crestview.



**Figure 3-5B. Project Area for the Water and Sewer System Extension to the Highway 90 East Area.**

This program is designed to reduce nonpoint-source pollution and nutrient loading into the Shoal River watershed and prevent impairments from the increasing inputs over time. The Shoal River discharges into the Yellow River Marsh Aquatic Preserve, and ultimately discharges into East (Pensacola/Escambia) Bay, the Intracoastal Waterway, and the Gulf of Mexico. This program has benefits to the rivers, estuaries, and other waterbodies of Okaloosa, Santa Rosa, and Escambia Counties.

### PURPOSE AND OBJECTIVES

The overall goal of the program is protect water quality in the Shoal River system by preventing the periodic sewer overflows at the BSAIP and the installation of thousands of septic tanks and a series of small package plants in the watershed. The program will also increase capacity at the Bob Sikes Industrial Park Water Reclamation Facility to handle the additional residential and industrial waste as growth continues in the area and would otherwise use inefficient septic systems or small package plants. In addition, Dorcas Road will be redesigned to prevent sediment from continuing to enter the Shoal River watershed during the area's frequent rain storms.

In addition to the road work, this program is a pre-emptive move to make public sewer available to areas where none exists in areas near BSAIP and in the community just east of Crestview. Over the last 10 years, Okaloosa County Water & Sewer (OCWS) has made a commitment to public sewer in north Okaloosa County, investing millions of dollars into a collection system and wastewater treatment/disposal capacity. This funding will allow the County to develop a proper master plan for the areas east of Crestview and ensure high quality, long term solution to the present piecemeal approach to handling wastewater.

### PROJECT COMPONENTS

This program has three projects.

The first project proposes to expand the existing sewer system infrastructure east of Crestview. This area will include the Shoal River Ranch area and other proximate properties. (See **Figure 3-5B**).



**Figure 3-5C. Project Area for the BSAIP. Pump Station (left) and WRF (right).**

The second project is a 2-phase project at BSAIP. In phase I, the OCWS will expand the capacity of the BSAIP Water Reclamation Facility (WRF). This project will expand the effluent disposal system capacity at the from 0.391 mgd to 1.132 mgd to match the permitted treatment capacity. The sewer plant and effluent disposal system will eliminate nutrients through a state-of-the-art wastewater plant. The added absorption beds will lead to increased groundwater recharge. This project is designed and permitted. See **Figure 3-5C**.

In phase II, OCWS will increase the capacity and upgrade a pump station that is located at the Bob Sikes Airport. Currently the pump station conveys its' flow directly to

the BSAIP wastewater treatment facility through a force main located under the runway. This upgrade will increase the flow capacity, address operational concerns and relocate the force main so it is no longer under the runway. See **Figure 3-5C**.

The third project is known as the "Dorcas Rd Dirt to Pave" project. Dorcas Road is an east-west connector located between Highway 393 and Richardson Road in Okaloosa County, which connects to Walton County. This roadway floods several times each year at Pond Creek, a tributary to Shoal River, making the roadway impassable. Ongoing maintenance to keep the current dirt road passable results in continual erosion into the creek (see **Figure 3-5D**). The roadway would be designed to convey a 10-year storm event, consistent with the required design frequency for major roadways, as defined in the FDOT Green Book. Low impact stormwater management features would be included in the roadway design to meet the FDOT drainage standards and the wooden bridge over Pond Creek would be upgraded to a concrete bridge.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The Shoal River Headwater Protection Program will allow the county to grow in a manner that protects the Shoal River watershed and its ecological resources. The Shoal River, the Yellow River, and Pensacola Bay are designated as critical habitat for the Gulf sturgeon and the Shoal River and Yellow River include critical habitat for several species of protected freshwater mussels. Improvement and protection of water quality and aquatic habitat quality for these species are important components in the management plans for the watershed. Although some waterbodies downstream of this program's projects are listed as impaired for bacteria, most of the Shoal River and Titi River tributaries in the project areas currently meet water quality standards. The County's proactive plan to expand its sewer system and upgrade the BSAIP water treatment facility to handle future wastewater loads will allow future

economic growth and development while maintaining good water quality and preventing impairments for nutrients, bacteria, or other pollutants to downstream waters. Likewise, the Dorcas Road project will decrease sediment loads to Pond Creek and protect downstream waters from impairments due to turbidity. The WRF groundwater recharge will foster local aquifer and shallow groundwater lens recharge.

Water and Sewer infrastructure will benefit the county's economy and contribute to the industrial and residential growth of the county. Okaloosa County is regularly soliciting economic opportunities to grow its industrial and residential base. In addition, the Eglin AFB is one of the world's largest military installations, consisting of over 725 square miles is just south of Crestview and many military retirees settle in the area. The base and ancillary private sector support vendors are a large factor in the economy of Okaloosa County and the Crestview area is well-positioned for defense-related business expansion and residential development.



**Figure 3-5C.** Dorcas Road at Pond Creek Bridge with significant sedimentation next to the bridge.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region (primary); and
- Eligible Activity 6: Infrastructure projects benefiting the economy or ecological resources, including port infrastructure.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat; and
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## SECTION V: Proposed Projects, Programs and Activities

### Implementing Entities

The OCWS Department and Okaloosa County Roads Division will be the implementing entities and grant sub-recipients responsible for the design, permitting, construction, operation and maintenance, and monitoring of this program. OCWS has coordinated with numerous other agencies in the development of these projects, and may collaborate with other entities in the implementation of the projects through leveraging and other cooperative funding agreements.

### Best Available Science and Feasibility Assessment

This project is consistent with the following natural resource management and restoration plans:

- Northwest Florida Water Management District (NWFWMDC), 2017. Draft Pensacola Bay System Surface Water Improvement and Management (SWIM) Plan.
- Florida Department of Environmental Protection (FDEP), 2017. Yellow River Marsh Aquatic Preserve Management Plan.

The BSAIP Water Reclamation Facility is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

The other projects appear to be feasible. However, the other projects are only in the planning phase. The projects cannot be fully evaluated for feasibility until the 30% design is completed for each program component.

### Risks and Uncertainties

In the evaluation of this program, it was determined that the final design and permitting of the Bob Sikes Industrial Park (BSAIP) Water Reclamation Facility has been completed, the project is ready for implementation. The other projects within the program are in the planning stages with no engineering completed. The risks will be identified at the end of preliminary design.

### Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for

- Maintenance of ambient water quality (nutrient and bacterial concentrations) in the unimpaired segments of the Shoal River, the Titi River, and their tributaries; and
- Changes in water clarity and sedimentation in Pond Creek and the Shoal River.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Okaloosa County currently implements a water quality monitoring program and is committed to conducting the necessary monitoring and coordinating with other regional water quality monitoring entities to quantify project benefits.



## Milestones and Schedule

The total estimated time horizon of this program - from preliminary design through construction and subsequent success monitoring - is approximately 6 years. The expected start date is 2018, and the expected end date is 2024. Implementation of this project has been broken down into the three projects in the program, as shown in the milestone chart below. Success monitoring will last 2 years beyond the end of construction.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
<i>Highway 90 Sewer Expansion</i>												
Preliminary Design												
Final Design												
Construction												
<i>Bob Sikes Airport Industrial Park</i>												
Construction (Phase I, Water Reclamation Facility)												
Phase II, Pump Station & Force Main												
Preliminary Design (Phase II)												
Final Design (Phase II)												
Construction (Phase II)												
<i>Dorcas Road Dirt to Pave</i>												
Preliminary Design												
Final Design												
Construction												
Programmatic Water Quality Monitoring												

## Budget and Funding Sources

The overall project cost of the program is \$6.9 million dollars. The County intends to construct these projects using a combination of in-house construction forces and contractors. The planning phase was estimated at 3% of the total project cost. A breakdown of the cost per project is shown in the table below. Funds for water quality monitoring were requested by the county for a 15-year period at a rate of \$20,000/year. The county will provide \$350,000 and \$450,000 for the Bob Sikes Project (phase 2) and the Dorcas Road Project respectively. The county is also applying for state funding in the amount of \$834,000 for Phase II of the BSAIP project.

Several sources of leveraged funds have been identified. All but the Dorcas Road project component have been submitted to FDEP's portal for multiple pots of funds and State of Florida Water Project Funding (appropriation). The Highway 90 East work has been submitted for Triumph Gulf Coast funding. BSAIP Phase II has been submitted for Northwest Florida Water Management District Strategic Priority Water Projects.

PROJECT BUDGET		ESTIMATED DOLLARS
Monitoring		\$300,000
<i>Bob Sikes Airport Industrial Park</i>		
Implementation (Phase I, Water Reclamation Facility)		\$1,500,000
Planning (Phase II, Pump Station & Force Main)		\$30,000
Implementation (Phase II, Pump Station & Force Main)		\$970,000
	<b>Phase II Total</b>	<b>\$1,000,000</b>
	<b>Total Project</b>	<b>\$2,500,000</b>
<i>Highway 90 East Water and Sewer Expansion</i>		
Planning		\$65,000
Implementation		\$2,035,000
	<b>Highway 90 East Total</b>	<b>\$2,100,000</b>
<i>Dorcas Road Dirt to Pave</i>		
Planning		\$63,000
Implementation		\$1,937,000
	<b>Dorcas Total</b>	<b>\$2,000,000</b>
	<b>Total Cost</b>	<b>\$6,900,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$5,350,000
Direct Component (BSIP Phase I)		
Direct Component (Project 3)		
Other Grants or Co-Funding		\$2,000,000
Other County Funds		\$1,545,000
	<b>Total Secured Funding</b>	<b>\$8,895,000</b>
	<b>Budget Shortfall</b>	<b>+\$1,995,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
State requested funding for project BSAIP		\$834,940

## Partnerships/Collaboration

These projects are endorsed by the Okaloosa County Board of County Commissioners and supported by the Okaloosa County Economic Development Council (EDC). The EDC is regularly soliciting economic opportunities for the lands east of Crestview, especially in the Shoal River Ranch area and a future land use-designated industrial park. Other partnerships include Walton County and the Northwest Water Management for the Dorcas Road. project.

## OKALOOSA COUNTY

# Fort Walton Beach Access Areas

PROJECT NO. 3-6

## Project Description

### OVERVIEW AND LOCATION

Okaloosa County and Fort Walton Beach in particular, is a world-renowned vacation destination and the demand is high for public beach access during the tourist season. There are three existing beach access areas in Fort Walton Beach, that would be upgraded as part of this project. The project areas are located at the 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> Beach Parks along the Gulf of Mexico, just south of Santa Rosa Boulevard. These beach access points are an extension of a work the Okaloosa County has already completed at 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Beach Parks. The general location of the project is shown in **Figure 3-6A**.

### NEED AND JUSTIFICATION

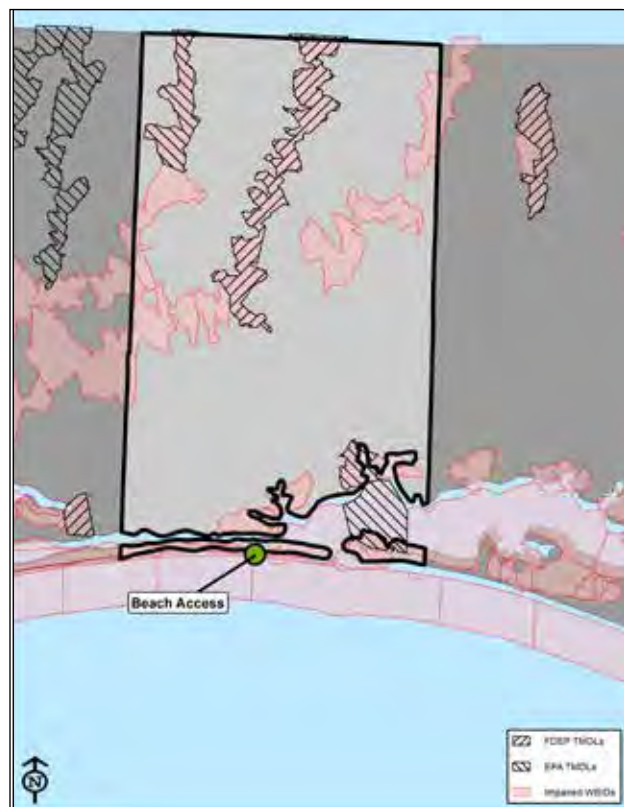
Fort Walton Beach is an immensely popular spot for tourists and residents alike during the season. The current 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> Beach Parks have minimal amenities and parking is not well defined which has led to stormwater/sediment transport issues and less use by the public.

### PURPOSE AND OBJECTIVES

Okaloosa County will install water, sewer and stormwater upgrades, provide paved parking areas with striped parking spaces, provide restrooms, a covered pavilion and landscape planting. The County proposes to use a blend of natural vegetation to reduce erosion and create dune habitat.

### PROJECT COMPONENTS

The three beach access sites are similar, including dry retention areas, stormwater infrastructure, and connections to County electric, water and sewer for the restrooms and pavilion areas. The parking areas will be paved and striped



**Figure 3-6A.** Project location in Okaloosa County.



with consistent landscaping at all three sites. The sites will have slight variations in the number of parking spaces, depending on the amount of space available at each parcel landward of the Coastal Construction Control Line (CCCL). (As shown in Fig 3-6B)

Only the boardwalk and pavilion at each location will be constructed seaward of the CCCL. The new boardwalk configuration will match with the existing dune crossover and ADA ramp to beach. The 4<sup>th</sup> Beach Park location will have 20 parking spaces, 5<sup>th</sup> Beach Park will have 25 spaces, and 6<sup>th</sup> Beach Park will have 32 parking spaces. At each location, there will be two designated handicapped parking spaces. The boardwalk and dune walkovers will be ADA compliant. Each project site will have a manual gate arm at the entrance and at the stabilized emergency vehicle beach access to control traffic and secure the site when not open to the public. The restroom, pavilion locations will be elevated to 15.67 ft (NAVD 88) in order to minimize damage for potential storm surge flooding.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

Enhancing these three beach access areas will provide a more inviting beach access areas to tourists and residents alike increasing availability to a wider range of user groups. The updated and renovated facilities will accommodate a greater amount of tourists to the area.

Finally, the construction and enhancement of the beach accesses and the amenities will provide a number of ecological benefits including: 1) stormwater retention and treatment; and 2) sewer connection for restroom facilities; and 3) vegetation to reduce erosion.

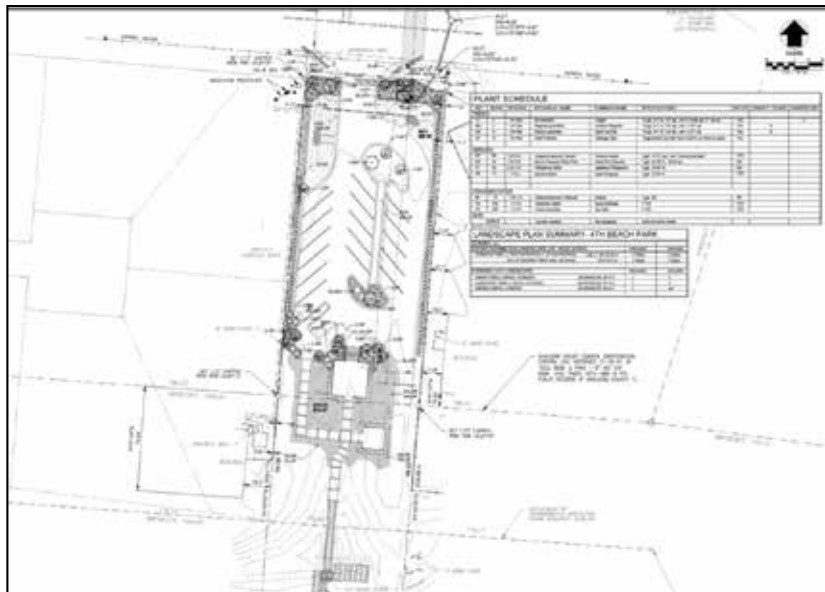


Figure 3-6B. Proposed Beach Access, 4th Beach Park (Genesis Engineering, 2015).

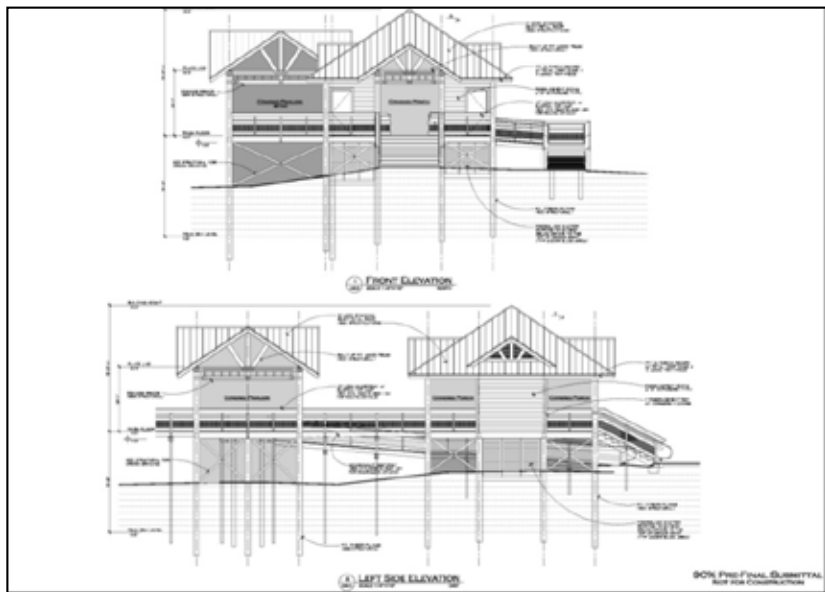


Figure 3-6C. Proposed Beach Access, 4th Beach Park (Genesis Engineering, 2015).

## SECTION V: Proposed Projects, Programs and Activities

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region, and
- Eligible Activity 10: Promotion of Tourism in the Gulf Coast Region including recreational fishing (primary).

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources; and
- Goal 5 Restore and Revitalize the Gulf Economy (primary).

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary).

### Implementing Entities

Okaloosa County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, and success monitoring of the program.

### Best Available Science and Feasibility Assessment

FDEP has provided guidance documents on dune crossovers, and dune plantings. Okaloosa County standard ADA design for boardwalks will be installed. Key documents that make up the basis for this project are included below:

- Beach/Dune Walkover Guidelines, by the Florida Bureau of Beaches and Coastal Systems, Florida Department of Environmental Protection, Revised January 2006.
- Beach Dune Walkover Structures, SUSF-SG-76, by Todd L. Walton, Jr., and Thomas C. Skinner. Published by the Marine Advisory Program of the Florida Cooperative Extension Service and the Florida Sea Grant, March 1983.

As discussed above, the need and justification for the project are well established; however, the final permits and notice-to-proceed must be obtained from FDEP and USACE, however, these agencies have already authorized similar permits for Beach Parks 1-3, so there is a precedent for this work.

This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct and effectively operate and maintain the project components over the long term.

### Risks and Uncertainties

In the evaluation of this program, no significant risks have been identified that would preclude implementation. There is some risk that beach accesses and the amenities could be damaged during tropical storm events; however, potential damage from storm surge and high waves will be factored into the siting and construction methods. This project has already completed design and is currently pursuing permits.

## Success Criteria and Monitoring

The beach access sites will be monitored bi-annually, with a yearly monitoring report focusing on the amount of public use.

## Milestones and Schedule

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Permits												
Bidding & Site Construction												
Park Amenities												
Success Monitoring & Reporting												

## Budget and Funding Sources

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$0
Implementation		\$2,350,000
Monitoring		\$50,000
<b>Total Cost</b>		<b>\$2,400,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$700,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds – Tourist Development Tax (Design Complete)		\$150,000
<b>Total Secured Funding</b>		<b>\$850,000</b>
<b>Budget Shortfall</b>		<b>\$1,550,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FDEP		
NRDA		
NFWF		

## Partnerships/Collaboration

Okaloosa County has partnered with the Choctawhatchee Bay Alliance and the Northwest Florida Water Management District for other similar projects and may be able to partner on the dune planting as an educational outreach.

## WALTON COUNTY

# Choctawhatchee Bay Water Quality Improvement Program

PROJECT NO. 4-1

## Project Description

### OVERVIEW AND LOCATION

This program will be expanding the existing wastewater infrastructure south along US 331 to areas in southern Walton county that currently use septic tanks for waste water treatment. The area with existing waste water infrastructure (west of US 331) needs to be upgraded to accommodate the increased flow from the expanded waste water system. The program will reduce nutrients to the Choctawhatchee Bay by removing old and outdated septic tanks and upgrading the existing sewer infrastructure to accommodate the increase flows due to removal of septic tanks. The program components are located near the town of Freeport, as shown in **Figure 4-1A**.

### PROGRAM NEED AND JUSTIFICATION

Choctawhatchee Bay is a large estuary with a major alluvial river basin (Choctawhatchee River) at the east end and a narrow gulf pass (East Pass) at the western end. Secondary inflows originate from a series of bayous. Due to its configuration and lack of a substantial outfall the estuary was originally oligohaline until the pass was dredged in 1929. For an estuary of this size there is relatively low exchange of bay and gulf waters, which fosters the potential for water quality issues. The Florida Department of Environmental Protection (FDEP) verified that the primary sources of nutrient loading to the estuary are the river and secondary inflows and the two primary nonpoint sources of nutrients to the bay are storm water runoff and septic tanks. This portion of Choctawhatchee Bay is listed as impaired for bacteria, nutrients, and nutrient response variables by FDEP under section 303(d) of the Federal Clean Water Act.

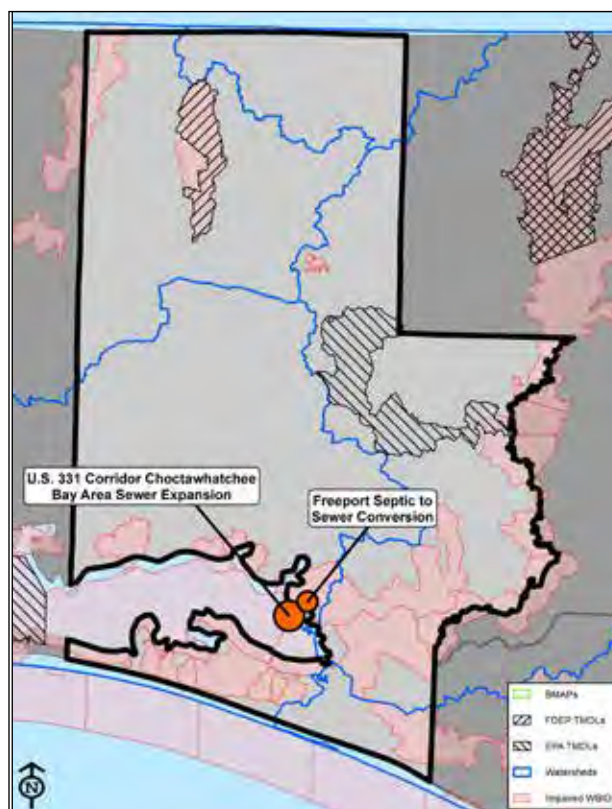


Figure XX-1A. Project location (map)



The water quality in this portion of the bay is of major concern due to the because of the prevalence of failing septic tanks adjacent to contributing waterbodies. A study was conducted in the project area to determine the quantity of existing septic tanks and the water quality of discharges to roadside swales from septic tanks after a major rain event. These samples showed that fecal coliform counts up to 3,090 far above allowable State limits. There are 655 septic tanks in the study area, with an additional 284 possible as existing parcels are built out.

The County plans to address these water quality issues by expanding its sewer systems. Existing service areas on US 331 are sporadic and service south along US 331 South does not currently exist. This project envisions the expansion of the existing sewer system to four communities and the removal of over 600 septic tanks; the new system will ultimately service 939 parcels. The expansion of the sewer system means that the existing sewer system west of US 331 needs to be upgraded to convey the increased wastewater to existing treatment facilities. Installation of central sewer system will take these relatively concentrated areas of septic tanks offline (see **Figure 4-1B**) and significantly reduce nutrient and bacteria inputs to this portion of the bay.

### PURPOSE AND OBJECTIVES

The proposed sewer expansion and upgrades along the US 331 Corridor is a vital component to facilitating the removal of septic tanks along the Choctawhatchee Bay. The infrastructure that will be constructed as part of this project is essential to the collect and transmit the wastewater that will be collected from the southern part of the county to the existing wastewater treatment facility. This will foster the maintenance and restoration of natural resources, ecosystems, fisheries, marine and wildlife habitats, as well as promoting seafood harvesting. Provision of reliable wastewater treatment along the US 331 corridor will also improve local conditions for small businesses along this road.

### PROJECT COMPONENTS

This program has two components: upgrade and expansion of the sewer system in two phases and provide sewer service to four areas (phase III). (See **Figure 4-1B**).

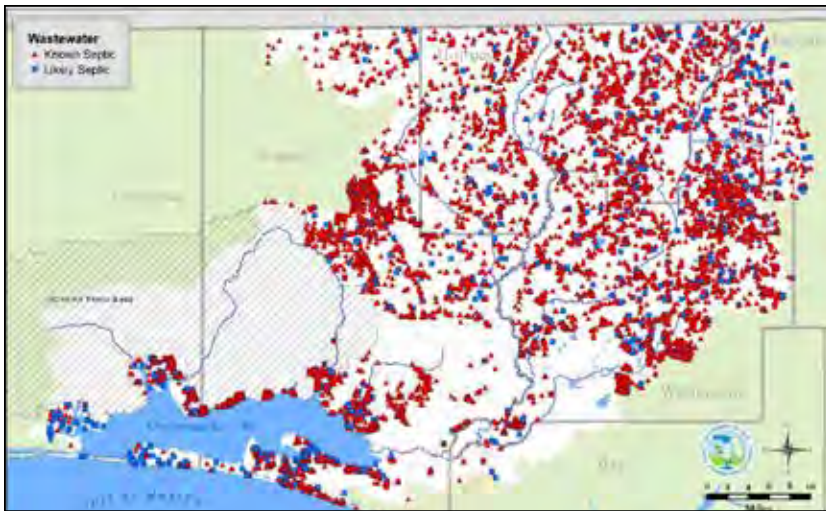
1. Phase I: US-331 Upgrade: Lift Stations and Offsite Improvements to Freeport Plant;
2. Phase II: US-331 Sewer Improvements from CR-3280 to Riverwalk (Segments I-IV).
3. Phase III: Expansion of sewer to Areas 1 to 4.



**Figure 4-1B. US 331 Corridor Project Areas.**

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The Choctawhatchee Bay is a large estuary located in Okaloosa and Walton counties. The Northwest Florida Water Management District (NFWFMD) SWIM plan update draft includes “Needs and opportunities for improved wastewater collection and treatment” as a watershed priority, specifically septic tank abatement. **Figure 4-1C** indicates the high concentrations of septic tanks in this project area along the bay’s northeastern shore. This program will directly address issues related to nitrogen and fecal coliform in the Choctawhatchee Bay.



**Figure 4-1C.** NFWFMD Assessment of Septic Tanks in the Choctawhatchee Bay watershed.

The City of Freeport is a very small city with a limited economic base and rural area economic development is critically important to Freeport’s future. For the economy to grow with a strong tax base and new business and employment opportunities for all adequate infrastructure must be available. By extending water and wastewater transmission lines along US 331, the existing and planned residential, commercial and industrial developments will be more stable. As a result of new developments in the area, the City and the County will see an increase in population, property value (tax revenue), retail and medical services.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources; and
- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

Walton County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project. Walton County has coordinated with numerous other agencies in the development of the waste water management plan, and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

## Best Available Science and Feasibility Assessment

Significant work has been done to monitor and characterize water quality in the Choctawhatchee Bay watershed and to implement water quality improvement and protection programs. This program is consistent with the goals of NFWFMD's latest draft update to the watershed management plan:

- Northwest Florida Water Management District (NFWFMD), 2017. Draft Choctawhatchee River and Bay Surface Water Improvement and Management (SWIM) Plan.

The project does appear to be feasible. However, only a conceptual study has been completed to date. The conceptual study does not develop project alternatives or determine how the system will be operated. The project cannot be fully evaluated for feasibility until preliminary design is completed.

## Risks and Uncertainties

This project is just beyond the conceptual phase; there has been a conceptual study performed but no design work has been completed on this project. The risks will be identified during the preliminary and final design phases.

## Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in ambient water quality (nutrient and bacterial concentrations) downstream of removed septic tanks in waterbodies which contribute to Choctawhatchee Bay;
- Changes in the frequency and/or duration of algal blooms (as measured by chlorophyll-a) in receiving waterbodies which contribute to Choctawhatchee Bay; and
- Changes in nutrient loads to Choctawhatchee Bay from non-point sources.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Walton County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project - from permit modification through success monitoring - is approximately seven years. The expected start date is 2018, and the expected end date is 2025. Implementation of this project has been broken down into three phases. Each phase will require preliminary design, final design and construction. Since several design and construction packages are required, they are sequenced so when one construction contract is completed, the next construction package is started.

MILESTONE	YEARS FROM SEP APPROVAL											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
Water Quality Monitoring Program												
<i>Phase I- US 331 Lift Stations and Offsite Improvements to Freeport Plant</i>												
Preliminary Design												
Final Design												
Construction												
<i>Phase II: US-331 Sewer Improvements from CR-3280 to Riverwalk (Segments I-IV)</i>												
Preliminary Design												
Final Design												
Construction												
<i>Phase III: Expansion of sewer, Areas 1 to 4.</i>												
Preliminary Design												
Final Design												
Construction												

### Budget and Funding Sources

The total project cost was estimated to be \$16.1 million dollars. Monitoring water quality and interpreting water quality data was estimated to be \$20,000 per year for 7 years and was assumed to be part of the implementation costs. Water quality monitoring was not in the County's budget request, but is expected to be required. The planning and detailed design phase the program was estimated to be about 15% of the total cost.

One possible funding opportunity is financial assistance is the USDA Rural Development Water and Waste Disposal Loan and Grant Program. Typically, this program requires a preliminary design report and financial review of the applicant that results in a determination of grant/loan combination for the construction of the project. The Department of Economic Opportunity also, provides grants/loan combinations for infrastructure projects based on a scoring criteria related to low income residents (LMI). A minimum of 51% LMI is typically required to meet minimum.

Matching funds are expected to be a combination of Pot 1 funds, State Revolving Funds (DEP), and possibly TIFF funds for the US-331 Segment. The other potentially available funding source identified by the County is the DEP 319 Grant Program for improved water quality in the Choctawhatchee Bay.

PROJECT BUDGET		ESTIMATED DOLLARS
US-331 Upgrade Phases I-II		
Planning and Final Design		\$2,415,245
Implementation (Lift Stations and Offsite Improvements)		\$2,099,667
Implementation (Segments I-IV)		\$5,847,261
<b>Total</b>		<b>\$7,946,928</b>
Phase III: Expansion of Sewer to Areas 1 to 4		
Planning and Final Design		\$887,128
Implementation		\$5,742,367
<b>Total</b>		<b>\$6,29,495</b>
<b>Total Cost</b>		<b>\$16,104,540</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$12,660,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$12,660,000</b>
<b>Budget Shortfall</b>		<b>\$3,444,540</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FDEP 319 Grants		
TIFF funds		
State Revolving Loan Funds		

## Partnerships/Collaboration

The primary partnership will be between Walton County and the City of Freeport. Additional collaborations will be with the Choctawhatchee Basin Alliance for water quality monitoring before and after project completion.



## BAY COUNTY

# North Bay Septic to Sewer Conversion & Water Quality Program

PROJECT NO. 5-1

## Project Description

### OVERVIEW AND LOCATION

The North Bay Water Quality & Septic to Sewer Conversion Program will reduce nutrient and bacteria loading into Deerpoint Lake and North Bay. As part of an overall program, the raw water line component will contribute significantly to the elimination of the surface water intake and discharge from the Lansing Smith Steam Plant (LSSP) into North Bay and the new wastewater collection system proposed for the Deerpoint Lake Protection Zone (DLPZ) will result in the removal of 893 septic systems. Deerpoint Lake and its protection zone and the LSSP are in central Bay County east and southwest, respectively, of the city of Southport (see **Figure 5-1A**).

### NEED AND JUSTIFICATION

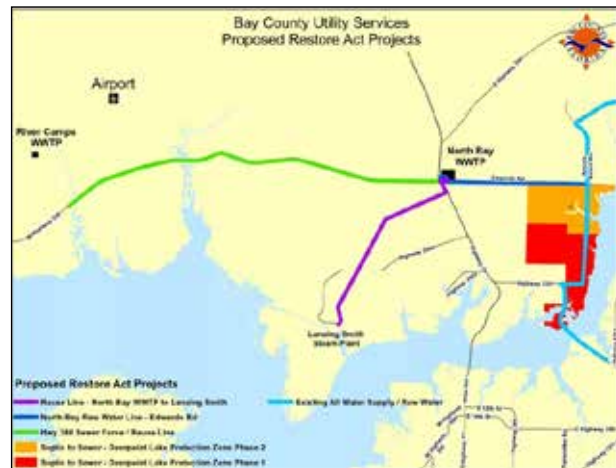
Deerpoint Lake Reservoir is at the northeast end of North Bay, which is a segment of the St. Andrews Bay estuary system. Deerpoint Reservoir is designated as a Class I waterbody and approximately 50 MGD of water is pumped from Deerpoint Lake, providing the main source of potable water for Bay County. In addition to supplying drinking water, between 500 MGD and 1,000 MGD of freshwater spills over Deerpoint Dam into North Bay.

The St. Andrew Bay estuary is ecologically and economically important and the quality of water going into the St. Andrew Bay is extremely important to the sensitive balance of this system. North Bay is currently listed an impaired waterbody for nutrients and nutrient response variables by FDEP under section 303(d) of the Federal Clean Water Act. North Bay and St. Andrews Bay are listed as impaired for fecal coliform bacteria and bacteria in shellfish.



Figure XX-1A. Project location (map)

This project is part of a master planning effort for improving water quality and implement water conservation within the St. Andrews Bay watershed. Currently, LSSP intakes and discharges 3 MGD of cooling water from/to North Bay. Although both discharges are currently permitted processes, future permitting may not allow these discharges into the impaired North Bay and West Bay systems. As part of a master planning strategy the county is planning to use treated effluent from North Bay Wastewater Treatment Facility (NBWWTF) to provide cooling water for Gulf Power's LSSP in lieu of North Bay surface waters and remove their current discharge into rapid infiltration basins. To implement the program component, a new raw water line from Resota Beach Road to the NBWWTF will be required to supplement the effluent line and provide sufficient capacity of reuse cooling water to the LSSP. (see **Figure 5-1B**).



**Figure 5-1B. Raw Water Line and LSSP Cooling Water Project.**

There is no centralized sewer system in the DLPZ, which has a high density of septic tanks, a large percentage of which are old, failing, and/or do not meet the current standard for construction. This allows nutrients and bacteriological pollution to infiltrate Deerpoint Lake. Current modeling predicts that by 2035, Bay County's permanent population is likely to grow by 19% putting even more nutrient loading and bacteriological pollution into the DLPZ unless a centralized sewer system is installed. This project will help improve water quality in Deerpoint Lake and the St. Andrew Bay estuary by installing a central sanitary sewer and removing aging septic tanks in two phases and sending the effluent to the NBWWTF, which is an advanced wastewater treatment facility that is under capacity (see **Figure 5-1C**).

## PURPOSE AND OBJECTIVES

As two major components of an overall county-wide program, when completed this program will convert the NBWWTF to an essentially zero discharge operation, as well as significantly reduce environmental impacts to the St. Andrews Bay and groundwater systems. The raw water line component is essential to the reduction and ultimate elimination of LSSP's surface water intake from and discharge into North Bay; also, supporting the elimination of effluent discharged through rapid infiltration basins (RIBs) from NBWWTF into coastal groundwater. This program will also protect Deerpoint Lake from nutrient and fecal coliform bacteria concentrations by implementing a septic to sewer conversion in the DLPZ.

## PROJECT COMPONENTS

This program has two primary components:

1. Build a raw water pipeline from Econfina Creek near Resota Beach Road (upstream of Deerpoint Lake) to the NBWWTF. The line is required to supplement the effluent line and provide sufficient capacity of reuse cooling water to the Lansing Smith Plant, to allow replacement of cooling water withdrawals from North Bay.
2. Expanding the existing wastewater collection infrastructure to provide sanitary sewer service to the Deerpoint Lake area. The expansion will be done in two phases. The type of sanitary sewer system to be used will not be known until the feasibility study and preliminary design is complete.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

North Bay is an integral component of the St. Andrews Bay estuary, which is an ecologically important estuary that supports numerous fisheries and has a high recreational value. Overall, by providing reclaimed/fresh cooling water to the LSSP, the surface water discharge of cooling water from the plant will be reduced & ultimately eliminated, as will wastewater discharges to coastal groundwater currently occurring via RIBs at the NBWWTF. These will significantly reduce environmental impacts to Deerpoint Lake and St. Andrews Bay and its groundwater systems resulting in: (1) improved water quality in the estuary, (2) reduced nitrogen loading to groundwater at the NBWWTF, (3) conversion of the NBWWTF to an essentially zero discharge operation, (4) reduced regulatory water quality requirements, and (5) reduced future treatment plant capital improvement costs.



Figure 5-1C. Deerpoint Sewer to Septic Project.

The expansion of sewer system and installation of a raw water line will contribute to growth in the county. This expansion will help the county to grow, improve its economy, and grow the tax base. This project will also help development of new businesses and employment opportunities. The proposed project will increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources

## Implementing Entities

Bay County Utilities will be the primary implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project. Gulf Power (Southern Company) may implement other facets of the larger program aimed at eliminating the discharge of cooling water from the LSSP to North Bay and removing rapid infiltration basins wastewater discharges to coastal groundwater at the NBWWTF. Bay County has coordinated with Florida Department of Environmental Protection and numerous other agencies in the development of the waste water management plan, and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

## Best Available Science and Feasibility Assessment

Significant work has been done to monitor and characterize water quality in the St. Andrew Bay watershed and to implement water quality improvement and protection programs. The Northwest Florida Water Management District (NFWFMD) is currently in the process of updating the St. Andrew Bay Watershed Surface Water Improvement and Management (SWIM) Plan. This project is consistent with the goals of the currently approved plan:

- NFWFMD, 2000. St. Andrew Bay Watershed SWIM Plan.

It also addresses current watershed and water resource issues identified in supporting documentation for the 2017 update to the SWIM Plan:

- Draft St. Andrew Bay Watershed Characterization. Ecology and Environment, Inc., 2016. Prepared for the NFWFMD.

These projects appear to be feasible. However, no studies or engineering has been completed to date. The project cannot be fully evaluated for feasibility until preliminary design is completed.

## Risks and Uncertainties

The raw water line can be designed to provide water to NBWWTF however the feasibility of the countywide program can't be determined because almost no engineering details are known. The risks will be identified during the feasibility and design phases.

A feasibility study has not been completed for either Deerpoint Lake sewer project and almost no engineering details are known. If soils at Deerpoint Lake are permeable or overlay karst, the water table is high and/or septic are not performing as efficiently as originally intended (i.e. leaking, damaged, etc.), then the project is justified from a receiving water quality improvement standpoint. This type of project can be engineered for the types of conditions present in this locale. Once engineering has commenced the requirements to attain feasibility (i.e. permissibility, constructability, etc.) will become apparent. At that time the County can determine how to proceed.

## Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in ambient water quality (nutrient and bacterial concentrations) in Deerpoint Lake; and
- Changes in nutrient and bacterial loads to North Bay from Deerpoint Lake.

## SECTION V: Proposed Projects, Programs and Activities

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Bay County is committed to implementing the necessary monitoring and coordinating with other regional water quality monitoring entities to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project - from feasibility study through construction and subsequent success monitoring - is approximately six years. The expected start date is 2018, and the expected end date is 2024.

Implementation of this project has been broken down into three phases, as shown in the milestone chart below.

The feasibility study through final design for each project is estimated to be 6 months to 24 months long. Design for Deerpoint Phase 2 is assumed to start after design for Deerpoint Phase 1 is complete. Construction is estimated to be 12 to 24 months long for each project.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
Water Quality Monitoring Program												
<i>Raw Water Line</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												
<i>Deerpoint Septic to Sewer Ph. 1</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												
<i>Deerpoint Septic to Sewer Ph. 2</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												

### Budget and Funding Sources

The preliminary budget is indicated in the table below. The County has estimated that the Deerpoint Phases I and II will cost \$11 million dollars. This estimate does not include the on-site costs of decommissioning the homeowner's septic tank or the cost for lateral connection installation. The raw water line cost is an estimated \$1.5 million. Water quality data will need to be collected, analyzed and reviewed to document performance for an estimated cost of \$560,000 (\$70,000 per year for 8 years). The total cost of the program is \$13.06 million dollars.

- For the Deerpoint Septic to Sewer Conversion Phase 1 the county has secured a \$1M grant from the Florida Department of Environmental Protection for improving North Bay's wastewater collection system. No money has been drawn from this grant.



Other potential leveraged funding sources identified by Bay County for this program are:

- Florida Department of Environmental Protection (FDEP)
- Gulf Power (Southern Company)
- Northwest Florida Water Management District (NWFWMMD), possibly through SWIM or springs funding
- US Environmental Protection Agency (EPA)
- NRDA Funds
- Gulf RESTORE Council/Pot 2

Matching funds for the project include Pot 1 funds for the Gulf Power Reuse Line, which is part of the overall programmatic approach. Pot 1 funds may also be used to address homeowners' connections costs once the sewage collection system has been installed.

PROJECT BUDGET		ESTIMATED DOLLARS
Monitoring		\$560,000
<i>Raw Water Line</i>		
Planning		\$100,000
Implementation		\$1,400,000
<b>Total</b>		<b>\$1,500,000</b>
<i>Deerpoint Septic to Sewer Phase 1</i>		
Planning		\$200,000
Implementation		\$6,300,000
<b>Total</b>		<b>\$6,500,000</b>
<i>Deerpoint Septic to Sewer Phase 2</i>		
Planning		\$140,000
Implementation		\$4,365,000
<b>Total</b>		<b>\$4,500,000</b>
<b>Total Cost</b>		<b>\$13,060,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$9,000,000
Direct Component		
Florida Department of Environmental Protection grant (Deerpoint Ph. 1)		\$1,000,000
Other County Funds		
Other		
<b>Total Secured Funding</b>		<b>\$10,000,000</b>
<b>Budget Shortfall</b>		<b>\$3,060,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
Florida Department of Environmental Protection (FDEP)		
Northwest Florida Water Management District (NWFWMMD)		
US Environmental Protection Agency (EPA)		

### Partnerships/Collaboration

- Florida Department of Environmental Protection (FDEP) is implementing partner.
- Other potential partners are:
  - Gulf Power (Southern Company)
  - Northwest Florida Water Management District (NWFWMDC), Possibly through SWIM program collaboration
  - Florida Department of Environmental Protection (FDEP)
  - Environmental Protection Agency (EPA)
  - Gulf RESTORE Council

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## BAY COUNTY

# St. Andrew Bay Water Quality Program

PROJECT NO. 5-2

## Project Description

### OVERVIEW AND LOCATION

The St. Andrew Bay Water Quality Program will reduce turbidity and nutrient loading into Grand Lagoon, St. Andrew Bay and North Bay by implementing projects that will stabilize dirt roads, retrofit stormwater control systems and construct a 16-acre stormwater facility (see **Figure 5-2A**).

### NEED AND JUSTIFICATION

The St. Andrew Bay estuary is ecologically and economically important, which means the quality of water going into the St. Andrew Bay is extremely important to the sensitive balance of this system. North Bay and portions of St. Andrew Bay is currently listed as an impaired waterbody for fecal coliform bacteria by FDEP under section 303(d) of the Federal Clean Water Act. Nutrients (Nitrogen and Phosphorus) and Total Suspended Solids (TSS) are also a major concern in the Bay.

A 17 year study from 1990 to 2006 on Grand Lagoon showed correlation between increasing phosphorus levels and decreasing water clarity during the study period. (Bay County) This project is part of a stormwater master planning effort for improving water quality within the St. Andrews Bay watershed. (see **Figure 5-2B**).

Bay County has successfully implemented the unpaved road stabilization project around Grand Lagoon and would like to expand this program to cover North Bay. (see **Figure 5-2C**). Reducing the sediment load dramatically reduces the TSS and allows light to penetrate to the seagrass beds.



**Figure 5-2A.** Project location in Bay County.

## PURPOSE AND OBJECTIVES

This program would focus on eliminating sediment and nutrients (Nitrogen & Phosphorus) from reaching Grand Lagoon, St. Andrew Bay, and North Bay. Model calculations show that the Grand Lagoon Regional Stormwater Facility could reduce Total Nitrogen by 43%, Total Phosphorus by 65% and Sediment by 80%. Bay County estimates stabilizing roads adjacent to North Bay would reduce TSS by 95%. Grand Lagoon, St. Andrew Bay, and North Bay are conditionally approved shellfish harvesting areas.

## PROJECT COMPONENTS

This program has five primary components: 1) Retrofit the stormwater collection system; 2) Acquire property for stormwater treatment facility; 3) Construct a 16 acre stormwater treatment facility; 4) Pave 11.27 miles of dirt roads and install vegetated stormwater swales; 5) Monitor sediment & nutrient removal.

The project will use existing data from similar retrofits to stormwater collection systems in the county to design and permit the installation of five centrifugal separation units or baffle boxes at key locations to remove trash, greases & oils, sediments and nutrients from the stormwater system prior to entering the Lagoon. The successful implementation of these systems is reliant on regular vacuum truck service to remove materials trapped by the units. This service can be used for success monitoring, to analyze the amount of material removed from the collection system. These units can be installed exclusive of the design, construction and operation of the stormwater treatment facility.

The land for the stormwater treatment facility will undergo an assessment and purchase agreement. Concurrently, the County will start the design and permitting process for the retention pond and stormwater controls. Once the property is acquired the project can be bid and awarded to a contractor to complete implementation of the project elements.

Finally, once the treatment facility is complete, post-construction monitoring of surface waters and sediments in the treatment facility and Grand Lagoon can commence.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

St. Andrews Bay is an ecologically important estuary that supports numerous fisheries and has a high recreational value. Overall, the stormwater retrofits and the regional stormwater treatment facility will significantly reduce environmental impacts to Grand Lagoon and St. Andrews Bay resulting in: 1) improved water quality in the estuary, 2) reduced nitrogen loading, and 3) reduced regulatory water quality requirements.



**Figure 5-2B. Proposed Grand Lagoon Stormwater Treatment Facility.**



## SECTION V: Proposed Projects, Programs and Activities

The St. Andrew Bay Water Quality Program will improve regional stormwater collection and treatment. These projects will help protect the waters of Grand Lagoon and St. Andrew Bay as the County continues to grow, improve its economy, and grow the tax base. The improvement of water quality will preserve the appeal of Bay County waters as a tourist destination and improve the local fishery. Construction of the proposed project will increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts.

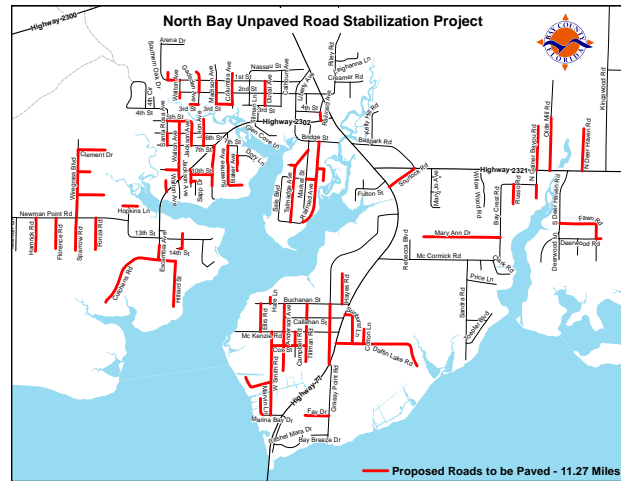


Figure 5-2C: Proposed North Bay Road Stabilization.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources

### Implementing Entities

Bay County will be the primary implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project.

## Best Available Science and Feasibility Assessment

Significant work has been done to monitor and characterize water quality in the St. Andrew Bay watershed and to implement water quality improvement and protection programs. The Northwest Florida Water Management District (NFWFMD) is currently in the process of updating the St. Andrew Bay Watershed Surface Water Improvement and Management (SWIM) Plan. This project is consistent with the goals of the currently approved plan:

- NFWFMD, 2000. St. Andrew Bay Watershed SWIM Plan.

It also addresses current watershed and water resource issues identified in supporting documentation for the 2017 update to the SWIM Plan:

- Draft St. Andrew Bay Watershed Characterization. Ecology and Environment, Inc., 2016. Prepared for the NFWFMD.

This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

## Risks and Uncertainties

The stormwater retrofits pose little risk as the technology has been available for many years and have a proven track record for success. The regional stormwater treatment area is contingent upon the proposed parcel's availability for sale as a critical piece in this program's success.

## Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Tracking the amounts (weights) of trash, sediments and nutrients removed from the stormwater collection units
- Tracking water quality in the stormwater treatment facility.
- Changes in ambient water quality (nutrient and bacterial concentrations) in Grand Lagoon; and

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Bay County is committed to implementing the necessary monitoring and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The planning, implementation, and success monitoring of this project is anticipated to be spread over a 7-year period, as shown in the milestone chart below.

## SECTION V: Proposed Projects, Programs and Activities

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Stormwater Retrofit Product Selection & Permitting												
Phase 1 Construction – Stormwater Retrofits												
Property Acquisition												
Design & Permitting of Stormwater Treatment Facility												
Phase 2 – Construction – Stormwater Treatment Facility												
Success Monitoring												

### Budget and Funding Sources

The preliminary budget is indicated in the table below. The County has estimated that the property acquisition will cost \$1.6 million dollars. The design and permitting work would be conducted by County Staff.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$150,000
Implementation		\$7,000,000
Monitoring		\$200,000
<b>Total Cost</b>		<b>\$7,350,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$3,660,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds – (In-kind, In-house Engineering Design)		\$350,000
<b>Total Secured Funding</b>		<b>\$4,010,000</b>
<b>Budget Shortfall</b>		<b>\$3,340,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FDEP		
NWFWMD		
NRDA		
NFWF		

### Partnerships/Collaboration

- Other potential partners are:
  - Northwest Florida Water Management District (NWFWMD), Possibly through SWIM program collaboration
  - Florida Department of Environmental Protection (FDEP)

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## GULF COUNTY

# Septic to Sewer Project

PROJECT NO. 6-1

### Project Description

#### OVERVIEW AND LOCATION

This program will fund a septic to sewer conversion and sewer upgrade program that will protect the water quality of St. Joseph and Apalachicola Bays by removing ongoing sewage inputs to these watersheds. The Beacon Hill and Wewahitchka projects are septic to sewer conversions affecting 850 small urban lots. The Port St. Joe project proposes to replace/upgrade 27,300 linear feet of existing sewer that has experienced numerous failures due to old, inferior pipe material, affecting 260 small urban lots. The general location of the three program components are shown in **Figure 6-1A**.

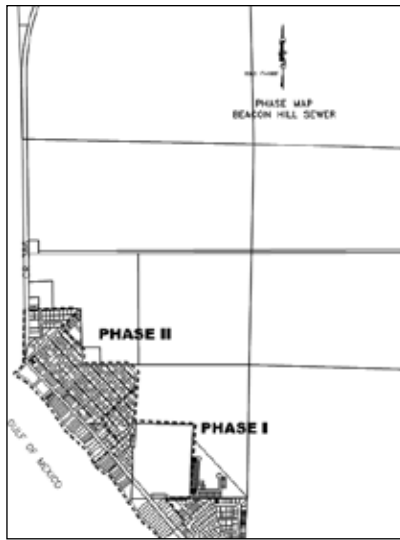
#### NEED AND JUSTIFICATION

Much of the region's economic base depends on the seafood industry associated with Apalachicola and St. Joseph Bay and ecotourism associated with the area's coastal aquatic preserves and beaches. The sustainability of natural resources within the region and protecting the health and productivity of these waterbodies is critical. Several waterbodies in Gulf County (and downstream of Gulf County waters) are designated Outstanding Florida Waters (OFW) because of their natural attributes, giving them special protection from water quality degradation: the Chipola River, the Apalachicola River, Apalachicola Bay, and St. Joseph Bay. St. Joseph Bay, a designated Aquatic Preserve and Gulf of Mexico Ecological Management Site (GEMS), is currently listed as impaired for nutrients and fecal coliform bacteria by FDEP under section 303(d) of the Federal Clean Water Act. Apalachicola Bay, an Aquatic Preserve, GEMS Site, and National Estuarine Research Reserve (NERR), has also been listed as impaired for bacteria in shellfish and fecal coliform bacteria. Protection and improvement of water quality in these bays is of significant economic and ecological importance.

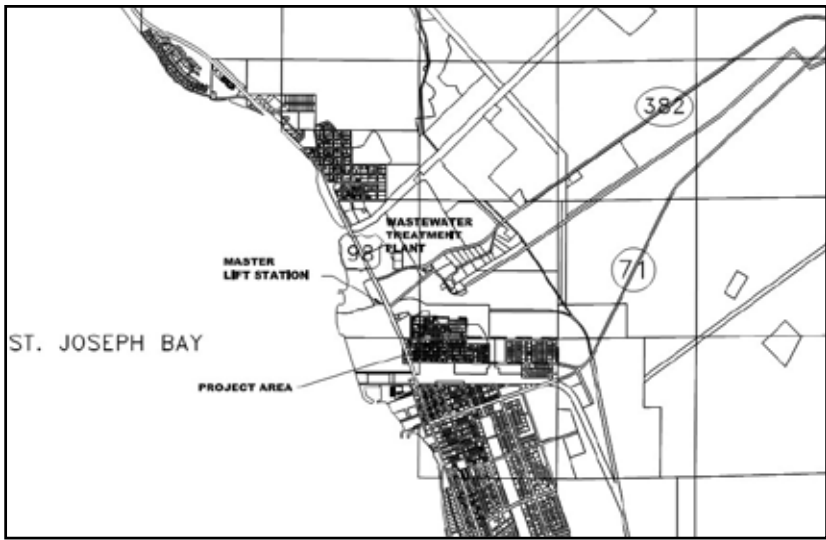


**Figure 6-1A.** Project location in Gulf County.





**Figure 6-1B.** Project Area for Beacon Hill.



**Figure 6-1C.** Port St. Joe Sewer Rehabilitation General Project Area.

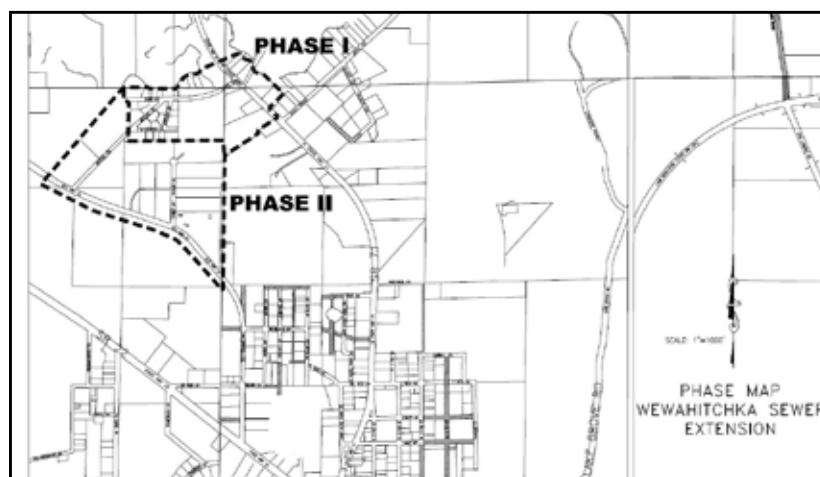
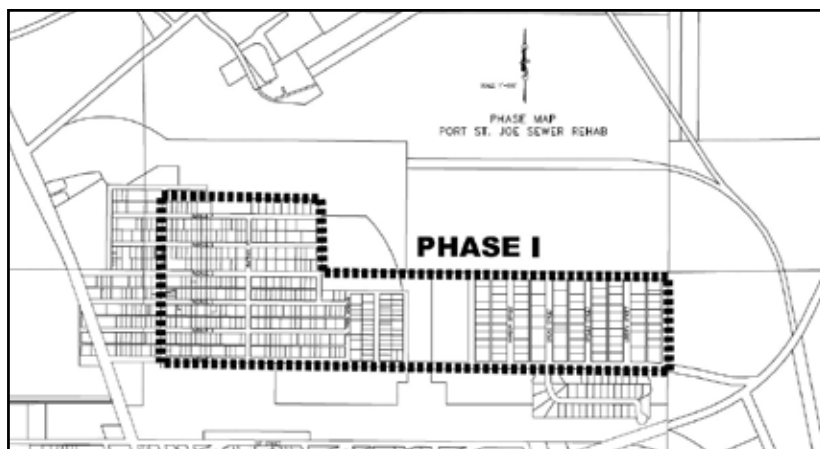
Aging septic systems and sewer infrastructure can contribute to the degradation of water quality in nearby waterbodies. Bacteria and viruses can be transmitted to surface and ground waters through many of the existing septic tanks, exposing residents and tourists alike to harmful pathogens. Additionally, these water quality impairments are a direct threat to many of the region's species of concern. The projects in this program will improve water quality and reduce nutrient and bacterial loads to by eliminating aging and failing sewer infrastructure directly adjacent to St. Joseph Bay; and by replacing septic systems and providing advanced wastewater treatment near public beaches and the portions of the Apalachicola River Watershed.

### PURPOSE AND OBJECTIVES

The program is designed to improve water quality through the conversion of septic tanks to centralized sewers in areas impacting Apalachicola River Watershed, including Apalachicola Bay, and St. Joseph Bay, adjacent estuaries on the Gulf of Mexico. Existing septic systems are contributing sources of water pollution to our environment impacting health and safety of humans and marine life habitat. The removal of the septic tanks will reduce the nutrient loading in the watershed. With a sanitary sewer system in place there will be increased protection of surface and ground waters for now and years to come. The proposed projects will build upon previous efforts to abandon residential septic systems and provide residents access to a safe and sanitary sewer system. These efforts are in line with many of the State and Federal agencies actions to protect surface and ground water, listed species, and decreased risk of exposing residents and tourists alike to harmful pathogens in the near shore area.

### PROJECT COMPONENTS

Project 1: No sewer infrastructure exists in Beacon Hill, along Highway 98 between St. Joe Beach and Mexico Beach, so septic tanks are used for wastewater treatment. Approximately 8 years ago, the City of Port St. Joe (City) constructed a sewer main from their lift station in St. Joe Beach to Beacon Hill. This line has not been put into service and is considered a "dry line" (a public or private sewer lateral that is intended for future use when authorized). This project proposes to utilize the "dry line" by constructing a new lift station and low pressure collection system to service approximately 650 customers in Beacon Hill. This will allow the abandonment of approximately 390 septic tanks. The abandonment will occur in two phases. In Phase I, 65 septic tanks will be



**Figure 6-1D (top).** Port St. Joe Sewer Rehabilitation Project Area.

**Figure 6-1E (bottom).** Wewahitchka Sewer Expansion Phase 1 and 2 - Project Area.

abandoned. In Phase II, there will be 325 septic tanks abandoned (see **Figure 6-1B**).

**Project 2:** Currently, older neighborhoods in the City of Port St. Joe have a 50 to 60 year-old sewer infrastructure that was built primarily with terracotta pipe, which is prone to failure and no longer used for sewer infrastructure. In Phase I the existing pipe has had leakage problems and road collapses due to failures over the system's 27,300 linear feet. The frequency of failures has led to the conclusion that replacement is the better long term option, because terracotta cannot be relied on as a safe, reliable long term method for sewage conveyance (see **Figures 6-1C and 6-1D**).

**Project 3:** Currently, the city of Wewahitchka does not have a central sewer system in the utility franchise area. The city is proposing to construct an extension to their existing low pressure sewer system and add lift stations to provide sewer to this area. This will allow at least 50 septic tanks to be abandoned, although the property appraiser's

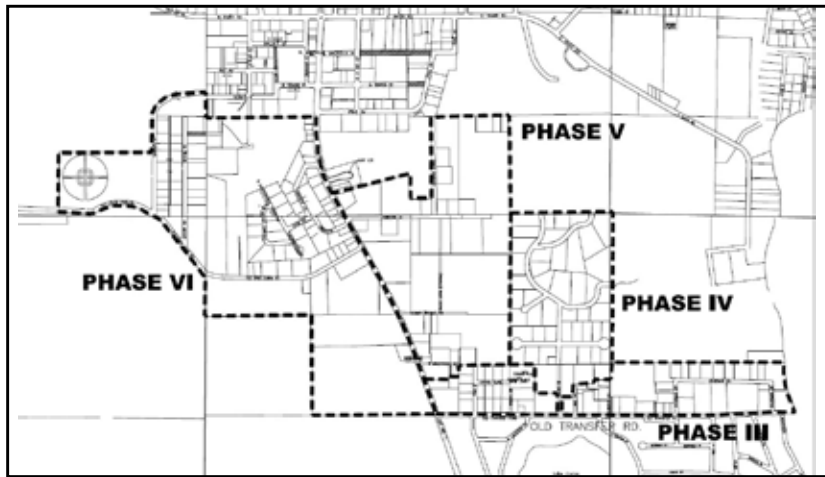
database indicates 260 parcels in Phase I; there are six phases planned. This will help reduce the impacts on the Chipola River in the Apalachicola Watershed, including the Apalachicola Bay (Bay), and the Gulf of Mexico (Gulf) (see **Figures 6-1E and 6-1F**).

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

St. Joseph Bay and Apalachicola Bay are widely recognized to be of special ecological significance and have been given protective designations to reflect their importance to the Gulf of Mexico ecosystem. Due to the sensitive nature of the receiving waters, these areas are considered high priority for protection, restoration, and conservation. Removal of pollution sources will improve and continue to protect their water quality and natural resources. St. Joseph Bay and Apalachicola Bay host vital seagrass resources which support numerous fish and invertebrate species, including many of commercial importance. Good water quality is essential for the maintenance of healthy seagrass systems and oyster bars. The rehabilitation of an existing sewer lines, installation of a new sanitary sewer

system to two communities and removal of existing septic tanks will increase the protection of surface and ground waters for years to come.

The expansion of sewer to these residential areas will contribute to economic growth in the county. This expansion will help the county to grow, improve its economy, and grow the tax base. This work will help tourism, increase local supplies of seafood and provide job opportunities.



**Figure 6-1F. Wewahitchka Sewer Expansion Phase 3 through 6 - Project Area.**

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

The City of Port St. Joe will be the implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of the Beacon Hill and Port St. Joe projects. The City of Wewahitchka will be the implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of the Wewahitchka project. They have coordinated with Florida Department of Environmental Protection and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

### Best Available Science and Feasibility Assessment

The importance of good water quality in St. Joseph Bay, the Apalachicola River, and Apalachicola Bay has been well studied and characterized. The Northwest Florida Water Management District (NFWFMD) is currently in the process of updating the Surface Water Improvement and Management (SWIM) Plans for the St. Andrew Bay watershed (which includes St. Joseph Bay) and the Apalachicola River and Bay watershed. The components of this program directly address the priority issues identified by NFWFMD in public presentations outlining the upcoming SWIM Plan updates. This project is consistent with the goals of the currently approved plans:

- NFWFMD, 2000. St. Andrew Bay Watershed SWIM Plan
- FDEP, 2008, St. Joseph Bay Aquatic Preserve Management Plan
- NFWFMD, 1996. Apalachicola River and Bay SWIM Plan
- FDEP, 2013, Apalachicola NERR Management Plan

It also addresses current watershed and water resource issues identified in supporting documentation for the 2017 updates to the SWIM Plans:

- Draft St. Andrew Bay Watershed Characterization. Ecology and Environment, Inc., 2016. Prepared for the NFWFMD
- NFWFMD, June 6, 2017, Apalachicola River and Bay Watershed SWIM Plan Update Presentation

These projects appear to be feasible. However, they are only at the conceptual phase. The project will be fully evaluated for feasibility as preliminary design is completed.

### Risks and Uncertainties

These projects are in the conceptual phase; there have been no study or design work completed on this project. The risks will be identified during the feasibility and design phases.

### Success Criteria and Monitoring

The projects in this program will affect water quality in an adjacent and downstream freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in ambient bacterial concentrations related to human wastewater downstream of removed septic tanks in waterbodies which contribute to the Chipola River, St. Joseph Bay, and the Gulf of Mexico;
- Changes in bacterial loads to the Chipola River, St. Joseph Bay, and the Gulf of Mexico from wastewater sources; and
- Changes in the frequency of sewage pipe failures and accidental releases of sewage to St. Joseph Bay from sewage pipes.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Gulf County is committed to implementing the necessary monitoring and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this program's implementation - from permit modification through success monitoring - is approximately 3-4 years. The expected start date is 2018, and the expected end date is 2022. Implementation of this program has been broken down into the three project components, with four phases each, as shown in the milestone chart below. Water quality-based success monitoring will extend two years beyond the end of construction activities.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
Water Quality Monitoring Program												
<i>Beacon Hill Septic to Sewer</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												
<i>Port St. Joe Sewer Upgrade</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction (Port St. Joe Sewer Upgrade)												
<i>Wewahitchka Septic to Sewer</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												

## Budget and Funding Sources

The total cost of the program is \$13.22 million dollars. These projects are in the feasibility stage so the planning money will go to design which is estimated to be 3% of the total project cost. These estimated project costs do not include the on-site costs of decommissioning the homeowner's septic tank or the cost for lateral connection installation. The county has also secured funding from the State Revolving fund for the Beacon Hill and Wewahitchka septic to sewer projects. The county will be seeking over \$5.0 million from the state revolving fund.



## SECTION V: Proposed Projects, Programs and Activities

PROJECT BUDGET		ESTIMATED DOLLARS
Monitoring		\$360,000
<i>Beacon Hill Septic to Sewer Phase I &amp; II</i>		
Planning		\$120,000
Implementation		\$3,880,000
	<b>Total</b>	<b>\$4,000,000</b>
<i>Port St. Joe Sewer Upgrade Phase I</i>		
Planning		\$180,000
Implementation		\$5,820,000
	<b>Total</b>	<b>\$6,000,000</b>
<i>Wewahitchka Septic to Sewer Phase I to IV</i>		
Planning		\$90,000
Implementation		\$2,816,000
	<b>Total</b>	<b>\$2,906,000</b>
	<b>Total Cost</b>	<b>\$13,266,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$7,000,000
Direct Component *		\$0
Other Grants or Co-Funding		
Other County Funds		
Other		
	<b>Total Secured Funding</b>	<b>\$7,000,000</b>
	<b>Budget Shortfall</b>	<b>\$6,266,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
Direct Component *		\$899,000
State Revolving Loan Fund – Beacon Hill		\$2,700,000
State Revolving Loan Fund – Wewahitchka		\$2,700,000

\*County is committed to contributing \$300k for Beacon Hill and \$599k for Wewahitchka for a total of \$899k.

### Partnerships/Collaboration

Gulf County has a great cooperative relationship with the City of Wewahitchka and the City of Port St. Joe and has also partnered with the Florida Department of Environmental Protection (FDEP) as an implementing partners. The County is likely to partner with other agencies in the development of this program such as: Northwest Florida Water Management District (NFWFMD), Environmental Protection Agency (EPA) and Gulf RESTORE.

# GULF COUNTY

## Coastal Access Program

PROJECT NO. 6-2

### Project Description

#### OVERVIEW AND LOCATION

This program involves public land acquisition and the construction and/or improvement of recreational amenities to enhance public access to the Chipola River, Dead Lakes, St. Joe Bay and the Gulf of Mexico. The County has evaluated several priority sites, the location of which are shown in **Figure 6-2A**.

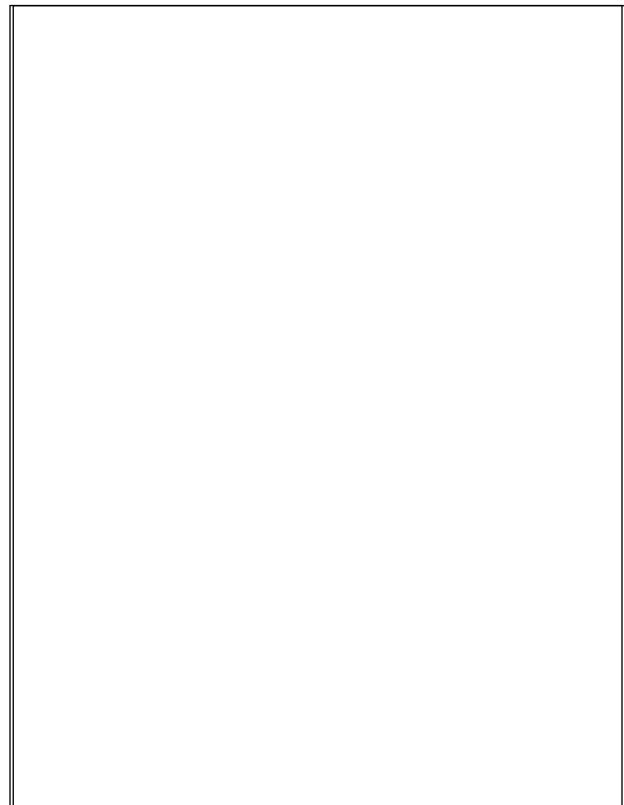
#### MAP OF POTENTIAL PUBLIC ACCESS POINTS NEED AND JUSTIFICATION

Gulf County is a rural, sparsely populated coastal county with abundant natural resources. For these reasons the county is experiencing a growth in eco-tourism; however, recreational opportunities are often over capacity during seasonal influxes of visitors. In addition, navigational access to the Gulf of Mexico by recreational boaters in Gulf County is often overwhelmed during scallop season. Therefore, there is a need to acquire additional public coastal access sites and develop supporting recreational amenities at these sites.

The County is looking to bolster existing locations and partner with other agencies to expand the types of recreational amenities offered. Coastal access in the county has historically focused on boat ramps, and this program would further that work, while also creating non-motorized vessel launch facilities and other park amenities.

#### PURPOSE AND OBJECTIVES

The purpose of this program is to acquire additional coastal access sites throughout the county. Objectives of the program include: 1) increase publicly-owned passive recreational facilities in the coastal zone; 2) enhance public access to the coastal zone and Gulf of Mexico; 3) grown the eco-tourism industry in Gulf County. by acquiring and



**Figure 6-2A.** Project location in Gulf County.

## SECTION V: Proposed Projects, Programs and Activities

developing park sites for passive recreation.

### PROJECT COMPONENTS

Gulf County would commission a feasibility study to locate and assess the best locations around the County for boat ramps focusing on access to the Chipola River, Dead Lakes, St. Joe Bay and Gulf of Mexico.

Sites may include existing county-owned facilities where a new boat ramp, floating docks, stabilized parking and restroom facilities are warranted. The study will also look at working with other local, state and federal agencies including City of Port St. Joe, State Parks, FWC, NFWFMD, and USFWS to establish a cooperative agreement to enhance publically held lands. Finally the study will assess acquisition of private lands that may be on the market for public access and boat ramp facilities as well (see **Figure 6-2B**).



**Figure 6-2B. Indian Pass Boat Ramp.**

Components of this program include: 1) identification and prioritization of sites for public acquisition; 2) acquisition of priority sites; 3) engineering design and permitting of site improvements; and 4) success monitoring. Gulf County does not have a formal conservation lands acquisition program. Therefore, Spill impact Component funds would be used to develop and implement such a program, with a focus on coastal passive recreation sites.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will bolster eco-tourism as a component of the Gulf County economy, and provide improved public access to their growing number of residents.

### Eligibility and Statutory Requirements:

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 10: Promotion of Tourism in the Gulf Coast Region, including recreational fishing.

### Comprehensive Plan Goals and Objectives:

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objective:

- Consortium Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.

## Implementing Entities

Gulf County will be the sole implementing entity and grant sub-recipient responsible for land acquisition, design, permitting, construction and success monitoring.

## Best Available Science and Feasibility Assessment

This is primarily a land acquisition and recreational amenity improvement project; therefore, a Best Available Science analysis is not applicable. This project is considered to be feasible with respect to the ability to: 1) secure necessary property agreements and permits; 2) construct the proposed recreational improvements; and 3) operate and maintain the improved infrastructure over the long term.

## Risks and Uncertainties

Coastal park and recreational amenities are at risk for damage by tropical storms and sea-level rise. However, the proposed recreational improvements will factor coastal storm hazards and sea level rise into the design, as appropriate. Gulf County has identified priority properties and is ready to proceed with property acquisitions and improvements.

## Success Criteria and Monitoring

This program will involve property acquisition and the development of recreational amenities. Specific success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Acres of coastal access properties acquired;
- Increase in the number of public recreational users.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Gulf County is committed to conducting the monitoring necessary to quantify project benefits.

## Project Milestones and Schedule

The total estimated time horizon of this project is approximately 5four years. The expected start date is 2018, and the expected end date is 2022. The project milestone chart is shown below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Property Feasibility/Assessments												
Property Acquisition												
Boat Ramp/Amenity Design & Permitting												
Construction of Recreational Amenities												
Success Monitoring												

## SECTION V: Proposed Projects, Programs and Activities

### Budget/Funding and Leveraged Resources

Gulf County has estimated the total cost to acquire and improve identified priority waterfront properties to be approximately \$2,000,000. The County is proposing to use \$2,000,000 of their Spill Impact Component allocation to implement this program. A summary of the cost and funding sources for this program is provided in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning (feasibility, design & permitting)		\$250,000
Implementation (property acquisition & construction)		\$2,360,000
Monitoring		\$50,000
<b>Total Cost</b>		<b>\$2,660,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$2,660,000
Direct Component		\$0
Other Grants or Co-funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$2,660,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA Recreational Component		

### Partnerships/Collaboration

Gulf County may seek to partner with the Florida Fish and Wildlife Conservation Commission in the acquisition and management of the subject properties.



## GULF COUNTY

# Coastal Erosion Control Project

PROJECT NO. 6-3

## Project Description

### OVERVIEW AND LOCATION

The St. Joseph Peninsula sticks into the Gulf of Mexico like a thumb, a salient feature along the coastline which takes the full brunt of the Gulf's fury as storms approach. The Gulf County Coastal Erosion Control Project includes placing a series of segmented, submerged breakwater structures at critically eroded locations in support of a beach nourishment effort at Stump Hole along the south end of the St. Joseph Peninsula (see **Figure 6-3A**).

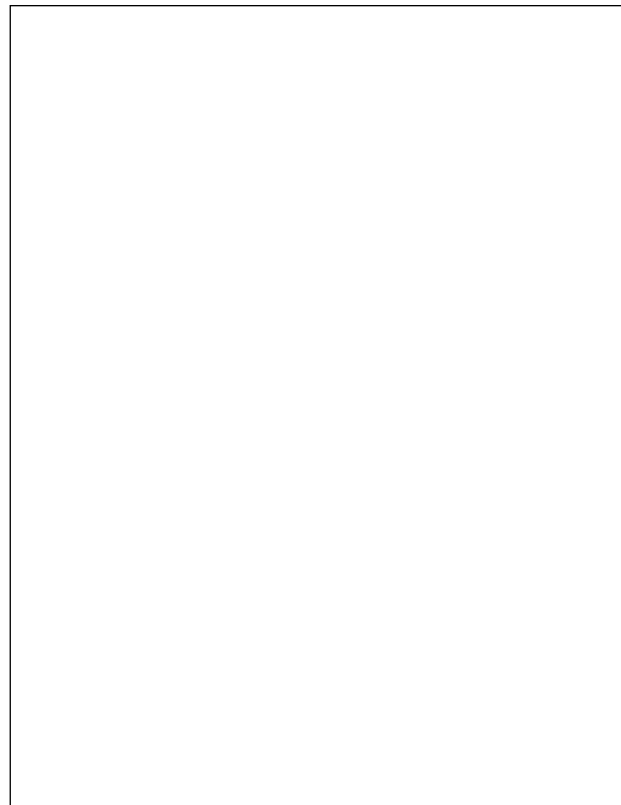
### NEED AND JUSTIFICATION

In 2009, the St. Joseph Peninsula Beach Restoration Project in the area placed 3.6 million cubic yards of sand along 7.5 miles of the beach. This reach has lost on average 26 feet of beach width per year since that project was completed. This monitoring data shows that beach nourishment alone is not enough to sustain this beach. Gulf County has held preliminary permitting meeting with FDEP, USACE and USFWS and determined that a segmented, submerged breakwater would provide the most protection while reducing impacts to sea turtle nesting activity.

This beach is not only a popular recreation spot with over 100,000 visitors per year (FDEP Permit, 2007), it establishes the barrier between the Gulf of Mexico and St. Joseph Bay which is home to critical habitats and species endemic to the area. This recreational area is part of the St. Joseph Peninsula State Park, protects a crucial highway route (Hwy 30E) to the north St. Joseph Peninsula and is the location of a Tyndall Air Force Base tracking station.

### PURPOSE AND OBJECTIVES

The purpose of this project is to reduce erosion to the beach nourishment project being constructed along the



**Figure 6-3A.** Project location in Gulf County.

## SECTION V: Proposed Projects, Programs and Activities

St. Joseph Peninsula in 2018.

The objectives of the project are to: 1) reduce beach erosion; 2) stabilize adjacent shorelines; and 3) enhance recreational opportunities and aesthetics for local residents. The goal is to extend the interval between beach nourishment projects reducing the maintenance costs to the County and the State of Florida, as a cost share partner.

### PROJECT COMPONENTS

The project proposes to place thirteen segmented, submerged breakwaters 200 feet in length and 40 feet in width from R-101 to R-105.5 with 100 foot gaps between each structure (MRD, 2017) (see **Figure 6-3B**). In order to reduce scour and settlement of the breakwaters, marine mattresses will be used as base layer. (see **Figure 6-3D**) The armor stone that will make up the breakwater material will be based on the final location and water depths at the project site and therefore are still to be determined in the final design phase. The project will dissipate wave energy, creating a

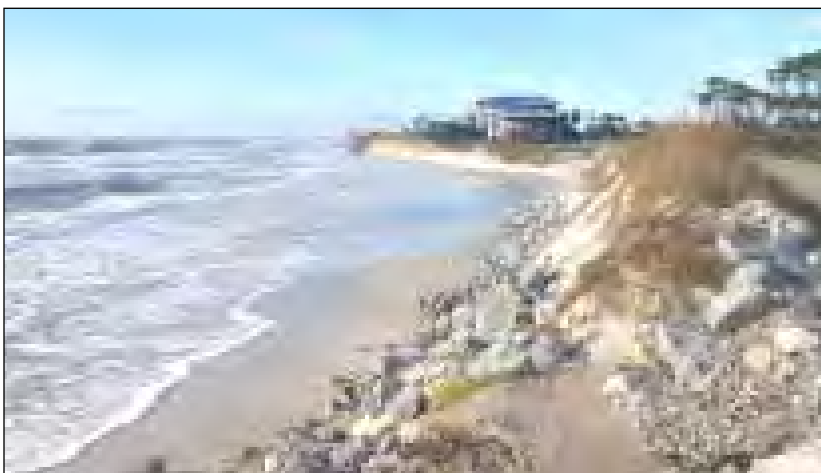
quiescent area landward of the breakwaters where sediment can fall out of suspension and accumulate in the lee of the structures. Longshore transport processes are not interrupted, so sand is still allowed to migrate laterally as the breakwater hold the “toe of slope.” The structures create a “cusped” beach as depicted in **Figure 6-3C** below.

Increased beach width not only provides more protection for beach recreation and protection for the highway and other infrastructure, but it also provides additional area for sea turtle and shorebird nesting.

In addition to protecting the shoreline the segmented breakwaters will also create a nearshore artificial reef. The reef may be ephemeral (covered in sand during portions of the year), but this is typical of hardbottom found in the nearshore area. There are several unique species of marine invertebrates and crustaceans that thrive in this environment. It also will improve recreational fishing in the area attracting baitfish, whiting, pompano, redfish, sheepshead, and snappers.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The St. Joseph Peninsula has flourished with an increase in the amount of tourists and part time residents over the past decade. This project will protect the infrastructure and roadway that provides the access to the peninsula.



**Figure 6-3B.** Existing erosion north of Stump Hole (MRD Assoc, 2017).



**Figure 6-3C.** Proposed Breakwater Alignment Plan View (MRD Assoc, 2017).

The project will also employ local workers which will support economic recovery efforts.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.

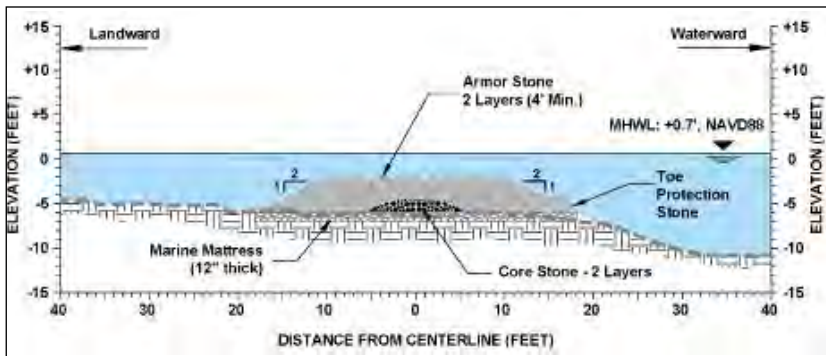


Figure 6-3C. Proposed Breakwater Cross Section View (MRD Assoc, 2017).

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 4: Restore and Enhance Natural Processes and Shorelines.

## Implementing Entities

Gulf County will be the implementing entity and sole grant sub-recipient responsible for the design, permitting, construction and success monitoring of the program.

## Best Available Science and Feasibility Assessment

Studies on the conditions on the St. Joseph Peninsula have been researched by state and local agencies as well as engineering consultants for decades. Key documents that make up the basis for this project are included below:

- St. Joseph Peninsula South Beach Erosion Control Project Design Report. MRD Associates, Inc. March 2017.
- FDEP Permit issued December 2007.

As discussed above, the need and justification for the project are well established; however, the final design must be addressed. Final permits and notice-to-proceed must be obtained from FDEP and USACE, however, these agencies have already authorized in permits for the beach nourishment project.

### Risks and Uncertainties

At this time the final design will still determine 1) the distance offshore/depth for the breakwater, 2) segment gap dimensions and 3) armor stone material. The shoreline response has been predicted using numerical modeling software, but the actual effect will need to be monitored closely. The standard requirement for FDEP permit compliance is 5 years with annual reporting. The design of this project would allow for some adjustments to the breakwaters to achieve the desired shoreline protection.

### Success Criteria and Monitoring

Gulf County will perform post-construction surveys to ensure compliance with the project plans and specifications and monitor the response of the beach after the structures are placed. Beach and structure surveys will be based off existing DEP Range Monuments and profiles/cross sections will be at published offsets and azimuths. Additionally, sea turtle and benthic surveys will monitor the response of marine life to the breakwater installation. Gulf County is committed to conducting the success monitoring necessary to quantify project benefits.

### Milestones and Schedule

This final design, implementation, and success monitoring of this project is anticipated to be spread over a 9-year period, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Final Design, Permitting, Bidding												
Deployment of Reef Segments												
Success Monitoring												

## Budget and Funding Sources

A total cost estimate has been developed by Gulf County based on the best available information and a number of assumptions. This preliminary cost estimated is shown in the budget table below. The completion of the final design is expected to result in a detailed cost estimate.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$100,000
Implementation	\$5,520,000
Monitoring	\$380,000
<b>Total Cost</b>	<b>\$6,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$3,000,000
Direct Component	\$0
Other Grants or Co-Funding (FDEP)	\$2,000,000
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$5,000,000</b>
<b>Budget Shortfall</b>	<b>\$1,000,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
NRDA	
NFWF	
Pot 2/FDEP	

Gulf County plans to apply for additional grant funding/leveraging to make up the overall project budget shortfall. However, the project will be phased in a manner that will allow for completion of portions of the project based on the amount of funding available.

## Partnerships/Collaboration

Florida Department of Environmental Protection – Beach Management Funding Assistance Program (BMFA) will likely contribute about 30% of the overall project cost.



## FRANKLIN COUNTY

# Emergency Operations Center

### PROJECT NO. 7-1

## Project Description

### OVERVIEW AND LOCATION

This project will create a new Emergency Operations Center (EOC) for Franklin County. Potential locations are shown in **Figure 7-1A**.

### NEED AND JUSTIFICATION

Franklin County's current EOC building is located in an old Division of Forestry Building on the shores of Apalachicola Bay and is currently in a flood zone. There is the need for a new building, in a sustainable location, with the latest technology to serve the residents and visitors in Franklin County.

### PURPOSE AND OBJECTIVES

The purpose of this project is to 1) move the EOC building to a location out of the floodplain, 2) provide a new facility with state-of-the-art technology, 3) promote sustainability in this coastal community. This new EOC will allow Franklin County to respond in a timely manner to a wide array of emergency situations.

### PROJECT COMPONENTS

Franklin County will commission a feasibility study to hire a consultant to determine the best location for the new EOC and begin the design process. Once a location and design are determined, building permits will be acquired and the project will be bid out to a contractor. The new EOC will be built to exceed the latest standards and allow multiple local, state and federal agencies to utilize the facility as their base of operations for extended periods of time during an emergency. The building will also have facilities for training and simulation events to prepare for emergency situations.



**Figure 7-1A.** Project location in Franklin County.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

Design and construction will employ local consultants and contractors.

### Implementing Entities

Franklin County will be the sole sub-recipient on the grant responsible for design, permitting and construction of the EOC.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Activity 6: Infrastructure projects benefitting the economy or ecological resources, including port infrastructure (primary).

### Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 4: Enhance Community Resilience (primary); and
- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 5: Promote Community Resilience; and
- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary).

### Best Available Science and Feasibility Assessment

Best available science will be applied to this project in terms of using sea-level rise projections as part of the feasibility study and property assessment in the process of selecting the new EOC site.

The project is feasible and will create a more sustainable community for Franklin County's future.

### Success Criteria/Metrics/Outcomes and Monitoring/Evaluation

Franklin County's EOC can be evaluated based on the improvements over the existing structure. However, the true test will unfortunately be the first emergency that requires a multi-agency response based out of the new EOC. The timetable for that emergency is unknown. During the feasibility study and design, a comprehensive plan will be developed to assess the success of the project.

## Milestones and Schedule

The planning, implementation, and success monitoring of this program will be spread over a 4-year period, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
EOC Feasibility Study												
EOC Design & Permitting												
EOC Bidding & Construction												
Success Monitoring												

## Budget and Funding Sources

A preliminary cost estimate has been developed by Franklin County and their consultants based on the best available information and prior projects. This preliminary cost estimated is shown in the budget table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$250,000
Implementation		\$620,000
Monitoring		\$30,000
<b>Total Cost</b>		<b>\$1,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,000,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$1,000,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA		
NFWF		
Pot 1		

## Partnerships/Collaboration

Franklin County plans to apply for additional grant funding/leveraging to apply towards the overall project budget. If successful, these funds would be allocated to other future sustainability efforts in Franklin County.

## FRANKLIN COUNTY

## Oyster Restoration Project

PROJECT NO. 7-2

## Project Description

## OVERVIEW AND LOCATION

The Franklin County Oyster Restoration Project involves the placement of substrate (cultch) on degraded reefs in Apalachicola Bay (see **Figure 7-2A**) to restore oysters and oyster reefs that have been lost or damaged as a result of drought, hydrologic changes, increased salinities, disease and predation, and over harvest of oysters.

OYSTER RESTORATION PROJECT  
LOCATION NEED AND JUSTIFICATION

The proposed project is needed to recover from the oyster fishery failure declared in Apalachicola Bay (and Florida's west coast) by NOAA in 2013. The resource disaster was declared pursuant to the Inter-Jurisdictional Fisheries Act and the Magnuson-Stevens Fishery Conservation and Management Act, based on reduced numbers of oysters and associated economic and ecological resources following the dramatic decline in oysters and oyster harvesting trips in Apalachicola Bay after August 2012. The effects on the fishery are anticipated to continue over multiple generations, thereby compromising the long term sustainability of the reefs. The project is justified by the demonstrated success of historical cultching efforts since the 1880s and cultching projects implemented in Apalachicola Bay in response to hurricanes in 1985.



**Figure 7-2A.** Project location in Franklin County.

## SECTION V: Proposed Projects, Programs and Activities

## PURPOSE AND OBJECTIVES

The purpose of the proposed project is to restore oyster reef habitat and associated ecological functions for estuarine dependent species, in support of ecological and economic sustainability of Apalachicola Bay, via placement of cultch in subtidal areas to create, expand, or enhance oyster abundance at existing reefs. The objectives of the project are to:

- Provide suitable habitat for oyster settlement;
- Provide three-dimensional living structural habitat for oysters and associated species; and
- Recover and support a sustainable regional oyster fishery.



**Figure 7-2B.** Locations of potential restoration sites in Apalachicola Bay (Source: FDACS).

These objectives, and the proposed approach for restoration, are consistent with those developed for oyster restoration in the Gulf of Mexico by NOAA (2016) as part of the **Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement**.

## PROJECT COMPONENTS

The proposed project is one of several oyster reef restoration projects proposed by Franklin County and Florida counties that, combined, will have regional benefits along the Florida Gulf coast. Cultch, e.g. natural shell or other suitable material, will be placed on existing and/or former subtidal oyster reefs in the Bay, thereby providing the substrate on which oysters can settle, as well as structural habitat for numerous other recreationally and commercially important species. Approximately 35,000 cubic yards (cy) of suitable oyster reef substrate will be placed in designated locations (see **Figure 7-2B**).

Large and small barges will be used, depending on the depth at the reef location, and cultch will be deployed from barges (see **Figure 7-2C**) to form parallel ridges of appropriate thickness on hard bottom.

Components of the proposed project include:

- Site selection confirmation;
- Cultch placement on existing and historic locations of oyster reefs at appropriate depths on appropriate hard bottom, with considerations for elevation relative to mean low water; and
- Pre- and post- monitoring and data collection.



Data for in-situ water quality and bay bottom characteristics will be collected to inform site selection, cultch volumes, and monitoring. A shellfish hatchery to provide a source of oyster larvae to local oyster reefs and others along the Gulf Coast may be proposed for a future phase.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

The proposed project will contribute to the recovery of the oyster reefs and associated ecological sustainability in Apalachicola Bay, a designated Outstanding Florida Water, Aquatic Preserve, and National Estuarine Research Reserve. Oysters are an ecological keystone species and contribute to the integrity and healthy function of the nearshore ecosystem. “Healthy, interconnected oyster populations form reefs that provide the hard substrate needed for oyster larvae to settle, grow, and sustain the population. In addition to providing habitat for oysters, oyster reefs: 1) serve as habitat for a diversity of marine organisms, from small invertebrates to large recreationally and commercially important species such as stone crab, blue crab, red drum, and black drum; 2) provide structural integrity that reduces shoreline erosion; and 3) improve water quality and help recycle nutrients by filtering large quantities of water” (Grabowski et al. 2012, NOAA 2016).

The proposed project will also contribute to the recovery of Florida’s oyster fishery and our artisanal oyster harvesting (hand tonging). Oyster landings from Apalachicola Bay in the last half century accounted for about 90 percent of Florida’s commercial oyster harvest (Arnold and Berrigan 2002) and were harvested primarily from public reefs. In 2012, Apalachicola Bay oyster fishers harvested more than three million (\$3M) pounds of oyster meat, about 92 percent of the Florida oyster harvest and 10 percent of the harvest nationwide; the total declined to around \$1M pounds in 2013, affecting the 12,000 to 14,000 seafood industry jobs in Franklin County (Pillon, 2014).

## Eligibility and Statutory Requirements

The proposed project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region (primary);
- Activity 2: Mitigation of damage to fish, wildlife, and natural resources (secondary); and
- Activity 4: Workforce development and job creation (secondary).



**Figure 7-2C.** Cultch being placed on a bay bottom from a barge for restoration (source: White 2012).

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources;
- Goal 4: Enhance Community Resilience; and
- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 3: Protect and Restore Living Coastal and Marine Resources;
- Objective 5: Promote Community Resilience.

### Implementing Entities

Franklin County will be the implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring for the proposed project. Franklin County will coordinate with appropriate agencies during planning and implementation of this project and may collaborate with agencies or other entities via leveraging and other funding agreements.

### Best Available Science and Feasibility Assessment

The oyster fishery collapse in Apalachicola Bay has been attributed to drought and upstream water withdrawals and subsequent increases in salinities and associated predation and disease (e.g., FFWCC, 2013; Havens et al. 2013), as well as over harvest (Havens et al., 2013). The decline in oyster landings and recruitment of juvenile oysters is considered “unprecedented” and is also due to recruitment failure or high mortality of oysters smaller than 3 inches in size (market size) oysters (Havens et al. 2013). The FFWCC (2013) reports full recovery from the oyster collapse will require five years and significant funding. The value of restoring oyster reefs and oyster recruitment is well documented and includes enhanced estuarine habitats, shoreline stabilization, reduced storm surge and erosion, water quality improvements, and shelter for over 300 species, which in turn are consumed by recreationally and commercially important finfish and crustaceans (NOAA, 2016; Peterson et al., 2003).

The proposed project approach is justified by the use of traditional cultching of degraded reefs as a management technique allowing resource managers “to mitigate resource losses, increase oyster production, and contribute direct economic benefit to fisheries-dependent communities,” used previously in Apalachicola Bay (Arnold and Berrigan, 2002; Berrigan, 1990). The proposed project is consistent with Gulf-wide objectives and restoration techniques outlined in the science-based **Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS)**, which presents detailed information supporting the value of oyster reef restoration (NOAA, 2016). Project implementation will be consistent with Best Management Practices, as outlined by FDACS.

The feasibility of the proposed approach is demonstrated by the success of previous Apalachicola Bay oyster reef restoration following hurricanes Elena and Kate in 1985, which resulted in an estimated benefit: cost ratio of almost 21:1 after 10 years (Arnold and Berrigan, 2002; Berrigan, 1990). The proposed project will build on and enhance the efforts of similar projects and, when combined, will ensure adequate substrate to support a sustainable oyster

fishery. Other proposed or underway projects that target sustainable oyster reefs in the Bay include: 1) Apalachicola Bay Oyster Restoration (18 acre/ \$4.2M GEBF funded restoration and research project); 2) Florida Oyster Cultch Placement (18,000 cy/ 90 acres/ \$5.4M NRDA Phase III Early Restoration Project); and 3) Apalachicola Bay Oyster Restoration (43,858 cy/ 219 acres/ \$4.68M State of Florida project).

Based on preliminary information from regulating agencies such as FDEP and FDACS, construction costs for similar projects, and operation and maintenance of other projects, the proposed project is considered feasible with respect to: 1) permitting; 2) construction within the proposed budget; and 3) effective long term operation and maintenance of the project components. Key literature reviewed in the evaluation of this project includes the following:

- Arnold, W. and M. Berrigan, 2002. *A summary of the oyster (Crassostrea virginica) fishery in Florida*. A Report to the Division of Marine Fisheries, Florida Fish and Wildlife Commission, St. Petersburg, Florida, USA.
- Baggett, L. P. et al., 2015. *Guidelines for evaluating performance of oyster habitat restoration*. Restoration Ecology 23: 737–745. doi:10.1111/rec.12262
- Berrigan, M. 1990. *Biological and economical assessment of an oyster resource development project in Apalachicola Bay, Florida*. J. Shellfish Res. 9: 149-158.
- FFWCC. 2013. *2012-2013 Florida Gulf Coast Oyster Disaster Report*. May 2013. <http://www.floridajobs.org/docs/default-source/2015-community-development/2015-cmty-plan-acsc/20122013floridagulfcoastoysterdisasterreport.pdf?sfvrsn=2>
- Grabowski, J.H. et al., 2012. *Economic valuation of ecosystem services provided by oyster reefs*. BioScience 62: 900–909.
- Havens, K. et al., 2013. *Apalachicola Bay oyster situation report*. Technical Publication 201. Gainesville, FL: University of Florida Sea Grant.
- NAS (National Academy of Sciences, Engineering, and Medicine), 2017. *Effective Monitoring to Evaluate Ecological Restoration in the Gulf of Mexico*. Washington, DC: The National Academies Press. doi: 10.17226/23476.
- NOAA. 2016. *Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS)*. <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>
- Peterson, C.H., J.H. Grabowski, and S.P. Powers. 2003a. *Estimated enhancement of fish production resulting from restoring oyster reef habitat: quantitative valuation*. Marine Ecology Progress Series 264:249-264.
- Pillon, D., 2014. *Florida oysters in crisis: 'Our industry needs to be shut down,' Apalachicola seafood rep says*. Gulf Coast Beaches section of AL.com. September 2014.
- White, H., 2012. *Restoration is good for business*. Coastal Review Online, NC Press Association. <https://www.coastalreview.org/author/howardwhite/>

### Risks and Uncertainties

Establishing monitoring goals and success criteria are critical to reducing and managing risk and uncertainty for the proposed project (see **Success Criteria and Monitoring**). Drought, hurricanes, hydrologic changes, and oyster harvest can compromise a restoration effort. However, drought conditions have receded in the southeast, and upstream water supply and freshwater flow issues – which affect salinity, predation, and disease - are being addressed through a pending multi-State legal settlement. The proposed project will preclude oyster harvest from restored areas until oysters are of legal size and will require continued coordination and combined efforts of oystermen and agencies in support of improved fishery management strategies. Monitoring data will be used to assess the effects of restoration methods and are critical to managing project risks and uncertainties.

### Success Criteria and Monitoring

Potential success criteria for the proposed project include:

- Increases in areal extent of viable oyster reefs;
- Increases in average reef height;
- Increases in oyster density, and
- Oyster size-frequency distribution representative of a sustainable oyster population.

An economic success criterion of benefits (economic returns for increased landings) vs. cost (of restoration) may also be used. More specific quantitative criteria will be developed within planning and monitoring frameworks developed for oyster reef restoration or enhancement in the Gulf (NOAA, 2016). Criteria for three environmental variables (water temperature, salinity, and dissolved oxygen) are also recommended (Baggett et al., 2014). Well-defined goals and objectives, statistically sufficient monitoring designs, and project documentation are absent from many restoration projects (NAS, 2017), but are critical to the success of the proposed project. The implementation grant request will include a detailed monitoring program design that addresses goals, objectives, data collection, and data assessment and evaluation for these success criteria.

### Milestones and Schedule

Construction completion is anticipated within two years following planning, design, and permitting. Monitoring is planned to inform and support this and future restoration projects and will continue for the life of the proposed project.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Project Design and Permitting												
Permitting Complete												
Contractor Selected												
Restoration/ Barge Shelling												
Complete Culch Placement												
Certification												
Success Monitoring												

## Budget and Funding Sources

The project budget was developed based on previous oyster restoration specific to Florida's west coast, with estimates ranging from about \$75 to \$120/ cubic yard of material and \$15,000 to \$25,000/ acre of material placed.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$250,000
Implementation		\$4,500,000
Success Monitoring		\$250,000
<b>Total Cost</b>		<b>\$5,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$5,000,000
Direct Component		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$5,000,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA		\$5,000,000

If additional leveraged funds become available, they would be applied to the areal expansion of the reef restoration project as well as the development of a shellfish hatchery to provide a source of oyster larvae to local oyster reefs and others along the Gulf Coast.

## Partnerships/Collaboration

Potential project partners include University of Florida/IFAS, Florida State University, FFWCC, and The Nature Conservancy. Coordination with the following agencies is anticipated: FDACS, FFWCC, FDEP, NFWFMD, NMFS, USACE, and USFWS.



## FRANKLIN COUNTY

# Cooperative Dredging Program

PROJECT NO. 7-3

## Project Description

### OVERVIEW AND LOCATION

This program seeks to continue joint efforts by Franklin County and the US Army Corps of Engineers (USACE) to maintain waterways that are critical to the commercial, charter and recreational fishing industries in the County. The Eastpoint and Two-Mile Channel project areas are located south of US 98 in St. George Sound and Apalachicola Bay respectively (see **Figure 7-3B** – Eastpoint, and **Figure 7-3C** Two-Mile)

### NEED AND JUSTIFICATION

Apalachicola Bay and St. George Sound have an open fetch exposing the fleet of recreational and commercial fishing boats to high winds and waves. Captains rely on the navigation channels for safe passage to and from the fishing/oyster areas. When these channels shoal in due to sediment loads from the Apalachicola River and sediment transport from the Bays, maintenance dredging is required to preserve safe passage and refuge for the fleet. Eastpoint Channel and Two-Mile Channel are both past their routine maintenance interval and require dredging to maintain published navigation depths. The project areas are shown in **Figures 7-3D** and **7-3E**, depths shown in red indicate areas shallower than -6 ft MLW and require dredging.

### PURPOSE AND OBJECTIVES

The purpose of this project is to remove accumulated sediments from the Eastpoint and 2 mile channels. The objectives of the project are to: 1) improve navigation for commercial, charter and recreational fishing interests; 2) beneficially reuse the dredge material to create a 26-acre marsh for habitat creation and shoreline protection.



**Figure 7-3A.** Project location in Franklin County.



Figure 7-3B. Eastpoint Channel.



Figure 7-3C. Two-Mile Channel.

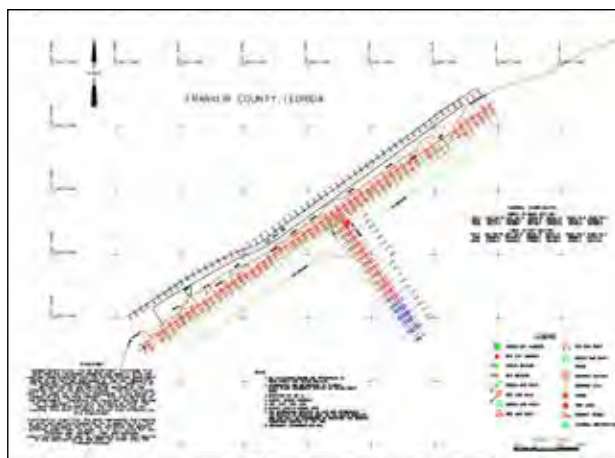
Two-mile channel may also look at the possibility of beneficial reuse during the design, feasibility and permitting process.

### PROJECT COMPONENTS

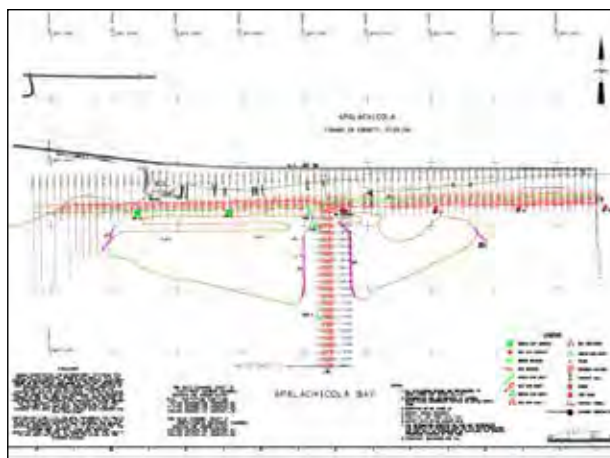
The Eastpoint Channel is currently permitted through 2023 and will be dredged to -6.4 ft NAVD 88 (-6.0 ft MLW) with -2 ft advanced maintenance and -2 ft allowable overdredge and 5:1 side slopes. This will generate approximately 244,000 cubic yards of dredged material that will be pumped to the containment cell. This is consistent with previous dredging projects in the channel and permitted by the Florida Department of Environmental Protection (FDEP) and U.S. Army Corps of Engineers (USACE). Dredge spoil from the channel will be beneficially re-used, creating 26 acres of coastal marsh seaward of the existing breakwaters protecting the channel. Re-use of the dredge spoil in this manner will reduce project costs, create habitat and establish a sustainable barrier for the Eastpoint channel.

The marsh will naturally recruit spartina and juncus marsh grasses providing habitat for juvenile fish, shellfish and crustaceans. In turn, this will provide foraging areas for a variety of native and migratory shorebirds and waterfowl. Eastpoint will be required to conduct cultural resource work prior to the use of the containment area. Chemical sediment testing may also be required to be submitted to FDEP, prior to disposal in the containment area. Eastpoint Channel has design plans complete and permits in hand. Therefore, this project would be ready to bid and construct as soon as the grant was awarded. Construction is estimated to take 24 months. Updated pre-construction bathymetric surveys would be required immediately prior to construction to document channel conditions and provide construction volumes. The project would be bid and managed by USACE.

The 2 Mile Channel will be dredged to -6.4 ft NAVD 88 (-6.0 ft MLW) with -2 ft advanced maintenance and -2 ft allowable overdredge and 5:1 side slopes. This project will generate approximately 450,000 cubic yards of dredged material and the final disposal location will be based on the sediment sampling effort and determined during the design and permitting stage. This project has used a dedicated, 40 Acre, upland dredge material management area on Apalachicola Airport Property in the past, but this facility now requires renovation prior to construction. The County and the USACE will collaborate on the design and permitting of the new facility before accepting material from the 2 Mile Channel. USACE will also explore beneficial reuse options similar to those proposed at Eastpoint.



**Figure 7-3D.** Eastpoint Channel Bathymetric Survey (USACE, 2016).



**Figure 7-3E.** Two-Mile Channel Bathymetric Survey (USACE, 2016).

Cultural resource and environmental surveys will be required for Eastpoint within the dredge template and the proposed containment/disposal area. Physical and chemical sediment analyses will be required for permitting and design. 2 Mile Channel would require design and permitting through USACE and FDEP. An initial grant request for design and permitting will get the project underway with construction to follow in 2-5 years when regulatory approvals are in place. Construction is projected to take 36 months.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Construction of the dredging projects will bring revenue to Franklin County as the dredging contractor houses staff, equipment and materials for the projects. Once the projects are complete it will increase the number of safe fishing days for the recreational and commercial fishing fleet. Also with the maintenance dredging complete larger vessels can use the channels safely. Additionally, the marsh creation will increase the productivity of the nearshore area as a nursery, and the sustainability of the bay.

### Implementing Entities

Franklin County proposes to add USACE as a sub-recipient on the grant in order to provide funding of this collaborative effort to design, permit and construct the dredging projects.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region; and
- Activity 6: Infrastructure projects benefitting the economy or ecological resources, including port infrastructure (primary).

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 3 Replenish and Protect Living Coastal and Marine Resources; and
- Goal 4: Enhance Community Resilience; and
- Goal 5: Restore and Revitalize the Gulf Economy (primary).

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 4: Restore and Enhance Natural Processes and Shorelines; and
- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary).

## Best Available Science and Feasibility Assessment

Studies on the channel conditions in Eastpoint and Two-Mile Channels have been documented by USACE for decades. Key documents that make up the basis for this project are included below:

- FDEP Eastpoint Permit issued April 2013, extended to 2023
- Apalachicola Bay, FL Channel Condition Report (USACE, 1989)
- Pensacola Bay Water Management Plan. Bay Area Resource Council. 2005.

As discussed above, the need and justification for the project are well established. There are permit compliance elements that must be addressed at the Eastpoint project and the design, feasibility and permitting of the Two-mile project of the project must be further addressed. The permitting complexity and construction feasibility of the project will depend largely on disposal volumes and the physical handling characteristics of the sediments (e.g., grain size and percent organics). However, the USACE completed a major maintenance dredging project in Eastpoint in 2012 and Two Mile Channel in 2002, and acceptable dredging and spoil handling technologies were determined and authorized in permits for those projects. Therefore, there is a recent precedent for successful permitting and construction of a dredging projects at both project locations.

## Success Criteria/Metrics/Outcomes and Monitoring/Evaluation

There will be period monitoring of the marsh creation for performance including species diversity, recruitment of vegetation and oysters. The channels will also be monitored by the USACE on a regular basis with periodic bathymetric survey to calculate channel in-fill rates.

## Milestones and Schedule

The planning, implementation, and success monitoring of this program is anticipated to be spread over a 12-year period, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Eastpoint Channel Compliance Studies												
Eastpoint Dredging & Marsh Creation												
Two-Mile Channel Feasibility Study												
Two Mile Dredging & Disposal												
Success Monitoring												

## Budget and Funding Sources

A total cost estimate has been developed by Franklin County and the USACE based on the best available information and prior dredging projects. This preliminary cost estimated is shown in the budget table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$300,000
Implementation		\$6,000,000
Monitoring		\$360,000
<b>Total Cost</b>		<b>\$6,660,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$6,660,000
Direct Component		\$0
Other Grants or Co-Funding (USACE)		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$6,660,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA		
NFWF		
Pot 2/FDEP		

## Partnerships/Collaboration

Franklin County plans to apply for additional grant funding/leveraging to apply towards the overall project budget. If successful, these funds would be allocated to other future joint channel maintenance in a partnership with the USACE.



## WAKULLA COUNTY

## Water Quality Protection Program

PROJECT NO. 8-1

## Project Description

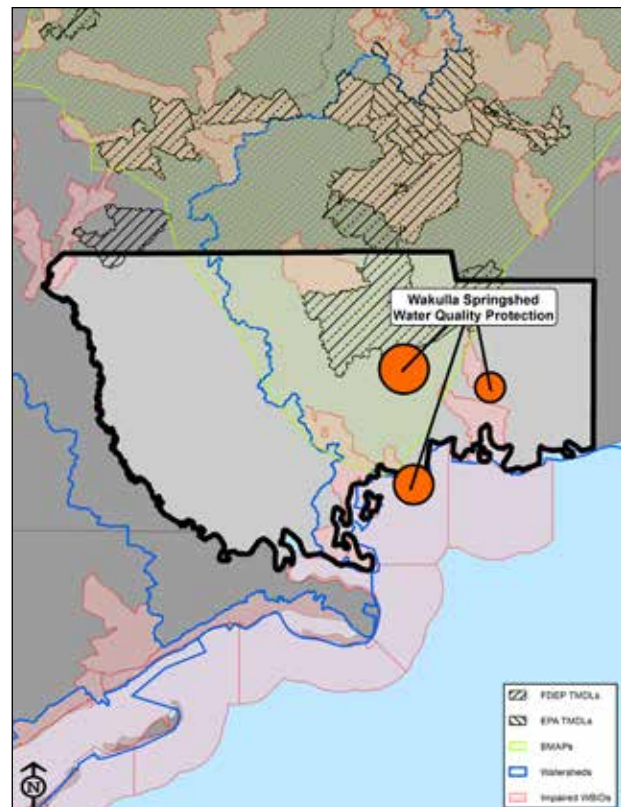
## OVERVIEW AND LOCATION

The Wakulla Springshed Water Quality Protection Program is designed to improve water quality in the springshed and Apalachee Bay. This program focuses on three areas: (1) expansion or improvement of existing sewer infrastructure to continue an ongoing septic to sewer conversion program; (2) design and construction of storm water conveyance; and (3) upgrading and expanding one treatment plant and the potential purchase of another. The location of the program components are scattered throughout Wakulla County as shown in **Figure 8-1A**.

## NEED AND JUSTIFICATION

The natural systems of the St Marks River watershed and Apalachee Bay provide significant economic and recreational opportunities for the people of Wakulla County and serve as important habitat for a diversity of wildlife. Of particular interest in this locale is that prevalence of karst features with a thin overburden layer that underlies the program area (see **Figure 8-1B**). The focus of this program is to remove nutrient and bacterial inputs to groundwater in large part due to their influence on the Woodville Karst Plain ground-surface water system.

Although the St. Marks River/Apalachee Bay watershed generally have good water quality, portions of the Wakulla River, St. Marks River, and Apalachee Bay are listed as verified impaired for bacteria and a total maximum daily load (TMDL) for nutrients has been established for part of the Wakulla River. Septic systems and out of date sewer and wastewater treatment facilities contribute nutrient and bacteria to these waterbodies, and upgrades to the existing



**Figure 8-1A.** Project location in Wakulla County.

## SECTION V: Proposed Projects, Programs and Activities

infrastructure could result in substantial reductions in pollutant loads to downstream waters (NFWFMD 2017, reference provided below).

Currently, the communities of Shell Point, Oyster Bay and Spring Creek Area have their own sewer system but 80% of the residences use septic tanks; which also causes operational issues with the sewer system due to low flows. Live Oak Island is entirely on septic. These communities are located directly adjacent to the Bay. They also occur in the Woodville Karst plain in an area with thin overburden and coastal springs. These communities are subject to flooding during moderate rain events and are likely contributing nutrients to the shallow groundwater and Bay. Connecting these lots to central sewer and upgrading the sewer system will yield benefits to the shallow karstic ground/surface water system in this area.



**Figure 8-1B. Karst, Springs and Sinks are Common in Program Area (NFWFMD 2009).**

The Wakulla Gardens and Grieners Addition areas also use septic tanks and are in the Wakulla Springs springshed. These communities are in a watershed which is known for a distinctive “bowl shaped” groundwater flow effect due to its location in the Woodville Karst Plain. There is an on-going 31-million-dollar program to improve the springs water quality. The first two phases of this program have already been completed. The county is planning on expanding the existing sanitary sewer system to include Wakulla Gardens (phase 3, 4 and 5) and Grieners Addition to restore and protect the spring’s water quality.

The county also needs to modify the existing Otter Creek WWTP to meet existing demands and regulations. It also needs to expand its treatment capacity to meet current and future sewer demands in its service area. Finally, the upgrade of stormwater conveyance upgrades in the Panacea area east of US98 (culverts, cross drains, etc.), in conjunction with the Otter Creek project, will reduce nutrient and bacterial inputs to the shallow groundwater and surface water systems in the Panacea area prior to discharging to Apalachee Bay.

### PURPOSE AND OBJECTIVES

The purpose of this program is to reduce nutrient loading and improve water quality in the Apalachee Bay and St Marks River. This will be done by converting areas near the Bay from septic to sewer. The program will also design and construct storm water facilities near Panacea. In addition, the program will increase the capacity of the Otter Creek WWTP. This will provide the needed treatment capacity for future expansion of the sewer system so that existing septic tanks can be removed and new developments can be placed on a sewer system instead of installing septic tanks.

### PROJECT COMPONENTS

The program has the following project components:

1. Sewer Master Planning
2. Wakulla Springs Springshed Program
3. Coastal Sewer Program (Talquin Sewer System and coastal communities)

#### 4. Otter Creek WWTP Upgrade

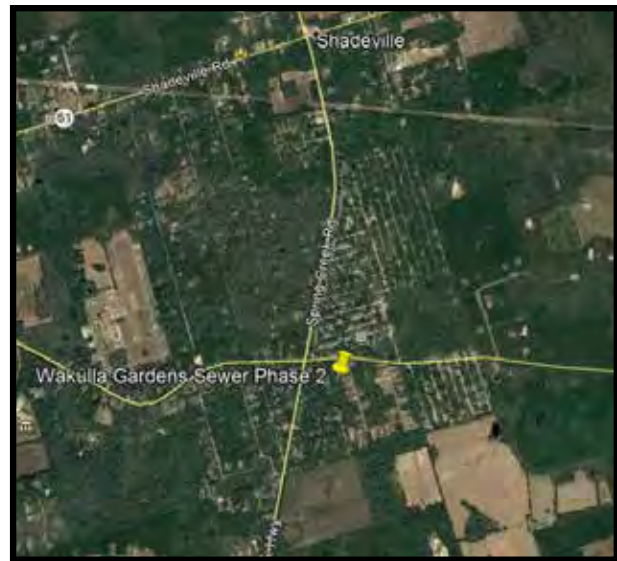
#### 5. Panacea Stormwater

Project 1: This is a master planning effort to assess the various wastewater systems in the southern portion of the county to better understand how they could be most efficiently integrated and operated. It involves the Wakulla Gardens North, WINCO, Crawfordville Gravity Sewer system, and the Talquin system in the Shell Point and Spring Creek areas. The master planning effort will include a robust septic to sewer conversion component.

Project 2: This programmatic component proposes expanding the sanitary sewer infrastructure in the Wakulla Springs Springshed. It includes phases in Wakulla Gardens (phases 3, 4 and 5), the Magnolia & Grieners Addition (phase 3) and the Crawfordville Gravity Sewer Collection project area (phase 1). These neighborhoods are high density and many of the >1,000 septic tanks are aging, dating to the 1940's and 1950's. This is part of an ongoing program to eliminate septic tanks in the area which is especially vulnerable to groundwater inputs due to the prevalent karst terrain. The county has already completed the first two phases of the program. See **Figure 8-1C**.

Project 3: This project combines four (4) areas within the county for the design and construction of new and upgraded sewer infrastructure in low-lying coastal areas that are subject to flooding during moderate rain events. Once the connections to central sewer are made abatement of existing septic systems would occur. This project is at the beginning of the planning phase therefore the number of lots for connection to the proposed sewer is unknown now. The project includes the purchase of the Talquin-owned existing sewer systems, design and construction of new and upgraded sewer infrastructure to Shell Point and Oyster Bay. This project also addresses operational issues in Live Oak Island and Spring Creek areas. The county is currently experiencing low wastewater flows from these areas accelerating the deterioration of the existing infrastructure. A potential solution is to increase flows by installing a sanitary sewer pipe in a subaqueous crossing from Live Oak Island to Shell Point to alleviate the low flows and take more septic tanks offline. See **Figures 8-1D and 8-1E**.

Project 4: This project proposes to modify the existing Otter Creek WWTP to meet future waste water demands by adding a third and fourth train to the existing plant. The expanded capacity is needed to provide capacity for



**Figure 8-1C. Wakulla Gardens and Grieners Addition.**



**Figure 8-1D. Coastal Sewer Program.**

## SECTION V: Proposed Projects, Programs and Activities

expanding sewer in the western and southern parts of Wakulla County and south, southwest of the Wakulla River and to accommodate future growth in the County. These areas will also see increased flow as more areas are converted from septic tanks to sewer. The expansion is needed due to increased volumes of waste water due to county growth and septic to sewer conversions. See **Figure 8-1E** for the Otter Creek service area.

Project 5: This project proposes the design and construction of storm water conveyance in the Panacea area east of US98 (culverts, cross drains, etc.) to address local stormwater pollution loads into the Apalachee Bay system.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The projects in this program will improve water quality in Apalachee Bay and waterbodies that contribute to the Bay by decreasing nutrient and bacterial loads to the system. Apalachee Bay supports oyster reefs and extensive tidal marshes and seagrass beds, which are important habitat for many fish and invertebrate species. These resources are dependent on good water quality to retain their ecological and economic value. Nutrient inputs are important factors for phytoplankton bloom development and can ultimately have an impact on seagrass health. In particular, localized seagrass losses in Apalachee Bay have been linked to reduced water clarity as a result of high phytoplankton concentrations (NWFWMMD 2017).

The expansion of sewer system and WWTP will contribute to economic growth in the county. This expansion will help the county to grow, improve its economy, and grow the tax base. The proposed projects will increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts of abandoning septic tanks and installing the collection system on side streets. The proposed projects require experienced and technically skilled positions often associated with a full-time salary, higher wage and benefits.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity
- Goal 3: Replenish and Protect Living Coastal and Marine Resources
- Goal 1: Restore and Conserve Habitat

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources
- Objective 3: Protect and Restore Living Coastal and Marine Resources
- Objective 1: Restore, Enhance, and Protect Habitats Implementing Entities

Wakulla County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project. Wakulla County has coordinated with



numerous other agencies in the development of the waste water management plan, and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

## Best Available Science and Feasibility Assessment

This project is consistent with the goals and recommendations of the following natural resource management plans:

- US Fish and Wildlife Service (USFWS), 2006. St. Marks National Wildlife Refuge Comprehensive Conservation Plan.
- Northwest Florida Water Management District, 2017. Draft St. Marks River and Apalachee Bay Surface Water Improvement and Management (SWIM) Plan.
- Florida Department of Environmental Protection (FEDP), 2014. Big Bend Seagrasses Aquatic Preserve Management Plan.
- Florida Department of Environmental Protection (FDEP), 2015. Final Basin Management Action Plan (BMAP) for the Implementation of the Total Maximum Daily Load for Nutrients (Biology) by the Florida Department of Environmental Protection in the Upper Wakulla River and Wakulla Springs Basin.

These projects are considered to be feasible. However, they are all in the feasibility study or conceptual design phase. The projects cannot be fully evaluated for feasibility until the preliminary design is completed.

## Risks and Uncertainties

In the evaluation of this program, it was found that all of these projects are in the feasibility stage. The risks will be identified during the feasibility and design phases.

## Success Criteria and Monitoring

This project will affect water quality in the local surface waters and an adjacent estuarine system. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in ambient water quality (nutrient and bacterial concentrations) downstream of removed septic tanks in Apalachee Bay;
- Changes in water quality (nutrient and bacterial concentrations) in the Wakulla and St. Marks Rivers;
- Changes in stormwater pollutant concentrations in Dickerson Bay (nutrients, bacteria, sediments, etc.); and
- Changes in seagrass coverage in Apalachee Bay.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Wakulla County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.



## Milestones and Schedule

The total estimated time horizon to implement this program - from feasibility studies through success monitoring - is approximately 14 years. The expected start date is 2018, and the expected end date is 2031. The proposed project schedules are shown on the milestone chart below. The schedule indicates the duration of all planning activities (feasibility) and implementation (design, permitting, construction, connections). To verify performance, water quality monitoring will be required for the entire period.

MILESTONE	YEARS TO COMPLETE													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Planning and Project Management														
Water Quality Monitoring Program														
Master Sewer Plan/PER														
<i>Wakulla Gardens North</i>														
WINCO Utility														
Crawfordville Sewer Gravity Collection														
Coastal Sewer														
<i>Magnolia/Grieners Phase 3</i>														
Home Connections														
<i>Wakulla Gardens Phases 3-5</i>														
Home Connections (Ph 3)														
Design and Permitting (Ph 4)														
Home Connections (Ph 4)														
Design (Ph 5)														
Home Connections (Ph 5)														
<i>Crawfordville Sewer Phase 1</i>														
Design and Permitting														
<i>Coastal Sewer</i>														
Utility Acquisition Feasibility														
Utility Systems Acquisition														
Design and Permitting														
Home Connections														
<i>Otter Creek WWTP</i>														
Feasibility Train 3														
Feasibility Train 4														
<i>Panacea Storm Water</i>														
Feasibility														
Engineering														

## Budget and Funding Sources

This program is anticipated to cost approximately \$9.2 million dollars. Most of the funds are earmarked for implementation, specifically final design engineering, permitting and the costs to connect homes to the new systems. Some funds are allocated to conduct master planning of the various wastewater systems in the county to better understand how they could be most efficiently integrated and operated. The remainder of the funding is designated for project-specific feasibility studies. The cost of success monitoring is assumed to be part of the cost of the other projects in the program.

The county has identified several sources of funding for these projects including County funds, Direct Component (Pot 1) funds, Grant Funding, and Gulf Triumph. The total funds secured is \$9.2 million. The funding requests for the projects is shown in the table below.

PROJECT BUDGET	ESTIMATED DOLLARS
<i>Master Sewer Plan/PER (Planning)</i>	
Wakulla Gardens North	\$100,000
WINCO Utility	\$100,000
Crawfordville Sewer Gravity Collection	\$100,000
Coastal Sewer	\$100,000
<b>Total</b>	<b>\$400,000</b>
<i>Magnolia Gardens and Grieners Addition - Phase 3</i>	
Planning	\$0
Implementation - Home Connections	\$874,250
<b>Total</b>	<b>\$874,250</b>
<i>Wakulla Gardens - Phase 3</i>	
Planning	\$0
Implementation - Home Connections	\$1,479,500
<b>Total</b>	<b>\$1,479,500</b>
<i>Wakulla Gardens - Phase 4</i>	
Planning	\$0
Implementation – Design and Permitting and Home Connections	\$1,251,000
<b>Total</b>	<b>\$1,251,000</b>
<i>Wakulla Gardens - Phase 5</i>	
Planning	\$0
Implementation – Design and Home Connections	\$1,251,000
<b>Total</b>	<b>\$1,251,000</b>
<i>Crawfordville Sewer Gravity Collection – Phase 1</i>	
Implementation - Design Engineering and Permitting	\$235,000
<b>Total</b>	<b>\$235,000</b>
<i>Talquin Sewer System-Shell Point</i>	
Planning - Feasibility and Utility Systems Acquisition Cost Estimation	\$150,000
Implementation	\$0
<b>Total</b>	<b>\$150,000</b>

## SECTION V: Proposed Projects, Programs and Activities

<i>Shell Point, Live Oak Island &amp; Spring Creek</i>	
Planning	\$0
Implementation - Design and Permitting and Home Connections	\$2,352,000
<b>Total</b>	<b>\$2,352,000</b>
<i>Otter Creek WWTP</i>	
Planning - Feasibility Trains 3 and 4	\$1,100,000
Implementation	\$0
<b>Total</b>	<b>\$1,100,000</b>
<i>Panacea Stormwater</i>	
Planning – Feasibility	\$50,000
Implementation - Engineering	\$50,000
<b>Total</b>	<b>\$100,000</b>
<b>Total Cost</b>	<b>\$9,192,750</b>
<b>SECURED FUNDING SOURCES</b>	
Spill Impact Component	\$9,192,750
Direct Component (Pot 1)	
County Funded	
<b>Total Secured Funding</b>	<b>\$9,192,750</b>
<b>Budget Shortfall</b>	<b>\$0</b>
<b>POTENTIAL LEVERAGED FUNDING SOURCES</b>	
Grant Funded	
Gulf Triumph	
Other Funding	

## Partnerships/Collaboration

Wakulla County has coordinated with numerous other agencies in the development of the wastewater management plan, and will collaborate with other entities as required. Some of the potential partnerships include the WINCO and Talquin Utilities.

# WAKULLA COUNTY Coastal Access and Preservation Program

PROJECT NO. 8-2

## Project Description

### OVERVIEW AND LOCATION

63% of Wakulla County is in conservation<sup>1</sup>, nearly a quarter of a million acres. Those lands include the Apalachicola National Forest (269 sq. miles), St. Marks National Wildlife Refuge (97 sq. miles) and Wakulla Springs State Park (9 sq. miles). Wakulla Springs is one of the world's largest springs; its water flow has been measured at 1.23 billion gallons per day. Because of these resources Wakulla County is a regional leader in eco-tourism, home to the St. Marks Trail, the first paved rail trail in Florida. This program seeks to build on earlier recreational access efforts of the county through a combination of coastal zone land acquisition and park development.

### NEED AND JUSTIFICATION

Wakulla County has established eco-tourism as one of the economic development strategies in their Comprehensive Plan. Based on their experiences over the last 25 years with the St. Marks Trail they are seeking to improve and expand their trail network. Wakulla County has nine boat ramp locations that are heavily utilized and parking is often unavailable. Additionally, waterfront sites that are suitable for recreational access are often in demand for development. Passive recreational development<sup>2</sup> at key waterfront locations rather than dense residential development is a proven strategy to prepare for catastrophic storm events and sea level rise. Preserving these sites as passive recreation sites helps preserve critical habitat, and promote community resilience both economically and ecologically.

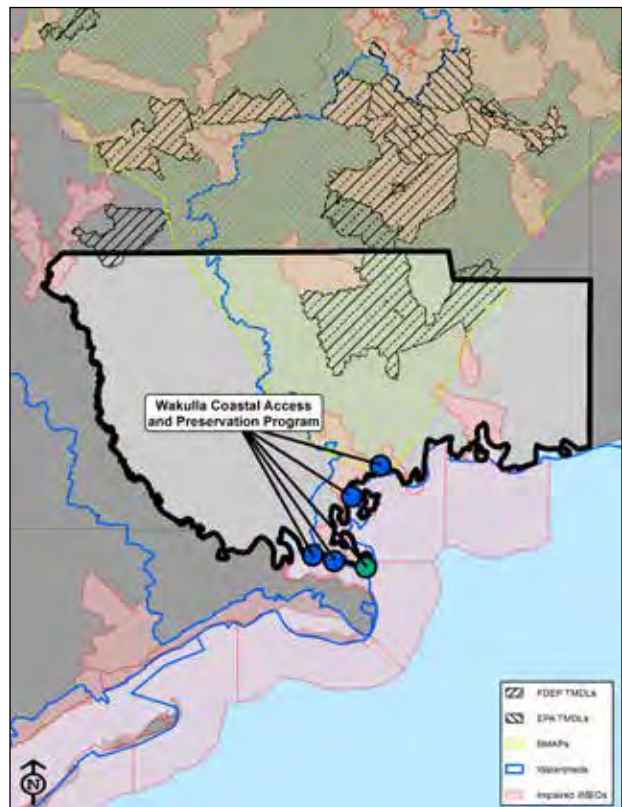


Figure XX-1A. Project location (map)

<sup>1</sup> Acres of Conservation Land by County, March 2017, Florida Natural Areas Inventory, [http://www.fnai.org/pdf/MAxCounty\\_201703.pdf](http://www.fnai.org/pdf/MAxCounty_201703.pdf)

<sup>2</sup> Adaption Action Areas: Policy Options for Planning for Rising Sea Levels, November 2013, South Florida Regional Planning Council, <http://www.floridajobs.org/docs/default-source/2015-community-development/community-planning/crdp/aaapolicyoptions2013.pdf?sfvrsn=2>

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

This program's purpose is to increase community resilience by acquiring and developing park sites for passive recreation. Ancillary benefits include economic development and environmental protection. While five projects have been defined in this program, if these project sites become unavailable, other sites that meet the goals of this program will be substituted. This project will build and sustain Wakulla's capacity to adapt to short and long-term natural and manmade hazards, particularly increased flood risks associated with sea-level rise and environmental stressors. The project will also promote ecosystem restoration that enhances community resilience through the establishment of non-structural, natural buffers against storms and flooding.

### PROJECT COMPONENTS

#### Oaks Trailhead and Park Development

- Existing Florida Department of Transportation acquisition
- Development of first trailhead facilities for Ochlockonee Bay Bike Trail (existing 14 mile trail) and the Capital City to the Sea Loop Trail (to be completed by 2019)
- Project will develop parking, restrooms, and playground, walking paths, stormwater features, educational kiosk and signage on US 98.

#### Mashes Sands Park Development

- Existing park featuring coastal marsh ecosystem on the Gulf of Mexico that includes the terminus of the Ochlockonee Bay Bike Trail.
- Project will develop a walkway and overlook, provide for beach renourishment to protect the dune system, dredge for den

This project is consistent with, and addresses, the following Comprehensive Plan Objective:

- Objective 3: Protect and Restore Living Coastal and Marine Resources
- Objective 5: Promote Community Resilience

### Implementing Entities

Acquisition activities will either be conducted by an NGO on behalf of the Gulf Consortium or by Wakulla County as a sub-recipient to the Gulf Consortium. Development of park projects will be conducted by Wakulla County as a sub-recipient.

### Best Available Science and Feasibility Assessment

An analysis of best available science is required for programs and projects that would restore and protect the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, coastal wetlands, and economy of the Gulf Coast. The main focus of this project is community resilience through the provision of recreational access, so a best available science analysis is not required for the majority of the program's components.

This program includes a project, Mashes Sands Park development, that includes beach renourishment. Erosion is mainly influenced by eustatic rise in sea level, hurricanes and other storm events, lack of beach material, human interference of natural shoreline processes, and subsidence (Finkl 1981). Erosion, naturally occurring on beaches, is only exacerbated by sea level rise, and large-scale coastal evolution is ever more dependent on human manipulations



to prevent erosion (Morton 2005, Ells 2012). If no action is taken there will be severe risk to nesting shorebird, beach mouse, and sea turtle habitat, as well as risk to structures landward of the beach due to wave erosion, storm events, and imminent sea level rise (Finkl et al. 2007, Environmental Assessment 2016). Erosion on Florida's west coast is minimized due to low wave energy and frequent beach nourishment, which this project seeks to continue (Morton 2005). If nourishment is not completed, the shoreline will inevitably continue to erode and hard stabilization structures might be proposed, which will have net negative impacts on erosion rates and habitat stability (Morton 2005, Ells 2012). To maintain the beach as a storm buffer to protect upland infrastructure and keep shoreline for habitat and recreational purposes, erosion control measures are necessary, and beach nourishment is the preferred method to build the beach (Ells 2012, Finkl et al. 1981, Morton 2005). Ells (2012) concludes that long-scale shoreline stability and evolution will be strongly tied to human manipulation of the shoreline as sea level rise and subsidence continually threaten the stability of native beaches (Finkl 1981).

- Ells, Kenneth, and A. Brad Murray. "Long-Term, Non-Local Coastline Responses to Local Shoreline Stabilization." *Geophysical Research Letters*, vol. 39, no. 19, Feb. 2012, doi:10.1029/2012gl052627.
- Finkl, Charles W. "Beach Nourishment, a Practical Method of Erosion Control." *Geo-Marine Letters*, vol. 1, no. 2, 1981, pp. 155–161., doi:10.1007/bf02463334.
- Finkl, Charles W., et al. "Presence of Beach-Compatible Sediments in Offshore Borrowers: New Challenges and Trade Offs in Developing Codifications." *Coastal Sediments '07*, Nov. 2007, doi:10.1061/40926(239)197.
- Morton, Robert A., et al. "Historical Shoreline Changes Along the US Gulf of Mexico: A Summary of Recent Shoreline Comparisons and Analyses." *Journal of Coastal Research*, vol. 214, 2005, pp. 704–709., doi:10.2112/04-0230.1.

This program is considered to be feasible with respect to the ability to: 1) obtain subject property; 2) construct the park amenity projects in future phases; and 3) effectively operate and maintain the projects over the long term.

## Risks and Uncertainties

The greatest risk in any land acquisition program is securing a willing seller. A seller can leave prior to a final contract due to a change of heart about the sale, another buyer being able to move quickly and at an above asking price offer, or appraisals not meeting a seller's expectation of price. Strategies to mitigate that risk will be pursued including the possibility of the Gulf Consortium only submitting grant applications for parcels with executed sales contracts.

## Success Criteria and Monitoring

Success will be measured through acres acquired, recreational amenities completed, and tracking public use.

## Milestones and Schedule

This program will commence in 2018 and be completed in 2023, a five year interval.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Bayside Marina Assessment												
Bayside Marina Acquisition												
Bayside Marina, Oaks Trailhead and Mashers Sands design and permitting												
Spring Creek Acquisition												
Bayside Marina Construction												
Skipper Bay Feasibility Study, Land Acquisition and Construction												
Mashers Sands Construction												
Success Monitoring												

## Budget and Funding Sources

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$400,000
Implementation		\$3,100,000
Monitoring		\$25,000
<b>Total Cost</b>		<b>\$3,525,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$2,925,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$2,925,000</b>
<b>Budget Shortfall</b>		<b>\$600,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
Florida Boating Improvement Fund		
Recreational Trails Program		
Pot 1		\$600,000

## Partnerships/Collaboration

The Florida Department of Transportation partners with Wakulla County on trail development. Two of the projects identified will provide amenities to trail users.

## WAKULLA COUNTY

Artificial and Oyster Reef  
Habitat Program

PROJECT NO. 8-3

## Project Description

## OVERVIEW AND LOCATION

The proposed program feasibility analysis of artificial reefs and sites in offshore federal waters, combined with deployment of reef materials for oyster reef restoration and fisheries habitat in nearshore waters, of Wakulla County (see **Figure 8-3A**).

## NEED AND JUSTIFICATION

Wakulla County experienced a 52% increase in the number of registered recreational vessels between 2000 and 2009 (FDEP 2010), demonstrating a need to expand its artificial reef program in support of recreational fishing and boating opportunities and economic benefits. Artificial reefs can also provide: 1) hard substrate to support encrusting and colonial benthic organisms, e.g., sponges and corals; 2) habitat for small marine invertebrates; and 3) shelter for larval and juvenile fishes. Wakulla County coastal waters have historically supported oyster reefs, and provided most of Florida's oyster harvest after the oyster decline in neighboring Apalachicola Bay after hurricanes Kate and Elena in 1985. However, there has been a significant reduction in oysters and oyster reefs along Florida's Big Bend Coast, inclusive of Wakulla County, over the last few decades, and the County proposes to address this loss by restoring oyster reefs and associated fisheries habitat by placing suitable materials at appropriate sites in nearshore waters. Similar restoration efforts throughout Florida's Gulf coast have been successful.

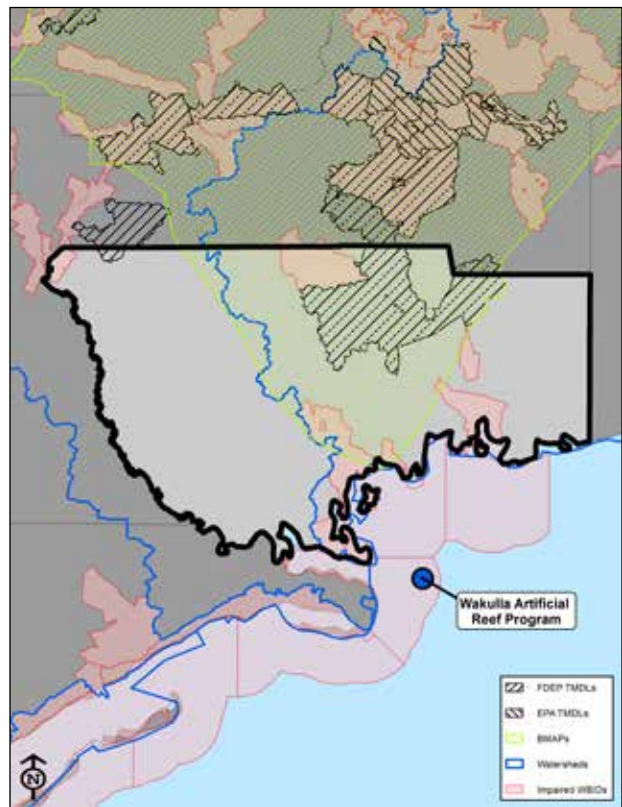


Figure XX-1A. Project location (map)

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of this program is to 1) evaluate the feasibility of deploying artificial reefs in a 40-acre artificial reef site in Wakulla County offshore waters to support increased public recreational fishing and boating opportunities; and 2) deploy suitable cultch material to restore habitat and associated ecological functions for estuarine dependent species, in support of ecological and economic sustainability. The objectives of the artificial reef project are consistent with those of the Florida Fish and Wildlife Conservation Commission's (FWC) artificial reef program (<http://myfwc.com/conservation/saltwater/artificial-reefs/>). The objectives of the oyster reef restoration are consistent with those developed for oyster restoration in the Gulf of Mexico by NOAA (2016).

### PROJECT COMPONENTS

This program involves two components, outlined below.

- Development of a feasibility assessment for artificial reef deployment, including acquisition of concrete, rock, and/or steel materials for reefs, identification and selection of sites, and the deployment of five artificial reefs (from barges) into offshore permitted reef sites.
- Oyster reef restoration, including nearshore site selection and subsequent deployment (via barge) of cultch material at locations in Ochlockonee Bay, Skipper Bay, and Apalachee Bay.
- Pre and post monitoring and data collection for the oyster reef restoration project.

Additional planning assistance will be required for permitting, design, and implementation of both projects. Locations of artificial reefs and oyster reef restoration sites will be made available to the public once completed and locations will remain available for recreational use.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Wakulla County's population growth and number of registered recreational boats point clearly to a large community of recreational fishers and boaters, both resident and tourist, and the proposed projects will contribute to the economy of the County. The artificial reef project will: 1) support increased demand for recreational fishing, boating, and other water related activities; and 2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in the County's coastal waters. The oyster reef restoration will provide: 1) habitat for a diversity of marine organisms, from small invertebrates to large recreationally and commercially important species such as stone crab, blue crab, red drum, and black drum; 2) structural integrity that reduces shoreline erosion; and 3) improved water quality ... via filtration of large quantities of water (Grabowski et al. 2012, NOAA 2016).

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region; and
- Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing (primary).

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 1: Restore & Conserve Habitat; and
- Goal 3: Replenish & Protect Living Coastal & Marine Resources; and
- Goal 5: Restore and Revitalize the Gulf Economy (primary).

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance and Protect Habitats; and
- Objective 3: Protect and Restore Living Coastal and Marine Habitats; and
- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary).

## Implementing Entities

Wakulla County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction and success monitoring of the program.

## Best Available Science and Feasibility Assessment

The recreational and economic benefits of artificial reefs along Florida's Gulf coast are widely recognized (Adams et al., 2011). Oyster reef habitat enhancement and restoration via traditional cultching methods is also widely accepted as a management technique that allows resource managers "to mitigate resource losses, increase oyster production, and contribute direct economic benefit to fisheries-dependent communities," as used previously in nearby Apalachicola Bay (Arnold and Berrigan, 2002; Berrigan, 1990). Restoration will also help address the 66% decline in oyster reefs that has occurred in the last 30 years along the Big Bend, inclusive of Wakulla County (Seavey et al. 2011). The scientific literature on the ecological benefits of artificial reefs is not yet consistent and includes evidence both: 1) in favor of artificial reefs that provide fisheries habitat; and 2) indicating the reefs simply attract and congregate fish with no benefits to fish stocks (see Lindberg et al., 2014; Fikes, 2013; Bortone et al., 1994, others). However, research has produced best practices guidance on site selection, design features, and construction methods, criteria that are now part of the FWC permitting regulations for artificial reefs. As a program, the proposed projects will enhance recreational and economic opportunities and support the ecological health of Wakulla County's coastal waters.

Key literature that forms the basis for the Wakulla County Artificial Reef Program are cited below.

- Adams, C., et al., 2011. The economic benefits associated with Florida's artificial reefs. EDIS document FE649 (2011): 1-6.
- Arnold, W. and M. Berrigan, 2002. A summary of the oyster (*Crassostrea virginica*) fishery in Florida. A Report to the Division of Marine Fisheries, FWC, St. Petersburg, Florida, USA.
- Bortone, S.A., Martin, et al., 1994. Factors affecting fish assemblage development on a modular artificial reef in a northern Gulf of Mexico estuary. *Bull. Mar. Sci.* 55 (2-3), 319-332.
- Grabowski, J.H. et al., 2012. Economic valuation of ecosystem services provided by oyster reefs. *BioScience* 62: 900-909.
- Lindberg, W.J., et al., 2014. Rationale and Evaluation of an Artificial Reef System Designed for Enhanced



## SECTION V: Proposed Projects, Programs and Activities

Growth and Survival of Juvenile Gag, *Mycteroperca microlepis*. Proc.66th Gulf and Caribbean Fisheries Institute November 4 – 8. Corpus Christi, TX. Pages 320-325.

- NOAA. 2016. Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS), which can be found at: <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.

This project is feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; 3) effectively operate and maintain the project components over the long term. The permitting of the offshore artificial reef sites will be facilitated through Nationwide U.S. Army Corps of Engineers (USACE) permits and through the FWC for site specific state criteria. Furthermore, this project is consistent with the National Artificial Reef Plan published in 1985, the Florida Artificial Reef Strategic Plan (FWC, 2003).

### Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this project that would preclude project implementation. Wakulla County will ensure design to limit damage to artificial reefs from tropical storms. Controls for lionfish and other nuisance/exotic species may be required. Regulatory constraints will address issues such as spatial boundaries for navigation, channels, marine habitat resources, historic areas, sand borrow areas, existing structures and leases, etc. The proposed project will preclude oyster harvest from restored areas until oysters are of legal size and will require continued coordination and combined efforts of oystermen and agencies in support of improved fishery management strategies. Monitoring data will be used to assess the effects of restoration methods and are critical to managing project risks and uncertainties.

### Success Criteria and Monitoring

This and all artificial reef projects involve the placement of hard substrate to: support recreational demand for offshore reef fishing and fishing opportunities; and enhance the abundance, distribution, and structural diversity of hardbottom habitat in the affected waters. Therefore, a range of success criteria will be developed and described in the implementation grant request. Artificial Reef quantitative success criteria will be developed for:

- Increase in the coverage of new artificial reef habitat;
- Metrics on the recruitment of benthic encrusting organisms and fish; and
- Increase in recreational use.

Potential success criteria for the proposed oyster reef restoration project include:

- Increases in areal extent of oyster reefs;
- Increases in average reef height;
- Increases in oyster density; and
- Oyster size-frequency distribution representative of a sustainable oyster population.

The proposed project will be constructed consistent with the Gulf States Marine Fisheries Commissions Guidelines for Artificial Reef Materials (2004). In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methods for the listed criteria. Wakulla County, is committed to conducting the monitoring necessary to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project is approximately 10 years. The expected start date is 2018, and the expected end date is 2021. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEAR TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Siting surveys												
Collect, Prepare and Stage Reef Materials												
Transport and Deploy Oyster Reef Cultch Materials												
Success Monitoring												

## Budget and Funding Sources

Wakulla County has estimated the total cost of this program to be \$325,000, including \$25,000 (all for planning and feasibility) for the artificial reefs project component and \$300,000 for the oyster restoration component. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$175,000
Implementation		\$130,000
Monitoring		\$20,000
<b>Total Cost</b>		<b>\$325,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$325,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$325,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FWC Artificial Reef Construction Grants		

## Partnerships/Collaboration

The Wakulla County Artificial Reef Program routinely collaborates with the Florida Artificial Reef Program managed by the FWC. This collaboration includes representatives from nearly all coastal counties in Florida and assists with material collection resources, technical construction assistance, artificial reef construction best practices, and outreach. Wakulla County may also collaborate with Franklin County and the oyster harvesting community.

## JEFFERSON COUNTY

# Headwaters Protection Program

### PROJECT NO. 9-1

## Project Description

### OVERVIEW AND LOCATION

This program will protect the Wacissa River Headwaters, Aucilla Basin, and Lake Miccosukee from nutrient and bacterial pollution by 1) removing approximately 56 septic systems and one package treatment plant; 2) providing a sanitary sewer to undeveloped areas to prevent the installation of septic systems in the future; and 3) refurbishing and modernizing three existing outdated lift stations to prevent sewage spills into the watershed. The projects are in central Jefferson County in and between the cities of Lloyd and Monticello (see **Figure 16-1A**).

### NEED AND JUSTIFICATION

This project will be implemented south of Monticello in an area where surface waters drain to the Aucilla and St. Marks Rivers. Both rivers are classified as Outstanding Florida Waters (OFW), giving them special protection with respect to water quality standards. The groundwater in this area contributes to the Wacissa River and Springs, waterbodies that are verified impaired for nutrients, which are associated with an ecological imbalance of algae in the system. Domestic wastewater and septic systems have been identified as possible sources of nitrogen to the Wacissa River and Springs (FDEP 2017, reference provided below). Removal of septic systems and expansion of and upgrades to centralized wastewater collection systems will remove some nitrogen inputs from the system and ensure that nitrogen loads to the Wacissa River and Springs do not increase as the area is developed for commercial use.

Currently, the area between the outskirts of the city of Monticello and the intersection of I-10 and SR 59 is sparsely developed. Any development in this area will require septic or package plants to treat the waste. The county is



**Figure XX-1A. Project location (map)**

promoting commercial development near the intersection of I-10 and SR 59. There already is a hotel and gas station at this location using a package treatment plant to process waste water. In addition, there are three existing lift stations in the city of Monticello that are old, outdated and at risk of failure. If these lift stations fail, they will discharge wastewater into the watershed (see **Figure 16-1B**).

### PURPOSE AND OBJECTIVES

The purpose of this program is to reduce nutrient loads and improve water quality in these sensitive watersheds by implementing a septic to sewer conversion; as well protect water quality via the rehabilitation and upgrade of the outdated lift stations. The septic to sewer conversion will prevent the installation of new package plants and septic systems in the future, and take old ones offline. The lift stations rehabilitations will protect water quality through mitigation of spills and possible bacterial contamination into the watershed in the Lake Miccosukee basin. This is consistent with the Florida Water Management District SWIM plans.

### PROJECT COMPONENTS

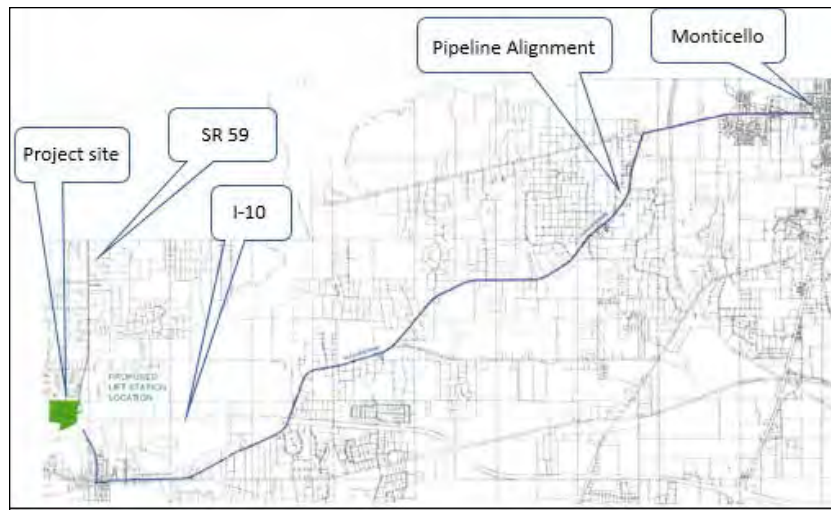
There are two project components:

1. Installation of sanitary sewer from the existing sewer infrastructure in Monticello to the intersection of I-10 and SR-59 along Old Lloyd Road.
2. Rehabilitate and upgrade of three existing lift station in the city of Monticello.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will improve the water quality conditions in the Wacissa River and Springs, along with the Aucilla River Watershed and the St. Marks River Watershed, both of which flow to the Gulf of Mexico and the Big Bend Seagrasses Aquatic Preserve by removing sources of nutrient and bacterial contamination caused by existing septic systems and an existing package treatment plant. The expansion of sewer will also prevent the installation of new septic systems and protect water quality from future impacts as the area develops. Upgrading the aging lift stations will prevent inevitable spills and preserve water quality.

Installation of sewer infrastructure will support economic development at the southwest corner of the I-10 and SR 59 intersection. Development in this area will expand the tax base and expand the local economy. The proposed project will also increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts.



**Figure 9-1B. Septic to Sewer Project at I-10 and SR-59.**

## SECTION V: Proposed Projects, Programs and Activities

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources

### Implementing Entities

Jefferson County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project. Jefferson County has coordinated with numerous other agencies in the development of this plan, and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

### Best Available Science and Feasibility Assessment

Water quality issues related to nutrients in the Wacissa River and Springs are described in the following report (and references cited therein):

- Florida Department of Environmental Protection (FDEP), 2017. Nutrient TMDL for Wacissa River and Springs (WBIDs 3424 and 3424Z) and Documentation in Support of Development of Site-Specific Numeric Interpretations of the Narrative Nutrient Criterion.

This program is consistent with the components and recommendations of the following natural resource management plans:

- Northwest Florida Water Management District, 2017. Draft St. Marks River and Apalachee Bay Surface Water Improvement and Management (SWIM) Plan.
- Florida Department of Environmental Protection (FDEP), 2014. Big Bend Seagrasses Aquatic Preserve Management Plan.
- Suwannee River Water Management District, 1991. Aucilla River System Surface Water Improvement (SWIM) Plan.

These projects are considered to be feasible. However, these projects are only in the conceptual phase. The project cannot be fully evaluated for feasibility until preliminary design is completed.



## Risks and Uncertainties

This expansion of the sewer to I-10 and SR-59 is in the conceptual phase; there have been no studies or design work completed on this project. The risks will be identified during the feasibility and design phases.

The rehabilitation and upgrade of the lift stations is feasible, but preliminary design needs to be completed before the risks can be assessed.

## Success Criteria and Monitoring

This project will affect water quality in an adjacent estuarine system. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Maintenance of ambient water quality (nutrient and bacterial concentrations) in the unimpaired tributaries to the Aucilla River and St. Marks River; and
- Changes in groundwater nutrient concentrations in the Wacissa River and Springs contribution area.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Wakulla County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of these projects - from feasibility through construction and success monitoring is approximately four years. The expected start date is 2018, and the expected end date is 2022. Implementation of these projects has been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Water Quality Monitoring Program												
<i>I-10 to SR 59 Sewer Expansion</i>												
Feasibility Study												
Preliminary Design												
Final Design/Permitting												
Construction												
<i>Lift Stations Rehabilitation</i>												
Preliminary Design												
Final Design/Permitting												
Construction												

## Budget and Funding Sources

The preliminary budget is indicated in the table below. The cost of preliminary design is estimated to be 3% of the project cost. The cost of the water quality data evaluation is expected to cost \$100,000 (25,000 per year for 4 years). The county did not request funds for water quality monitoring but it is believed to be necessary. The total cost of the program is \$7,160 million dollars. Potential leveraging could come from State Revolving Fund, NFWFMD Water Quality Grant and USDA Rural Development funding. CDBG \$1.5 million for economic development has been identified for the sewer expansion project. No matching funds have been identified.

PROJECT BUDGET		ESTIMATED DOLLARS
Monitoring		\$100,000
	<b>Total</b>	<b>\$100,000</b>
<i>I-10 to SR 59 Sewer Expansion</i>		
Planning		\$100,000
Implementation		\$6,785,000
	<b>Total</b>	<b>\$6,885,000</b>
<i>Lift Station Rehabilitation</i>		
Planning		5,000
Implementation		\$170,000
	<b>Total</b>	<b>\$175,000</b>
	<b>Total Cost</b>	<b>\$7,160,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$7,160,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
	<b>Total Secured Funding</b>	<b>\$7,160,000</b>
	<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
State Revolving Fund		
NFWFMD Water Quality Grant		
USDA Rural Development		

## Partnerships/Collaboration

The primary partnership will be between Jefferson County and the City of Monticello.

## JEFFERSON COUNTY

Wacissa River  
Headwaters Park Masterplan

PROJECT NO. 9-2

## Project Description

## OVERVIEW AND LOCATION

This Jefferson County masterplan for the headwaters of the Wacissa River will coordinate recreational access and land management efforts surrounding the Wacissa Springhead, Malloy Landing and additional properties when available. The subject properties are located just south of County Road 59 (Gamble Rd.) south of the town of Wacissa. These efforts will compliment County funded projects near the springhead to stabilize the shoreline, add a boardwalk with spring boil overlook and park amenities (see **Figure 9-1A**).

## NEED AND JUSTIFICATION

The Wacissa Spring is a popular recreations spot offering swimming, diving, fishing, canoeing and kayaking. The current park amenities include a boat ramp, restrooms, and pavilions. There are currently several user groups accessing the same area and causes overcrowding and the potential for safety issues when the boat ramp and swimming hole are immediately adjacent to one another. The County has funded future park improvements including a non-motorized vessel launch area, a boardwalk, and an overlook area near the spring boil.

## PURPOSE AND OBJECTIVES

This program will provide more public recreation opportunities to an increased number of user groups. This will be accomplished by acquiring Malloy Landing which will add another boat ramp and reduce use near the swimming area. Ancillary benefits to this program include economic development and environmental education and protection. The plan will also address controlling the spread of hydrilla and promoting native submerged aquatic vegetation. Jefferson County will work with the Wacissa Springs Committee to complete community educational and environmental enhancement projects.

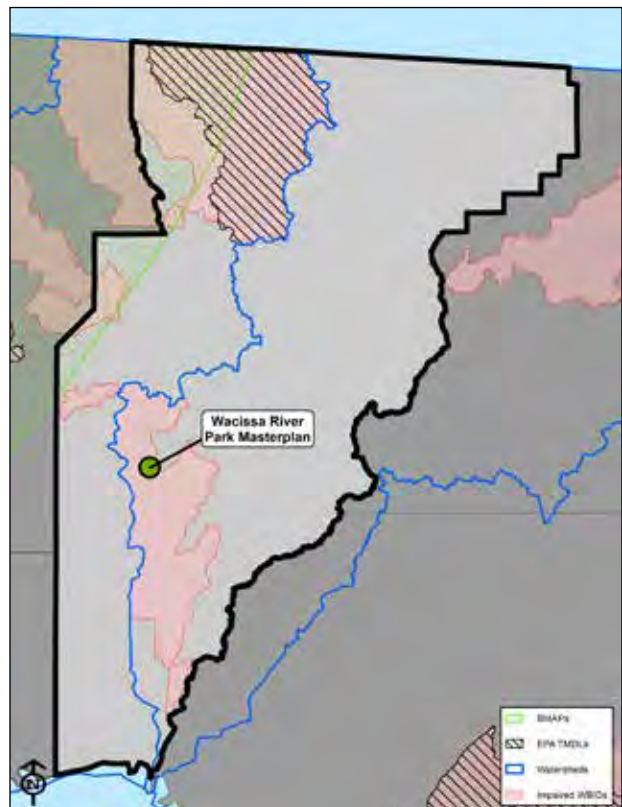


Figure XX-1A. Project location (map)

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

Jefferson County will conduct a feasibility study that will establish planning sessions to determine locations and preliminary design of program elements and amenities. This plan will look at integrating Malloy Landing into Wacissa Park, expanding park amenities like parking areas, bathrooms, pavilions, stabilize riverbanks, multi-use trails, while restoring habitat and preserving cultural resource sites. Program elements will include:

1. Wacissa Park Amenities
  - composting bathrooms
  - additional picnic shelters
  - multi-use trailheads
2. Malloy Landing
  - land Acquisition for additional park amenities
  - boat ramp
  - sediment abatement/canal dredging
  - FWC/Sheriff Officer Housing
3. Hydrilla Control
  - public education at boat ramps
  - treatment regimen
  - meet with UF/IFAS on experimental solutions
4. Wacissa Spring Committee Projects
  - community involvement
  - educational kiosks and outreach
  - environmental enhancements

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Jefferson County wants to provide public access to their growing number of residents and visitors to one of the main natural attractions in the County. With increased amenities attracting a wider number of user groups the local economy with benefit in additional sales to commercial stores and vendors.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.
- Eligible Activity 10: Promotion of Tourism in the Gulf Coast Region, including recreational fishing (primary).

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources; and
- Goal 5: Restore and Revitalize the Gulf Economy (primary).

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 3: Protect and Restore Living Coastal and Marine Resources; and
- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary).

## Implementing Entities

Development of the Wacissa Headwaters Masterplan will be conducted by Jefferson County as a sub-recipient. The County will be responsible for a feasibility study, design, permitting, construction and monitoring of the projects.

## Best Available Science and Feasibility Assessment

A best available science review is required for programs and projects that would restore and protect the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, coastal wetlands, and economy of the Gulf Coast. The main focus of this project is the provision of recreational access, so a best available science analysis is not required for the majority of the program's components.

Hydrilla control, dredging and riverbank restoration will be ancillary elements and their design will be guided by best available science.

This program is considered to be feasible with respect to the ability to: 1) obtain subject property; 2) construct the park amenity projects in future phases; and 3) effectively operate and maintain the projects over the long term.

## Risks and Uncertainties

There is the chance that negotiation for the land acquisition may not be successful. If these parcels are not feasible, then Jefferson County will propose additional areas that are consistent with this masterplan.

## Success Criteria and Monitoring

Success will be measured through acres acquired, recreational amenities completed, and tracking public use.



## Milestones and Schedule

This program will commence in 2018 and be completed in 2026, an eight-year interval.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning Sessions												
Masterplan Development												
Land Acquisition												
Permitting & Design												
Park Amenities												
Education & Environmental Enhancement												
Success Monitoring												

## Budget and Funding Sources

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$400,000
Implementation	\$1,550,000
Monitoring	\$50,000
<b>Total Cost</b>	<b>\$2,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$2,000,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$2,000,000</b>
<b>Budget Shortfall</b>	<b>0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
Florida Boating Improvement Fund	
Recreational Trails Program	

## Partnerships/Collaboration

Jefferson County would like to partner with the Wacissa Springs Committee to plan and implement future phases of the plan.

# JEFFERSON COUNTY Recreation / Public Access Program

PROJECT NO. 9-3

## Project Description

### OVERVIEW AND LOCATION

This program seeks to build on successful recreational access efforts in Jefferson County through a combination of park amenities, and agreements with other state/federal agencies to co-manage land. Project areas include the Pinhook River, a Historic Dam on the Wacissa River, the Goose Pasture Recreation Area and restoration of the County Mine Facility. These projects are located in the southern portion of Jefferson County (see **Figure 9-3A**).

### NEED AND JUSTIFICATION

Jefferson County's coastline wholly within the boundaries of the St. Mark's National Wildlife Refuge (SMNWR), but residents and visitors must go to neighboring counties in order to get public access to the Gulf of Mexico. Currently there is no public access allowed to the public through the Jefferson County portion of the Refuge to the Gulf. The County is looking to partner with the Refuge managers and other agencies to expand the types of recreational amenities offered at existing, publically owned areas.

### PURPOSE AND OBJECTIVES

This program's purpose is to provide more public recreation opportunities to an increased number of user groups while responsibly managing the land. This will be accomplished by acquiring partnerships with the U.S. Fish and Wildlife Service (USFWS), and the Suwannee River Water Management District (SRWMD) to develop existing publically held lands and park sites for additional types of recreation. Ancillary benefits to this program include economic development and environmental education and protection. While four project areas have been defined in this program, if these project sites become unavailable, other sites that meet the goals of this program will be substituted.

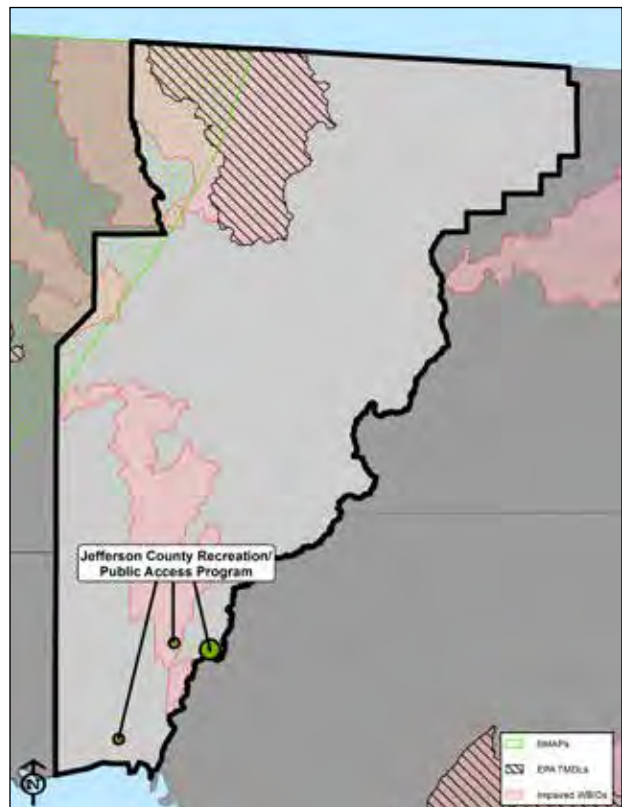


Figure XX-1A. Project location (map)

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

Jefferson County will conduct a feasibility study that will establish planning sessions with SMNWR and SRWMD to determine locations and preliminary design of program elements and amenities. This program will upgrade park amenities like bathrooms, pavilions, stabilized parking areas, multi-use trails, while restoring habitat and preserving cultural resource sites.

1. Pinhook River Coastal Access Point
  - Enter into a memorandum of agreement with SMNWR
  - Stabilize road, bridges and create linear a parking area.
  - Add a composting restroom and a small boat launch area.
2. Historic Dam Structure
  - Preserve and restore the original dam and weir structure
  - Add a canoe & kayak portage structure
  - Add educational kiosk
  - Use area to control hydrilla
3. Goose Pasture Recreation Area
  - Enter into a Memorandum of Agreement with SRWMD
  - Designate trails for hiking, biking, horses and ATVs
  - Expand boat ramp facilities, pavilions and composting restrooms
4. County Mine Restoration
  - Restore the floodplain creating a natural buffer along the Wacissa River to reduce sedimentation and allow natural aquifer recharge.
  - Provide park amenities
  - Plan and design a ATV park

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Jefferson County wants to provide public access to their growing number of residents and visitors. These lands are currently in public management but historically have been under-utilized. With increased amenities attracting a wider number of user groups these parks could reduce overcrowding other local parks. The goal is to allow passive, low/no-impact recreation through these public access projects.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.
- Eligible Activity 10: Promotion of Tourism in the Gulf Coast Region, including recreational fishing (primary).

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources; and
- Goal 5: Restore and Revitalize the Gulf Economy (primary)

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 3: Protect and Restore Living Coastal and Marine Resources; and
- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary)

## Implementing Entities

Development of the public access program will be conducted by Jefferson County as a sub-recipient. The County will be responsible for design, permitting, construction and monitoring of the projects.

## Best Available Science and Feasibility Assessment

A best available science review is required for programs and projects that would restore and protect the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, coastal wetlands, and economy of the Gulf Coast. The main focus of this project is the provision of recreational access, so a best available science analysis is not required for the majority of the program's components.

This program is considered to be feasible with respect to the ability to: 1) obtain subject property agreements; 2) construct the park amenity projects in future phases; and 3) effectively operate and maintain the projects over the long term.

## Risks and Uncertainties

Placing amenities along the coast are always at risk to damage by tropical storms and climate change/sea-level rise. The amenities in this program will incorporate these criteria into the design. There is also the chance that agreements with the other parties are not successful. If these projects are not feasible, they Jefferson County will propose additional park areas that are consistent with this program.

## Success Criteria and Monitoring

Success will be measured through acres acquired, recreational amenities completed, and tracking public use.

## Milestones and Schedule

This program will commence in 2018 and be completed in 2030, a six-year interval.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Pinhook River Planning, Permitting & Design												
Pinhook River Construction												
Historical Dam Planning, Permitting & Design												
Historical Dam Construction												
Goose Pasture Planning, Permitting & Design												
Goose Pasture Construction												
County Mine Planning, Permitting & Design												
County Mine Construction												
Success Monitoring												

## Budget and Funding Sources

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$400,000
Implementation	\$2,980,000
Monitoring	\$120,000
<b>Total Cost</b>	<b>\$3,500,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$3,500,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$3,500,000</b>
<b>Budget Shortfall</b>	<b>0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
Florida Boating Improvement Fund	
Recreational Trails Program	

## Partnerships/Collaboration

Jefferson County would like to partner with SRWMD and USFWS to manage two properties for public access.



## TAYLOR COUNTY

Coastal Public Access and  
Boat Ramp Program

PROJECT NO. 10-1

## Project Description

## OVERVIEW AND LOCATION

Taylor County ranks second only to Monroe County in the number of miles of Gulf shoreline. Those lands include the Big Bend Wildlife Management Area, Hickory Mound, Snipe Island, Spring Creek and Tide Swamp Units totaling over 60,000 acres of public land managed by FWC. For all this shoreline and public land, Taylor County's public boat ramps exceed capacity regularly during the summertime. This program seeks to expand recreational access efforts of the County through a combination of coastal zone land acquisition with boat ramp and park development (see **Figure 10-1A**).

## NEED AND JUSTIFICATION

Taylor County has public boat ramps at Keaton Beach and Steinhatchee, but during the summer scallop season these facilities are beyond capacity as visitors come from around Florida and Georgia to ply the nearshore waters from July through September. The number of vehicles, and vessels causes severe congestion on the roadways and waterways in these two areas of the County.

Visitors prefer paved road access for speed of access and also limits the damage to towed vessels. Taylor County residents have become increasingly frustrated with the traffic problems in these small communities and have asked the County to explore additional boat ramp facilities in Keaton Beach, Steinhatchee and other areas throughout the County.

## PURPOSE AND OBJECTIVES

The purpose of this program is to increase the number of new boat ramp facilities and to expand the capacity of the existing County/FWC boat ramp facilities. This also includes infrastructure improvements to roads, parking areas and County park facilities to accommodate this seasonal influx of visitors.



**Figure 10-1A.** Project location in Taylor County.

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

The first step in the program would be for Taylor County to conduct a feasibility study to determine the suitability for acquiring properties that would:

1. Have paved road access
2. Ability to pave roads to existing boat ramps
3. Relieve traffic congestion
4. Have navigable channel access (at -4 ft MLW?)
5. Suitable parking area for boat trailers
6. Ability to have park amenities
7. All of the above improvements must be permissible and minimize environmental impact

The study would look at cost of acquisition, design, permitting and construction of amenities. This would include bathymetric surveys, environmental impact assessments, traffic and vessel studies.

The following list of properties include potential areas and items of concerns for these locations:

1. Potential Land Acquisition (Keaton Beach Area)
  - Navigable access
  - Minimize environmental impact
  - Traffic Congestion
2. Potential Land Acquisition (Steinhatchee Area)
  - Expand parking
  - Traffic Congestion
3. Existing FWC Property to be improved/expanded
  - Paved Road Access
  - Navigable Access

Potential properties are shown on **Figure 10-1B**.

Once the feasibility study is complete the property assessments can be completed in preparation for sale. For the existing FWC properties a memorandum of agreement would be required between Taylor County and FWC to agree to expand the boat ramp facilities, potentially pave roads and additional amenities/restrooms, docks, etc.



**Figure 10-1B. Potential Boat Ramp Facilities in Taylor County.**

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

Scallop season is a big influx of tourism dollars in the summertime for Taylor County. Predominantly Keaton Beach, Perry, Dekle Beach and Steinhatchee are the areas with lodging and Gulf Access. Of these towns Perry and Steinhatchee have the most commercial business interests in the form of fuel, restaurants and hotels. Dekle and Keaton Beach are predominantly made up of private residences that are rented seasonally. Expanding into new areas may bring commercial opportunities to other parts of the County. By partnering with FWC the existing facilities could be expanded with minimal environmental impact.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Activity 6: Infrastructure projects benefitting the economy or ecological resources, including port infrastructure (primary).

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 4: Enhance Community Resilience; and
- Goal 5: Restore and Revitalize the Gulf Economy (primary).

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary).

## Implementing Entities

Property acquisition activities will either be conducted by Taylor County as a sub-recipient to the Gulf Consortium by an NGO on behalf of the Gulf Consortium. Development of park projects will be conducted by Taylor County as a sub-recipient.

## Best Available Science and Feasibility Assessment

An analysis of best available science is required for programs and projects that would restore and protect the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, coastal wetlands, and economy of the Gulf Coast. The main focus of this project is community resilience through the provision of recreational access, so a best available science analysis is not required for the majority of the program's components.

This program is considered to be feasible with respect to the ability to: 1) obtain subject property; 2) construct the park amenity projects in future phases; and 3) effectively operate and maintain the projects over the long term.

## Risks and Uncertainties

The greatest risk in any land acquisition program is securing a willing seller. A seller can leave prior to a final contract due to a change of heart about the sale, another buyer being able to move quickly and at an above asking price offer, or appraisals not meeting a seller's expectation of price. Strategies to mitigate that risk will be pursued including the possibility of the Gulf Consortium only submitting grant applications for parcels with executed sales contracts.

## Success Criteria and Monitoring

Success will be measured through acres acquired, recreational amenities completed, and tracking public use.

## Milestones and Schedule

This program will commence in 2018 and be completed in 2030, a twelve-year interval.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Taylor County Public Access Study												
Property Assessments & Agreements												
Property Acquisition												
Property Design and Permitting												
Construction												
Success Monitoring												

## Budget and Funding Sources

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$500,000
Implementation		\$11,960,000
Monitoring		\$200,000
<b>Total Cost</b>		<b>\$12,660,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$12,660,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$12,660,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
Florida Boating Improvement Fund		
Recreational Trails Program		

Taylor County plans to apply for additional grant funding/leveraging to hopefully add to the funds available for this program. However, the program will be phased in a manner that will allow for purchase of property and additional amenities based on the amount of funding available.

## Partnerships/Collaboration

Taylor County will cooperate with FWC and local landowners to expand the coastal public access.

## DIXIE COUNTY

# Horseshoe Beach Working Waterfront Rehabilitation

PROJECT NO. 11-1

## Project Description

### OVERVIEW AND LOCATION

This project involves the dredging of the main Horseshoe Beach navigation channel and turning basin, and the construction of a commercial dock for staging vessels and offloading seafood directly to wholesale trucks. The location of the Town of Horseshoe Beach is shown **Figure 11-1A**.

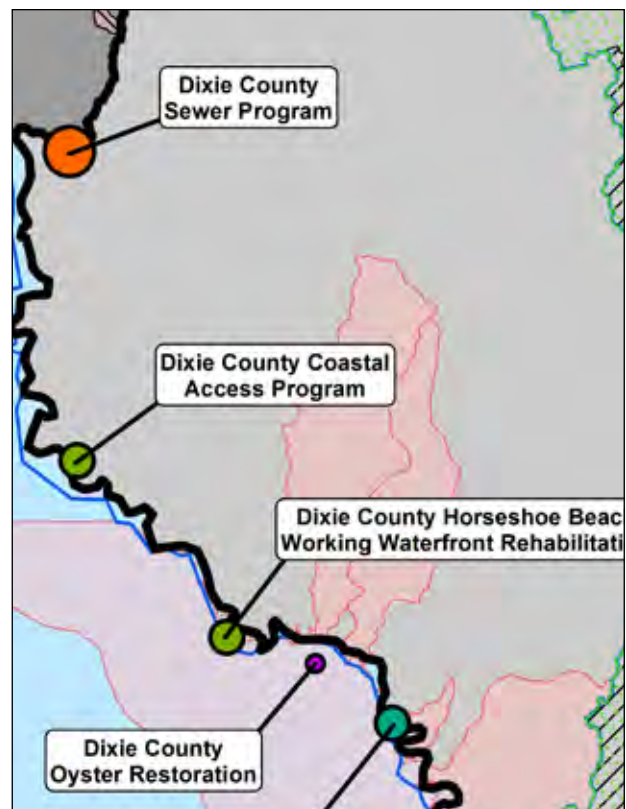
### HORSESHOE BEACH WORKING WATERFRONT PROJECT NEED AND JUSTIFICATION

Commercial, charter, and recreational fishing are an important aspects of Dixie County's economy. The Horseshoe Beach main channel was last dredged in 1996 and with recent storms like Hurricane Hermine, areas have shoaled and become encumbered with debris that are a hazard to navigation. There is a need to maintenance dredge this channel to provide safe navigational access to both commercial and recreational fishing vessels.

In addition, commercial dockage for offloading seafood is currently limited in Horseshoe Beach, and throughout Dixie County in general. Dixie County owns waterfront property that abuts the main navigation channel, however, the property needs to be developed to support a working waterfront. This project is compatible with and supports Project 11-3 – Dixie County Oyster Restoration.

### PURPOSE AND OBJECTIVES

The purpose of this project is to rehabilitate the working waterfront for commercial fisherman in Horseshoe Beach. Project objectives include: 1) improve navigational access through maintenance dredging of the auxiliary channels; and 2) construct a commercial dock for staging vessels and offloading seafood directly to wholesale trucks.



**Figure 11-1A.** Project location in Dixie County.



## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

Components of this project include:

1) engineering design and permitting; 2) construction; and 3) success monitoring. Maintenance dredging of the Horseshoe Beach main channel and turning basin have been previously permitted by the U.S. Army Corps of Engineers, and there is an existing permitted dredged material management area (DMMA). The proposed dredging would be to the following specifications:

- Auxiliary channel areas dredged to -5 feet MLW; and
- Dredge disposal will be at a previously permitted dredged material management area north of Horseshoe Beach.



**Figure 11-1B.** Proposed commercial fishing dock in the Town of Horseshoe Beach.

Construction of the commercial dock would take place on county-owned waterfront parcel shown in **Figure 11-1B**. Construction would include:

- Rehabilitation of the concrete seawall;
- Concrete pilings with rubber fenders pier/wharf structure for larger vessels; and
- Aluminum gangway to floating dock for smaller vessels.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Dixie County has a thriving fisheries economy and providing safe navigation to a harbor with a clean, stable and reliable loading and unloading area for the fishing fleet will enhance the seafood industry in the area. The same model has been used around the Gulf coast and actually brings commercial businesses in the form of restaurants catering to tourists that seek the sea to table experience. In addition to commercial fishing, charter fishing guides and captains also need a clean, safe location to meet their clients. With a maintained channel depth of -7.5 feet MLW, Horseshoe Beach can become a launching point for larger commercial and recreational vessels and the docks and launching facilities should be upgraded to compensate.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Activity 6: Infrastructure projects benefiting the economy or ecological resources, including port infrastructure (primary); and
- Activity 10: Promotion of Tourism in the Gulf Coast Region, including recreational fishing.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Consortium Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary); and
- Objective 5: Promote Community Resilience.

## Implementing Entities

Dixie County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction and success monitoring of the project.

## Best Available Science and Feasibility Assessment

This is primarily an economic and infrastructure improvement project; therefore, a Best Available Science analysis is not applicable. Maintenance dredging of the navigation channel and turning basin were previously approved by the U.S. Army Corps of Engineers, and there is a permitting DMMA to accommodate spoil disposal.

This project is considered to be feasible with respect to the ability to: 1) secure necessary property agreements and permits; 2) dredge the navigation channel and turning basin; 3) construct the commercial docking facilities; and 4) operate and maintain the improved infrastructure over the long term.

## Risks and Uncertainties

Coastal infrastructure is at risk for damage by tropical storms and sea-level rise. However, the engineering design of the proposed infrastructure improvements will consider coast storm hazards and sea level rise, as appropriate.

## Success Criteria and Monitoring

This project will improve navigation and port infrastructure and create local jobs. Therefore, a range of appropriate success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Pre- and post-construction dredge surveys;
- Increase in local commercial and recreational seafood landings; and
- Increase in local economic activity.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Dixie County is committed to conducting the monitoring necessary to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project is approximately six years. The expected start date is 2018, and the expected end date is 2023. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Engineering Design & Permitting												
Maintenance Dredging												
Construction of Commercial Dockage												
Success Monitoring												

### Budget and Funding Sources

A preliminary total cost estimate of \$6.5 million has been developed for this project using available information from comparable projects, and certain assumptions. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$100,000
Implementation		\$5,850,000
Monitoring		\$50,000
<b>Total Cost</b>		<b>\$6,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$3,000,000
Direct Component		\$0
Other Grants or Co-Funding (FEMA)		\$3,000,000
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$6,000,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
Florida Boating Improvement Fund		
FWC (Working Waterfronts Grants)		

### Partnerships/Collaboration

Dixie County will collaborate with the Town of Horseshoe Beach in the design and implementation of this project.

## DIXIE COUNTY

Shired Island County Park Beach  
Nourishment and Living Shoreline

PROJECT NO. 11-2

## Project Description

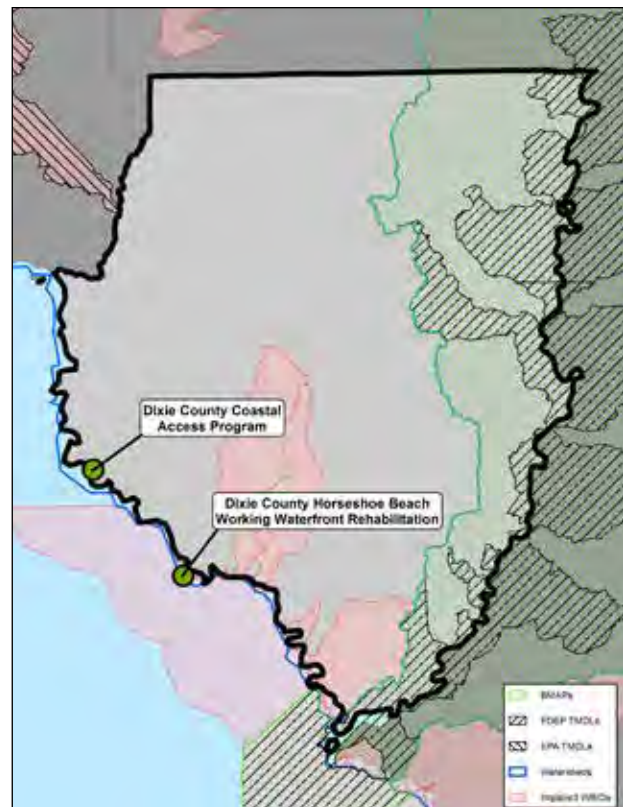
## OVERVIEW AND LOCATION

This project involves beach nourishment, the creation of a living shoreline, purchase of adjacent property and the improvement of recreational amenities at Shired Island County Park which is located on the shores of Shired Creek and the Gulf of Mexico, north of the Suwannee River in southwestern Dixie County (see **Figure 11-2A**).

## NEED AND JUSTIFICATION

Dixie County is a rural, sparsely populated coastal county with abundant natural resources. For these reasons the county is experiencing a growth in ecotourism; however, recreational opportunities for residents and tourists are limited due to the lack of adequate park facilities. Shired Island County Park encompasses approximately 70 acres, with facilities that include a boat ramp, a fishing pier, hiking trails, a sandy beach, tent campsites, bathrooms, and an outdoor shower. It is one of only a few locations along the Dixie County shoreline where a natural sand beach occurs.

The park is a locally popular site for fishing, kayaking, camping, hiking, and wildlife viewing. The location also includes a historically significant site for cultural resource artifacts. However, in 2016 the park experienced substantial storm damage from Hurricane Hermine, resulting in significant beach erosion and the destruction of the fishing pier. In addition, the bathroom facilities were badly damaged. While the fishing pier has been rebuilt using FEMA funds, there is a need to restore and protect the beach, and to make other improvements to the park facilities.



**Figure 11-2A.** Project location in Dixie County.

## SECTION V: Proposed Projects, Programs and Activities

Beach nourishment would restore the beach which currently has overnight camping and day-use kayakers both competing for space. In addition, the purchase of the adjacent property would allow for expansion of the camping area and a new well for water supply. The living shoreline would be to reduce wave energy and erosion along the beach, protect sensitive cultural resources, and create an artificial reef feature that would attract trout, redfish, sheepshead and snapper to the area.

### PURPOSE AND OBJECTIVES

The purpose of this project is to improve both the natural environment and recreational amenities at Shired

Island County Park. The objectives of the project include: 1) restore the sandy beach; 2) construct a living shoreline offshore of the beach to protect the shoreline from future erosion and enhance local habitats and fishing; 3) construct new bathroom and shower facilities and other amenity improvements; 5) purchase additional property to expand and enhance coastal recreational opportunities for both residents and tourists; and 6) create local construction jobs.

### PROJECT COMPONENTS

Components of this project include: 1) acquisition of property; 2) completion of a conceptual design and feasibility study; 3) engineering design and permitting; 4) construction; and 5) success monitoring. The comprehensive conceptual design and feasibility study would determine the following: 1) volume of sand required for beach nourishment; 2) local compatible beach sand sources; 3) location and materials for living shoreline; and 4) amenity upgrades (restrooms, parking, campsites, etc.). This study would also provide a detailed cost estimate for the project.

**Figure 11-2B** shows an aerial photograph of Shired Island County Park and the potential alignment of the living shoreline.

This park borders the Big Bend Seagrasses Aquatic Preserve, so engineering design and permitting must consider the sensitive nature of the existing marine environment, and incorporate design features that are compatible with local habitats and hydrographic conditions, while also protecting and improving local water quality.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will bolster ecotourism as a component of the Dixie County economy and provide improved public access to their growing number of residents. Project construction will be completed by local contractors which will also infuse money into the local economy. In addition, the project will improve the local environment, and protect the shoreline from future storm damage, thus contributing to the long-term sustainability Shired Island County Park.



**Figure 11-2B.** Aerial photograph of Shired Island County Park and proposed improvements.



## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region (primary); and
- Eligible Activity 10: Promotion of Tourism in the Gulf Coast Region, including recreational fishing.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources (primary); and
- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 4: Restore and Enhance Natural Processes and Shorelines (primary);
- Objective 3: Protect and Restore Living Coastal and Marine Resources;
- Consortium Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.

## Implementing Entities

Dixie County will be the sole implementing entity and grant sub-recipient responsible for land acquisition, design, permitting, construction and success monitoring.

## Best Available Science and Feasibility Assessment

The benefits of beach nourishment and living shorelines are well documented. A key document used as the basis for the living shoreline component of this project is cited below:

- NOAA, 2015. Guidance for Considering the Use of Living Shoreline. National Oceanic and Atmospheric Administration Living Shorelines Workgroup.

Beach nourishment and the construction of improved amenities are considered to be feasible project components; however, the ability to secure necessary permits and construct a living shoreline in this location needs to be determined through the completion of a comprehensive conceptual design and feasibility study.

## Risks and Uncertainties

Coastal park amenities are at risk for damage by tropical storms and sea-level rise. However, the proposed living shoreline will be designed to reduced coastal storm hazards, sea level rise will be factored into the design.

## Success Criteria and Monitoring

This project will restore the beach and improve nearshore habitats at Shired Island County Park, as well as enhance recreational opportunities and create local jobs. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

## SECTION V: Proposed Projects, Programs and Activities

- Restoration of beach profiles through pre- and post-construction surveys;
- Metrics on the recruitment of benthic encrusting organisms and fish on the living shoreline;
- Increase in recreational usage; and
- Local construction jobs created.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Dixie County is committed to conducting the monitoring necessary to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project is approximately eight years. The expected start date is 2018, and the expected end date is 2026. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Conceptual Design & Feasibility Study												
Engineering Design & Permitting												
Construction												
Success Monitoring												

### Budget and Funding Sources

A preliminary total cost estimate of \$2 million has been developed for this project using available information from comparable projects, and certain assumptions. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$400,000
Implementation		\$1,500,000
Monitoring		\$100,000
<b>Total Cost</b>		<b>\$2,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$2,000,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$2,000,000</b>
<b>Budget Shortfall</b>		<b>0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
Florida Boating Improvement Fund		
Recreational Trails Program		
NRDA		
NFWF		

## Partnerships/Collaboration

The Florida Department of Environmental Protection typically cost-shares about 30 percent of the total cost of beach nourishment projects, and this project may qualify. In addition, Dixie County may collaborate with the Suwannee River Water Management District and the Florida Fish and Wildlife Conservation Commission with regard to leveraged funding for the living shoreline component.

RESTORE Act  
Compliance

Public Participation

Financial Integrity

Overall Consistency

Proposed Projects

Appendices

## DIXIE COUNTY

# Oyster Restoration Project

PROJECT NO. 11-3

## Project Description

### OVERVIEW AND LOCATION

The Dixie County Oyster Restoration Project will place substrate in Suwannee Sound along the Dixie County coast to restore once productive oyster reefs that have been degraded due primarily to reduced freshwater flows and associated disease and predation on the oysters (see **Figure 11-3A**).

### NEED AND JUSTIFICATION

Although 90 percent of the Florida oyster harvest is from Apalachicola Bay in Florida's northwest panhandle, the estuarine waters of the Suwannee River along Florida's Big Bend, including Dixie and Levy counties, provide most of Florida's remaining commercial oyster harvest. Commercial shellfish harvest is approved in Dixie County from Horseshoe Beach south, but conditionally closed or restricted depending on water quality. Although the Big Bend area has the greatest length of undeveloped coastline in the continental U.S., the areal extent of intertidal oyster reefs here has declined by 66 percent over the last 30 years (Seavey et al. 2011). The decline is also demonstrated by the commercial oyster fishery failure declared for Florida's Gulf coast by NOAA in 2013, pursuant to the Interjurisdictional Fisheries Act and the Magnuson-Stevens Fishery Conservation and Management Act. The continued effects of the decline over multiple generations will compromise the long term sustainability of the oyster fishery. The proposed restoration is needed to restore loss of oyster harvest from intertidal and subtidal areas in the Suwannee Sound and provide oyster reefs for fisheries habitat.



**Figure 11-3A.** Project location in Dixie County.

The proposed project is justified by the success of traditional and more recent cultching efforts used to support the recovery of oysters and associated habitat along Florida's Gulf coast.

### PURPOSE AND OBJECTIVES

The purpose of the proposed project is to restore oyster reef habitat and ecological functions for associated estuarine dependent species in support of ecological and economic sustainability in the Suwannee Sound using a combination of restoration techniques and materials to enhance and/or re-establish reef infrastructure. Objectives of the proposed project are to:

- Provide suitable habitat for oyster settlement;
- Provide three-dimensional structural habitat for oysters and associated species; and
- Recover and support a sustainable oyster fishery.

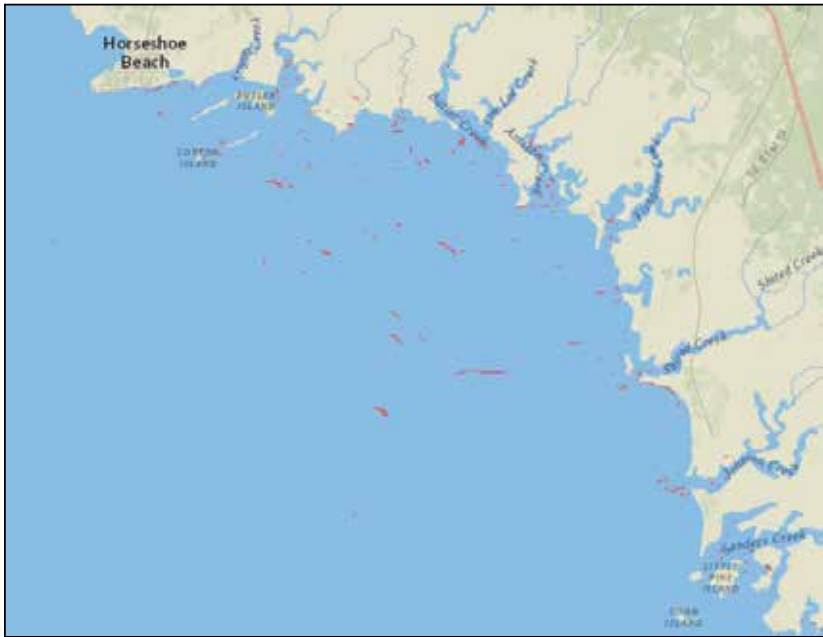
These objectives, and the proposed approach for restoration, are consistent with those developed for oyster restoration in the Gulf of Mexico by NOAA (2016) as part of the *Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement*.

### PROJECT COMPONENTS

Cultch (e.g. suitable material such as shell, rock, and/or concrete) will be placed at locations of existing reefs to: (1) create reef infrastructure, (2) stimulate spat setting, (3) enhance ecological function, and (4) accelerate oyster recovery. Approximately 19,256 cubic yards (cy) of suitable oyster reef substrate will be placed in designated locations, selected based on pre-construction monitoring.

The proposed project will restore oyster reefs and habitat needed to help restore an ecologically and economically sustainable oyster population in Suwannee Sound. The project has three primary components, listed below.

- Site selection;
- Cultch material placement on degraded oyster reefs to appropriate depths; and
- Pre- and post-monitoring and data collection to inform site selection, cultch volumes, and monitoring.



**Figure 11-3B.** Locations of potential restoration sites in Suwannee Sound (lower figure) in Dixie County.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The proposed project will contribute to the recovery of the oyster reefs and associated ecological sustainability in Suwannee Sound, which is part of a designated Aquatic Preserve and an Outstanding Florida Water. Restored oyster reefs will help to address losses of oysters and associated economic and ecological resources linked to episodic freshwater flow reductions from the Suwannee River by adding needed substrate for repeated oyster recruitment anticipated under more favorable conditions. Restored reefs will increase the sustainability of the reef systems (Frederick et al. 2015) and reduce storm impacts in the absence of barrier reefs (Edwards and Raabe 2004).

Oysters are an ecological keystone species that contribute to the integrity and healthy function of the nearshore ecosystem.

“Healthy, interconnected oyster populations form reefs that provide the hard substrate needed for oyster larvae to settle, grow, and sustain the population. In addition to providing habitat for oysters, the reefs: 1) are habitat for a diversity of marine organisms, from small invertebrates to large recreationally and commercially important species such as stone crab, blue crab, red drum, and black drum; 2) provide structural integrity that reduces shoreline erosion; and 3) improve water quality and help recycle nutrients by filtering large quantities of water.”

- Grabowski et al., 2012; NOAA, 2016

Restored reefs would also provide wintering habitat for the state’s largest population of oystercatchers (designated as threatened in Florida), which roost on high-tide sandbars and oyster reefs in Cedar Key.

Unlike most of Florida, coastal towns such as Horseshoe Beach and others along the Big Bend coast remain working waterfront communities and a return to oyster harvesting occurred in the years following an oyster collapse in Apalachicola Bay. For example, when oyster landings in Franklin County declined dramatically after hurricanes Kate and Elena (1985), landings in Dixie and Levy counties were the primary contributors from peninsular west Florida (Arnold and Berrigan 2002). The proposed project will provide wages for participants and will generate revenues through the purchase of equipment, fuel and lubricants, supplies, and services from local businesses, as well as temporary employment for fishermen during closed oyster season. Long-term economic benefits of harvesting, processing, and marketing fishery products will support local commercial fisheries and recreation.

### Eligibility and Statutory Requirements

The proposed project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region (primary);
- Activity 2: Mitigation of damage to fish, wildlife, and natural resources (secondary); and
- Activity 4: Workforce development and job creation (secondary).

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources;
- Goal 4: Enhance Community Resilience; and
- Goal 5: Restore and Revitalize the Gulf Economy.



This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 3: Protect and Restore Living Coastal and Marine Resources;
- Objective 5: Promote Community Resilience; and
- Objective 7: Improve Science-Based Decision-Making Processes.

## Implementing Entities

Dixie County will be the implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring for the proposed project. Dixie County staff will coordinate with appropriate agencies during planning and implementation of this project and may collaborate with agencies or other entities via leveraging and other funding agreements.

## Best Available Science and Feasibility Assessment

The proposed project is based on years of oyster reef restoration along the Gulf Coast as well as specific examples of successful restoration of nearshore oyster reef restoration (e.g., LaPeyre et al., 2014), and examples specific to the Big Bend area (e.g., Frederick et al. 2015; Arnold and Berrigan, 2002). Success is demonstrated by oyster densities on restored or created reefs that increased by 2.65 times on rock, 14.5 times on clam bags, and 9.2 times overall compared with control sites (LaPeyre et al., 2014). The value of restoring oyster reefs is also well documented and includes enhanced estuarine habitats, shoreline stabilization, reduced storm surge and erosion, water quality improvements, and shelter for over 300 species, which in turn are consumed by recreationally and commercially important finfish and crustaceans (NOAA, 2016; Peterson et al., 2003). The ratio of restored reef to the resulting restored estuarine habitat is an estimated 1:670 in the Big Bend (Frederick et al., 2015).

The proposed project approach is consistent with Gulf-wide objectives and restoration techniques outlined in the science-based *Final Programmatic Damage Assessment and Restoration Plan* (PDARP) and *Final Programmatic Environmental Impact Statement* (PEIS), which presents detailed information supporting the value of oyster reef restoration (NOAA, 2016). Project implementation will be consistent with Best Management Practices, as outlined by Florida Department of Agriculture and Consumer Services (FDACS).

The proposed project will, combined with other proposed or ongoing projects along the Big Bend coast, provide regional benefits in the form of improved management and sustainability of oyster habitat and associated ecological functions. Other proposed or underway projects that target sustainable oyster reefs include:

1. The State of Florida's Restoring Resilience to Oyster Reefs in the Big Bend of Florida's Gulf Coast in Dixie and Levy Counties – 4.6 miles of oyster reef restoration funded by RESTORE Comprehensive Plan Component (Pot 2) (\$5,181,697)
2. The University of Florida's (and partners) Recovery and Resilience of Oyster Reefs in the Big Bend of Florida – 32 acres/3 miles of restored reefs (\$8,334,400)

Based on preliminary information from regulating agencies such as Florida Department of Environmental Protection (FDEP) and FDACS, construction costs for similar projects, and operation and maintenance of other projects, the proposed project is considered feasible with respect to: 1) permitting; 2) construction within the proposed budget;

## SECTION V: Proposed Projects, Programs and Activities

and 3) effective long-term operation and maintenance of the project components. Key literature reviewed in the evaluation of this project includes the following:

- Arnold, W. and M. Berrigan, 2002. *A summary of the oyster (Crassostrea virginica) fishery in Florida*. A Report to the Division of Marine Fisheries, Florida Fish and Wildlife Conservation Commission (FFWCC), St. Petersburg, Florida, USA.
- Edwards, R. and E. Raabe, 2004. *Ecological Characteristics and Forcing Functions of the Suwannee River Estuary*. In B. Katz and E. Raabe (Ed.) Suwannee River Basin and Estuary Integrated Science Workshop. Sponsored by USGS, Suwannee River Water Management District (SRWMD), FMRI. Cedar Key, Florida.
- Frederick et al., 2015. *Restoring Resilient Oyster Reefs in Florida's Big Bend*. Final Report to The Nature Conservancy and NOAA. 49 pages.
- Grabowski, J.H. et al., 2012. *Economic valuation of ecosystem services provided by oyster reefs*. BioScience 62: 900–909.
- La Peyre, M., et al., 2014. *Oyster reef restoration in the northern Gulf of Mexico: Extent, methods and outcomes*. Ocean & Coastal Management 89: 20-28.
- NOAA. 2016. *Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS)*. <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>
- Seavey, J. R., W. E. Pine, III, P. Frederick, L. Sturmer, and M. Berrigan. 2011. *Decadal changes in oyster reefs in the Big Bend of Florida's Gulf Coast*. Ecosphere 2(10):114.

## Risks and Uncertainties

Establishing monitoring goals and success criteria are critical to reducing and managing risk and uncertainty for the proposed project. The proposed project will preclude oyster harvest from restored areas until oysters are of legal size and will require continued coordination and combined efforts of oyster fishers and agencies in support of improved fishery management strategies. In addition, oyster populations are still expected to periodically decline in response to natural declines in freshwater flows, although oyster reefs will help to hold freshwater in the estuaries.

## Success Criteria and Monitoring

Potential success criteria for the proposed project include:

- Increases in areal extent of oyster reefs;
- Increases in average reef height;
- Increases in oyster density, and
- Oyster size-frequency distribution representative of a sustainable oyster population.

An economic success criterion of benefits (economic returns for increased landings) vs. cost (of restoration) may also be used. More specific quantitative criteria will be developed within planning and monitoring frameworks developed for oyster reef restoration or enhancement in the Gulf (NOAA, 2016). Criteria for three environmental variables (water temperature, salinity, and dissolved oxygen) are also recommended (Baggett et al., 2014). Well-defined goals and objectives, statistically sufficient monitoring designs, and project documentation are absent from many restoration

projects (NAS, 2017), but are critical to the success of the proposed project. The implementation grant request will include a detailed monitoring program design that addresses goals, objectives, data collection, and data assessment and evaluation for these success criteria.

## Milestones and Schedule

Construction completion is anticipated within two years following planning, design, and permitting. Monitoring is planned for five years to inform and support this and future restoration projects and will continue for the life of the proposed project, for up to ten years.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Project Design and Permitting												
Permitting Complete												
Contractor Selected												
Restoration/ Barge Shelling												
Complete Cultch Placement												
Certification												
Success Monitoring												

## Budget and Funding Sources

The project budget was developed based on previous oyster restorations specific to Florida's west coast, with estimates ranging from about \$75 to \$120/ cubic yard of material and \$15,000 to \$25,000/ acre of material placed. Total cy of material planned are approximately 19,256, based on \$650,000.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$100,000
Implementation		\$650,000
Success Monitoring		\$250,000
<b>Total Cost</b>		<b>\$1,000,000</b>
FUNDING SOURCES		
Spill Impact Component		\$500,000
<b>Total Funding</b>		<b>\$500,000</b>
<b>Budget Shortfall</b>		<b>\$500,000</b>

## Partnerships/Collaboration

Potential project partners include University of Florida/IFAS, Suwannee River Water Management District, Suwannee Oystermen's Association, FFWCC, and The Nature Conservancy. Coordination with the following agencies is anticipated: FDACS, FFWCC, FDEP, SRWMD, National Marine Fisheries Service, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service.

## DIXIE COUNTY Coastal Access Program

PROJECT NO. 11-4

### Project Description

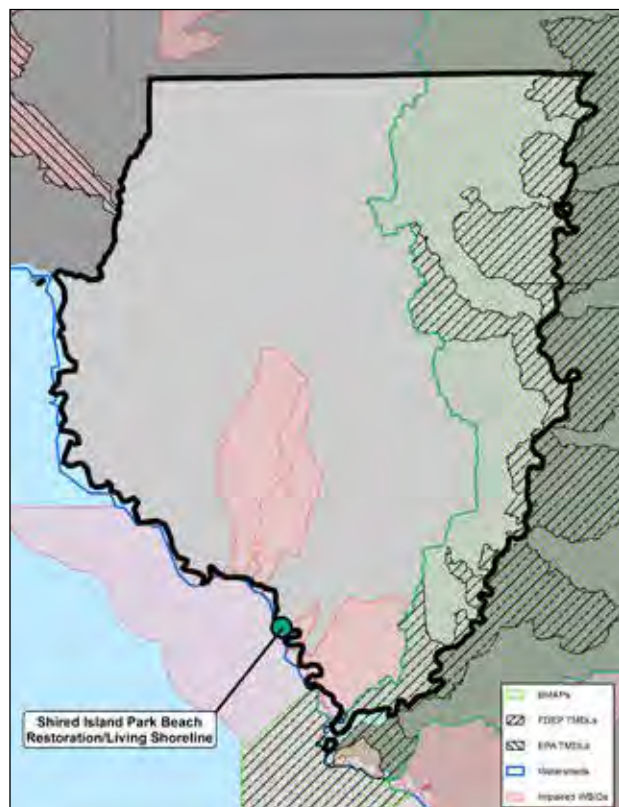
#### OVERVIEW AND LOCATION

This program involves public land acquisition and the construction and/or improvement of recreational amenities to enhance public access to the Gulf of Mexico. The County has evaluated several priority sites, the location of which are shown in **Figure 11-4A**.

#### NEED AND JUSTIFICATION

Dixie County is a rural, sparsely populated coastal county with abundant natural resources. For these reasons the county is experiencing a growth in eco-tourism; however, recreational opportunities for residents and tourists are limited due to the lack of adequate park facilities. In addition, navigational access to the Gulf of Mexico by recreational boaters in Dixie County, and the other counties of the Big Bend area of Florida, is very much restricted due to the naturally shallow coastal waters and relatively few dredged channels. Therefore, there is a need to acquire additional public coastal access sites and to develop supporting recreational amenities at these sites.

The County is looking to bolster existing locations and partner with other agencies to expand the types of recreational amenities offered. In the past coastal access in the county has primarily focused on boat ramps, and this program would further that work, but would also include non-motorized vessel launch facilities and an observation tower for bird watching.



**Figure 11-4A.** Project location in Dixie County.

## PURPOSE AND OBJECTIVES

The purpose of this program is to acquire additional coastal access sites. Objectives of the program include: 1) increase publicly-owned passive recreational facilities in the coastal zone; 2) enhance public access to the coastal zone and Gulf of Mexico; 3) grown the eco-tourism industry in Dixie County. by acquiring and developing park sites for passive recreation.

## PROJECT COMPONENTS

Components of this program include:

1) identification and prioritization of sites for public acquisition; 2) acquisition of priority sites; 3) engineering design and permitting of site improvements; and 4) success monitoring. Dixie County does not have a formal conservation lands acquisition program. Therefore, Spill impact Component funds would be used to develop and implement such a program, with a focus on coastal passive recreation sites.

Dixie County has identified three potential sites for acquisition and/or improvement in the near term, including:

- Rocky Creek boat ramp site improvements;
- Freeman Tract acquisition and recreational improvements; and
- Cow Creek site acquisition and recreational improvements.

The Rocky Creek boat ramp is an existing county-owned facility where a new boat ramp and floating dock was constructed in 2016. However, this site lacks adequate paved parking, bathroom facilities, and stormwater treatment best management practices; and there are also restoration and public educational opportunities at this site.

The Freeman Tract is an island property currently owned by the Florida Fish and Wildlife Conservation Commission, who is seeking to transfer the property to Dixie County. The property has an existing observation tower overlooking a large saltmarsh and the Gulf. The hiking trail and footbridge to the island need to be upgraded and replaced, and the observation tower needs maintenance. There are also restoration and public educational opportunities at this site.

**Figure 11-4B** shows an aerial photograph of the Freeman Tract.

The Cow Creek site is located at the end of SW Highway 361, a road that dead ends in an extensive salt marsh. The concrete bridge over Cow Creek is in disrepair and is in need of replacement. Concepts for this site include: 1) replacement of the concrete bridge with a wooden single lane bridge; 2) construction of a kayak launch in Cow Creek; 3) and construction of an observation tower, parking facilities and composting bathrooms at the terminus of SW Highway 361. Acquisition of lands outside county rights-of-way may be need to implement the proposed improvements. **Figure 11-4C** shows an aerial photograph of the Cow Creek site and proposed improvements.



**Figure 11-4B.** Aerial photograph of the Freeman Tract with proposed improvements.



## SECTION V: Proposed Projects, Programs and Activities

If these project sites become unavailable, other sites that meet the goals of this program will be substituted.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will bolster eco-tourism as a component of the Dixie County economy, and provide improved public access to their growing number of residents.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE

- Eligible Activity 10: Promotion of Tourism in the Gulf Coast Region, including recreational fishing.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objective:

- Consortium Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.

### Implementing Entities

Dixie County will be the sole implementing entity and grant sub-recipient responsible for land acquisition, design, permitting, construction and success monitoring.

### Best Available Science and Feasibility Assessment

This is primarily a land acquisition and recreational amenity improvement project; therefore, a Best Available Science analysis is not applicable. This project is considered to be feasible with respect to the ability to: 1) secure necessary property agreements and permits; 2) construct the proposed recreational improvements; and 3) operate and maintain the improved infrastructure over the long term.



**Figure 11-4C.** Aerial photograph of the Freeman Tract with proposed improvements.

Act eligible activity:



## Risks and Uncertainties

Coastal park and recreational amenities are at risk for damage by tropical storms and sea-level rise. However, the proposed recreational improvements will factor coastal storm hazards and sea level rise into the design, as appropriate. Dixie County has identified priority properties and is ready to proceed with property acquisitions and improvements.

## Success Criteria and Monitoring

This program will involve property acquisition and the development of recreational amenities. Specific success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Acres of coastal access properties acquired;
- Increase in the number of public recreational users.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pinellas County is committed to conducting the monitoring necessary to quantify project benefits.

## Project Milestones and Schedule

The total estimated time horizon of this project is approximately four years. The expected start date is 2018, and the expected end date is 2021. The project milestone chart is shown below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Property acquisition												
Construction of recreational amenities												
Success monitoring												

## SECTION V: Proposed Projects, Programs and Activities

### Budget/Funding and Leveraged Resources

Dixie County has estimated the total cost to acquire and improve identified priority waterfront properties to be approximately \$1,960,000. The County is proposing to use \$1,960,000 of their Spill Impact Component allocation to implement this program. A summary of the cost and funding sources for this program is provided in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$250,000
Implementation (property acquisition)		\$1,660,000
Monitoring		\$50,000
<b>Total Cost</b>		<b>\$1,960,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,960,000
Direct Component		\$0
Other Grants or Co-funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$1,960,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA Recreational Component		

### Partnerships/Collaboration

Dixie County seek to partner with the Florida Fish and Wildlife Conservation Commission in the acquisition and management of the subject properties.

## DIXIE COUNTY

Septic to Sewer  
Conversion Program

PROJECT NO. 11-5

## Project Description

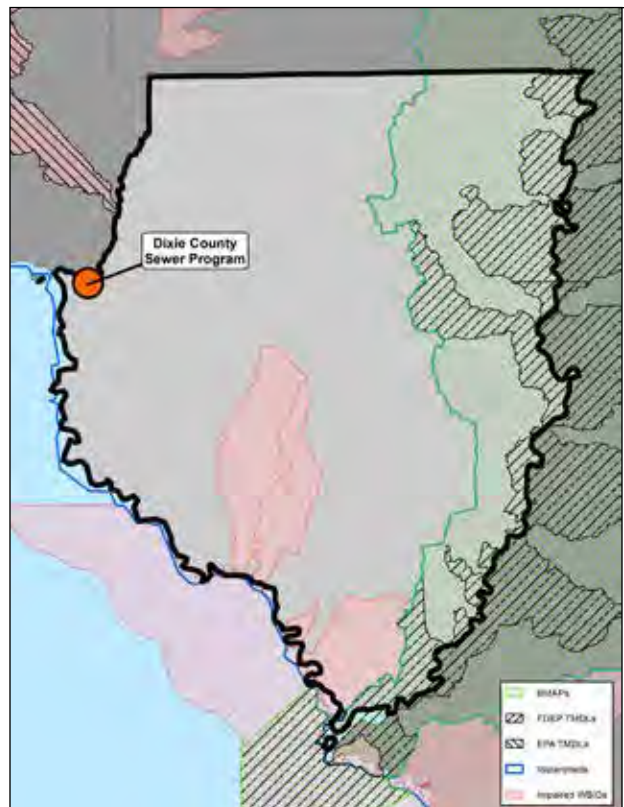
## OVERVIEW AND LOCATION

This project consists of the expansion of three existing sewer systems to areas served by septic systems and development of one new wastewater system in Dixie County. All four projects will convert existing septic systems to a centralized wastewater treatment system. Three projects will be located on the Gulf of Mexico coastline and the fourth (Old Town) is located next to the Suwannee River near Fanning Springs along US 19 as shown in **Figure 11-5A**.

## NEED AND JUSTIFICATION

The entirety of Dixie County's coastline is part of the Big Bend State Aquatic Preserve (BBSAP), which contains some of the world's largest coastal salt marsh and seagrass habitats, and one of the most pristine coastal areas in Florida (FDEP 2014, reference provided below). Seagrass is an important habitat for a large number of fish and invertebrate species, including many of commercial importance. Seagrasses are greatly affected by poor water quality and water clarity and seagrass declines in the BBSAP have been linked to increased stressors such as nutrient and turbidity inputs from adjacent coastal watersheds. Protection of seagrasses in the BBSAP is a major focus of management activities, and identifying and eliminating negative water quality impacts from anthropogenic sources is the highest priority action.

Septic tanks have been identified as a source of pollutants to coastal watersheds in Dixie County (FEDP 2008, reference provided below). This project will decrease nutrient loads to the Suwannee River (and associated springs), the Steinhatchee River, and the Gulf of Mexico by expanding centralized wastewater infrastructure to areas currently served by septic systems.



**Figure 11-5A.** Project location in Dixie County.

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of this project is to eliminate septic systems through the expansion of sewer main systems and construction of one new wastewater treatment system. The objectives of this project are to improve water quality in the Gulf of Mexico coastal waters, the Steinhatchee River watershed, and the Suwannee River watershed including Fanning Springs and Manatee Springs.

### PROJECT COMPONENTS

The program consists of the following component projects:

1. Sewer main expansion from Steinhatchee in Taylor County to Jena to facilitate abandonment of septic tanks in Jena.
2. Sewer main expansion from the City of Fanning Springs in Gilchrist/Levy Counties to Old Town to facilitate abandonment of septic tanks in Old Town.
3. Expand the existing wastewater collection system in Suwannee to provide a means for taking more existing septic tanks offline.
4. Design and construct a wastewater collection and treatment infrastructure in Horseshoe Beach to provide a means to take the existing septic tanks offline.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will improve water quality conditions in the Gulf of Mexico near Horseshoe Beach, as well as in the Steinhatchee and Suwannee Rivers (including Fanning and Manatee Springs), which discharge directly into the Gulf of Mexico. These are ecologically and economically important rivers, which support numerous fisheries and have high recreational values. The Suwannee River has been listed by FDEP as impaired for nutrients, dissolved oxygen, and fecal coliform bacterial by FDEP and a total maximum daily load (TMDL) has been established for the middle and lower Suwannee River system. The Steinhatchee River is designated as an Outstanding Florida Water (OFW), making it worthy of special protection from water quality degradation. Eliminating septic systems and providing advanced treatment of wastewater before it is discharged will decrease nutrient and bacterial loads to these rivers and downstream waters, and will protect ecological resources in the Gulf such as shellfish and seagrass.

Preserving the pristine waters the region has become known for, will contribute to economic growth in the County and adjacent areas, especially its fishery and ecotourism. The wastewater projects will increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts. The proposed project requires experienced and technically skilled positions often associated with a full-time salary, higher wage and benefits.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat; and
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

The County will be the sole implementing entity and grant sub-recipient responsible for the feasibility studies, design, permitting, construction, operation and maintenance, and monitoring of this project.

## Best Available Science and Feasibility Assessment

Water quality issues related to nutrients in the Suwannee River and the associated springs are described in the following report (and references cited therein):

- Florida Department of Environmental Protection (FDEP), 2008. Nutrient and Dissolved Oxygen TMDL for the Suwannee River, Santa Fe River, Manatee Springs (3422R), Fanning Springs (3422S), Branford Springs (3422J), Ruth Springs (3422L), Troy Spring (3422T), Royal Spring (3422U), and Falmouth Spring (3422Z).

This project is consistent with the goals and objectives of the following natural resource management plan:

- Suwannee River Water Management District, 1991. Suwannee River System Surface Water Improvement and Management (SWIM) Plan.
- Florida Department of Environmental Protection (FDEP), 2014. Big Bend Seagrasses Aquatic Preserve Management Plan.
- Suwannee River Water Management District, 1995. Coastal Rivers Watershed Management Plan, Surface Water Improvement and Management (SWIM) Program.

These projects are considered to be feasible. However, these projects are only in the conceptual phase. The project cannot be fully evaluated for feasibility until preliminary design is completed.

## Risks and Uncertainties

This project is in the conceptual phase; there has been no study or design work completed on this project. The risks will be identified during the feasibility and design phases.

### Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for

- Changes in ambient water quality (nutrient and/or bacterial concentrations) in the Suwannee River, Fanning Springs, Manatee Springs, and the Gulf of Mexico near the project areas;
- Changes in the frequency and/or duration of algal blooms (as measured by chlorophyll-a) in the Gulf of Mexico near Horseshoe Beach and the Suwannee River;
- Changes in water clarity in the Gulf of Mexico near Horseshoe Beach and the Suwannee River; and
- Maintenance of seagrass health (as measured by distribution, density, or epiphyte load) in the Gulf adjacent to the project areas.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Dixie County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of these projects - from feasibility study through construction and subsequent success monitoring - is approximately 5 years. The expected start date is 2018, and the expected end date is 2023. The feasibility study through the final design is estimated to be 18 months and the construction 12 to 15 months for each project. All four projects may start concurrently.



MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
Water Quality Monitoring Program												
<i>Jena – Sewer Collection System</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												
<i>Old Town – Sewer Collection System</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												
<i>Suwannee – WWTP Expansion</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												
<i>Horseshoe Beach – Sewer Collection and Treatment</i>												
Feasibility Study												
Preliminary Design												
Final Design												
Construction												

## Budget and Funding Sources

At this time the County has not provided an estimate of the total project cost to design, permit and construct this system; however, this type of project can be implemented in phases so a total project cost is not imperative at this stage.

## SECTION V: Proposed Projects, Programs and Activities

PROJECT BUDGET		ESTIMATED DOLLARS
<i>Jena</i>		
Planning		\$60,000
Implementation		\$2,415,000
Monitoring		\$20,000
<b>Total Cost</b>		
<i>Old Town</i>		
Planning		\$60,000
Implementation		\$2,415,000
Monitoring		\$20,000
<b>Total Cost</b>		
<i>Suwanee</i>		
Planning		\$60,000
Implementation		\$2,415,000
Monitoring		\$20,000
<b>Total Cost</b>		
<i>Horseshoe Beach</i>		
Planning		\$60,000
Implementation		\$2,415,000
Monitoring		\$20,000
<b>Total Cost</b>		<b>\$10,000,000</b>
<b>Overall Cost</b>		
SECURED FUNDING SOURCES		
Spill Impact Component		\$5,200,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$5,200,000</b>
<b>Budget Shortfall</b>		<b>\$4,800,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
SRWMD		
FDEP		

### Partnerships/Collaboration

The county will work with the City of Fanning Springs towns of Steinhatchee, Suwannee, and Horseshoe Beach to accomplish these goals.

## LEVY COUNTY

## Waccasassa River Land Acquisition

PROJECT NO. 12-1

## Project Description

## OVERVIEW AND LOCATION

The Waccasassa River is one of the most undisturbed rivers in the state and connects to the Gulf through the Waccasassa Bay Preserve State Park. An additional section along the river would be available for public access and also be protected from development by acquiring this land. The project is located in Gulf Hammock West of U.S. Hwy 19, off County Road 326 (see **Figure 12-1A**).

## NEED AND JUSTIFICATION

Currently there is public access to the Waccasassa River via a boat ramp at a nearby parcel at Waccasassa Park. This purchase would add a boat ramp and dock facility and extend the publicly held areas along the Waccasassa River corridor. These properties include: Bronson Blue Spring (Levy County), Devil's Hammock Wildlife Management Area (FWC), the subject property, Waccasassa Park (Levy County) and then the Waccasassa Bay Preserve State Park (State Park Service).

## PURPOSE AND OBJECTIVES

Levy County would allow passive recreation from the property, with boat and kayak launching as the primary use, while the majority of the upland property would be managed for wildlife conservation. This land acquisition will expand public access to the Gulf for Levy County Residents and visitors. Waterfront sites that are suitable for recreational access are often in demand for development. Preserving these sites as passive recreation sites helps to preserve critical habitat, and promote eco-tourism. While specific parcels have been defined in this project, if these project sites become unavailable, other sites that meet the goals of this program will be substituted.



**Figure 12-1A.** Project location in Levy County.

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

Levy County will acquire 226 privately held acres along the shores of the Waccasassa River for public access and conservation. The parcel has an existing boat ramp and dockage that would expand the launching facilities at Waccasassa River and provide additional parking for vehicles and trailers. The ramps would allow motorized and non-motorized vessels to be launched in separate areas reducing ramp congestion. Levy County would also add a handicap accessible canoe/kayak launch. The amount of County held property in this vicinity, would expand from five acres to 226 acres and the types of recreation offered from this location would expand as well. Structures on the property would remain and be managed by Levy County. The County would hire a vendor to run the convenience store, in addition to the store there are a property manager's residence, four cabins and 25 RV hookups that could be renovated and expanded up to 50 RV hookups. There is an opportunity to offer the residence to local law enforcement or FWC officer. There are also educational opportunities as the structures could be converted to an educational classroom partnering with the School Board or local non-profit organizations (NPO) (see **Fig 12-1B**).

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Purchasing this property will provide increased river access areas to tourists and residents alike increasing availability to a wider range of user groups. The expanded boat ramp facilities will accommodate a greater amount of tourists to the area (**Fig 12-1D**).

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region; (primary) and
- Eligible Activity 10: Promotion of Tourism in the Gulf Coast Region including recreational fishing.



**Figure 12-1B.** Potential outdoor classroom.



**Figure 12-1C.** Proposed Property Acquisition – Waccasassa Fishing Club.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources; (primary) and
- Goal 5 Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats (primary);
- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.



**Figure 12-1D.** Additional dock and non-motorized vessel launch area.

## Implementing Entities

Acquisition activities will either be conducted by Levy County as a sub-recipient to the Gulf Consortium or by an NGO on behalf of the Gulf Consortium. Development of park projects will be conducted by Levy County as a sub-recipient.

## Best Available Science and Feasibility Assessment

Best Available Science should focus on conservation and preservation. Examples of these types of literature are found here:

Levy County needs to expand their public access in this location and the ability to preserve and protect more of the Waccasassa Shoreline is another big benefit.

This project is considered to be feasible with respect to the ability to: 1) obtain subject property; 2) construct the park amenity projects in future phases; and 3) effectively operate and maintain the projects over the long term.

## Risks and Uncertainties

In the evaluation of this program, no significant risks have been identified that would preclude implementation. There is some risk that a seller can leave prior to a final contract due to a change of heart about the sale, another buyer being able to move quickly and at an above asking price offer, or appraisals not meeting a seller's expectation of price. Strategies to mitigate that risk will be pursued including the possibility of the Gulf Consortium only submitting grant applications for parcels with executed sales contracts.

## Success Criteria and Monitoring

Success will be measured through acres acquired, recreational amenities completed, and tracking public use.

## Milestones and Schedule

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Property Assessment												
Property Acquisition												
Park Amenities-Upgrades												
Success Monitoring & Reporting												

## Budget and Funding Sources

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$80,000
Implementation		\$1,855,000
Monitoring		\$25,000
<b>Total Cost</b>		<b>\$1,960,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,960,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds – Tourist Development Tax (Design Complete)		\$0
<b>Total Secured Funding</b>		<b>\$1,960,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FDEP		
NRDA		
NFWF		

## Partnerships/Collaboration

Levy County would like to work with other non-profit and state organizations on management planning once the land is acquired. If leveraged or Co-funding opportunities are available Levy County would apply those funds to similar parcels for coastal public access and conservation.



## LEVY COUNTY

## Oyster Restoration Project

## PROJECT NO. 12-2

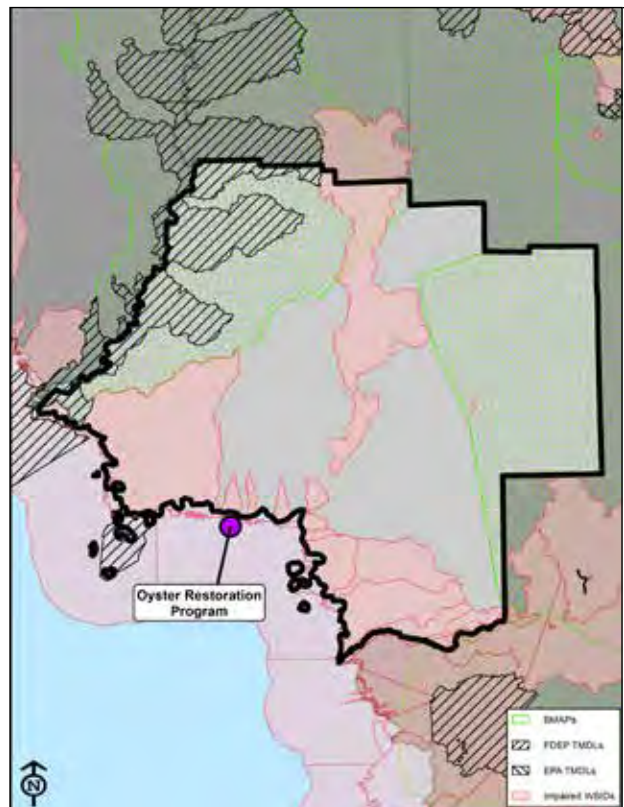
## Project Description

## OVERVIEW AND LOCATION

The Levy County Oyster Restoration Project (see **Figure 12-2A**) will place substrate in Suwannee Sound and Waccasassa Bay along Florida's Big Bend coast, near the town of Cedar Key (see **Figure 12-2B**), to restore once productive oyster reefs that have been degraded due primarily to reduced freshwater flows and associated disease and predation.

## NEED AND JUSTIFICATION

The proposed project is needed to restore and manage historic oyster and oyster reef losses in Suwannee Sound and Waccasassa Bay. While the Big Bend area has the greatest length of undeveloped coastline in the continental U.S., the areal extent of intertidal oyster reefs here has declined by 66 percent over the last 30 years (Seavey et al. 2011). The decline is also demonstrated by the commercial oyster fishery failure declared for Florida's Gulf coast by NOAA in 2013, pursuant to the Interjurisdictional Fisheries Act and the Magnuson-Stevens Fishery Conservation and Management Act. The effects of the oyster decline are anticipated to continue over multiple generations, thereby compromising its long term sustainability of the fishery. The proposed project is justified by the success of traditional and more recent clutching efforts used to support the recovery of oysters and associated habitat along Florida's Gulf coast.



**Figure 12-2A.** Project location in Levy County.

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of the proposed project is to restore oyster reef habitat and associated ecological functions for estuarine dependent species in support of ecological and economic sustainability in the Suwannee Sound and Waccasassa Bay using a combination of proven restoration techniques to re-establish reef infrastructure. Objectives of the proposed project are to:

- Provide suitable habitat for oyster settlement;
- Provide three-dimensional structural habitat for oysters and associated species; and
- Recover and support a sustainable fishery.

These objectives, and the proposed approach for restoration, are consistent with those developed for oyster restoration in the Gulf of Mexico by NOAA (2016) as part of the *Final Programmatic Damage Assessment and Restoration Plan* and *Final Programmatic Environmental Impact Statement*.

### PROJECT COMPONENTS

Cultch, e.g. suitable material such as shell, rock, and/or concrete, will be placed at locations where natural oyster reproduction is present and reefs will be re-seeded with juvenile stocks to (1) create reef infrastructure, (2) stimulate spat setting, (3) enhance ecological function, and (4) accelerate oyster recovery, as long term solutions to current habitat degradation (see **Figure 12-2C**).

Approximately 33,000 cubic yards (cy) of suitable oyster reef substrate will be placed in designated locations.

The proposed project will restore oyster reefs and habitat needed to support an ecologically and economically sustainable oyster population in Suwannee Sound and Waccasassa Bay. The project has five primary components, listed below.

- Restoration and donor site selection;
- Cultch material placement on degraded oyster reefs (recipient sites) to appropriate depths;
- Transplant/ relay of live of oysters from donor sites to recipient sites;
- Repopulation of reefs with hatchery-reared seed where reproductive potential is low; and
- Pre- and post- monitoring and data collection to inform site selection, cultch volumes, and monitoring.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The proposed project will contribute to the recovery of the oyster reefs and associated ecological sustainability in Suwannee Sound and Waccasassa Bay, both of which are part of a designated Aquatic Preserve and an Outstanding Florida Water. Restored oyster reefs will help to address reductions in oysters and associated economic and



**Figure 12-2B.** Locations of potential restoration sites in Waccasassa Bay (upper figure) and Suwannee Sound (lower figure) Levy County.

ecological resources that have been linked to episodic reductions in freshwater flows from the Suwannee River by providing a substrate for repeated recruitment by oysters under favorable conditions, increasing the sustainability of the reef systems (Frederick et al. 2015) and reducing storm impacts in the absence of barrier reefs (Edwards and Raabe 2004).

Oysters are an ecological keystone species that contribute to the integrity and healthy function of the nearshore ecosystem. “Healthy, interconnected oyster populations form reefs that provide the hard substrate needed for oyster larvae to settle, grow, and sustain the

population. In addition to providing habitat for oysters, the reefs: 1) are habitat for a diversity of marine organisms, from small invertebrates to large recreationally and commercially important species such as stone crab, blue crab, red drum, and black drum; 2) provide structural integrity that reduces shoreline erosion; and 3) improve water quality and help recycle nutrients by filtering large quantities of water” (Grabowski et al., 2012; NOAA, 2016). Restored reefs would also provide wintering habitat for the state’s largest population of oystercatchers (designated as threatened in Florida), which roost on high-tide sandbars and oyster reefs in Cedar Key.

Unlike most of Florida, Cedar Key and other coastal towns along the Big Bend coast remain working waterfront communities and a return to oyster harvesting has occurred in the years following an oyster collapse in Apalachicola Bay. For example, when oyster landings in Franklin County dropped precipitously after hurricanes Kate and Elena (1985), landings in Dixie and Levy counties were the primary contributors from peninsular west Florida (Arnold and Berrigan 2002). The proposed project will provide wages for participants and will generate revenues through the purchase of equipment, fuel and lubricants, supplies, and services from local businesses, as well as temporary employment for fishermen during closed oyster season. Long term economic benefits of harvesting, processing, and marketing fishery products will support local commercial fisheries and recreation.

## Eligibility and Statutory Requirements

The proposed project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region (primary);
- Activity 2: Mitigation of damage to fish, wildlife, and natural resources (secondary); and
- Activity 4: Workforce development and job creation (secondary).



**Figure 12-2C.** Photograph of participants collecting oyster clusters from a donor reef for transport to a recipient reef.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources;
- Goal 4: Enhance Community Resilience; and
- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 3: Protect and Restore Living Coastal and Marine Resources;
- Objective 5: Promote Community Resilience.
- Objective 7: Improve Science-Based Decision-Making Processes.

### Implementing Entities

The Cedar Key Oysterman Association (CKOA) will be the implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring for the proposed project, based on 30 years of experience performing oyster restoration in the area. The CKOA will coordinate with appropriate agencies during planning and implementation of this project and may collaborate with agencies or other entities via leveraging and other funding agreements.

### Best Available Science and Feasibility Assessment

The proposed project is based on years of oyster reef restoration along the Gulf Coast as well as specific examples of successful restoration of nearshore oyster reef restoration (e.g., LaPeyre et al., 2014), and examples specific to the Big Bend area (e.g., Frederick et al. 2015; Arnold and Berrigan, 2002). Success is demonstrated by oyster densities on restored or created reefs that increased by 2.65 times on rock, 14.5 times on clam bags, and 9.2 times overall compared with control sites (LaPeyre et al., 2014). The value of restoring oyster reefs is also well documented and includes enhanced estuarine habitats, shoreline stabilization, reduced storm surge and erosion, water quality improvements, and shelter for over 300 species, which in turn are consumed by recreationally and commercially important finfish and crustaceans (NOAA, 2016; Peterson et al., 2003). The ratio of restored reef to the resulting restored estuarine habitat is an estimated 1:670 in the Big Bend (Frederick et al., 2015).

The proposed project approach is consistent with Gulf-wide objectives and restoration techniques outlined in the science-based *Final Programmatic Damage Assessment and Restoration Plan (PDARP)* and *Final Programmatic Environmental Impact Statement (PEIS)*, which presents detailed information supporting the value of oyster reef restoration (NOAA, 2016). Project implementation will be consistent with Best Management Practices, as outlined by Florida Department of Agriculture & Consumer Services (FDACS).

The proposed project will, combined with other proposed or ongoing projects along the Big Bend coast, will provide regional benefits in the form of improved management and sustainability of oyster habitat and associated ecological functions. Other proposed or underway projects that target sustainable oyster reefs include:



1. The State of Florida's *Restoring Resilience to Oyster Reefs in the Big Bend of Florida's Gulf Coast in Dixie and Levy Counties* - 4.6 miles of oyster reef restoration funded by RESTORE Comprehensive Plan Component (Pot 2) (\$5,181,697)
2. The University of Florida's (and partners) *Recovery and Resilience of Oyster Reefs in the Big Bend of Florida* - 32 acres / 3 miles of restored reefs (\$8,334,400)

Based on preliminary information from regulating agencies such as Florida Department of Environmental Protection (FDEP) and FDACS, construction costs for similar projects, and operation

and maintenance of other projects, the proposed project is considered feasible with respect to: 1) permitting; 2) construction within the proposed budget; and 3) effective long term operation and maintenance of the project components. Key literature reviewed in the evaluation of this project includes the following:

- Arnold, W. and M. Berrigan, 2002. *A summary of the oyster (Crassostrea virginica) fishery in Florida*. A Report to the Division of Marine Fisheries, Florida Fish and Wildlife Conservation Commission (FFWCC), St. Petersburg, Florida, USA.
- Edwards, R. and E. Raabe, 2004. *Ecological Characteristics and Forcing Functions of the Suwannee River Estuary*. In B. Katz and E. Raabe (Ed.) *Suwannee River Basin and Estuary Integrated Science Workshop*. Sponsored by USGS, SRWMD, FMRI. Cedar Key, Florida.
- Frederick et al., 2015. *Restoring Resilient Oyster Reefs in Florida's Big Bend*. Final Report to The Nature Conservancy and NOAA. 49 pages.
- Grabowski, J.H. et al., 2012. *Economic valuation of ecosystem services provided by oyster reefs*. *BioScience* 62: 900–909.
- Kaplan DA, et al., 2016. *Freshwater Detention by Oyster Reefs: Quantifying a Keystone Ecosystem Service*. *PLOS ONE* 11(12): e0167694. <https://doi.org/10.1371/journal.pone.0167694>
- La Peyre, M., et al., 2014. *Oyster reef restoration in the northern Gulf of Mexico: Extent, methods and outcomes*. *Ocean & Coastal Management* 89: 20-28.
- NOAA. 2016. *Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS)*. <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>



**Figure 12-2D.** Oyster assemblage with oysters attached in clusters (Source: Mark Berrigan).

### Risks and Uncertainties

Establishing monitoring goals and success criteria are critical to reducing and managing risk and uncertainty for the proposed project. The proposed project will preclude oyster harvest from restored areas until oysters are of legal size and will require continued coordination and combined efforts of oyster fishers and agencies in support of improved fishery management strategies. In addition, oyster populations are still expected to periodically decline in response to natural declines in freshwater flows, although oyster reefs will help to hold freshwater in the estuaries.

The project will require cooperation with the FFWCC due to the transplanting of natural, living oyster seed and juveniles from public reefs onto donor sites. A “Special Activity License to Collect and Release Juvenile Oysters” has been issued for similar project and is anticipated for this restoration project.

### Success Criteria and Monitoring

Potential success criteria for the proposed project include:

- Increases in areal extent of oyster reefs;
- Increases in average reef height;
- Increases in oyster density, and
- Oyster size-frequency distribution representative of a sustainable oyster population.

An economic success criterion of benefits (economic returns for increased landings) vs. cost (of restoration) may also be used. More specific quantitative criteria will be developed within planning and monitoring frameworks developed for oyster reef restoration or enhancement in the Gulf (NOAA, 2016). Criteria for three environmental variables (water temperature, salinity, and dissolved oxygen) are also recommended (Baggett et al., 2014). Well-defined goals and objectives, statistically sufficient monitoring designs, and project documentation are absent from many restoration projects (NAS, 2017), but are critical to the success of the proposed project. The implementation grant request will include a detailed monitoring program design that addresses goals, objectives, data collection, and data assessment and evaluation for these success criteria.

### Milestones and Schedule

Construction completion is anticipated within two years following planning, design, and permitting. Monitoring is planned for five years to inform and support this and future restoration projects and will continue for the life of the proposed project, for up to ten years. Phase 2 is not included here.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Project Design and Permitting												
Permitting Complete												
Contractor Selected												
Restoration/ Barge Shelling												
Complete Cultch Placement												
Certification												
Success Monitoring												



## Budget and Funding Sources

The project budget was developed based on previous oyster restorations specific to Florida's west coast, with estimates ranging from about \$75 to \$120/cubic yard of material and \$15,000 to \$25,000/acre of material placed.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$400,000
Implementation		\$3,100,000
Success Monitoring (5 years initially)		\$500,000
<b>Total Cost</b>		<b>\$4,000,000</b>
FUNDING SOURCES		
Spill Impact Component		\$4,000,000
<b>Total Funding</b>		
<b>Budget Shortfall</b>		

## Partnerships/Collaboration

Potential project partners include University of Florida/Institute of Food and Agricultural Sciences, Florida State University, FFWCC, and The Nature Conservancy. Coordination with the following agencies is anticipated: FDACS, FFWCC, FDEP, Northwest Florida Water Management District, National Marine Fisheries Service, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service.

## LEVY COUNTY

# Septic to Sewer Conversion Program

PROJECT NO. 12-3

## Project Description

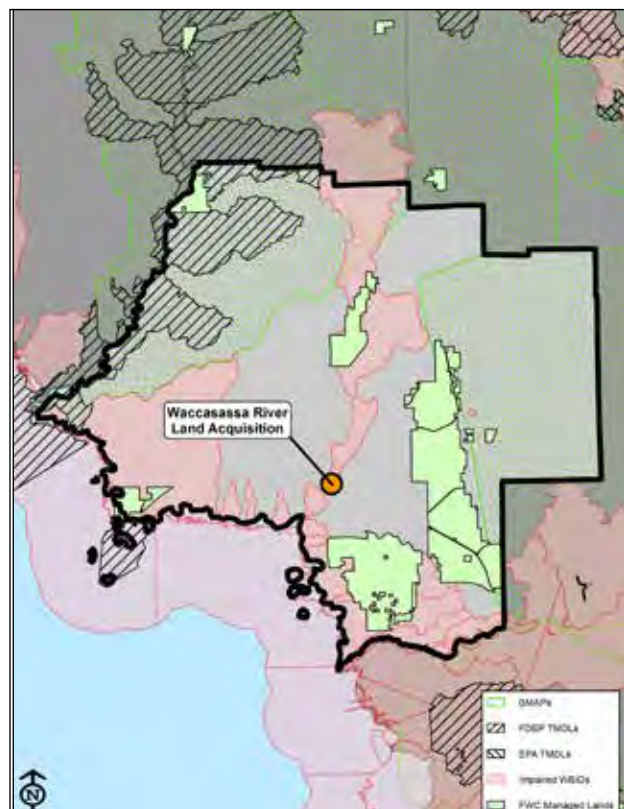
### OVERVIEW AND LOCATION

The Levy County Septic to Sewer Conversion Program includes provision of a centralized sewer system and removal of septic systems in two regions of Levy County: southern Levy near the Withlacoochee River and in the Fowler's Bluff area near the Suwannee River. The general location of the two project areas are shown in **Figure 12-3A**.

### NEED AND JUSTIFICATION

Septic systems are contributing sources of nutrients and bacteria and the County has identified the need to reduce non-point source contributions for nutrients and bacteria from septic systems in the Withlacoochee and Suwannee Rivers. It is not known exactly how many septic systems exist in the project area but the County provided a range of 80 to 100 in Fowler's Bluff and several hundred in southern Levy County. No County wastewater infrastructure exists in the South Levy area, which are currently served by septic tanks. The customers in this area consist of a mix of residential, industrial, and commercial with several hundred properties to serve. A large percentage of these septic tanks are old, failing, and/or do not meet the current standard for construction. This septic to sewer conversion program will help improve water quality in the Withlacoochee and Suwannee Rivers, as well as downstream in the Gulf of Mexico, by moving wastewater from aging septic systems to advanced water treatment, thereby reducing nutrient and bacteria loads to the system.

The County plans to develop wastewater infrastructure in the Fowler's Bluff area and remove the septic tanks there as well. The County wants to provide this service using either traditional gravity sewer, Low Pressure Sewer (LPS),



**Figure 12-3A.** Project location in Levy County.

or vacuum sewer, although no feasibility study or design work has been completed. The area is on its own water system with a water treatment plant (WTP) owned and operated by the residents. Community Development Block Grant (CDBG) funds were applied for but the project did not qualify. There is a potential for a neighboring property to be used for a new WWTP and effluent disposal area. Another possible septic tank area is off County Road 320 east of the river. There is available property southeast for a possible new WWTP and effluent disposal. This site is about 10 miles from the Fowler's Bluff area next to the river. It is the County's plan to conduct a feasibility study of replacing the existing aging septic tanks with new sanitary sewer system and a wastewater treatment plan/effluent disposal system or conversion to advanced septic tanks.

## PURPOSE AND OBJECTIVES

Older septic systems are contributing sources of water pollution to the environment, impacting health and safety of humans and marine life habitat. The purpose of the program is to install central sanitary sewer infrastructure needed to abandon existing septic tank systems in the South Levy and Fowler's Bluff areas. The objectives of this project are: 1) to reduce nutrient and fecal coliform bacteria concentrations and improve water quality in the Withlacoochee and Suwannee Rivers; and 2) to reduce nutrient and fecal coliform bacterial loads discharged from Withlacoochee and Suwannee Rivers to the Gulf of Mexico.

## PROJECT COMPONENTS

The program consists of the following components:

1. Create wastewater infrastructure in southern Levy County near Inglis and Yankeetown to provide new sanitary sewer service using either traditional gravity sewer, low pressure sewer (LPS), or vacuum sewer and wastewater treatment plant/effluent disposal system in order to remove the septic tanks in this area. A hybrid of these systems may be required but will not be known until the feasibility study and preliminary design is complete.
2. Create wastewater infrastructure in the Fowler's Bluff near the Suwannee River and wastewater treatment plant/effluent disposal system in order to remove the septic tanks in this area.

As the engineering review is conducted for both project areas, in areas with low residential densities, the County desires to consider the option of including Advanced Septic Tanks as part of the overall system designs.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will improve water quality conditions in the Withlacoochee and Suwannee Rivers, which discharge directly into the Gulf of Mexico. These are ecologically and economically important rivers, which support numerous fisheries and have high recreational values. The Suwannee River has been listed by FDEP as impaired for nutrients, dissolved oxygen, and fecal coliform bacterial and a total maximum daily load (TMDL) has been established for the middle and lower Suwannee River system. The Withlacoochee River is designated as an Outstanding Florida Water (OFW), making it worthy of special protection from water quality degradation. Eliminating septic systems and providing advanced treatment of wastewater before it is discharged will decrease nutrient and bacterial loads to these rivers and downstream waters, and will protect ecological resources in the Gulf such as shellfish and seagrass. The expansion of sewer system in this residential area will contribute to growth in the County. This expansion will help the County to grow, improve its economy, and grow the tax base. This will also help development of new businesses and employment opportunities.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

### Implementing Entities

The County will be the sole implementing entity and grant sub-recipient responsible for the feasibility studies, design, permitting, construction, operation and maintenance, and monitoring of this project.

### Best Available Science and Feasibility Assessment

This project is consistent with the following natural resource management plans:

- Suwannee River Water Management District, 1991. Suwannee River System Surface Water Improvement and Management (SWIM) Plan.
- Florida Department of Environmental Protection (FEDP), 2014. Big Bend Seagrasses Aquatic Preserve Management Plan.

The County has not completed a project-specific feasibility study for this project and very little engineering details are known. If soils are permeable, water table is high, and/or septic tanks are not performing as efficiently as originally intended (i.e. leaking, damaged, etc.), then the project is justified from a receiving water quality improvement standpoint.

### Risks and Uncertainties

This project is in the conceptual phase. There have been no study or design work completed on this project. The risks will be identified during the feasibility and design phases.

## Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for

- Changes in ambient water quality (nutrient and bacterial concentrations) in the Suwannee River and Withlacoochee River;
- Changes in the frequency and/or duration of algal blooms (as measured by chlorophyll-a) in the Suwannee River; and
- Changes in dissolved oxygen conditions in the Suwannee River.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Levy County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project - from feasibility study through construction and subsequent success monitoring - is approximately 7 years. The expected start date is 2018, and the expected end date is 2025. Implementation of this program has been broken down into two phases, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Success/Monitoring												
<i>South Levy Septic to Sewer</i>												
Feasibility												
Design and Permitting												
Construction												
<i>Fowlers Bluff Septic to Sewer</i>												
Feasibility												
Design and Permitting												
Construction												

### Budget and Funding Sources

The preliminary budget is indicated in the table below. The total program cost is estimated to be \$30M as provided by Levy County.

PROJECT BUDGET	ESTIMATED DOLLARS
<i>South Levy Septic to Sewer</i>	
Planning	\$300,000
Implementation	18,500,000
Monitoring	\$200,000
<b>Total Cost</b>	<b>\$19,000,000</b>
<i>Fowlers Bluff Septic to Sewer</i>	
Planning	\$200,000
Implementation	\$10,600,000
Monitoring	\$200,000
<b>Total Cost</b>	<b>11,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$6,700,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$6,700,000</b>
<b>Budget Shortfall</b>	<b>\$23,300,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES	

### Partnerships/Collaboration

The County will work and collaborate with other agencies as required. Some potential partners are:

- Florida Department of Environmental Protection (FDEP)
- Suwannee Water Management District (SRWMD)
- US Environmental Protection Agency (EPA)
- RESTORE Pot 1 funds



## CITRUS COUNTY

## Barge Canal Boat Ramp Project

PROJECT NO. 13-1

## Project Description

## OVERVIEW AND LOCATION

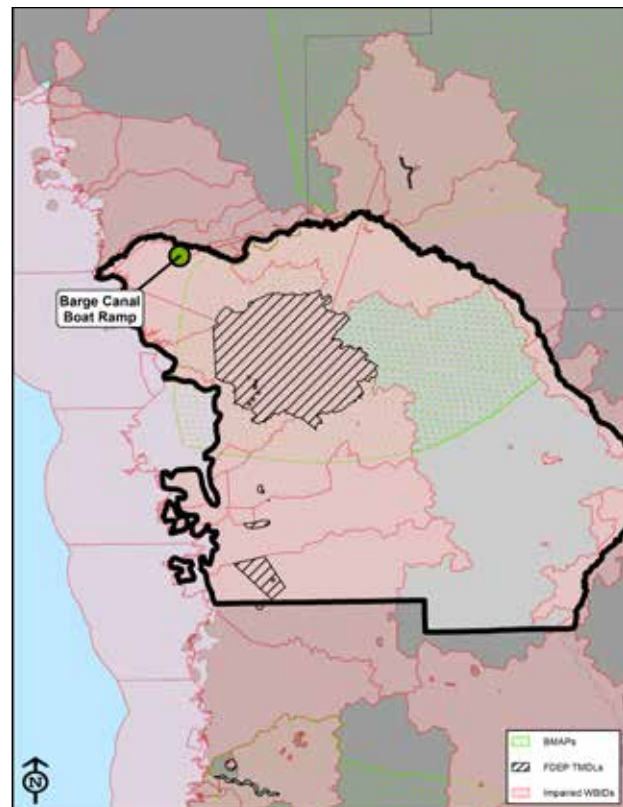
The Cross Florida Barge Canal was dredged to a depth of 10 ft to allow a shortcut across Florida for barge based commerce. Due to environmental and funding concerns the project started and stopped several times between 1936 and the final suspension of work in 1971. The western portion was completed from the Gulf of Mexico to Lake Rousseau and currently affords Citrus County deep water access to the Gulf. Citrus County has designed and permitted a boat ramp to be constructed just west of US 19 on the north side of the canal (see **Figure 13-1A**).

## NEED AND JUSTIFICATION

Currently there are a limited amount of boat ramps in Citrus County that are available to the public. During the summer scallop season these facilities in Homosassa and Crystal River are over capacity. The south Levy and north Citrus County corridor is growing with residents and visitors. Citrus County would like to capitalize on this growth by expanding public access to the Gulf in this region. Currently the other County Boat Ramps are in the same rivers that are frequented by the West Indian Manatee. Also the goal of this project is to reduce the amount of vessel traffic in critical manatee habitat (see **Figure 13-1B**).

## PURPOSE AND OBJECTIVES

The existing boat ramps in the Crystal River and Yankeetown areas are beyond capacity, especially during scallop season. The new, multi-lane boat ramp on the barge canal will provide safe, well-marked navigation for a wide range of vessels. This will reduce the boat traffic on the Homosassa, Crystal and Withlacoochee Rivers which are critical manatee habitat.



**Figure 13-1A.** Project location in Citrus County.

### PROJECT COMPONENTS

The Citrus County Barge Canal Boat Ramp project will create a 10 lane boat ramp with 61 parking spaces for vehicles with boat trailers, and 10 non-trailer parking spots on a 7.92 acre parcel of property currently owned by the Florida State Park Service as part of the Marjorie Harris Carr Cross Florida Greenway. There is also the potential for future expansion of the park to the north to accommodate more trailer parking. Phase one will include a 4 lane boat ramp with 2 finger piers consisting of a concrete landing, aluminum gangways and floating courtesy docks. These finger piers will be ADA accessible, with approved sloping, landings, and railings. Phase two will construct the additional six boat ramps and add three finger piers. The boat ramp basin will be dredged to -6.77 ft NAVD 88 (-5 ft MLW) removing approximately 7,300 cubic yards of material. The parking lot area will be used for staging of construction equipment and dewatering of dredged material from the boat ramp construction. Once the ramp construction is complete the parking lot will be graded and include dry retention ponds for stormwater treatment. Park amenities will include picnic tables and restrooms.

This project is consistent with the Citrus County Manatee Protection Plan and the FDEP Marjorie Harris Carr Cross Florida Greenway Management Plan.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Citrus County's has always had a thriving eco-tourism economy. In recent years many Florida residents as well as visitors to the state have flocked to the area in scallop season. The new boat ramp facility will capitalize on a growing portion of the County and potentially bring more commercial opportunities including bait and tackle stores, gas stations, dive shops, restaurants and hotels. This new facility will be an expansion of an already robust recreational,

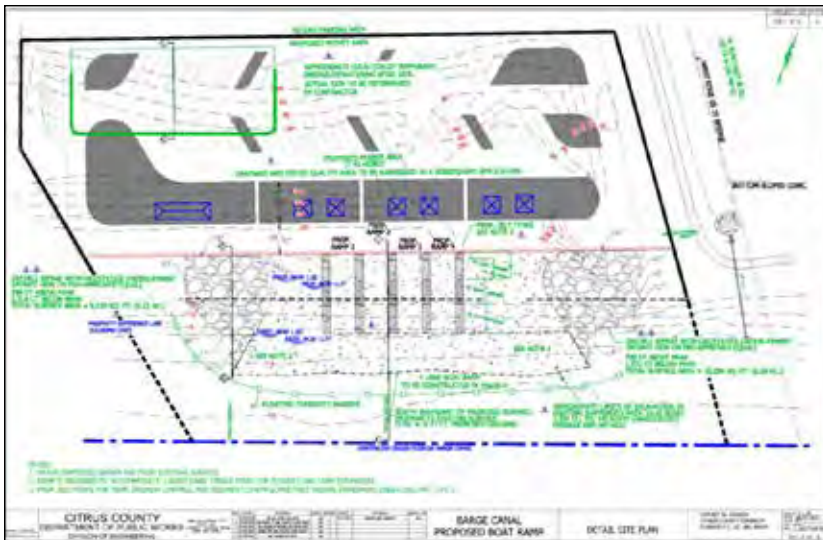


Figure 13-1B. Boat ramp design plan.

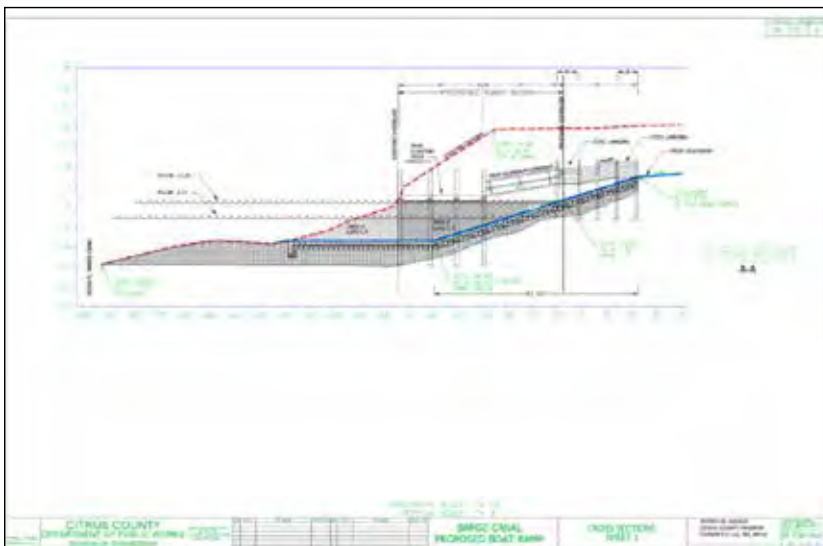


Figure 13-1C. Boat ramp cross section.

charter and commercial fishing industries. This new ramp will also alleviate vessel traffic from Homosassa and Crystal Rivers which are critical manatee habitat.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.
- Eligible Activity 10: Promotion of Tourism in the Gulf Coast Region, including recreational fishing. (primary)

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources;
- Goal 5: Restore and Revitalize the Gulf Economy (primary)

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 3: Protect and Restore Living Coastal and Marine Resources.
- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary)

## Implementing Entities

Citrus County will be the sole implementing entity and grant sub-recipient responsible for the design, construction, and success monitoring of the program.

## Best Available Science and Feasibility Assessment

Citrus County has successfully acquired permits from the US Army Corps of Engineers (USACE) and a letter of consent from the Southwest Florida Water Management District (SWFWMD). As part of the USACE Permitting There was a Cursory Biological Survey completed of the site in 2011 by Environmental Consultants for listed species.

This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) effectively design and construct the project elements; 3) Monitor the success.

## Risks and Uncertainties

In the evaluation of this program, no significant risks have been identified that would preclude implementation.

## Success Criteria and Monitoring

The new boat ramp and adjacent ramp facilities will be monitored monthly, with a yearly monitoring report. Monitoring will include boat/vessel traffic surveys and manatee sighting reports.

## SECTION V: Proposed Projects, Programs and Activities

### Milestones and Schedule

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Boat Ramp Construction												
Success Monitoring & Reporting												

### Budget and Funding Sources

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$0
Implementation	\$4,340,000
Monitoring	\$60,000
<b>Total Cost</b>	<b>\$4,400,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$3,958,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds – (In-kind, In-house Engineering Design)	\$442,000
<b>Total Secured Funding</b>	<b>\$4,400,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
FWC – FBIP Grant	
SWFWMD	
FDEP	

### Partnerships/Collaboration

Citrus County would like to partner with the Florida Fish and Wildlife Conservation Commission through the Florida Boating Improvement Fund to acquire additional grant funding for this project for up to 10% of the project cost. Other partners for the project include: Levy County, Alachua County, Town of Inglis, Town of Yankeetown, City of Dunnellon, Withlacoochee Aquatic Restoration, and the FDEP Park Service which owns the land.

# CITRUS COUNTY

## Artificial Reef Program

### PROJECT NO. 13-2

## Project Description

### OVERVIEW AND LOCATION

This project will add stockpiled materials, including U.S. 19 bridge segments, and add new artificial reefs, to existing permitted Citrus County sites (see **Figure 13-2A**). The proposed artificial reef location is in the area of Fish Haven #1 (see **Figure 13-2B**).

### NEED AND JUSTIFICATION

Citrus County has deployed ten artificial reefs into existing permitted artificial reef sites since it began its program in 1985 to meet the increasing recreational demand for offshore bottom fishing and scuba diving opportunities. Materials have included concrete rubble, culverts, bridge rubble, and boat molds. There is a continuing need to augment existing permitted artificial reef sites, and to create new sites, to support the demand of recreational fishing and diving enthusiasts, both residents and tourists. In addition to enhancing recreational opportunities and associated economic benefits, artificial reefs can also provide ecological benefits. Hard substrate and vertical structure are limited habitats in the Gulf of Mexico (Fikes, 2013), and artificial reef habitats can provide: 1) hard substrate to support encrusting and colonial benthic organisms such as sponges and corals; 2) niche space for small marine invertebrates; and 3) shelter for larval and juvenile fishes. The project is justified by the demonstrated benefits of artificial reefs, i.e., increased economic activity (i.e., expenditures, incomes, and jobs) (Adams et al., 2011).



**Figure 13-2A.** Project location in Citrus County.



## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of the proposed project is to add to and improve the network of artificial reefs in coastal waters of Citrus County to provide greater recreational and economic opportunities for residents and tourists and reduce pressure on natural reefs. Specific objectives of the proposed project include: 1) increasing recreational fishing opportunities, 2) increasing structure for snorkeling, scuba, and marine life viewing, and 3) potentially increasing fish productivity by providing habitat structure. These objectives are consistent with those of the Florida Fish and Wildlife Conservation Commission's (FWC) artificial reef program, listed below.

1. Enhance private recreational and charter fishing and diving opportunities;
2. Provide a socio-economic benefit to local coastal communities;
3. Increase reef fish habitat;
4. Reduce user conflicts;
5. Facilitate reef related research; and,
6. While accomplishing objectives 1-5, do no harm to fishery resources... or human health.

### PROJECT COMPONENTS

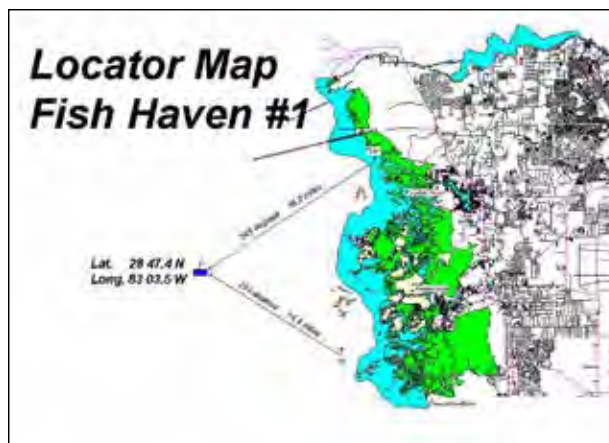
The artificial reef projects will be completed in phases over a ten-year period. Project components include:

- Deployment of artificial reefs in five phases, using stockpiled materials, e.g. rubble from former US 19 bridge over the Cross-Florida Barge Canal (see **Figure 13-2C**);
- Selection of additional artificial reef locations; and
- Pre- and post- monitoring and data collection.

The reef locations will be available for public use for recreational fishing and diving as part of a larger network of artificial reef programs along the Nature Coast to ensure residents and visitors have access regardless of county boundaries. Post construction monitoring will also be conducted to ensure the deployment of this material produced high quality habitat that supports important reef fish species (e.g., grouper, snapper). Additional planning assistance will be required for permitting, design, and implementation of the proposed project.

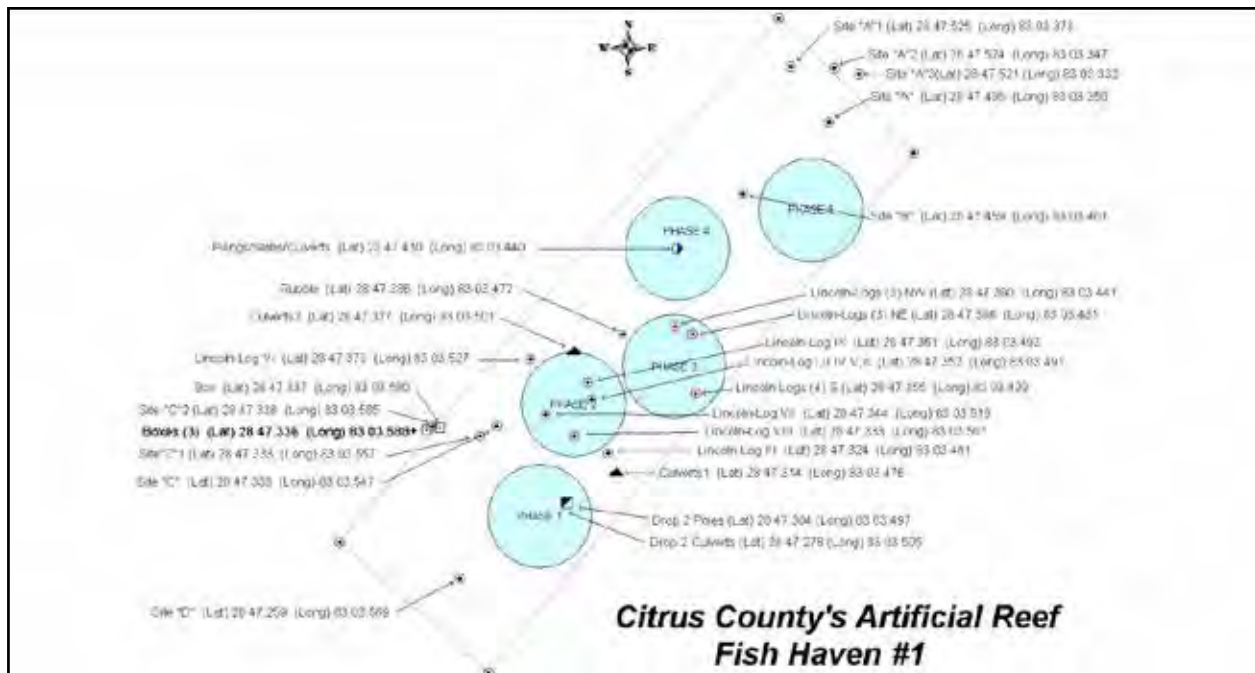
### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The proposed project will enhance the local recreation and tourism related economy. The proposed project will support snorkeling, diving, fishing, kayaking and numerous other recreational water activities that in turn provide economic support to Citrus County. This project will: 1) support the increasing recreational demand for offshore reef fishing and scuba diving opportunities by both residents and tourists; and 2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in Citrus County offshore waters.



**Figure 13-2B.** Location Map of Existing Artificial Reef (Fish Haven #1).





**Figure 13-2C.** Future phases of artificial reef deployment associated with Fish Haven #1.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing (primary);
- Eligible Activity 8: Planning assistance; and
- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 5: Restore and Revitalize the Gulf Economy (primary);
- Goal 1: Restore & Conserve Habitat; and
- Goal 3: Replenish & Protect Living Coastal & Marine Resources.

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary);
- Objective 1: Restore, Enhance and Protect Habitats; and
- Objective 3: Protect and Restore Living Coastal and Marine Habitats.

### Implementing Entities

Citrus County will be the sole implementing entity and grant sub-recipient responsible for the design, construction, and success monitoring of the program.

### Best Available Science and Feasibility Assessment

Artificial reefs in the Gulf of Mexico have been extensively studied with regard to the habitat and economic benefits they provide. The scientific literature on the ecological benefits is somewhat controversial (Lindberg et al., 2014, Fikes, 2013, Bortone et al. 1994, others). Some experts argue that artificial reefs are functionally comparable to natural reefs, and that they augment fish populations by providing habitat that is naturally limiting in the Gulf of Mexico. Others argue that artificial reefs simply attract and aggregate existing fish populations and do not enhance fish stocks. While those assertions may be debatable, the economic benefits of artificial reefs are not. Artificial reefs provide significant recreational opportunities and associated benefits along the Gulf coast of Florida (Swett et al., 2011, Adams et al., 2011). In addition, research has produced best practices guidance on site selection, design features, and construction methods, which are now part of the FWC permitting regulations. Ongoing research in the Big Bend waters (Lindberg et al., 2014) will further inform artificial reef efforts. Key literature forming the basis for Citrus County's Artificial Reef Program are cited below.

- Adams, C., et al., 2011. The economic benefits associated with Florida's artificial reefs. EDIS document FE649 (2011): 1-6.
- Bortone, S.A., et al., 1994. Factors affecting fish assemblage development on a modular artificial reef in a northern Gulf of Mexico estuary. Bull. Mar. Sci. 55 (2-3), 319-332.
- Fikes, R., 2013. Artificial Reefs of the Gulf of Mexico: A Review of Gulf State Programs & Key Considerations. National Wildlife Federation.
- Lindberg, W.J., et al., 2014. Rationale and Evaluation of an Artificial Reef System Designed for Enhanced Growth and Survival of Juvenile Gag, *Mycteroperca microlepis*. Proc. 66th Gulf and Caribbean Fisheries Institute November 4 – 8. Corpus Christi, TX. Pages 320-325

This project is feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; 3) effectively operate and maintain the project components over the long term. Furthermore, this project is consistent with the National Artificial Reef Plan published in 1985, and the Florida Artificial Reef Strategic Plan (FWC, 2003).

### Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this project that would preclude project implementation. Citrus County will ensure design to limit damage from tropical storms. Controls for lionfish and other nuisance/exotic species may be required. Regulatory constraints will address issues such as spatial boundaries for navigation, channels, marine habitat resources, historic areas, sand borrow areas, existing structures and leases, etc. Success monitoring is critical in a fisheries management context given these reefs have not previously been used as fisheries management tools.

## Success Criteria and Monitoring

This and all artificial reef projects involve the placement of hard substrate to: support recreational demand for offshore reef fishing and scuba diving opportunities; and enhance the abundance, distribution, and structural diversity of hardbottom habitat in the affected waters. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Increase in the coverage of new artificial reef habitat;
- Metrics on the recruitment of benthic encrusting organisms and fish; and
- Increase in recreational use.

The proposed project will be constructed consistent with the Gulf States Marine Fisheries Commissions Guidelines for Artificial Reef Materials (2004). In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Citrus County is committed to conducting the monitoring necessary to quantify project benefits.

## Milestones and Schedule

The project will begin in June 2018 and completion of deployment is anticipated in 2024, followed by success monitoring through June 2028.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Artificial Reef Design & Permitting												
Phase 1 Reef Construction												
Phase 2 Reef Construction												
Phase 3 Reef Construction												
Phase 4 Reef Construction												
Phase 5 Reef Construction												
Phase 6 Reef Construction												
Artificial Reef Success Monitoring												

## Budget and Funding Sources

The total estimated cost of the proposed project is approximately \$850,000. The project budget and secured funding are presented in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$80,000
Implementation		\$695,000
Monitoring		\$75,000
<b>Total Cost</b>		<b>\$850,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$850,000
Direct Component		\$0
Other Grants or Co-Funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$850,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FWC		
NFWF		
FDEP		

## Partnerships/Collaboration

Citrus County plans to partner with neighboring counties Hernando and Pasco to implement a Regional Artificial Reef Program to ensure coordination of monitoring, design, and permitting efforts and better inform future reef projects. Coordination with the following agencies is anticipated: FFWCC, FDEP, SRFWMD, NMFS, USACE, and USFWS.

# CITRUS COUNTY Springshed Protection Program

PROJECT NO. 13-3

## Project Description

### OVERVIEW AND LOCATION

Citrus County is a growing area with residential and commercial development expanding east from the US 19 corridor into the upper portions of the watersheds for many of the County's coastal rivers.

This program will route and treat stormwater in regional retention areas that will allow it to infiltrate back into the aquifer. The goal is to retain more freshwater in the upper part of the springshed so that it can be polished and discharged through the springs at the headwaters of Crystal River and Homosassa River, rather than quickly flowing downriver as surface water and out of the system (see **Figure 13-2A**).

### NEED AND JUSTIFICATION

It is believed that the King's Bay was once filled with native SAV which helped maintain water clarity and provided abundant aquatic habitat. Native SAV has declined substantially due to the combined effects of invasive species (including algae), salinity increases, muck accumulation, and sedimentation. Kings Bay is listed as an Impaired Water Body for Nitrogen. Taking preemptive actions in the watersheds for the Homosassa, Chassahowitzka and Withlacoochee Rivers would prevent impairment and maintain spring flows.



**Figure 13-3A.** Project location in Citrus County.

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of this project is to capture stormwater in a facility that will polish the water naturally as it infiltrates through the sandy substrate replenishing the aquifer. This natural process will improve the water quality by removal of nitrogen, phosphorus and other impurities. Specific goals include:

- Creating the stormwater facility; and
- Routing stormwater from the area into the facility; and
- Infiltration to the aquifer; and
- Providing a sustainable flow in the headwaters of the springsheds.

### PROJECT COMPONENTS

Citrus County has designated several key properties to develop regional stormwater facilities that will capture runoff and allow it to slowly infiltrate back into the aquifer. To date, two facilities have been constructed and are operational, the plan is to add six new stormwater facilities through this program. The County has selected the sites and started design for three of the stormwater facilities and plan to perform feasibility assessments on the remaining 3 sites. Property assessments, design, permitting and monitoring will all be paid for from County funds. Citrus County is seeking to use Pot 3 funds for construction only.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat; and
- Goal 2: Restore Water Quality (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

### Implementing Entities

Citrus County will be the sole implementing entity and grant sub-recipient responsible for the design, construction, and success monitoring of the program.



## Best Available Science and Feasibility Assessment

This project is part of the Kings Bay/Crystal River SWIM Plan and is consistent with the goals of the FDEP Springs Program.

This project requires a feasibility study with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

## Risks and Uncertainties

Risks are very low, proposed property for the stormwater facilities are currently held by the County or in the process of acquisition.

## Success Criteria and Monitoring

This project will affect water quality in the springs and rivers. It is anticipated that quantitative success criteria will be developed for:

- Water quality improvement
- Water quantity

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Citrus County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Regional Stormwater Facility Site 1												
Regional Stormwater Facility Site 2												
Regional Stormwater Facility Site 3												
Regional Stormwater Facility Site 4												
Regional Stormwater Facility Site 5												
Regional Stormwater Facility Site 6												
Facility Success Monitoring												

## Budget and Funding Sources

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$0
Implementation		\$3,952,000
Monitoring		\$400,000
<b>Total Cost</b>		<b>\$4,352,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$4,352,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$4,352,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
SWFWMD		

## Partnerships/Collaboration

Citrus County will continue to work with SWFWMD and FDOT on the implementation and monitoring of these regional stormwater facilities.

## CITRUS COUNTY

## NW Quadrant Septic Forcemain

## PROJECT NO. 13-4

## Project Description

## OVERVIEW AND LOCATION

This project consists of the expansion of a wastewater force main to areas primarily served by septic systems and private package plants in Citrus County (County). The wastewater will be routed to Meadowcrest Wastewater Treatment Plant (WWTP) to produce reclaimed water flows that will be sent to the Duke Energy Crystal River Power Complex for use as cooling water. The project will be located along US 19 in the northwest quadrant of Citrus County as shown in **Figure 13-4A**.

## NEED AND JUSTIFICATION

Crystal River Watershed and Kings Bay Springshed are impacted by reduced water clarity, an altered aquatic vegetation community, and elevated nutrients in the springs. Florida Department of Environmental Protection (FDEP) determined that nutrients contribute to the degraded condition of Kings Bay and some associated springs and set a total maximum daily load (TMDL) for nutrients in those waterbodies to use as a restoration target (FDEP 2017, reference provided below). Water quality management plans for restoration of a healthy spring system are focused on reducing anthropogenic nutrient inputs to the system and septic tanks have been identified as a priority water quality management action for Crystal River/Kings Bay (SWFWMD 2015, reference provided below). This project will decrease nutrient loads to Crystal River and Kings Bay by expanding centralized wastewater infrastructure to areas currently served by septic systems or that may be developed with septic systems in the future. Expanding the availability of wastewater infrastructure in this area which is underlain by karst features with a thin overburden layer is critical to ensuring water quality in the Kings Bay Springshed.



**Figure13-4A.** Project location in Citrus County.

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of this project is to eliminate septic systems through the expansion of the County's wastewater force main system. In addition, two package plants can be taken offline and potential compliance issues associated with them removed from the Springshed. The objectives of this project are to improve water quality in Crystal River Watershed and Kings Bay Springshed.

### PROJECT COMPONENTS

The project consists of two components; the wastewater force main expansion along 5.6 miles of US 19 from Crystal River to Power Line Station Road and taking two private wastewater package treatment plants offline and sending the flows to the Meadowcrest WWTP.

Creating this wastewater infrastructure where none presently exists will allow existing and future residential septic removal along the route, as well as allow for businesses to tie into the system. The flows associated with the septic and package plant systems will go to Meadowcrest WWTP, which is already expanded to handle additional capacity and provides high-level disinfection treatment. Reclaimed water from Meadowcrest WWTP is conveyed to Black Diamond Ranch golf course and will also be sent for reuse at Duke Power facility in the northern portion of the County.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The Crystal River/Kings Bay system discharges into the Gulf of Mexico near the middle of the Springs Coast. Many gulf species inhabit the Crystal River and Kings Bay, and Kings Bay is a winter thermal refuge for marine fish and the Florida manatee. The Springs Coast is home to a variety of important coastal habitats including seagrass beds, oyster bars, mangroves, and salt marshes that are dependent on good water quality and can be negatively impacted by high nutrient inputs. This project will result in an estimated total nutrient reduction of 87,791 pounds of nitrogen per year from the Crystal River Watershed and the Crystal River/Kings Bay Springshed and improve water quality and the ecological balance in the system.

The expansion of the sewer system and WWTP will contribute to economic growth in the county, including the ecotourism industry. This expansion will help the county to grow, improve its economy, and grow the tax base. The proposed projects will increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts of abandoning septic tanks and installing the collection system on side streets. The proposed projects require experienced and technically skilled positions often associated with a full-time salary, higher wage and benefits.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat; and

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

The County will be the sole implementing entity and grant sub-recipient responsible for the feasibility studies, design, permitting, construction, operation and maintenance, and monitoring of this project.

## Best Available Science and Feasibility Assessment

Water quality issues related to nutrients in the Kings Bay and the associated springs are described in the following report (and references cited therein):

- Florida Department of Environmental Protection (FDEP), 2017. Nutrient TMDL for Kings Bay (WBID 1341), Hunter Spring (WBID 1341C), House Spring (WBID 1341D), Idiot's Delight Spring (WBID 1341F), Tarpon Spring (WBID 1341G) and Black Spring (WBID 1341H).

This project is consistent with the goals and objectives of the following natural resource management plan:

- Southwest Florida Management District (SWFWMD), 2015. Crystal River/Kings Bay Surface Water Improvement (SWIM) Plan: A Comprehensive Conservation and Management Plan.

This project is considered to be feasible. However, the project components are only in the conceptual phase. The project cannot be fully evaluated for feasibility until preliminary design is completed.

## Risks and Uncertainties

This project is in the conceptual phase; there has been no study or design work completed. The risks will be identified during the feasibility and design phases.

## Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for

- Changes in ambient water quality (nutrient and bacterial concentrations) in the Crystal River;
- Changes in the frequency and/or duration of algal blooms (as measured by chlorophyll-a) in the Crystal River; and
- Changes in water clarity in the Crystal River.

## SECTION V: Proposed Projects, Programs and Activities

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Citrus County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project - from feasibility study through construction and subsequent success monitoring - is approximately seven years. The expected start date is 2018, and the expected end date is 2025.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Feasibility Study (Springs Funding)												
Water Quality Monitoring Program												
Final Design/Permitting												
Construction												

### Budget and Funding Sources

At this time the County has not provided a total cost estimate to design, permit and construct this project; however, this type of project can be implemented in phases so a total project cost is not imperative at this stage and will be provided after completion of the feasibility study.

The Florida Department of Environmental Protection (FDEP) and SWFWMD are providing, during the 2017-18 fiscal year, a total of \$6 million in collaborative funding for wastewater force main expansion construction within the Northwest quadrant of Citrus County primarily serviced by septic systems. This wastewater main extension will route wastewater flows to the Meadowcrest WWTP to produce additional high-quality reclaimed water flows to be sent to the Duke Energy Crystal River Power Complex.

The preliminary budget is indicated in the table below. The total project request is \$3.5M.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning: Feasibility Study	\$285,000
Implementation Phase: Final Design and Permitting, Construction	\$9,115,000
Monitoring	\$100,000
<b>Total Cost</b>	<b>\$9,500,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$3,500,000
Direct Component	
FDEP/SWFWMD Collaborative Springs Funding	\$6,000,000
Other Grants or Co-Funding	
Other County Funds	
<b>Total Secured Funding</b>	<b>\$9,500,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	



## Partnerships/Collaboration

The county is working closely with FDEP and SWFWMD to accomplish the goals of this program.

RESTORE Act  
Compliance

Public Participation

Financial Integrity

Overall Consistency

Proposed Projects

Appendices

# HERNANDO COUNTY Artificial Reef Program Augmentation

PROJECT NO. 14-1

## Project Description

### OVERVIEW AND LOCATION

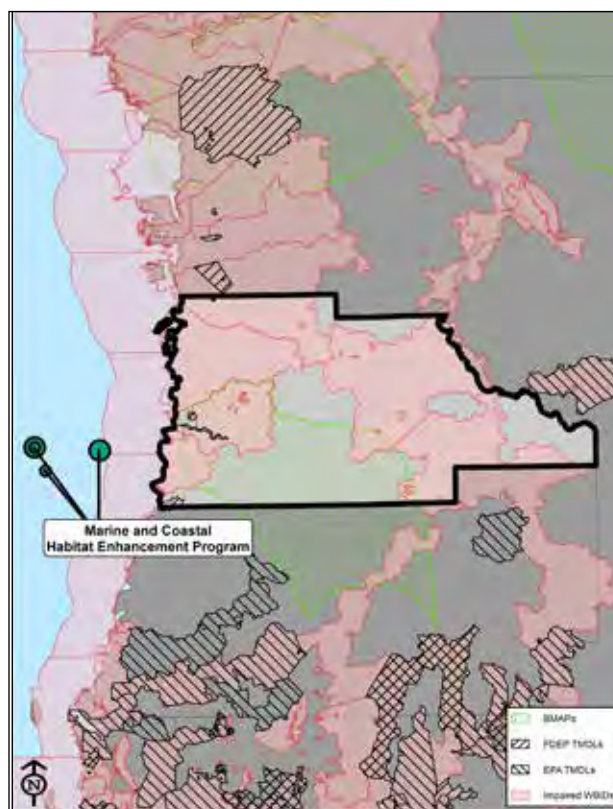
This project includes the installation of 10 artificial reefs at selected locations (see **Figure 14-1A**) to expand upon the existing permitted artificial reefs in Hernando County's nearshore and offshore waters.

### NEED AND JUSTIFICATION

Hernando County first implemented its artificial reef program in 1977 and the program presently includes four offshore reefs. Additional nearshore artificial reefs are needed to meet the increasing demand for snorkeling, diving, and marine life viewing opportunities. Nearshore locations will be accessible by smaller boats, and therefore more residents and tourists. In addition to enhancing recreational opportunities and associated economic benefits, artificial reefs can also provide ecological benefits. Hard substrate and vertical structure are limited habitats in the Gulf of Mexico (Fikes, 2013), and artificial reef habitats provide: 1) hard substrate to support encrusting and colonial benthic organisms such as sponges and corals; 2) niche space for small marine invertebrates; and 3) shelter for larval and juvenile fishes. The project is justified by the demonstrated benefits of artificial reefs, including increased economic activity (Adams et al. 2011).

### PURPOSE AND OBJECTIVES

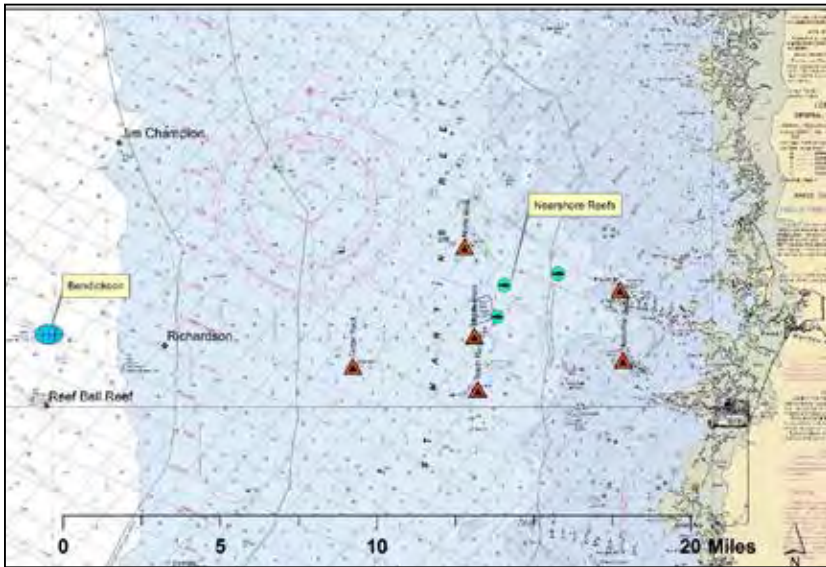
The purpose of this project is to augment Hernando County's existing permitted artificial reef network with clean concrete and other suitable materials, as well as manufactured artificial reef balls. The objectives of the project are to: 1) support the increasing recreational demand for offshore reef fishing and scuba diving opportunities; and 2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in the county's coastal waters.



**Figure 14-1A.** Project location in Hernando County.

Objectives are consistent with those outlined by the Florida Fish and Wildlife Conservation Commission's (FFWCC) artificial reef program, listed below.

1. Enhance private recreational and charter fishing and diving opportunities;
2. Provide a socio-economic benefit to local coastal communities;
3. Increase reef fish habitat;
4. Reduce user conflicts;
5. Facilitate reef related research; and,
6. While accomplishing objectives 1-5, do no harm to fishery resources or human health.



**Figure 14-1B. Location Map of Existing Artificial Reefs and Planned Reefs within Hernando County**

## PROJECT COMPONENTS

A total of ten artificial reefs will be deployed over 12 years (see Figure 14-1B). Project components are listed below.

- Site surveys and site selection for artificial reef locations;
- Acquisition and storage of reef balls and other appropriate material;
- Deployment of artificial reef material by boats and barges at years three, six, and 10;
- Pre- and post- monitoring and data collection.

The reef locations will be available for public use for recreational fishing and diving as part of a larger network of artificial reef programs along the Nature Coast to ensure residents and visitors have access regardless of county boundaries. Post construction monitoring will also be conducted to ensure the deployment of this material produced high quality habitat that supports important reef fish species (e.g., grouper, snapper). Additional planning assistance will be required for permitting, design, and implementation of the proposed project.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

Hernando County has become a destination for eco-tourism focused on scuba diving and recreational fishing. This project will: 1) support the increasing recreational demand for offshore reef fishing and scuba diving opportunities by both residents and tourists; and 2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in coastal waters of Hernando County.

### Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing (primary);
- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region; and
- Eligible Activity 8: Planning assistance.

### Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 5: Restore and Revitalize the Gulf Economy (primary);
- Goal 1: Restore & Conserve Habitat; and
- Goal 3: Replenish & Protect Living Coastal & Marine Resources.

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary);
- Objective 1: Restore, Enhance and Protect Habitats; and
- Objective 3: Protect and Restore Living Coastal and Marine Habitats.

### Implementing Entities

Hernando County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction and success monitoring of the program.

### Best Available Science and Feasibility Assessment

Artificial reefs in the Gulf of Mexico have been extensively studied with regard to the habitat and economic benefits they provide. The scientific literature on the ecological benefits is somewhat controversial (Lindberg et al., 2014, Fikes, 2013, Bortone et al. 1994, others). Some experts argue that artificial reefs are functionally comparable to natural reefs, and that they augment fish populations by providing habitat that is naturally limiting in the Gulf of Mexico. Others argue that artificial reefs simply attract and aggregate existing fish populations, but do not enhance overall fish stocks. While those arguments may be debatable, the economic benefits of artificial reefs are not. Artificial reefs provide significant recreational opportunities and associated benefits along the Gulf coast of Florida (Swett et al., 2011, Adams et al., 2011). In addition, research has produced best practices guidance on site selection, design features, and construction methods; criteria that are now part of the Florida Fish and Wildlife Conservation Commission (FWC) regulations for permitting. Key literature that forms the basis for the Hernando County Artificial Reef Program are cited below.

- Adams, C., et al., 2011. *The economic benefits associated with Florida's artificial reefs*. EDIS document FE649 (2011): 1-6.
- Bortone, S.A., et al., 1994. *Factors affecting fish assemblage development on a modular artificial reef in a northern Gulf of Mexico estuary*. Bull. Mar. Sci. 55 (2-3), 319-332.
- Fikes, R., 2013. *Artificial Reefs of the Gulf of Mexico: A Review of Gulf State Programs & Key Considerations*. National Wildlife Federation.

- Lindberg, W.J., et al., 2014. *Rationale and Evaluation of an Artificial Reef System Designed for Enhanced Growth and Survival of Juvenile Gag, Mycteroperca microlepis*. Proc.66th Gulf and Caribbean Fisheries Institute November 4 – 8. Corpus Christi, TX. Pages 320-325

This project is feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; 3) effectively operate and maintain the project components over the long term. Furthermore, this project is consistent with the National Artificial Reef Plan published in 1985, and the Florida Artificial Reef Strategic Plan (FWC, 2003).

## Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this project that would preclude project implementation. Hernando County will ensure design to limit damage from tropical storms. Controls for lionfish and other nuisance/exotic species may be required. Regulatory constraints will address issues such as spatial boundaries for navigation, channels, marine habitat resources, historic areas, sand borrow areas, existing structures and leases, etc. Success monitoring is critical in a fisheries management context given these reefs have not previously been used as fisheries management tools.

## Success Criteria and Monitoring

This and all artificial reef projects involve the placement of hard substrate to: support recreational demand for offshore reef fishing and scuba diving opportunities; and enhance the abundance, distribution, and structural diversity of hardbottom habitat in the affected waters. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Increase in the coverage of new artificial reef habitat;
- Metrics on the recruitment of benthic encrusting organisms and fish; and
- Increase in recreational usage.

The proposed project will be constructed consistent with the Gulf States Marine Fisheries Commissions Guidelines for Artificial Reef Materials (2004). In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Hernando County, is committed to conducting the monitoring necessary to quantify project benefits.

## Milestones and Schedule

The timeframe for the proposed project is an estimated 12 years, beginning in 2018 and ending in 2013, as outlined below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Artificial Reef Feasibility, Design & Permitting												
Phase 1 Reef Construction (3 Sites)												
Phase 2 Reef Construction (3 Sites)												
Phase 3 Reef Construction (4 Sites)												
Artificial Reef Success Monitoring												

## Budget and Funding Sources

Hernando County has developed a cost estimate of approximately \$2,000,000 for the proposed project. Project funding is summarized in the table below.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$750,000
Implementation	\$900,000
Monitoring	\$250,000
<b>Total Cost</b>	<b>\$1,900,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$1,900,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$100,000
<b>Total Secured Funding</b>	<b>\$2,000,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
FDEP	
FWC	
NRDA	
NFWF	

## Partnerships/Collaboration

Hernando County plans to partner with neighboring counties Citrus and Pasco to implement a Regional Artificial Reef Program to ensure coordination of monitoring, design, and permitting efforts and better inform future artificial reef projects. Collaboration with the Florida Artificial Reef Program as well as representatives of material collection resources, technical construction assistance, artificial reef construction best practices, and outreach is anticipated. Coordination with the following agencies is anticipated: Suwannee River Water Management District, FFWCC, Florida Department of Environmental Protection, National Marine Fisheries Service, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service.



# HERNANDO COUNTY Coastal Habitat Enhancement Program

PROJECT NO. 14-2

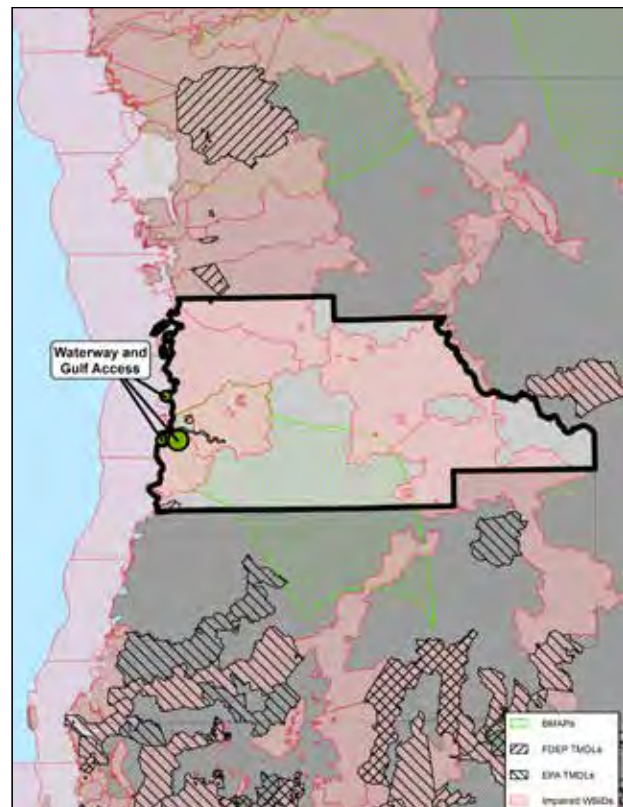
## Project Description

### OVERVIEW AND LOCATION

This program involves the restoration of nearshore coastal habitats, including the enhancement of existing oyster bars and the creation of living shorelines, in the Jenkins Creek and Hernando Beach areas of coastal Hernando County. The general location of the program components is shown in **Figure 14-2A**.

### NEED AND JUSTIFICATION

Portions of coastal Hernando County have been substantially altered and impacted by historical dredge and fill activities (SWFWMD) for residential development. The Hernando Beach community (see **Figure 14-2B**), which began construction in the 1950's is an example of coastal development that occurred prior to the passage of laws and regulations limiting impacts to wetlands and submerged habitats. Although regulations are now in place to prevent future impacts of this magnitude, physical restoration is needed to partially offset historic coastal habitat losses and to enhance existing coastal habitats. In addition to enhanced habitat functions, this project will also provide for improved water quality and shoreline stabilization in areas prone to erosion from boat wakes and sea level rise (Suwannee River Water Management District 2017).



**Figure 14-2A.** Project location in Hernando County.

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of this program is to restore, create, and enhance nearshore coastal habitats to address multiple objectives. These objectives include:

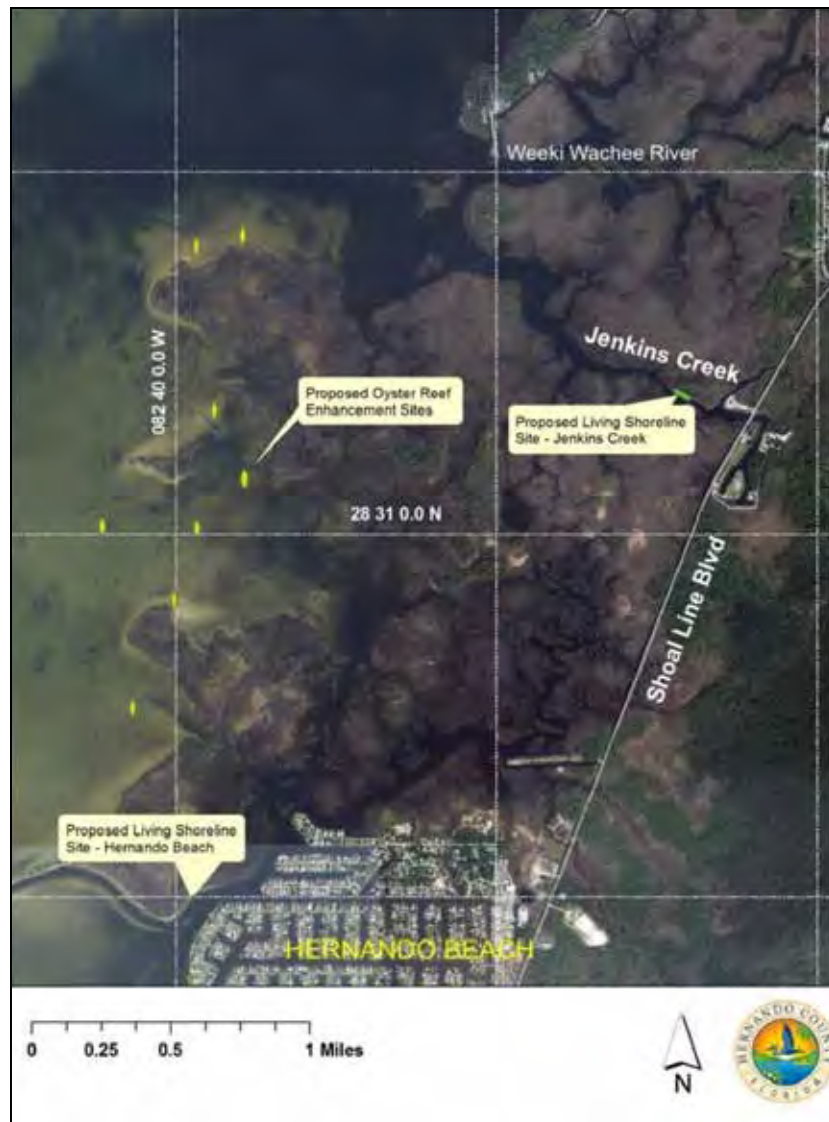
1. enhance fish and wildlife habitat
2. support and augment recreational uses
3. improve water quality
4. shoreline erosion protection in vulnerable areas

The project will also include an educational component with plans to engage students and residents to assist with the installation of oyster shells, planting of marsh grasses, and to incorporate project monitoring into coastal and marine curriculums at local high schools and colleges.

These objectives, and the proposed approach for restoration, are consistent with those developed for coastal habitat and oyster restoration in the Gulf of Mexico by the National Oceanic and Atmospheric Administration (2016) as part of the *Final Programmatic Damage Assessment and Restoration Plan* and *Final Programmatic Environmental Impact Statement*.

### PROJECT COMPONENTS

Hernando County has identified eight nearshore oyster reef sites (see **Figure 14-2B**) where coastal habitat enhancement could be achieved by creating new oyster reefs, or expanding upon small areas of existing oyster reef. Available salinity data indicate that natural recruitment of oyster larval and growth in these areas will be favorable. In addition to nearshore oyster habitat the County plans to construct living shorelines at three sites (see **Figure 14-2B**) where shoreline erosion has occurred. These sites are located near Jenkins Creek, along shorelines in Linda Pedersen County Park, and along the Hernando Beach channel spoil islands.



**Figure 14-2B.** Proposed Hernando County living shoreline and oyster reef project sites.

Both the oyster reef and living shoreline project components will provide the unique opportunity to involve citizens through a shell recycling program and placement of oyster bags and/or oyster settlement sites, growing and planting marsh grass, and constructing and deploying shallow water reef modules. At least one site will be selected that will be easily accessible by the public for use as an educational amenity.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This program will enhance fish and wildlife habitat, support existing and augment future recreational uses of the coastal zone, and improve water quality and shoreline erosion protection in vulnerable areas. In addition, the program will provide opportunities for public environmental education through participation in project implementation and monitoring. The project is also expected to provide economic benefits to Hernando County in the form of increased eco-tourism. Hernando County has become a destination for kayak and stand-up paddleboard tours of the Weeki Wachee River, activities which are expanding throughout the coastal areas of the County. This program will enhance eco-tourism opportunities and associated economic activity.

Finally, the construction and enhancement of nearshore oyster reefs and living shorelines will provide a number of ecological benefits including the provision of: 1) substrate for oyster spat settlement and new oyster larval production; and 2) micro-benthic habitats for numerous small organisms such as amphipods, isopods, burrowing shrimp, crabs, oyster dwelling fish (blennies and gobies). These organisms in turn support recreational important fish species including redfish, snapper, sheepshead and black drum.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat.
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

Hernando County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the program. Hernando County has coordinated extensively with the Florida Sea Grant program in the planning, feasibility analysis, design, of the program components.

### Best Available Science and Feasibility Assessment

Oyster reef restoration and living shoreline construction have been well studied, and a range of best siting practices and successful construction methods have been developed. This program has been informed by key literature in this field including the following references.

- Baggett, L.P., S.P. Powers, R. Brumbaugh, L.D. Coen, B. DeAngelis, J. Greene, B. Hancock, and S. Morlock, 2014. Oyster Habitat Restoration Monitoring and Assessment Handbook. The Nature Conservancy, Arlington, VA, USA., 96pp.
- Barnes TK, Volety AK, Chartier K, Mazzotti FJ, Pearlstine L (2007) A habitat suitability index model for the eastern oyster (*Crassostrea virginica*), a tool for restoration of the Caloosahatchee Estuary, Florida. *Journal of Shellfish Research* 26 (4):949-959. doi:10.2983/0730-8000(2007)26[949:ahsimf]2.0.co;2
- La Peyre M, Furlong J, Brown LA, Piazza BP, Brown K (2014) Oyster reef restoration in the northern Gulf of Mexico: Extent, methods and outcomes. *Ocean & Coastal Management* 89:20-28. doi:10.1016/j.ocecoaman.2013.12.002
- Seavey JR, Pine WE, Frederick P, Sturmer L, Berrigan M (2011) Decadal changes in oyster reefs in the Big Bend of Florida's Gulf Coast. *Ecosphere* 2 (10). doi:10.1890/es11-00205.1
- Scyphers SB, Powers SP, Heck KL, Byron D (2011) Oyster Reefs as Natural Breakwaters Mitigate Shoreline Loss and Facilitate Fisheries. *Plos One* 6 (8). doi:10.1371/journal.pone.0022396
- Allen M, Ankerson T, Pistole E, Sanders S, and Barshel A (2017). Hernando County Marine Area Plan Interim Report. Levin College of Law and Nature Coast Biological Station, University of Florida. Gainesville, Florida.



**Figure 14-2C.** Oyster reef in Centipede Bay, Hernando County (Source: Keith Kolasa).

This program is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

### Risks and Uncertainties

In the evaluation of this program, no significant risks have been identified that would preclude implementation. There is some risk that constructed oyster reefs and living shorelines could be damaged during tropical storm events; however, potential damage from storm surge and high waves will be factored into the siting and construction methods. This project is ready to begin design and permitting.

## Success Criteria and Monitoring

The oyster reef and living shoreline sites will be monitored bi-annually as they are installed, with a yearly monitoring report. Pre and post construction monitoring will be completed of the oyster reefs and living shorelines to evaluate the ecological benefits and ecosystem services gained from these projects, and to provide recommendations for future similar projects.

At each of eight (8) reef locations, and the three (3) living shorelines sites, bi-annual and quantitative sampling will be conducted along pre-determined transects with HD video for:

- Fish/shellfish/crustacean populations
- Invertebrates

## Milestones and Schedule

The total estimated time horizon of this project, from design and permitting through success monitoring, is approximately 10 years. The expected start date is 2018, and the expected end date is 2028. Permitting, implementation, and monitoring will be completed for half the sites within the first five years, with the remaining sites to be completed during the subsequent 5 years.

Hernando County will utilize an adaptive management approach to project design and implementation, using ongoing monitoring from constructed sites to inform the design of future implementation activities. Implementation of this project has been broken down into nine milestones/phases, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Oyster Reef Design& Permitting	■		■		■							
Living Shoreline Design & Permitting	■	■	■									
Phase 1 Oyster Reef Construction (2 Sites)		■										
Phase 2 Oyster Reef Construction (2 Sites)				■								
Phase 3 Oyster Reef Construction (4 Sites)						■						
Phase 1 Living Shoreline Const. (3 Sites)		■										
Phase 2 Living Shoreline Const. (3 Sites)				■								
Oyster Reef Success Monitoring			■	■	■	■	■	■	■	■		
Living Shoreline Success Monitoring			■	■	■	■	■					



## Budget and Funding Sources

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$300,000
Implementation		\$550,000
Monitoring		\$250,000
<b>Total Cost</b>		<b>\$1,100,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$950,000
Direct Component		\$0
Other Grants or Co-Funding		\$75,000
Other County Funds		\$75,000
<b>Total Secured Funding</b>		<b>\$1,100,000</b>
<b>Budget Shortfall</b>		
POTENTIAL LEVERAGED FUNDING SOURCES		
FDEP		
SWFWMD		
NRDA		
NFWF		

If additional leveraged funds become available, they would be applied to the areal expansion of the oyster reef restoration and living shoreline construction projects.

## Partnerships/Collaboration

Hernando County and the University of Florida have recently created a partnership to develop a marine resource management plan (Allen *et al*/2017), create research opportunities, and to foster marine and coastal stewardship through creating education programs incorporated within specific enhancement projects. As discussed above, an education component is planned as part of the oyster reef and living shoreline projects. Hernando County has recently hired (May 2016) a full time Sea Grant agent who will assist with developing education component of the program. Partnerships have been developed with restaurants for oyster shell recycling and also the Coastal Conservation Association. The Coastal Conservation Association has also offered community support during deployment of shells and marsh grass planting. The County's Aquatic Services Manager will provide project management and oversight of the projects, and four waterways technicians will assist with reef deployment. It is expected that the staff time can be used as a partial in-kind match.



## HERNANDO COUNTY

## Waterway / Gulf Access Program

PROJECT NO. 14-3

## Project Description

## OVERVIEW AND LOCATION

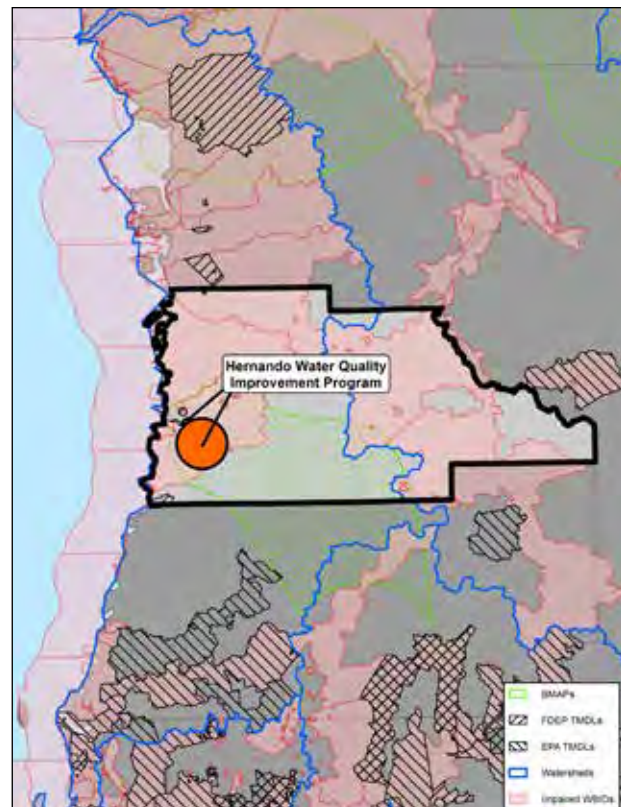
The Hernando County Waterway and Gulf Access Program will provide for upgraded coastal resiliency for existing public access parks and expand boat ramps, docks and parking. The program will also include projects for dredging to maintain waterways at Pine Island, Hernando Beach, and Bayport Channels as shown in **Figure 14-3A**.

## NEED AND JUSTIFICATION

Hernando County has great public access along the Gulf, however with a growing number of visitors the amenities need to be upgraded and expanded to meet the needs of different user-groups. Some of these areas are seasonally inundated with water during “king-tides” and storm events rendering them inaccessible and leaving the County with maintenance costs. Stabilizing roads and parking areas will eliminate sediment from the nearby waterways. Structural improvements to the fishing pier, bridge, boardwalk and seawall will create elevated, sustainable structures that can survive future storms. Dredging the canals and waterways will remove sediment that has caused shoaling and maintain flushing and safe navigation.

## PURPOSE AND OBJECTIVES

Hernando County wants to provide a safe and sustainable way for residents and visitors to access the Gulf. The County already owns key properties that promote public access to the Gulf, but would like to expand the number of boat ramp slips and upgrade to floating docks so that the ramps are usable at all water levels. Dredge shoals from the canals and waterways that lead from the County Parks to the Gulf and provide increased access points and designated paddling trails for non-motorized vessels.



**Figure 14-3A.** Project location in Hernando County.

## SECTION V: Proposed Projects, Programs and Activities



**Figure 14-3B.** Proposed Amenities at Linda Pedersen Park.



**Figure 14-3C.** Proposed Amenities at Jenkins Creek Park.

### PROJECT COMPONENTS

Hernando County will work use a combination of in-house staff, Sea Grant staff and local consultants to complete feasibility studies, conduct engineering design, acquire permits and monitor the projects. As part of the planning and feasibility process for the dredging projects bathymetric survey and sediment sampling work will be performed to delineate project areas and quantities. Potential hazards to navigation will be mapped during the process as well and designated for removal. The program will include projects that will address public access for motor and non-motorized vessels including signage for paddling trails and separate launching facilities dedicated to kayak and canoe launches. Seawalls, docks and fixed hardscape elements will be raised to account for sea level rise and reduce the amount of future maintenance required by the County. Where possible floating docks will be used to account for seasonal and storm induced fluctuations in water levels. Improvement of access roads, parking lots, board walks and trails will be just a few of the park amenities that are also included as projects under this program. **Figure 14-3B** indicates where these amenities are located in Linda Pedersen Park and **Figure 14-3C** depicts similar project elements in Jenkins Creek Park. The proposed projects will improve sustainability of County assets while enhancing the adjacent environmental resources.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

These projects will increase public access to the Gulf for a growing nature-based tourism in the Hernando County area. The additional amenities will increase daily and season usage, and relieve pressure on other parks that may be over capacity during peak usage days. The program will also be linked to Hernando County's living shorelines

and oyster restoration projects presenting the opportunity for outdoor classroom and local non-profit organization sponsored events.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region; and
- Eligible Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing (primary).

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.

## Implementing Entities

Hernando County would be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project. The County has coordinated with numerous other agencies in the development of the program, and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements (SWFWMD, NFWF, FDEP).

## Best Available Science and Feasibility Assessment

Elements of this project were previously designed and permitted. That historical information will be incorporated into the basis for design, as well as previous studies that indicate sea level rise projections and storm surge levels.

This project is feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; 3) effectively operate and maintain the project components over the long term.

## Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this project that would preclude project implementation. Hernando County will ensure design to limit damage from tropical storms. Controls for lionfish and other nuisance/exotic species may be required. Regulatory constraints will address issues such as spatial boundaries for navigation, channels, marine habitat resources, historic areas, sand borrow areas, existing structures and leases, etc. Success monitoring is critical in a fisheries management context given these reefs have not previously been used as fisheries management tools.

### Success Criteria and Monitoring

This project will affect County park visitor numbers and usage. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that criteria will be developed for:

- Number of visitors
- Alleviation of park congestion

In the implementation grant request a detailed monitoring will be described to address data collections and assessment of the above list criteria.

### Milestones and Schedule

The timeframe for the proposed project is an estimated 12 years, beginning in 2018 and ending in 2030, as outlined below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Feasibility, Design & Permitting												
Boat Ramp/Park Amenities Construction												
Channel Improvements Construction												
Paddling Trail Construction												
Success Monitoring												

## Budget and Funding Sources

Based on previous County projects, a preliminary opinion of probable construction engineering, permitting, construction, and monitoring costs for the project was developed, based on best available information for quantities and unit prices for the year 2016. The total project cost was estimated to be \$4,000,000.

Project funding is summarized in the table below.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$165,000
Implementation	\$4,410,000
Monitoring	\$135,000
<b>Total Cost</b>	<b>\$4,710,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$4,610,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$100,000
<b>Total Secured Funding</b>	<b>\$4,100,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
FDEP	
FWC	
NRDA	
NFWF	

## Partnerships/Collaboration

Hernando County has an excellent working relationship with SeaGrant and the Southwest Florida Water Management District:

- SeaGrant/IFAS
- Southwest Florida Water Management District
- Florida Fish and Wildlife Conservation Commission – Florida Boater Improvement Fund
- Florida Department of Environmental Protection;



# HERNANDO COUNTY Water Quality Improvement Program - District A Phases 1 & 2

PROJECT NO. 14-4

## Project Description

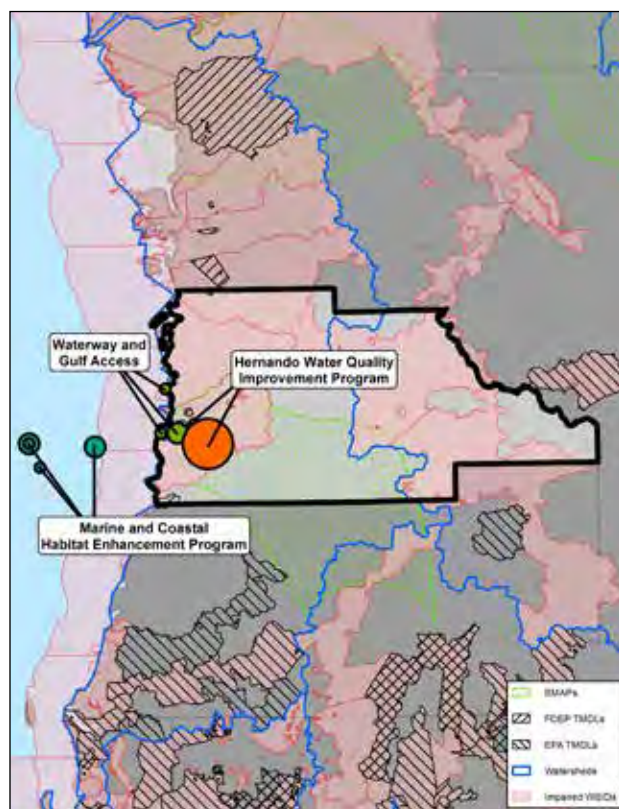
### OVERVIEW AND LOCATION

The Hernando Septic to Sewer Conversion Program is an effort to provide sewer to 30,000 lots that use septic tanks for onsite treatment and disposal of waste water. The overall program has divided this large 30,000 parcel area into 19 Districts (A to S). In accordance with the overall program, District A will be the first area where the septic to sewer conversion will take place. District A has 717 lots with septic tanks. This project will remove the existing septic tanks and provide sewer to all 899 lots in the area. The location of the project is in southeast Hernando County in the city of Weeki Wachee (see **Figure 14-4A**).

### NEED AND JUSTIFICATION

Over the past hundred years, Weeki Wachee River has experienced significant ecological shifts. FDEP determined that nitrogen is a contributing factor for an ecological imbalance (excessive growth of algae) in Weeki Wachee Spring and Weeki Wachee River and established a total maximum daily load (TMDL) for nitrate nitrogen in the system.

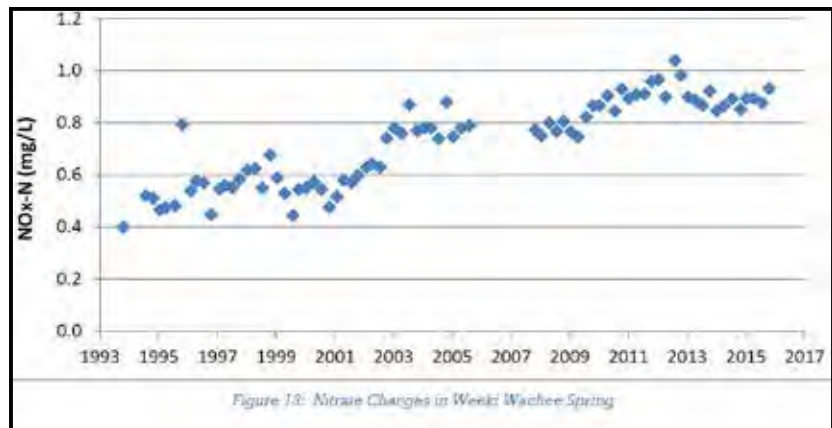
Weeki Wachee Spring (WWS), is fed from a large shallow aquifer under approximately 260 square miles of urbanized areas, agricultural lands and forested uplands. The WWS aquifer underlies portions of Hernando and Pasco counties. Nitrogen enrichment, particularly in the inorganic form nitrate, is an issue because nitrate is mobile and conservative once it reaches the groundwater. Nitrate concentrations have been increasing in the water discharging from Weeki Wachee Spring from 0.1 mg/L or less historically (SWFWMD 2017, see below) to 0.9 mg/L in 2015 (See **Figure 14-4B**). Development of a basin management action plan (BMAP) for reducing nutrient loads and restoring these impaired waterbodies is underway.



**Figure 14-4A.** Project location in Hernando County.



The aquifer feeding WWS is shallow and vulnerable to nutrients from septic tanks. Groundwater flow velocities in the aquifer have been estimated at 2 ft/day based upon the hydraulic conditions. The nutrients from the septic tanks in District A (see **Figure 14-4C**) have the shortest travel time to reach the WWS (about 5 years). Hernando County has prioritized the septic to sewer program based on the proximity of the septic tanks to the springs, the shortest travel times and the nitrogen load contribution. The



**Figure 14-4B. Nitrate Concentration in WWS, 1993-2016.**

County plans to remove the septic tanks nearest the WSS to prevent the it from wastewater nutrients and remove an estimated 11,000 lbs N/yr from District A alone.

### PURPOSE AND OBJECTIVES

The purpose of this project is to remove the highest density septic tanks in the areas most likely to affect the WWS. Hernando County divided the contributing area most affecting the WWS into 19 separate Districts; District A has is the highest priority for remediation. This project will be the first such remediation project of the overall program.

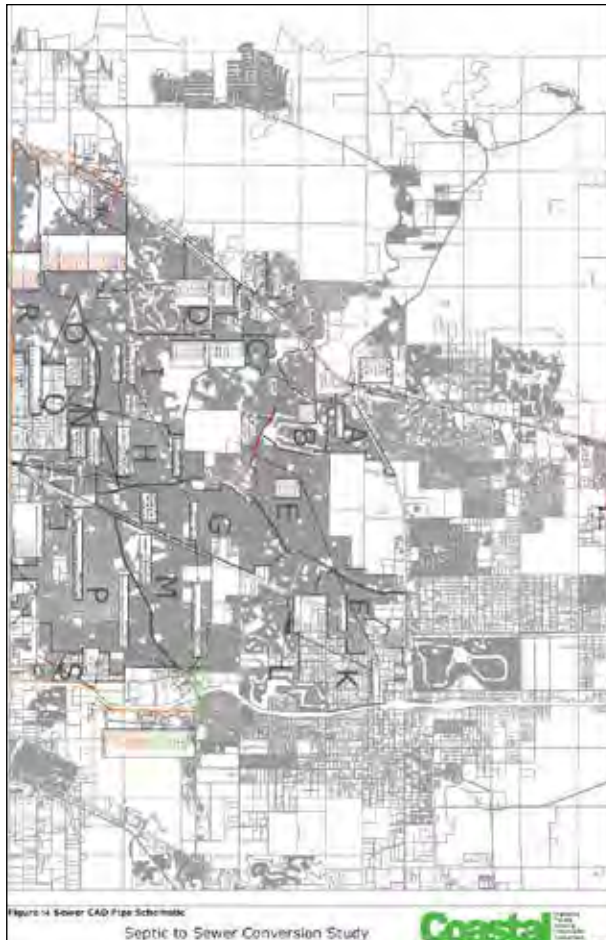
### PROJECT COMPONENTS

This project will provide conventional gravity sewer to District A. The existing wastewater infrastructure was modeled to determine if existing force mains and pump stations could handle additional flows from new sewer connections, indicating that they could. The project area is depicted on **Figure 14-4C** and the conversion in District A will take place in 2 phases. It will be necessary to conduct water monitoring program demonstrate the expected improvements to water quality in Weeki Wachee Spring and downstream waterbodies.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

Weeki Wachee Spring and the Weeki Wachee River support a diverse ecological community of aquatic vegetation, fish, and wildlife and are an important economic resource. Nitrogen enrichment is an ongoing issue for the Spring and River, stimulating phytoplankton growth, resulting in decreased water clarity and light penetration to submerged aquatic vegetation (SWFWMD 2017). Reduction of nitrogen loads is the primary focus of water quality management actions for the Weeki Wachee River. Eliminating septic tanks would improve water quality in the River and downstream in the Gulf of Mexico. Implementation of this program in District A (a total of 899 lots) and processing the water through a wastewater treatment facility would remove over 11,000 lbs/year of nitrogen from the springshed (Coastal Engineering Associates 2016, reference provided below).

The expansion of the sewer system will contribute to economic growth in the county. This expansion will help the county to grow, improve its economy, and grow the tax base. The proposed project will increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts of abandoning septic tanks and installing the collection system on side streets. The proposed project requires



**Figure 14-4C.** Septic to Sewer Conversion Program Area, Districts A-S.

experienced and technically skilled positions often associated with a full-time salary, higher wage and benefits. The improvements at the river and springs will benefit the local ecotourism economy.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat; and
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

### Implementing Entities

Hernando County Public Utilities Department will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project. Hernando County Public Utilities Department has coordinated with Florida Department of Environmental Protection and numerous other agencies in the development of the waste water management plan, and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

## Best Available Science and Feasibility Assessment

The County completed a study to identify the best options for septic to sewer conversions to reduce nitrogen loading to the Weeki Wachee Springshed:

- Coastal Engineering Associates and Legette Brashears & Graham, 2016. Septic to Sewer Conversion Study. Final Report prepared for the Hernando County Utility Department.

This project is consistent with the goals and objectives of the following natural resource management plan:

- Southwest Florida Water Management District (SWFWMD), 2017. Weeki Wachee River Surface Water Improvement and Management (SWIM) Plan, A Comprehensive Conservation and Management Plan.

The project does appear to be feasible. However, only an initial planning and sewer master plan has been completed to date. The project cannot be fully evaluated for feasibility until preliminary design is completed.

## Risks and Uncertainties

In the evaluation of this program, it was determined that initial planning and a sewer master plan was completed. This is the first project associated with a much larger program. The project appears feasible but the risks and uncertainties will be evaluated after preliminary design has been completed. Hernando County has identified this as a high priority program and is ready to proceed with implementation.

## Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for

- Changes in ambient water quality (nutrient and bacterial concentrations) in the Weeki Wachee Spring and River;
- Changes in the frequency and/or duration of algal blooms (as measured by chlorophyll-a) in the Weeki Wachee River; and
- Changes in water clarity in the Weeki Wachee River.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Hernando County is committed to conducting the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project - from permit modification through success monitoring - is approximately 7 years. The expected start date is 2019, and the expected construction end date is 2023. The project will be constructed in two phases using a design build approach. Water monitoring is expected to last 2 years beyond the end of construction in 2025.

## SECTION V: Proposed Projects, Programs and Activities

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
Water Quality Monitoring Program												
Preliminary Design (Phase 1)												
Final Design/Construction (Phase 1)												
Preliminary Design (Phase 2)												
Final Design/Construction (Phase 2)												

### Budget and Funding Sources

The cost estimate for this project is \$23.05 million dollars which is the first project in a \$690 million-dollar program. The county has not included a funding request for water quality success monitoring, but it is believed to be required unless conducted under another program. This is estimated to be \$50,000 per year for five years for a total of \$350,000 dollars. Currently, there is no other grant money has been identified. These estimated project costs include the on-site costs of decommissioning the homeowner's septic tanks and the cost for lateral connection installation.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$500,000
Implementation		22,200,000
Monitoring		\$350,000
<b>Total Cost</b>		<b>\$23,050,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$5,100,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$5,100,000</b>
<b>Budget Shortfall</b>		<b>\$17,950,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		

### Partnerships/Collaboration

The septic to sewer conversion study was developed with financial assistance provided by the Fish and Wildlife Foundation of Florida, Inc. through the Protect Florida Springs program.

## HERNANDO COUNTY NAME

# Water Quality Improvement Program - Hudson Commercial Area Stormwater (Calienta Street)

PROJECT NO. 14-5

## Project Description

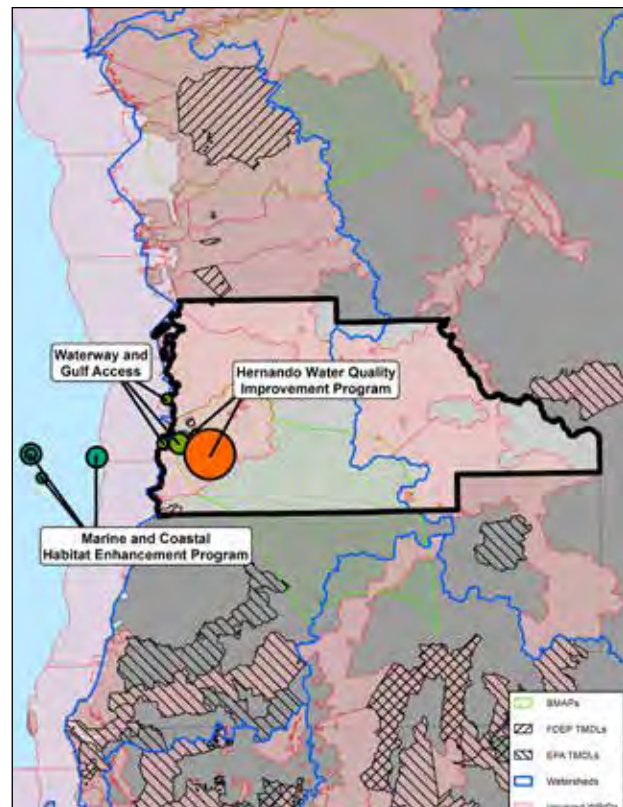
### OVERVIEW AND LOCATION

This project involves improvements to Calienta Street to improve water quality from currently untreated stormwater runoff, and which drains to the Gulf of Mexico. The stormwater upgrade design will also address coastal flooding which has become more prevalent. The project area is located just beyond the edge of the Weeki Wachee springshed and is well outside the Weeki Wachee watershed on the Hernando Beach canal system. The general location of the project is shown in **Figure 14-5A**.

### NEED AND JUSTIFICATION

As a result of recent maintenance activity on the Hernando Beach Canal, Calienta Street is seeing increased industrial type traffic associated with the commercial fishing industry (see **Figure 14-5B**). This increase in industrial traffic coupled with frequent recreational boat launch traffic has caused the roadway to degrade and crack, as well as contribute sediments to the canal system due to erosion. In addition, Calienta Street lacks any kind of roadside conveyance or stormwater treatment. Runoff from Calienta Street drains directly into the Gulf canals, carrying potential contaminants to and degrading water clarity in nearby seagrass beds. Due to these factors, the roadway also exhibits frequent flooding during typical storm events.

This project will address water quality degradation associated with a working commercial waterfront, from nutrient, erosion and roadway-related pollutant loadings by retrofitting the streetscape with appropriate BMPs. It will work in conjunction with other water quality treatment projects the county has planned in the residential areas along the canals involving structural improvements and bio-sorption facilities. They are also reviewing the feasibility of



**Figure 14-5A.** Project location in Hernando County.



## SECTION V: Proposed Projects, Programs and Activities

providing improvements at Jenkins Creek Park to reduce sediment loading into receiving waters. Overall, the synergies of these projects will benefit the receiving waters.

### PURPOSE AND OBJECTIVES

The purpose of this project is to enhance the water quality of the runoff from Calienta Street, and surrounding residential areas along the canals, as well as alleviate local flooding. The objectives include, to redirect runoff with a roadside ditch system, and to treat the quality of runoff with BMPs and preventing flooding caused by uphill precipitation and storm surge. The project could also potentially treat the runoff from the adjacent industrial parking lots.

### PROJECT COMPONENTS

Hernando County has identified a one-mile long roadway that is degrading and experiences flooding. Calienta Street is a major local road located in Hernando Beach that runs from Shoal Line Boulevard, north to the Maplewood Drive. This section of roadway services a commercial and industrial area, and provides access to the County boat ramp facility and several residential neighborhoods in Hernando Beach. In addition to restoring and widening the roadway and alleviating flooding caused by upland precipitation and storm surge, the County has identified the site as candidate for Water Quality treatment. The County is currently proposing to utilize road-side ditches to direct runoff from Calienta Street into a BMP, potentially an underdrain or exfiltration box. Additionally, the County is looking at structural improvements and bio-sorption facilities, or similar, to provide water quality treatment for the residential areas along the canals; and parking lot improvements at Jenkins Creek Park to reduce sediment and nutrient loading to the receiving waters. The project requires a conceptual design to determine the optimal BMP concepts.



Figure 14-5B. Calienta St. Project limits.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This program will improve water quality protection and alleviate flooding issues along a degrading roadway. The program will reduce nutrient and sediment loads to nearby seagrass beds, protecting them from smothering by sediment and from light limitation due suspended sediment or algal blooms in the water column. Seagrass supports numerous fish and invertebrate species, including many of commercial importance and good water quality is essential for the maintenance of healthy seagrass systems. project is also expected to provide economic benefits to Hernando County in the form of increased commercial fishing opportunities due to the improved roadway conditions. The roadway currently provides access to a major recreational boat ramp and a seafood packing operation.



## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region (primary); and
- Eligible Activity 7: Coastal flood protection and related infrastructure.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

Hernando County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the program. Hernando County has coordinated extensively with the Florida Sea Grant program in the planning, feasibility analysis, design, of the program components.

## Best Available Science and Feasibility Assessment

Stormwater BMPs for roadways have been well studied and described in the following report (and references cited within)

- FDOT Drainage Handbook. Office of Design, Drainage Section, 2012.

This project is considered to be feasible, although it is only in the concept phase and will require additional evaluation and planning to fully evaluate feasibility.

## Risks and Uncertainties

Preliminary design needs to be completed before risks can be assessed.

## Success Criteria and Monitoring

The project will affect water quality in the gulf. It is anticipated that quantitative success criteria will be developed for:

- Changes in ambient water quality (nutrient, total suspended sediment, turbidity, other roadway contaminants) after storm events downstream of the Calienta Street project.

### Milestones and Schedule

The total estimated time horizon of these projects - from feasibility through construction is approximately 5 years. The expected start date is 2018, and the expected end date is 2022. Implementation of these projects has been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Feasibility Study												
Preliminary Design												
Final Design/Permitting												
Construction												

### Budget and Funding Sources

This project is in the conceptual design stage, therefore detailed cost estimates have not been completed. Hernando County provided a conceptual level cost for the project, including planning, implementation, and monitoring. The County is also in discussions with FDEP and SWFWMD for additional funding for this project.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$150,000
Implementation		\$4,850,000
<b>Total Cost</b>		<b>\$5,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$2,500,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$2,500,000</b>
<b>Budget Shortfall</b>		<b>\$2,500,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FDEP		
SWFWMD		

### Partnerships/Collaboration

Hernando County has coordinated extensively with the Florida Sea Grant program in the planning, feasibility analysis, design, of the program components.

## PASCO COUNTY

Port Richey Watershed  
Stormwater Project

PROJECT NO. 15-1

## Project Description

## OVERVIEW AND LOCATION

This project involves converting the former Magnolia Valley Golf Course to a wetlands complex, restoring the hydroperiod and improving stormwater management for the Port Richey Watershed. The general location of the project is shown in **Figure 15-1A**.

## NEED AND JUSTIFICATION

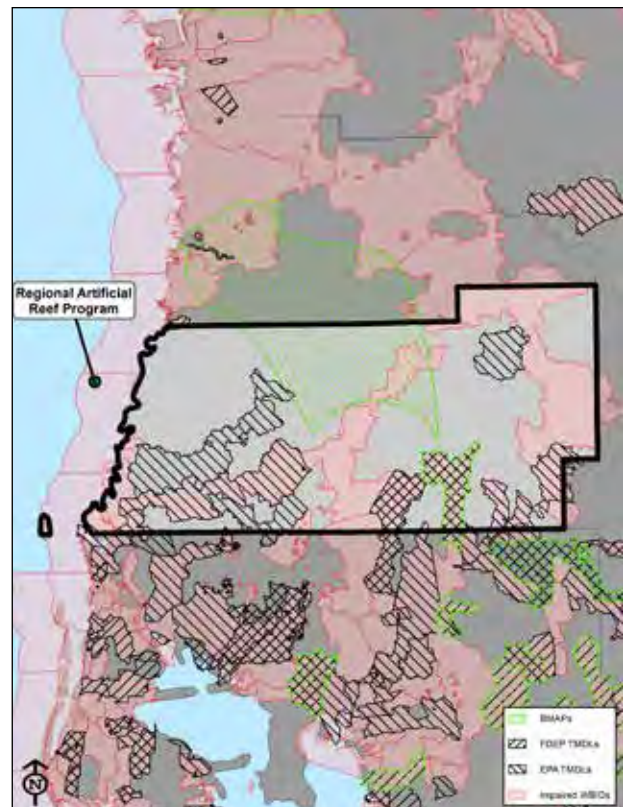
Salt Springs (WBID 1439), the primary receiving water for the project area, is impaired for nutrients.

Area of the Port Richey Watershed are frequently inundated with floodwaters during minor rain events due to growth of neighborhoods, loss of wetlands and in general high density populations in low lying areas. In order to improve the flooding issues new infrastructure is desperately needed to improve drainage. Improved drainage also means less exposure to run off and therefore better water quality for the Gulf of Mexico as all flood waters eventually end up in that body of water.

## PURPOSE AND OBJECTIVES

The purpose of this project is to improve water quality and provide water quantity control in the Port Richey Watershed through the creation of a wetland complex at the former Magnolia Valley Golf Course. Specific goals include:

- Establish a native wetland complex, including shallow wetlands and deep open water areas
- Establish appropriate native plants that will provide wetland habitat and slope stabilization
- Restoration of natural hydroperiod
- Water quality polishing of stormwater via the established and maintained wetlands



**Figure 15-1A.** Project location in Pasco County.

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

The Port Richey Watershed & Gulf Coast Program includes Magnolia Valley Golf Course Storage and Wetland Enhancement project.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The project will provide water quantity control and improved water quality the Port Richey Watershed, which drains into a salt springs system contiguous to the Gulf of Mexico. Specific goals include:

- Ecological- Providing water quality benefits to downstream receiving waters, which will provide for ecological improvement.
- Aesthetic – Reducing flooding for residents and visitors and providing water quality benefits to receiving waters.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat
- Goal 2: Restore Water Quality and Quantity
- Goal 3: Replenish and Protect Living Coastal and Marine Resources

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats
- Objective 2: Restore, Improve, and Protect Water Resources
- Objective 3: Protect and Restore Living Coastal and Marine Resources

### Implementing Entities

Pasco County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the project.

### Best Available Science and Feasibility Assessment

BMPs such as created wetlands have been well studied and described in the following report (and references cited within)

- FDOT Drainage Handbook. Office of Design, Drainage Section, 2012.

This project requires a feasibility study with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

## Risks and Uncertainties

Creating wetland complexes for water quantity and quality improvements is feasible and these activities are frequently implemented. Preliminary design needs to be completed before risks are assessed.

## Success Criteria and Monitoring

Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in storm water pollutants (nutrients, suspended sediments, metals, etc.) discharged into WBID 1439 (Salt Springs) and Boggy Bay;
- Maintenance of water quality in Millers Bayou;
- Wetland creation (acres)
- Decreased flooding of roadways and neighborhoods

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Pasco County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project - from preliminary design through construction is approximately 4 years. Implementation of this project has been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Preliminary Design												
Final Design/Permitting												
Construction												

### Budget and Funding Sources

This project is in the conceptual design stage, therefore only preliminary cost estimates have been completed. Pasco County provided a preliminary cost for the project, including planning, implementation, and monitoring in their SEP proposal. Pasco County is in discussions with SWFMWD for additional funding.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		
Implementation		
Monitoring		
<b>Total Cost</b>		<b>\$10,600,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$5,000,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$5,000,000</b>
<b>Budget Shortfall</b>		<b>\$5,600,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
SWFWMD		\$5,000,000
Other Grants or Co-Funding		\$300,000
Other County Funds (RESTORE Pre-Planning Funds)		\$300,000
<b>Total Potential Leveraged Funding</b>		<b>\$5,600,000</b>
<b>Potential Budget Shortfall</b>		<b>\$0</b>

### Partnerships/Collaboration

No partnerships or further collaboration for this project have occurred at this time.



## PASCO COUNTY

# Hammock Creek - Sea Pines Flood Abatement and Water Quality Improvement Program

PROJECT NO. 15-2

## Project Description

### OVERVIEW AND LOCATION

This program involves providing storage, improved conveyance, and water quality treatment for flood abatement and improved water quality. The general location of the project is shown in **Figure 15-2A**.

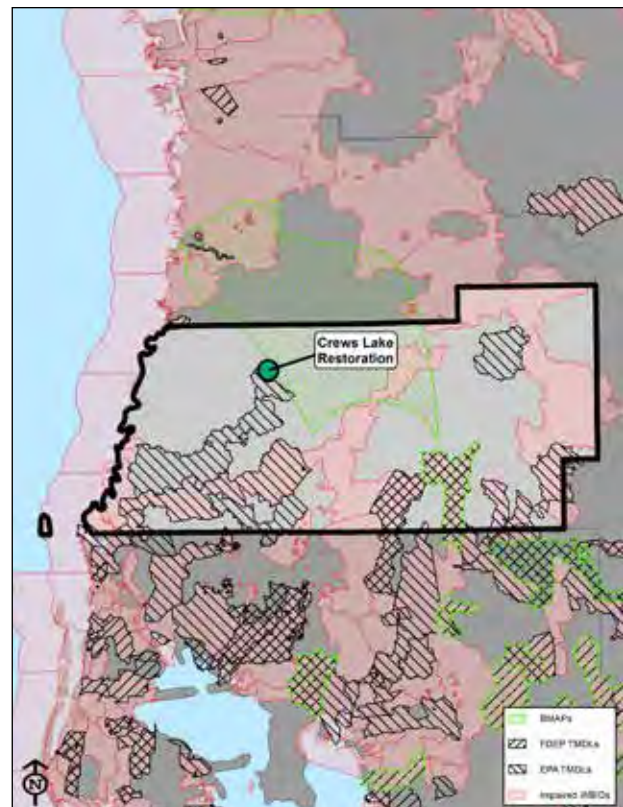
### NEED AND JUSTIFICATION

Areas of the Hammock Creek Watershed are frequently inundated with floodwaters during minor rain events due to growth of neighborhoods, loss of wetlands and in general high density populations in low lying areas. In order to improve the flooding issues new infrastructure is desperately needed to improve drainage. Improved drainage also means less exposure to run off and stormwater BMPs will improve water quality for the Gulf of Mexico as all flood waters eventually end up in that body of water.

### PURPOSE AND OBJECTIVES

The purpose of this project is to improve water quality and provide water quantity control in the Hammock Creek Watershed through the improvement of the stormwater infrastructure and installation of water quality BMPs. The objectives include preventing flooding caused by undersized conveyance systems, redirecting flows to an appropriate conveyance system, and treating the runoff with stormwater BMPs. The goal is to make this community more resilient to storm events and sea level rise.

### PROJECT COMPONENTS



**Figure 15-2A.** Project location in Pasco County.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The project will provide water quantity control and improved water quality in the Hammock Creek Watershed, which drains into a salt springs system contiguous to the Gulf of Mexico. Specific goals include:

- Ecological- Providing water quality benefits to downstream receiving waters, which will provide for ecological improvement.
- Aesthetic – Reducing flooding for residents and visitors and providing water quality benefits to receiving waters.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat
- Goal 2: Restore Water Quality and Quantity
- Goal 3: Replenish and Protect Living Coastal and Marine Resources

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats
- Objective 2: Restore, Improve, and Protect Water Resources
- Objective 3: Protect and Restore Living Coastal and Marine Resources

### Implementing Entities

Pasco County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the project.

### Best Available Science and Feasibility Assessment

Stormwater BMPs for roadways have been well studied and described in the following report (and references cited within):

- FDOT Drainage Handbook. Office of Design, Drainage Section, 2012.

This project requires a feasibility study with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

## Risks and Uncertainties

Improving roadway drainage and installing stormwater BMPs for roadways is feasible and these activities are frequently implemented. Preliminary design needs to be completed before risks are assessed.

## Success Criteria and Monitoring

Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in stormwater quality (nutrient, suspended sediments, metals, etc.) discharged to the Gulf of Mexico downstream of the Hammock Creek Watershed project.
- Decreased flooding of roadways and neighborhoods

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Pasco County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project - from preliminary design through construction is approximately 4 years. Implementation of this project has been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Preliminary Design												
Final Design/Permitting												
Construction												

## Budget and Funding Sources

This project is in the conceptual design stage, therefore only preliminary cost estimates have been completed. Pasco County provided a preliminary cost for the project, including planning, implementation, and monitoring in their SEP proposal. Pasco County is in discussions with SWFMWD for additional funding.

## SECTION V: Proposed Projects, Programs and Activities

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		
Implementation		
Monitoring		
	<b>Total Cost</b>	<b>\$4,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$2,000,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
	<b>Total Secured Funding</b>	
	<b>Budget Shortfall</b>	
POTENTIAL LEVERAGED FUNDING SOURCES		
SWFMWD		\$2,000,000
Other Grants or Co-Funding		\$150,000
Other County Funds (RESTORE Pre-Planning Funds)		\$150,000
	<b>Total Potential Leveraged Funding</b>	<b>\$2,300,000</b>
	<b>Potential Budget Shortfall</b>	<b>\$0</b>

### Partnerships/Collaboration

No partnerships or further collaboration for this project have occurred at this time.

## PASCO COUNTY

## Inshore Artificial Reef Development

PROJECT NO. 15-3

## Project Description

## OVERVIEW AND LOCATION

This project involves the creation of an inshore artificial reef and snorkeling trail near the mouth of the Pithlachascotee River in coastal Pasco County. The location of this project is shown on **Figure 15-3A**.

## NEED AND JUSTIFICATION

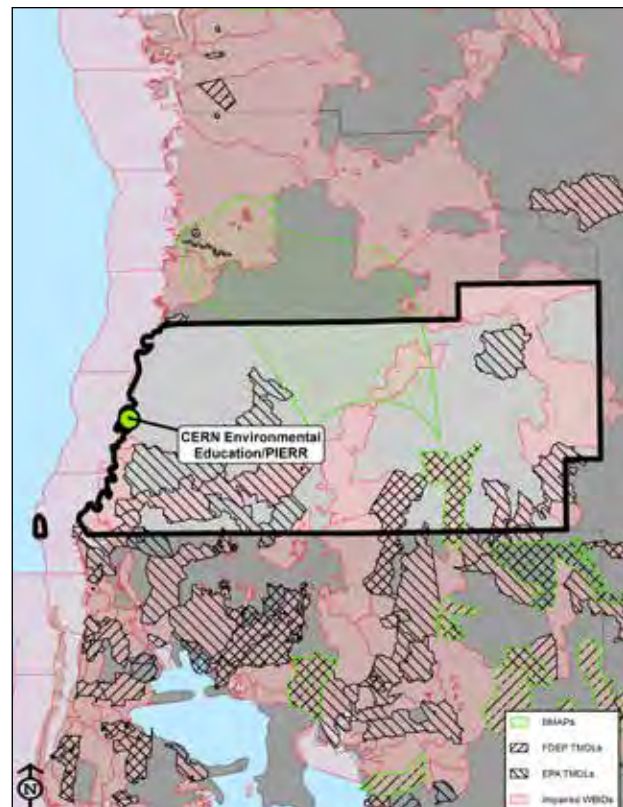
The Pithlachascotee River channel is one of only a few maintained dredged channels in Pasco County for access to the Gulf of Mexico, and the nearshore areas south of the channel are extremely popular with local boaters and fisherman. Durney Key is a spoil disposal island that is heavily used by boaters for picnicking and swimming. Public surveys have indicated a demand for additional recreational opportunities, as well as improved boating, safety in this area.

## PURPOSE AND OBJECTIVES

The purpose of this project is to create a nearshore artificial reef with the objectives of: 1) improving recreational fishing, swimming, and snorkeling opportunities; 2) enhancing nearshore hardbottom habitats. Associated with the creation of the nearshore artificial reef is the establishment of a boater exclusion and no wake zones to improve public safety and protect sensitive seagrass habitats.

## PROJECT COMPONENTS

This project involves the following components: 1) site assessments and bottom surveys to determine the best location and potential extent of the reef; 2) regulatory permitting of the reef; 3) preparation and staging of reef building materials and substrates; 4) reef installation; and 5) monitoring and assessment. It is anticipated that



**Figure 15-3A.** Project location in Pasco County.

## SECTION V: Proposed Projects, Programs and Activities

prefabricated hollow concrete reef balls will be utilized rather than construction debris to improve the aesthetics, public safety, and habitat complexity of the reef. Given the shallow depths in this area, the reef modules are anticipated to have a low vertical profile (< 3 feet).

Another component of this project would be the establishment of appropriate and enforceable boating restrictions, including exclusion and no wake zones, to improve public safety and protect seagrass. In addition, this project will also include installation of signage and educational kiosks to support the project objectives. The approximate location and extent of the anticipated artificial reef, snorkeling trail, and boater restriction zone is shown in **Figure 15-3B**.



**Figure 15-3B.** Approximate location and extent of the anticipated artificial reef, snorkeling trail, and boater restriction zone.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will enhance public recreational fishing, swimming, and snorkeling opportunities, create new inshore hard bottom habitats, and protect sensitive seagrass habitats from boat propeller damage. In addition, the project will promote local eco-tourism contribute to improved public environmental education.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast region (primary); and
- Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

### Implementing Entities

Pasco County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction and success monitoring of this project.



## Best Available Science and Feasibility Assessment

This project is somewhat of a hybrid between an offshore artificial reef and an inshore living shoreline. The objectives of the project are to create complex hard bottom habitat primarily to attract fish, but not necessarily to build natural oyster bars. Therefore, the project has more in common with offshore artificial reefs and the Best Available Science assessment should be similar to offshore artificial reef projects. Key literature citations applicable to this project include:

- Adams, C., et al., 2011. The economic benefits associated with Florida's artificial reefs. EDIS document FE649 (2011): 1-6.
- Bortone, S.A., Martin, T., Bundrick, C.M. 1994. Factors affecting fish assemblage development on a modular artificial reef in a northern Gulf of Mexico estuary. Bull. Mar. Sci. 55 (2-3), 319-332.
- Fikes, R., 2013. Artificial Reefs of the Gulf of Mexico: A Review of Gulf State Programs & Key Considerations. National Wildlife Federation.
- Lindberg, W.J., et al., 2014. Rationale and Evaluation of an Artificial Reef System Designed for Enhanced Growth and Survival of Juvenile Gag, *Mycteroperca microlepis*. Proc. 66th Gulf and Caribbean Fisheries Institute November 4 – 8. Corpus Christi, TX. Pages 320-325.
- Swett et al., 2011. Economic Impacts of Artificial Reefs for Six Southwest Florida Counties. Florida Sea Grant.

This project is considered to be feasible with respect to the ability to: 1) secure necessary property agreements and permits; 2) construct the proposed habitats; and 3) operate and maintain the improved recreational area and habitats over the long term.

## Risks and Uncertainties

In the evaluation of this project, no significant risks have been identified that would preclude implementation. There is some risk of damage to the artificial reef modules, and the potential for them to move, during tropical storm events; however, potential damage from storm surge and high waves will be factored into the siting and construction methods. There are also some uncertainties regarding the ability to obtain permits to place fill material in and around seagrass; however, the proposed boating restriction zone should adequately offset any resource impact concerns.

## Success Criteria and Monitoring

This project involves the placement of hard substrate to support recreational demand for offshore reef fishing and scuba diving opportunities, and enhance the abundance, distribution, and structural diversity of hardbottom habitat in the affected waters. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Increase in the coverage of new artificial reef habitat;
- Metrics on the recruitment of benthic encrusting organisms and fish; and
- Increase in recreational usage.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pasco County, is committed to conducting the monitoring necessary to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project is approximately four years. The expected start date is 2018, and the expected end date is 2021. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Site Assessments and Permitting												
Reef Module Preparation and Staging												
Reef Construction												
Success Monitoring												

## Budget and Funding Sources

Pasco County has developed a preliminary total cost estimate of \$600,000 for this project, based on experience with their offshore artificial reef program. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$50,000
Implementation		\$500,000
Monitoring		\$50,000
<b>Total Cost</b>		<b>\$600,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$500,000
Direct Component		\$100,000
Other Grants or Co-Funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$600,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		

## Partnerships/Collaboration

Pasco County will collaborate with the Florida Artificial Reef Program managed by the Florida Fish and Wildlife Conservation Commission. This collaboration includes representatives from nearly all coastal counties in Florida and assists with material collection resources, technical construction assistance, artificial reef construction best practices, and outreach.

## PASCO COUNTY

Coastal Environmental  
Research Network (CERN)

PROJECT NO. 15-4

## Project Description

## OVERVIEW AND LOCATION

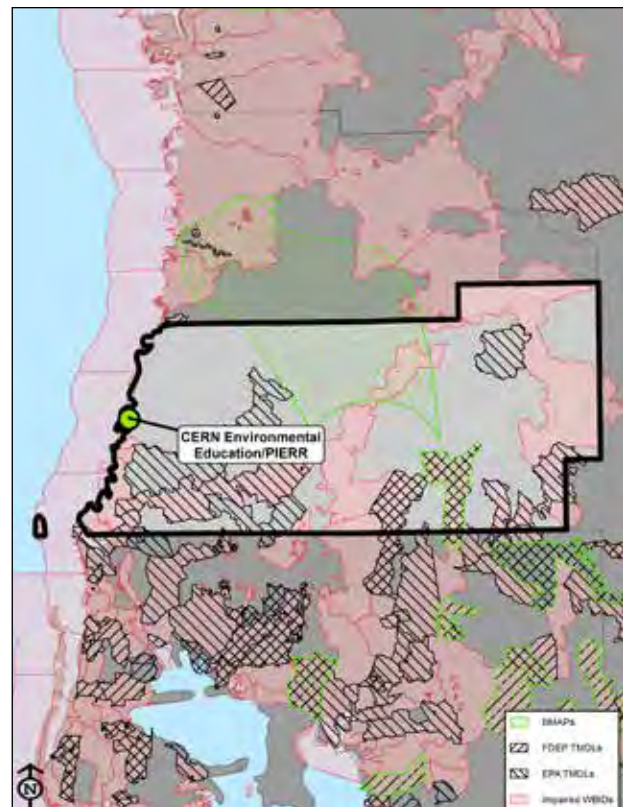
This project involves the establishment of an environmental education and research program within the Pasco County school board entitled the Pasco Institute for Environmental Research and Education (PIERR), as well as the construction of an environmental education academy and welcome center at Werner Boyce State Park. The location of Werner Boyce State Park is shown on **Figure 15-4A**.

## NEED AND JUSTIFICATION

The long-term sustainability of coastal natural resources along the Florida Gulf coast is dependent on a populace that is knowledgeable and respectful of the environment, which starts with public education. Environmental education at the local school board level if focused on standard curricula which lack a focus on the unique ecology of the Florida Gulf coast. Enhanced public education on Florida's coastal resources, and the challenges they face from pollution, development, overfishing, and sea level rise and climate change is needed through the State.

## PURPOSE AND OBJECTIVES

The purpose of this program is to establish an environmental education and research program within the Pasco County School Board, and to set an example for other local school boards to do the same to create a network of programs along the Florida Gulf coast. The objectives of the program include:



**Figure 15-4A.** Project location in Pasco County.

## SECTION V: Proposed Projects, Programs and Activities

1. enhance coastal environmental education at the grade 9-14 level;
2. partner with other coastal environmental research programs throughout Florida to establish a Coastal Environmental Research Network; and
3. ensure the long-term sustainability of coastal natural resources through enhanced public education.

### PROJECT COMPONENTS

This program involves both capital expenses for the purchase, improvement and development of environmental education facilities, as well as the professional services of the Pasco County school board staff and affiliated teaching professionals. Spill Impact Component funds would be used primarily for capital improvements, which include:

- Tier 1 -acquisition of a pontoon research vessel and boat lift;
- Tier 2 - renovation of the existing Pasco County Energy and Marine Center (EMC) teaching facility; and
- Tier 3 - construction of a new Environmental Academy and Welcome Center on Werner Boyce State Park.

A future phase of the program (Tier 4) would include the construction of Pasco Institute for Environmental Research and Education research facility at Werner Boyce State Park.

A key goal of the program is to engage high school and community college students in hands on environmental monitoring and habitat restoration activities in Werner Boyce State Park, and elsewhere along the Pasco County coastline. These activities will both enhance public education and awareness of coastal natural resources, as well as support ongoing monitoring and restoration activities being conducted by the Florida Department of Environmental Protection. The hands on experience gained by students is expected to lead to local job force creation in various environmental fields.

The long-term goal of the program is to establish an example for school boards in other Florida Gulf coast counties to follow, thus establishing a network of similar resources. Efforts are underway to establish affiliated programs in the Florida Keys and the Florida panhandle. Figure 15-4B shows the potential Coastal Environmental Research Network along the Florida Gulf coast.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This program will contribute to the promotion and enhancement of natural resource stewardship efforts that include formal and informal educational opportunities, professional development and training, communication, and other actions for all ages. The activities of engaged students will also contribute environmental data collection and hands on habitat restoration in Pasco County. Finally, this program is expected to contribute to local job force creation in a range of environmental professions.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast region (primary); and
- Activity 4: Workforce development and job creation.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 1: Restore and Conserve Habitat.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 6: Promote Natural Resource Stewardship and Environmental Education (primary);

## Implementing Entities

The Pasco County school board will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction and success monitoring of the program.

## Best Available Science and Feasibility Assessment

This is primarily an environmental education and facility improvement program; therefore, a Best Available Science analysis is not applicable. This program is considered to be feasible with respect to the ability to: 1) secure necessary property agreements and permits; 2) rehabilitate and construct the proposed facilities; and 3) operate and maintain the improved facilities over the long term.

## Risks and Uncertainties

There are no risks or uncertainties associated with the proposed facility improvements and enhanced public environmental education, as the program will be implemented by the Pasco County school board. However, there is some uncertainty with regard to the ability to expand the Coastal Environmental Research Network to other Florida Gulf coast counties, and to maintain and grow this network over time. No other Consortium member counties have proposed similar programs for inclusion in the SEP.

## Success Criteria and Monitoring

This project will improve public environmental education, engage students in local coastal monitoring and habitat restoration activities, and potentially create local jobs in various environmental fields. Therefore, a range of appropriate success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Number of students annually enrolled in the program;
- Acres of habitats restored; and
- Number of local environmental jobs created.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pasco County is committed to conducting the monitoring necessary to quantify project benefits.

## SECTION V: Proposed Projects, Programs and Activities

### Milestones and Schedule

The total estimated time horizon of this project is approximately four years. The expected start date is 2018, and the expected end date is 2021. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Purchase Pontoon Research Vessel												
EMC Renovations												
Construct Academy, Welcome Center & Research Facility												
Success Monitoring												

### Budget and Funding Sources

Pasco County has developed a preliminary total cost estimate of \$2.1 million for Tiers 1-3 of the program.

Professional services and costs associated with curricula development and teaching will be provided by the Pasco County school board as in-kind services. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$0
Implementation	\$2,000,000
Monitoring	\$100,000
<b>Total Cost</b>	<b>\$2,100,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$2,100,000
Direct Component	
Other Grants or Co-Funding	
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$2,100,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	

### Partnerships/Collaboration

The Pasco County school board proposes to partner and collaborate with a number of local and regional education institutions, including, but not limited to:

- Pasco Hernando State College;
- St. Leo University;
- St. Petersburg College;
- Tallahassee Community College-Wakulla Environmental Institute;
- Florida State University Marine Lab at Turkey Point;
- University of South Florida-Florida Institute of Oceanography; and
- University of West Florida.



## PASCO COUNTY

Artificial Reef Program –  
Hudson Reef

PROJECT NO. 15-5

## Project Description

## OVERVIEW AND LOCATION

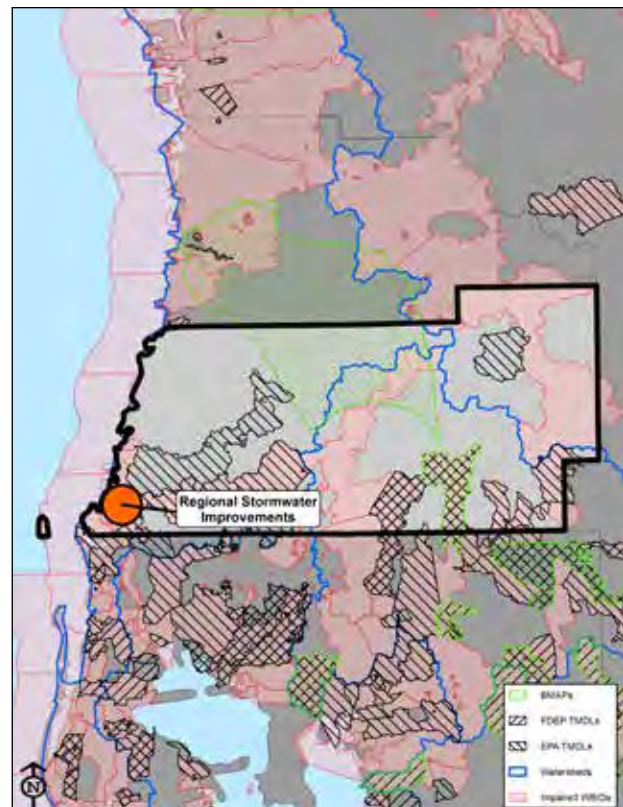
This project involves stockpiling clean concrete material and transporting it to existing permitted Pasco County artificial reef sites in coastal waters. The focus of this project is to re-permit and augment the Hudson Reef. The general location of the Pasco County artificial reefs is shown in **Figure 15-5A**.

## NEED AND JUSTIFICATION

Pasco County is in the nation's top 100 fastest growing counties and, to meet the recreational demand for offshore bottom fishing and scuba diving opportunities, has deployed four artificial reefs, beginning with its first in 1981. The County has a continuing need to augment existing permitted artificial reef sites, and to create new sites, to support the demand of recreational fishing and diving enthusiasts, both residents and tourists. In addition to enhancing recreational opportunities and associated economic benefits, artificial reefs can also provide ecological benefits. Hard substrate and vertical structure are limited habitats in the Gulf of Mexico (Fikes, 2013) and artificial reef habitats can provide: 1) hard substrate to support encrusting and colonial benthic organisms such as sponges and corals; 2) niche space for small marine invertebrates; and 3) shelter for larval and juvenile fishes. The project is justified by the demonstrated benefits of artificial reefs (Adams et al., 2011).

## PURPOSE AND OBJECTIVES

The purpose of this project is to augment existing permitted Pasco County artificial reef sites with clean concrete and other suitable construction materials, as well as sunken vessels and manufactured artificial reef balls. The objectives of the project are to: 1) support the increasing recreational demand for offshore reef fishing and scuba

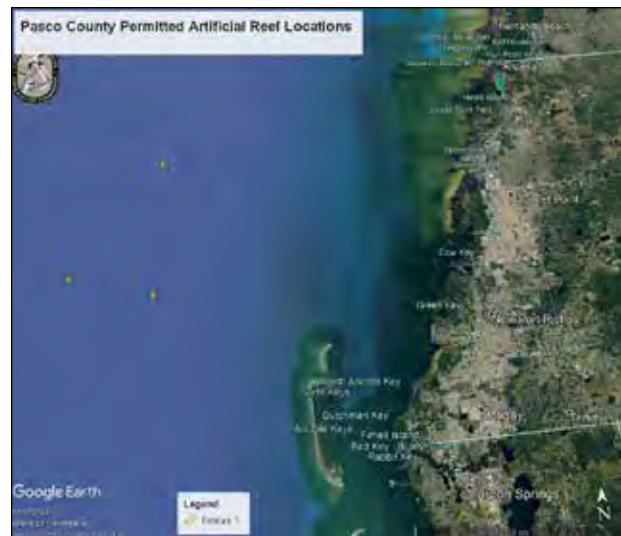


**Figure 15-5A.** Project location in Pasco County.

## SECTION V: Proposed Projects, Programs and Activities

diving opportunities; and 2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in the county's coastal waters. Objectives are consistent with those of the Florida Fish and Wildlife Conservation Commission's (FWC) artificial reef program, listed below.

1. Enhance private recreational and charter fishing and diving opportunities;
2. Provide a socio-economic benefit to local coastal communities;
3. Increase reef fish habitat;
4. Reduce user conflicts;
5. Facilitate reef related research; and
6. While accomplishing objectives 1-5, do no harm to fishery resources...or human health.



**Figure 15-5B.** Location of existing permitted artificial reef sites in Pasco County.

### PROJECT COMPONENTS

This project involves two primary components. The first component is to identify and acquire a sufficient amount of appropriate material, such as waste stream recovered second-use concrete, available vessels, or manufactured artificial reef modules, or combinations of these, and prepare (e.g., remove rebar) and stockpile this material at a County staging area. The second component is transport of the materials to currently permitted artificial reef locations off the coast of Pasco County via a barge, and to strategically deploy the materials to create high quality fish habitat. The reef locations will be published to the public and will remain available for public use for recreational fishing and diving. Post construction monitoring will also be conducted to ensure the deployment of this material produced high quality habitat that supports important reef fish species (e.g., grouper, snapper).

Pasco County currently manages three permitted artificial reef sites, shown in Figure 15-5B, and described below.

- Site 1 is approximately 11 nautical miles (nm) west of the Gulf Harbors Channel and contains steel barges, cylindrical containers, concrete culverts, and four sunken vessels;
- Site 2 is approximately 14 nm west of the Pithlachascotee River and contains steel barge, concrete culverts, and army tanks; and
- Site 4 (Site 3 has been discontinued) is approximately 10.5 nm west of Hudson Beach and contains concrete culverts and steel pipe.

Although material acquired through this project could be distributed to all three sites, the immediate priority is renewing the State and federal permits for Site 4 – Hudson Reef – and augmenting that site with new clean material. Additional planning assistance will be required for permitting, design, and implementation of the proposed project. This site was originally deployed in 1998, and material was placed there through 2008. A 2016 assessment of this site showed that greater than 95 percent of the materials placed there had 2 inches or more of encrusting growth in addition to large concentrations of game and bait fish.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will: 1) support the increasing recreational demand for offshore reef fishing and scuba diving opportunities by both residents and tourists; and 2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in Pasco County offshore waters.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing (primary); and
- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 5: Restore and Revitalize the Gulf Economy (primary);
- Goal 1: Restore & Conserve Habitat; and
- Goal 3: Replenish & Protect Living Coastal & Marine Resources.

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary);
- Objective 1: Restore, Enhance and Protect Habitats; and
- Objective 3: Protect and Restore Living Coastal and Marine Habitats.

## Implementing Entities

Pasco County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction and success monitoring of the program.

## Best Available Science and Feasibility Assessment

Artificial reefs in the Gulf of Mexico have been extensively studied with regard to the habitat and economic benefits they provide. The scientific literature on the ecological benefits is somewhat controversial (Lindberg et al., 2014, Fikes, 2013, Bortone et al. 1994, others). Some experts argue that artificial reefs are functionally comparable to natural reefs, and that they augment fish populations by providing habitat that is naturally limiting in the Gulf of Mexico. Others argue that artificial reefs simply attract and aggregate existing fish populations, but do not enhance overall fish stocks. While those conclusions may be debatable, the economic benefits of artificial reefs are not. Artificial reefs provide significant recreational opportunities and economic benefits along the Gulf coast of Florida (Adams et al. 2011). In addition, research has produced best practices guidance on site selection, design features, and construction methods; criteria that are now part of the FWC regulations for permitting. Key literature that forms the basis for the Pasco County Regional Artificial Reef Program are cited below:

## SECTION V: Proposed Projects, Programs and Activities

- Adams, C., et al., 2011. The economic benefits associated with Florida's artificial reefs. EDIS document FE649 (2011): 1-6.
- Bortone, S.A., Martin, T., Bundrick, C.M. 1994. Factors affecting fish assemblage development on a modular artificial reef in a northern Gulf of Mexico estuary. Bull. Mar. Sci. 55 (2-3), 319-332.
- Fikes, R., 2013. Artificial Reefs of the Gulf of Mexico: A Review of Gulf State Programs & Key Considerations. National Wildlife Federation.
- Lindberg, W.J., et al., 2014. Rationale and Evaluation of an Artificial Reef System Designed for Enhanced Growth and Survival of Juvenile Gag, *Mycteroperca microlepis*. Proc.66th Gulf and Caribbean Fisheries Institute November 4 – 8. Corpus Christi, TX. Pages 320-325.
- Swett et al., 2011. Economic Impacts of Artificial Reefs for Six Southwest Florida Counties. Florida Sea Grant.

This project is feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; 3) effectively operate and maintain the project components over the long term. The permitting of Pasco County offshore artificial reef sites has been facilitated through Nationwide U.S. Army Corps of Engineers (USACE) permits and through FWC for site specific state criteria. Furthermore, this project is consistent with the National Artificial Reef Plan published in 1985, and the Florida Artificial Reef Strategic Plan (FWC, 2003).

### Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this project that would preclude project implementation. Pasco County will ensure design to limit damage from tropical storms. Controls for lionfish and other nuisance/exotic species may be required. Regulatory constraints will address issues such as spatial boundaries for navigation, channels, marine habitat resources, historic areas, sand borrow areas, existing structures and leases, etc. Success monitoring is critical in a fisheries management context given these reefs have not previously been used as fisheries management tools.

### Success Criteria and Monitoring

This and all artificial reef projects involve the placement of hard substrate to: support recreational demand for offshore reef fishing and scuba diving opportunities; and enhance the abundance, distribution, and structural diversity of hardbottom habitat in the affected waters. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Increase in the coverage of new artificial reef habitat;
- Metrics on the recruitment of benthic encrusting organisms and fish; and
- Increase in recreational usage.

The proposed project will be constructed consistent with the Gulf States Marine Fisheries Commissions Guidelines for Artificial Reef Materials (2004). In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pasco County is committed to conducting the monitoring necessary to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project is approximately 4 years. The expected start date is 2018, and the expected end date is 2021. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Hudson Reef Permit Renewal												
Collect, Prepare and Stage Reef Materials												
Transport Material to Permitted Reef Sites												
Success Monitoring												

## Budget and Funding Sources

Pasco County has estimated the total cost of this project to be approximately \$620,000. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$20,000
Implementation		\$120,000
Monitoring		\$10,000
<b>Total Cost</b>		<b>\$150,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$100,000
Direct Component		\$50,000
Other Grants or Co-Funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$150,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FWC Artificial Reef Construction Grants		

## Partnerships/Collaboration

The Pasco County Artificial Reef Program routinely collaborates with the Florida Artificial Reef Program managed by the FWC. This collaboration includes representatives from nearly all coastal counties in Florida and assists with material collection resources, technical construction assistance, artificial reef construction best practices, and outreach.



## PASCO COUNTY

# Madison Street and Gulf Drive Stormwater Retrofit Project

PROJECT NO. 15-6

## Project Description

### OVERVIEW AND LOCATION

This project involves improving stormwater conveyance and adding water quality BMPs in the Madison Street and Gulf Drive area of New Port Richey in Pasco County, FL. The general location of the project is on the west-central coast of the county as shown in **Figure 15-6A**.

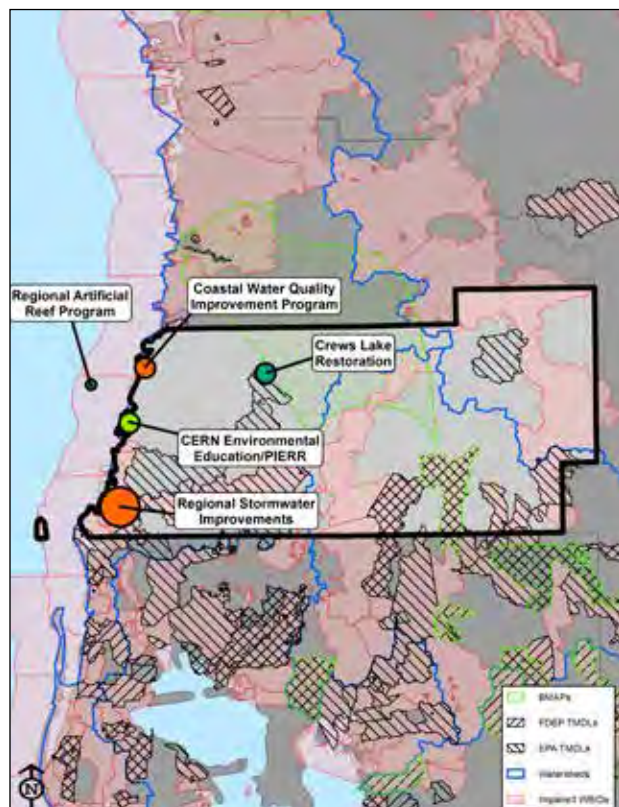
### NEED AND JUSTIFICATION

The roadways in this project area experience repetitive flooding in even minor rain events, impacting traffic flow. These streets are also along an evacuation route from the coast and therefore evacuation efforts are also negatively impacted when needed most. Additionally, stormwater currently flows, untreated to the Pithlachascotee River.

This project will alleviate the flooding by increasing stormwater pipe sizes and provide for enhanced water quality through installation of specific BMPs for proper treatment of stormwater (see **Figure 15-6B**).

### PURPOSE AND OBJECTIVES

The purpose of this project is to alleviate Coastal flooding and improve water quality in the impaired receiving waters. The project will restore and protect natural resources by removing pollutants, nutrients and sediments from stormwater prior to discharge into the Pithlachascotee River. It will also mitigate damage to fish, wildlife and natural resources by reducing stormwater impacts to the river. It will improve water quality prior to discharge into the Pithlachascotee River, which is part of an Outstanding Florida Water (OWF) body and provides improvements to an impacted coastal state park. Finally, workforce development and job creation will occur due to the ongoing need to have regular maintenance and vacuuming out the BMPs; in addition to the short term engineering design and



**Figure 15-6A.** Project location in Pasco County.



construction work that is generated.

### PROJECT COMPONENTS

This project consists of two phases. In phase I, 8 stormwater drain inlets will be replaced/upgraded, 18-inch diameter storm sewer will be installed within the basin to bring runoff to the replaced/upgraded 54-inch diameter main storm sewer pipe that leads to the Pithlachascotee River. Additionally, two 36-inch diameter outfalls will be replaced at the upstream end of the basin to alleviate flooding in this area.

In phase II, 16 stormwater drain inlets will be replaced/upgraded, 18-inch diameter storm sewer will be installed within the basin, which will connect to a new 36-inch and 42-inch diameter storm main that will then connect into the Phase I storm sewer and out to the Pithlachascotee River.

In addition to the above storm sewer upgrades, specific BMPs will be installed within the basin to treat the stormwater prior to discharge to the Pithlachascotee River (see **Figure 15-6 C**).

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

The project will provide improved flood control and improved water quality to Basin #126, which drains to the Pithlachascotee River, and ultimately reaches the Gulf of Mexico. Specific goals include:

- Ecological- Providing water quality benefits to downstream receiving waters, which will provide for ecological improvement.
- Aesthetic – Reducing flooding for residents and visitors and providing water quality benefits to receiving waters.
- Safety – Reducing flooding along evacuation routes allows for safe access away from the coast in the event of larger storms.

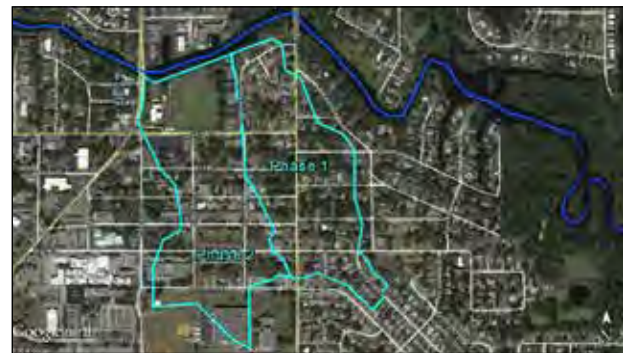
## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 7: Coastal flood protection and related infrastructure.



**Figure 15-6B.** Project Location indicating Phases 1 and 2. The Pithlachascotee River is indicated in blue.



**Figure 15-6C.**

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat; and
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

### Implementing Entities

The City of New Port Richey will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the project.

### Best Available Science and Feasibility Assessment

Roadway BMPs have been well studied and described in the following report (and references cited within)

- FDOT Drainage Handbook. Office of Design, Drainage Section, 2012.
- Conceptual design has been completed for this project. Based on initial reviews this project is determined to be feasible and permittable.

### Risks and Uncertainties

Retrofitting of urban roadways for water quantity and quality improvements is feasible and these activities are frequently implemented. Preliminary design needs to be completed before risks are assessed.

### Success Criteria and Monitoring

Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Decreased flooding of roadways
- Changes in stormwater loads of pollutants (nutrients, suspended sediments, metals, etc.) discharged to the Pithlachascotee River.

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. The City of New Port Richey is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project - from preliminary design through construction is approximately four years. Implementation of this project has been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Preliminary Design												
Final Design/Permitting (Phases 1 & 2)												
Construction (Phases 1 & 2)												

## Budget and Funding Sources

This project is in the conceptual design stage, therefore only preliminary cost estimates have been completed. The City of New Port Richey provided a preliminary cost for the project, including planning, implementation, and monitoring in their SEP proposal. New Port Richey is also in discussions with Pasco County and SWFMWD for additional funding.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		
Implementation		
Monitoring		
<b>Total Cost</b>		<b>\$1,281,900</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,025,400
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$1,025,400</b>
<b>Budget Shortfall</b>		<b>\$256,500</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
City of New Port Richey		\$256,500
Pennies for Pasco		\$0
SWFMWD CFI		
<b>Total Secured Funding</b>		<b>\$1,281,900</b>
<b>Budget Shortfall</b>		<b>\$0</b>

## Partnerships/Collaboration

SWFMWD has been identified as a potential partnership. No others or further collaboration for this project have been identified at this time.

## PASCO COUNTY

# Crews Lake Natural System Restoration Project

PROJECT NO. 15-7

## Project Description

### OVERVIEW AND LOCATION

This project involves the restoration of the ecological, hydrologic and water quality functions Crews Lake. The general location of the project is shown in **Figure 15-7A**.

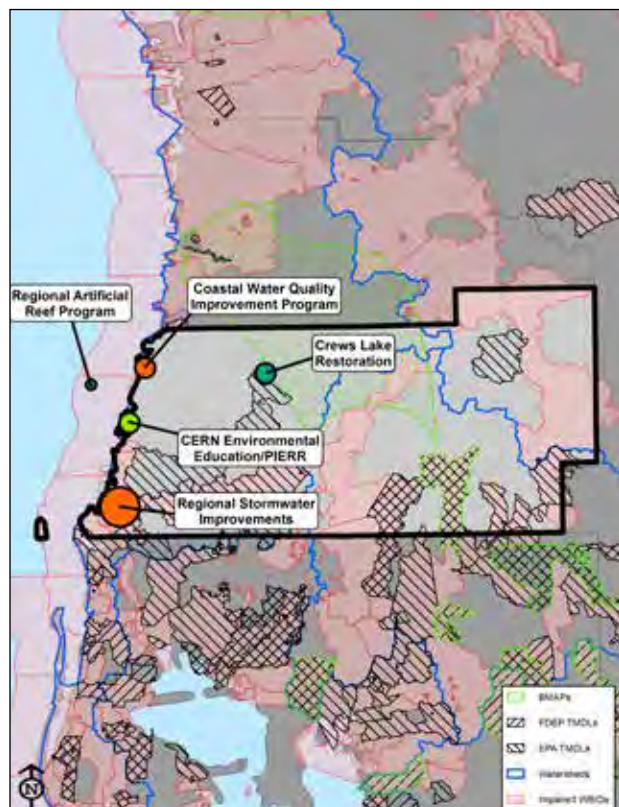
### NEED AND JUSTIFICATION

The Pasco County Utilities Services Branch (PCUSB) is investigating approaches to improve its ability to manage the Pasco County Master Reuse System (PCMRS) during wet-weather periods, including the feasibility of using reclaimed water to enhance Crews Lake and adjacent wetlands. Hydrologic conditions within the lake's watershed have been impacted by multiple factors in the past, including stormwater management/ drainage systems, wellfield drawdown, and watershed segmentation and surface water diversions, resulting in excessively low lake water levels. Use of reclaimed water from the PCMRS would help restore lake hydroperiod and biological communities impacted due to lake drawdown. This project proposes to use the hydrologically-altered wetlands in the North Basin of Crews Lake to receive PCMRS reclaimed water as allowed under the Wetlands Application Rule (Rule), Chapter 62-611, Florida Admin.Code (F.A.C.) before discharge to the South Basin of Crews Lake.

### PURPOSE AND OBJECTIVES

The purpose of this project is to restore Crews Lake hydrology and the adjacent hydrologically altered wetlands, and provide needed water reuse management options for PCUSB. Specific goals include:

- Restore native wetlands, including shallow wetlands and deep open water areas
- Establish appropriate native plants that will provide wetland habitat and slope stabilization



**Figure 15-7A.** Project location in Pasco County.

- Restoration of natural hydroperiod
- Water quality polishing of stormwater via the restored and maintained wetlands

### PROJECT COMPONENTS

The wetland restoration area layout consists of an application area constructed using existing onsite berms and adding two constructed berms (see **Figure 15-7B**). The application area will be created by constructing a raised berm that starts from the existing western berm and extends around the western perimeter of the site, enclosing a total of 135 acres. An additional small berm will be constructed within the application area to prevent short-circuiting from the inlet of the wetland system directly to the south. Within the application area, a 4-acre mitigation wetland and marsh will be created to account for the wetland impacts related to the construction of the two additional berms. The receiving wetland downstream of the application area utilizes existing berms and the natural Crews Lake bed perimeter. This area encloses a total of 90 acres and extends southwest from the existing southwestern berm to the Pasco County property line. The total footprint of the wetland restoration area is approximately 225 acres.



**Figure 15-7B. Crews Lake Project Area and Features.**

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

The project will provide restored hydrology of the Crews Lake system, restoration of biological communities, and improve the quality of water that enters the Pithlachascotee River and ultimately flows to the Gulf of Mexico. Through distribution of 4 MGD of reuse water, the project will rehydrate hydrologically altered wetlands, which are estimated to remove nitrogen to background levels <1 mg/l. A series of ecological benefits have been determined for the project, including delivering up to 4 million gallons of water daily; directly rehydrating at least 200 acres of wetlands; rehydrating an additional 150-200 acres; creating diverse wildlife habitat; improving water quality naturally and passively; and managing invasive species passively. Specific goals include:

- Ecological- Enhancing biological communities by restoring the lake hydroperiod and planting native vegetation.
- Aesthetic – Restoring the natural wetlands will improve the aesthetics of the area by creating a more diverse natural area.
- Socio-Economic - A healthy Crews Lake will garner more patronage and increase Parks revenue. Patrons of the park will once again fish, canoe, and kayak the lake.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.



### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity
- Goal 3: Replenish and Protect Living Coastal and Marine Resources
- Goal 1: Restore and Conserve Habitat

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources
- Objective 3: Protect and Restore Living Coastal and Marine Resources
- Objective 1: Restore, Enhance, and Protect Habitats

### Implementing Entities

Pasco County (specifically the Pasco County Utilities Services Branch) will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the Project.

### Best Available Science and Feasibility Assessment

A feasibility study has been conducted for this project, including predictions of environmental and water quality benefits, as summarized in this presentation:

Vázquez-Burney, et al. , 2012. Analysis of Land Use, Hydrology, and Water Quality of Beneficial Reuse for Natural Systems Restoration. Poster Presentation to the 9<sup>th</sup> INTECOL International Wetlands Conference, June 3 – 8<sup>th</sup>, 2012. Orlando Florida. This project is consistent with the goals and objectives of the following natural resource management plan:

- Southwest Florida Management District (SWFWMD), 2001. Springs Coast Comprehensive Watershed Management Plan.

This project is in the 30% design stage and is being independently reviewed for feasibility, permissibility, and cost estimates. Based on initial reviews this project is determined to be feasible and permissible.

### Risks and Uncertainties

Restoration of wetland facilities is feasible and these activities are frequently implemented. Risks related to an adjacent sinkhole are present, though geotechnical investigations and subsequent solutions are being incorporated into the design to mitigate those risks.

### Success Criteria and Monitoring

Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Wetland restoration (acres restored)
- Changes in water levels and flows in Crews Lake; and
- Changes in concentrations of stormwater associated pollutants (nutrients, suspended sediments, metals, etc.) in Crews Lake.



In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Pasco County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of these projects - from design through construction is approximately 5 years. Feasibility and preliminary design were started in 2016 and are undergoing peer review at this time. Final Design and permitting is expected to begin in 2018 (SEP approval year) and the expected end date is 2021. Implementation of this project has been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Final Design/Permitting												
Construction												

## Budget and Funding Sources

This project is in the 30% design stage, therefore preliminary cost estimates have been completed. Pasco County provided a preliminary cost for the project, including planning, implementation, and monitoring in their SEP proposal. Pasco County is also in discussions with FDEP and SWFMWD for additional funding.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	
Implementation	
Monitoring	
<b>Total Cost</b>	<b>\$7,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$1,400,000
Direct Component	
Other Grants or Co-Funding	
Other County Funds	
<b>Total Secured Funding</b>	<b>\$1,400,000</b>
<b>Budget Shortfall</b>	<b>\$5,600,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
FDEP	\$4,200,000
SWFMWD	\$1,400,000
Other County Funds	\$731,770
<b>Total Potential Leveraged Funding</b>	<b>\$6,331,770</b>

## Partnerships/Collaboration

SWFMWD and Pasco County have been partnering on this project for some time. No partnerships or further collaboration have occurred at this time.

## PINELLAS COUNTY

# Lake Seminole Sediment Removal Project

PROJECT NO. 16-1

## Project Description

### OVERVIEW AND LOCATION

The Lake Seminole Sediment Removal project involves the dredging of nutrient-enriched organic sediments from an impounded coastal lake to: 1) improve water quality and ecological conditions in the lake; and 2) reduce downstream nutrient loads to Boca Ciega Bay, a segment of the Tampa Bay estuarine system. Lake Seminole is located in west central Pinellas County, Florida (see **Figure 16-1A**).

### NEED AND JUSTIFICATION

Lake Seminole was created in the mid-1940s by the impoundment of the upper, brackish water, portion of Long Bayou, an historic segment of Boca Ciega Bay. The lake was originally created in part to provide irrigation water for adjacent citrus groves, but over time, the citrus groves were replaced by dense urban residential and commercial land uses. In 1967, Lake Seminole County Park was developed on the east side of the lake to provide public recreational access. Since that time the ecological conditions have steadily declined as a result of untreated agricultural and urban stormwater runoff, increased hydrologic residence time, and accumulation of organic sediments. Beginning in the early 1990's water quality degraded significantly, primarily due to frequent and severe blue-green algae blooms. In addition, sport fish stocks declined and nuisance aquatic vegetation proliferated.

In partnership with State and regional agencies, Pinellas County developed and adopted the Lake Seminole Watershed Management Plan (LSWMP) in 2004. The LSWMP recommended six structural projects to restore lake water quality, habitats, and fish wildlife populations. Most of these projects involved retrofitting advanced stormwater treatment systems into older urban development, as well as the eradication of exotic aquatic vegetation followed



**Figure 16-1A.** Project location in Pinellas County.

by the replanting of desirable native species. After combined public expenditures of over \$10 million, all but one of the structural projects recommended in the LSWMP have been completed, and ecological conditions have improved. However, high nutrient concentrations problems still persist and are attributable to the reservoir of nutrient enriched sediments that have accumulated on the lake bottom.

Sediment resuspension and nutrient recycling continue to fuel algae blooms in the lake, and because blue-green algae can pull nitrogen from the atmosphere, nitrogen loads contained in Lake Seminole waters discharged to Boca Ciega Bay are significantly increased by degraded lake water quality. The dredging of organic sediments from Lake Seminole was top ranked project recommended in the LSWMP to address water quality; however, it is the last project to be implemented due to its cost and complexity. The availability of RESTORE Act monies, and other leveraged funds, now make this project possible.

### PURPOSE AND OBJECTIVES

The purpose of this project is to remove approximately 1,000,000 cubic yards of organic and nutrient enriched sediments from the bottom of Lake Seminole. The objectives of the project are to: 1) reduce nutrient concentrations and improve water quality in Lake Seminole; 2) reduce nutrient loads discharged from Lake Seminole to Long Bayou and Boca Ciega Bay, a segment of the Tampa Bay estuarine system; and 3) increase seagrass coverage in Long Bayou and Boca Ciega Bay by improving estuarine water clarity.

### PROJECT COMPONENTS

Lake sediment removal will be accomplished using a hydraulic dredge, with the dredged spoil material being pumped to a county-owned upland 10-acre Dredged Material Management Area along the east side of the lake (see **Figure 16-1B**). Dredging will be conducted in stages over approximately 5 years to allow for managed on-site spoil dewatering and stockpiling. The dewatered spoil will be retained on-site and graded to create athletic fields in future.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will improve water quality conditions in both Lake Seminole - an economically-important coastal lake - and in Boca Ciega Bay, a segment of the Tampa Bay estuarine system. Based on sediment and dredge feasibility studies, the project will remove approximately 416 tons of nitrogen and 77 tons of phosphorus from Lake Seminole, and will reduce current nitrogen loadings from Lake Seminole to Boca Ciega Bay by approximately 56 percent. Boca Ciega Bay is nitrogen limited, therefore, nitrogen load reductions are predicted to improve water clarity and increase seagrass acreage in the Bay.



**Figure 16-1B.** Location of Lake Seminole dredge areas, lake impoundment and outfall, and the DMMA.

## SECTION V: Proposed Projects, Programs and Activities

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat;
- Goal 2: Restore Water Quality and Quantity; and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 2: Restore, Improve, and Protect Water Resources; and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

### Implementing Entities

Pinellas County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of this project. Pinellas County has coordinated extensively with the Southwest Florida Water Management District in the planning, feasibility analysis, design, and permitting of the project.

### Feasibility Assessment and Best Available Science

This project has been well-studied, including a watershed management plan, a sediment removal feasibility study, conceptual design and permitting, preparation of bid documents, and the review of multiple bids. The County has received State and federal permits as well as an approved bid for project construction. The basis for design and the assessment of sediment nutrient concentrations have been described in the following report:

- PBS&J, 2006. *Lake Seminole Sediment Removal Feasibility Study*. Final Report submitted to Pinellas County.

In the approved bid for project construction, the contractor proposed modifications for handling of spoil material, and negotiated these modifications with the County. Accordingly, the State and federal permits need to be amended to reflect the modified approach.

### Risks and Uncertainties

In the evaluation of this project, no significant risks or uncertainties have been identified that would preclude implementation. This project is ready to begin permit modification and construction.

## Success Criteria and Monitoring

This project will affect water quality in a coastal lake, and water quality and submerged aquatic vegetation in an adjacent estuarine system. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in water clarity and nutrient concentrations in Lake Seminole;
- Changes in nitrogen loads delivered from Lake Seminole to Long Bayou;
- Changes in water clarity in Long Bayou and nearby Boca Ciega Bay; and
- Changes in seagrass coverage in Long Bayou and nearby Boca Ciega Bay.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pinellas County implements a ambient water quality monitoring program in County surface waters, and is committed to conducting the monitoring necessary to quantify project benefits.

## Project Milestones and Schedule

The total estimated time horizon of this project - from permit modification through success monitoring - is approximately 6 years. The expected start date is 2018, and the expected end date is 2023. Implementation of this project has been broken down into three phases, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Modification of permits												
Construction dredging												
Success monitoring												

### Budget/Funding and Leveraged Resources

The estimated project cost of \$18,663,000 has been determined through an open bid process, and includes both planning and implementation activities. Planning activities total \$670,000 and involve: 1) design of the Dredged Material Management Area (DMMA); and 2) modification of State and federal permits. Construction costs are estimated at \$18,013,000, including contingencies. Pinellas County will also commit an additional \$200,000 for project-specific success monitoring. Therefore, the total project cost is estimated to be \$18,863,000.

Pinellas County has committed to allocating \$2,863,000 of its share of Florida's Spill Impact Component allocation to this project. The remaining \$16,000,000 in project costs will be funded by Pinellas County, and cooperatively funded by the Southwest Florida Water Management District (SWFWMD). A summary of the funding sources for this project is provided in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$670,000
Implementation		\$17,730,000
Monitoring		\$200,000
<b>Total Cost</b>		<b>\$18,600,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$2,600,000
Direct Component		\$0
SWFWMD Cooperative Funding		\$8,000,000
Other County Funds		\$8,000,000
<b>Total Secured Funding</b>		<b>\$18,600,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		

### Partnerships/Collaboration

Pinellas County has partnered with the Southwest Florida Water Management District in the development of the LSWMP, as well as the implementation of projects specified in that document. The SWFWMD has committed to co-funding the implementation of this project.



## PINELLAS COUNTY

## Wastewater Collection System Improvement

PROJECT NO. 16-2

## Project Description

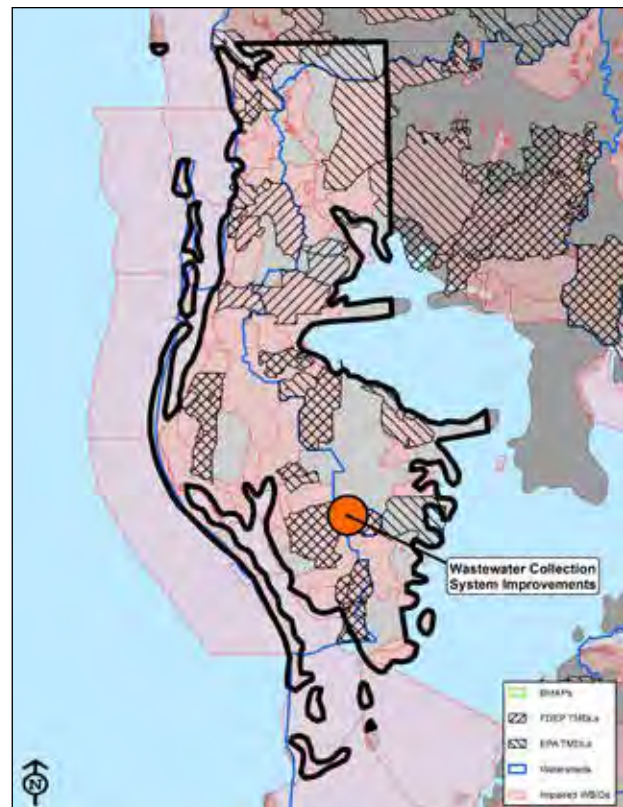
## OVERVIEW AND LOCATION

The Pinellas County Wastewater Collection System Improvement program involves assessing existing condition of the wastewater collection systems and evaluating the rain derived inflow and infiltration (I&I) in resident-owned mobile home parks (MHPs) around Lake Seminole and the Lealman unincorporated areas. From I&I evaluation study, design and construction solutions will be determined to cost-effectively reduce the rain derived I&I and Sanitary Sewer Overflows (SSOs), and thus, lessen impacts to local water bodies. The general locations of the program components are shown in **Figure 16-2A**.

## NEED AND JUSTIFICATION

Most Pinellas County waters do not meet Florida Department of Environmental Protection (FDEP) and Environmental Protection Association (EPA) water quality standards for pollutants related to sanitary sewer impacts. FDEP has approved Reasonable Assurance Plans (RAP) to attain compliance with nutrient water quality standards in Lake Seminole and the Tampa Bay Estuary. These plans set for the actions for reducing loading and restoring nutrient attainment in the waterbodies.

In some areas of the County such as near Lake Seminole and Lealman areas, residents and businesses are connected to County's sanitary sewer system via aging and poor condition sanitary sewers and old lateral pipes made of inadequate materials, which results in significant I&I. This I&I can cause SSOs and peak wastewater flows that exceed treatment capacity or undue stress on the treatment process. Sanitary sewer improvements can be cost prohibitive for property owners and covering these costs provides an overall net improvement to public health,



**Figure 16-2A.** Project location in Pinellas County.

## SECTION V: Proposed Projects, Programs and Activities

the environment, and property values. This project will improve water quality by reducing I/I, which is a source of SSOs and increased flows to South Cross Bayou Wastewater Reclamation Facility (WRF), and the removal of these pollution sources impacting Tampa Bay.

### PURPOSE AND OBJECTIVES

The purpose of this project is to reduce SSOs which is a contributing source of pollution and excess flows to South Cross Bayou WRF that would have to be treated and discharged. The objectives of this project are to eliminate/reduce SSOs in the streets/water bodies by reducing the rain derived I&I entering the wastewater system from private sewer systems to improve water quality in nearby waterbodies, Lake Seminole and Sawgrass Lake, and to reduce nutrient and bacterial loads discharged downstream to Long Bayou, Boca Ciega Bay, and Tampa Bay.

### PROJECT COMPONENTS

The project consists of the following components:

1. Evaluation of existing conditions and development of cost-effective engineering solutions to reduce rain derived I&I in the project area.
2. Design/Permit/Construction those recommended solution(s) that come out of the feasibility study (#1 above)
3. Develop a water monitoring program to retrieve and analyze water quality data to demonstrate the expected improvements to water quality.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will improve water quality conditions in Lake Seminole and Sawgrass Lake, as well as downstream waters in the Tampa Bay Estuary system, which support numerous fisheries and have high recreational value. Eliminating SSOs will decrease nutrient and bacterial loads, and will protect ecological resources in Tampa Bay and the Gulf of Mexico such as shellfish and seagrass. Implementation of the proposed project will also improve recreational conditions in County lakes, streams, bays, and coastal waters. Additionally, public health risks from contact with untreated or partially treated sewage that may result from SSOs will also be reduced. Economic impacts are also expected through increased property values.

These wastewater system improvements will help the County to grow, improve its economy, and grow the tax base. This will also help development of new businesses and employment opportunities.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources (primary);
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

The County will be the sole implementing entity and grant sub-recipient responsible for the feasibility studies, design, permitting, construction, operation and maintenance, and monitoring of this project.

## Best Available Science and Feasibility Assessment

This project is consistent with the following natural resource management plans:

- PBS&J, 2001. The Lake Seminole Watershed Management Plan. Prepared for the Pinellas County Public Works Department.
- PBS&J, 2007. The Lake Seminole Watershed Reasonable Assurance Plan. Prepared for Pinellas County.
- Tampa Bay Estuary Program, 2006. Charting the Course: The Comprehensive Conservation and Management Plan (CCMP) for Tampa Bay.

The County has not completed a project-specific feasibility study for this project and very little engineering details are known. This type of project can be engineered for the types of conditions present in this locale. Once engineering has commenced the requirements to attain feasibility (i.e. permissibility, constructability, etc.) will become apparent. At that time the County can determine how to proceed.

## Risks and Uncertainties

This project is in the conceptual phase; there have been no study or design work completed on this project. The risks will be identified during the feasibility and design phases.

## Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for

- Changes in ambient water quality (nutrient and bacterial concentrations) in Lake Seminole and Sawgrass Lake; and
- Changes in the frequency and/or duration of algal blooms (as measured by chlorophyll-a) in the Sawgrass Lake.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pinellas County currently implements a water quality monitoring program and is committed to implementing the necessary monitoring and coordinating with other regional water quality monitoring entities to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project - from feasibility study through construction and subsequent success monitoring - is approximately seven years. The expected start date is 2018, and the expected end date is 2025. Implementation of this project has been broken down into several phases, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Success/Monitoring												
Feasibility/Preliminary Design												
Design/Permit												
Construction												

### Budget and Funding Sources

The preliminary budget is indicated in the table below. The total project cost is estimated to be \$18M.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$125,000
Implementation	\$17,750,000
Monitoring	\$125,000
<b>Total Cost</b>	<b>\$18,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$5,680,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	
<b>Total Secured Funding</b>	<b>\$5,680,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	

### Partnerships/Collaboration

This project will require collaboration between Pinellas County Public Works and Utilities Departments and the Florida Department of Health. It is anticipated that there will be opportunities to partner with many of the twenty-four municipalities in the County either by expanding the program beyond the unincorporated boundaries or by sharing the program structure and materials for municipal implementation.

## PINELLAS COUNTY

## Land Acquisition for Floodplain Restoration and Resiliency

PROJECT NO. 16-3

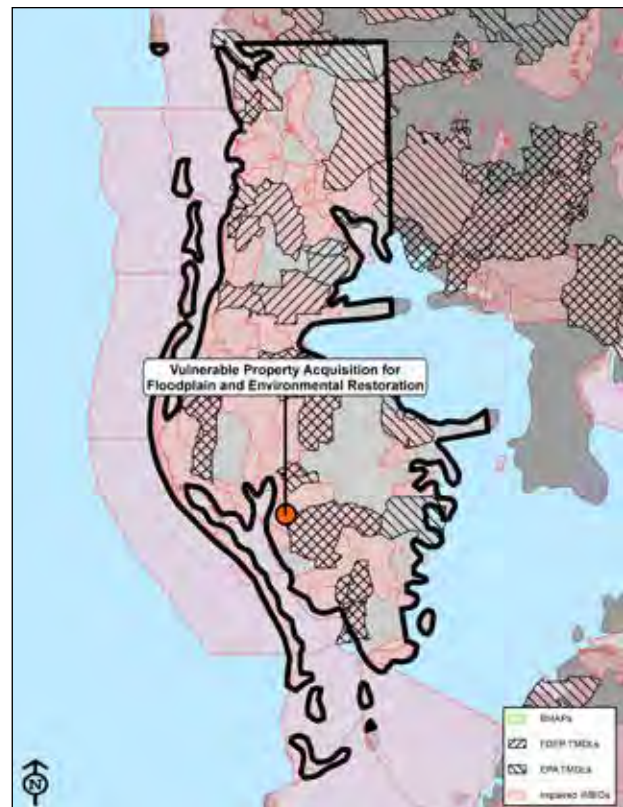
## Project Description

## OVERVIEW AND LOCATION

This program involves the prioritization and county acquisition of repetitive loss properties in the coastal flood zone. Targeted properties include those that also have failing wastewater and/or drainage infrastructure, and thus are sources of coastal pollution. Acquired properties will be razed and restored in the future to provide natural habitats and floodplain storage. Properties acquired under this program will be permanently designated as publicly-owned conservation areas. Targeted properties have been identified in the Brooker Creek, Cross Bayou, Smith Bayou, Stevenson's Creek, and Curlew Creek watershed, which are shown in **Figure 16-3A**.

## NEED AND JUSTIFICATION

Pinellas County is the most densely populated county in Florida, and much of the early Post-World War II development occurred in low-lying coastal areas with inadequate wastewater and drainage infrastructure. The County has identified approximately 35 Severe Repetitive Loss (SRL) residential and commercial properties in low-lying coastal areas. These properties not only experience frequent nuisance flooding, but also generate pollutants from failing wastewater (e.g., septic tanks) and inadequate stormwater treatment infrastructure. The costs associated with remediating flood damage and maintaining the development on these SRL properties are not sustainable over the long-term. In addition, the Brooker Creek, Cross Bayou, Smith Bayou, Stevenson's Creek, and Curlew Creek watersheds all have documented water quality impairments.



**Figure 16-3A.** Project location in Pinellas County.



### PURPOSE AND OBJECTIVES

The purpose of this program is to publicly acquire priority SRL residential and commercial properties in low-lying coastal areas, raze the existing development, and restore the properties back to natural systems that provide both habitat and floodplain storage functions. The objectives of the program are to: 1) improve coastal resiliency by eliminating unsustainable residential and commercial SRL properties; 2) remove existing failing infrastructure and eliminate on-site pollutant sources; 3) improve ambient water quality; 4) restore native fish and wildlife habitats; and 5) provide for increased coastal floodplain storage.

### PROJECT COMPONENTS

This program involves three components: 1) property acquisition; 2) the removal of existing development and failing infrastructure; and 3) restoration of natural systems and coastal floodplain storage. Spill Impact Component funds will be used only to acquire priority properties and to remove existing pollutant sources. Other County funds will be used for future restoration of natural systems. Acquired properties will be maintained in County ownership in perpetuity for conservation and floodplain storage functions. **Figure 16-2B** shows one of the priority properties. This property and is a densely populated mobile home park located on Cross Bayou, a tidal slough that connects Old Tampa Bay to Boca Ciega Bay. The mobile home park is frequently flooded, and the only wastewater treatment facilities are septic tanks. Under this program, the property would be acquired and razed, including the removal of all existing septic tanks. Using future County funds, the property would be graded, planted, and integrated into adjacent native habitats which include mangroves and oligohaline marshes. Similar conditions exist at the other identified priority SRL properties.



**Figure 16-4B.** Example SRL property in the Cross Bayou watershed of Pinellas County.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This program will improve coastal resiliency in Pinellas County by eliminating unsustainable residential and commercial SRL properties and converting them to public ownership for later restoration of native habitats and coastal floodplain storage. In addition, the project is expected to improve ambient water quality in several impaired waterbodies through the removing of failing wastewater and stormwater treatment infrastructure.

## Implementing Entities

Pinellas County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of this project.



## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat;
- Goal 2: Restore Water Quality and Quantity; and
- Goal 4: Enhance Community Resilience.
- 

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 2: Restore, Improve, and Protect Water Resources; and
- Objective 5: Promote Community Resilience.

## Feasibility Assessment and Best Available Science

This program is considered to be feasible with respect to the ability to: 1) acquire priority properties; 2) obtain necessary permits; 3) raze existing infrastructure and restore native habitats and coastal floodplain storage; and 4) effectively maintain the restored natural systems in perpetuity. The program is also consistent with the following adopted natural resource management plan:

- Comprehensive Conservation and Management Plan (CCMP) for Clearwater Harbor and St. Joseph Sound. Janicki Environmental et al., 2011. Final report prepared for the Pinellas County Department of Environmental and Infrastructure and the Southwest Florida Water Management District.

## Risks and Uncertainties

In the evaluation of this program, no significant risks or uncertainties have been identified that would preclude implementation. Pinellas County has identified priority properties and is ready to proceed with property acquisitions.

## Success Criteria and Monitoring

This program will involve property acquisition and restoration, and is also expected to improve adjacent water quality via the removal of existing pollutant sources. Specific success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Acres of SRL properties acquired;
- Acres of acquired properties restored; and
- Changes in ambient water quality in the affected watersheds and impaired segments.

## SECTION V: Proposed Projects, Programs and Activities

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pinellas County implements an ambient water quality monitoring program in County surface waters, and is committed to conducting the monitoring necessary to quantify project benefits.

### Project Milestones and Schedule

The total estimated time horizon of this project - from permit modification through success monitoring - is approximately five years. The expected start date is 2018, and the expected end date is 2023. Implementation of this project has been broken down into three phases, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Site assessments												
Property acquisition & pollutant removal												
Success monitoring												

### Budget/Funding and Leveraged Resources

Pinellas County has estimated the total cost to acquire identified priority SRL properties to be approximately \$10,000,000. The County is proposing to use \$3,000,000 of their Spill Impact Component allocation for property acquisition, with the remainder of the project cost to be made up with other County funds. A summary of the project budget and funding sources for this program is provided in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning (site assessments)		\$450,000
Implementation (property acquisition and pollutant removal)		\$9,500,000
Monitoring		\$50,000
<b>Total Cost</b>		<b>\$10,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$3,000,000
Direct Component		\$0
Other County Funds		\$7,000,000
<b>Total Secured Funding</b>		<b>\$10,000,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		

Should additional leveraged funds become available they would be used to conduct habitat restoration on the acquired properties.

### Partnerships/Collaboration

Pinellas County partnered with the Southwest Florida Water Management District (SWFWMD) in the development of the Clearwater Harbor and St. Joseph Sound CCMP, as well as the implementation of projects specified in the CCMP. It is anticipated that SWFWMD will provide co-funding for restoration of the acquired properties in the future.

## PINELLAS COUNTY

Land Acquisition for  
Floodplain Restoration and Resiliency

PROJECT NO. 16-4

Public Access to Waterways  
Project Description

## OVERVIEW AND LOCATION

This program involves the prioritization and county acquisition of waterfront properties to augment public access to coastal waterways. The general location is coastal Pinellas County (see **Figure 16-4A**).

## NEED AND JUSTIFICATION

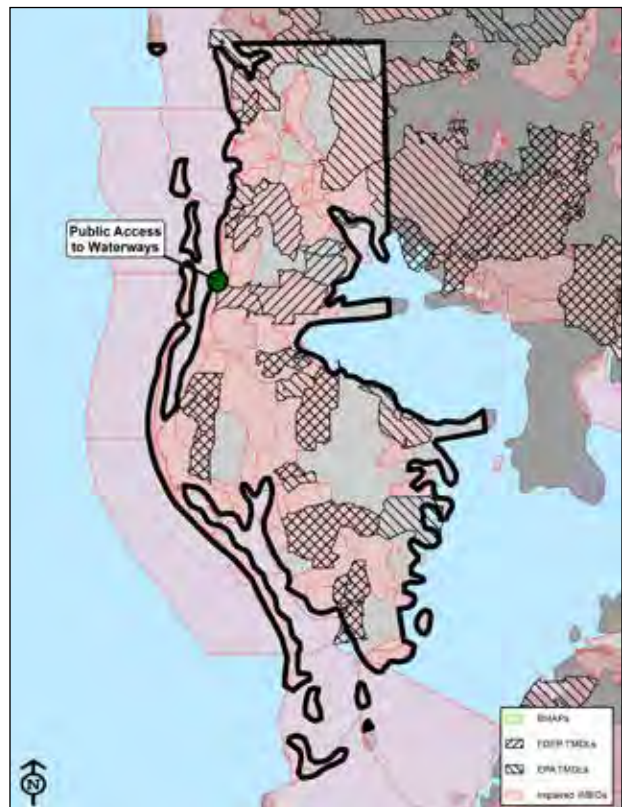
Pinellas County is the most densely populated county in Florida, and there is tremendous public demand for boat ramps and increased access to coastal waterways. Providing public access to coastal waters has been identified in public surveys as an important service that Pinellas County government offers to its residents and visitors. Pinellas County currently owns and manages \_\_\_ public boat ramps and \_\_\_ fishing piers, but there is a need to increase those numbers, especially in high use areas such as Clearwater Harbor and Boca Ciega Bay.

## PURPOSE AND OBJECTIVES

The purpose of this program is to publicly acquire priority waterfront sites to augment public access to coastal waterways within the County. The objectives of the program are to: 1) increase public access to coastal waters; and 2) enhance coastal zone recreational opportunities for residents and visitors.

## PROJECT COMPONENTS

This program involves two components: 1) property acquisition of strategically located waterfront parcels that can provide public access to coastal waters; and 2) the construction of recreational amenities and infrastructure. Depending on the sites involved, amenities could include: boat ramps, fishing piers, transient docks, and kayak



**Figure 16-4A.** Project location in Pinellas County.

## SECTION V: Proposed Projects, Programs and Activities

launches; as well as supporting infrastructure such as parking lots, bathroom facilities, fish cleaning areas, and interpretive public educational kiosks. Contributions to the Overall Economic and Ecological Recovery of the Gulf

This program will improve public access to the coastal waters of Pinellas County and enhance public recreational opportunities. In addition, this program will contribute to the local economy through increased local resident expenditures for recreational activities, as well as increased spending by visiting tourists.

### Implementing Entities

Pinellas County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of projects completed under this program. Pinellas County.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing.



**Figure 16-4B.** Example SRL property in the Cross Bayou watershed of Pinellas County.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Gulf Consortium Objective:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.

### Feasibility Assessment and Best Available Science

This program is consistent with other marine resource protection objectives. Pinellas County provides excellent guidance material to the public with regard to the locations of available access points as well as sensitive marine resources. Figure 16-4B is a map of the central county area from the Pinellas County website.

Location of boat ramps and sensitive marine resources in central Pinellas County.

This program is considered to be feasible with respect to the ability to: 1) acquire priority properties; 2) obtain necessary permits; 3) construct recreational amenities, and 4) effectively operate and maintain recreational amenities in perpetuity.

## Risks and Uncertainties

Coastal park and recreational amenities are at risk for damage by tropical storms and sea-level rise. However, the proposed recreational improvements will factor coastal storm hazards and sea level rise into the design, as appropriate. Pinellas County has identified priority properties and is ready to proceed with property acquisitions and improvements.

## Success Criteria and Monitoring

This program will involve property acquisition and the development of recreational amenities. Specific success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Acres of coastal access properties acquired;
- Increase in the number of public recreational users.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pinellas County is committed to conducting the monitoring necessary to quantify project benefits.

## Project Milestones and Schedule

The total estimated time horizon of this project is approximately four years. The expected start date is 2018, and the expected end date is 2021. The project milestone chart is shown below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Property acquisition												
Construction of recreational amenities												
Success monitoring												

### Budget/Funding and Leveraged Resources

Pinellas County has estimated the total cost to acquire and improve identified priority waterfront properties to be approximately \$2,000,000. The County is proposing to use \$2,000,000 of their Spill Impact Component allocation to implement this program. A summary of the cost and funding sources for this program is provided in the table below.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$250,000
Implementation (property acquisition)		\$1,700,000
Monitoring		\$50,000
<b>Total Cost</b>		<b>\$2,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,000,000
Direct Component		\$0
Other Grants or Co-funding		\$0
Other County Funds		\$1,000,000
<b>Total Secured Funding</b>		<b>\$2,000,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA Recreational Component		

### Partnerships/Collaboration

Pinellas County may partner with incorporated cities within the county, as appropriate as certain sites.



# PINELLAS COUNTY Artificial Reef Program Augmentation

PROJECT NO. 16-5

## Project Description

### OVERVIEW AND LOCATION

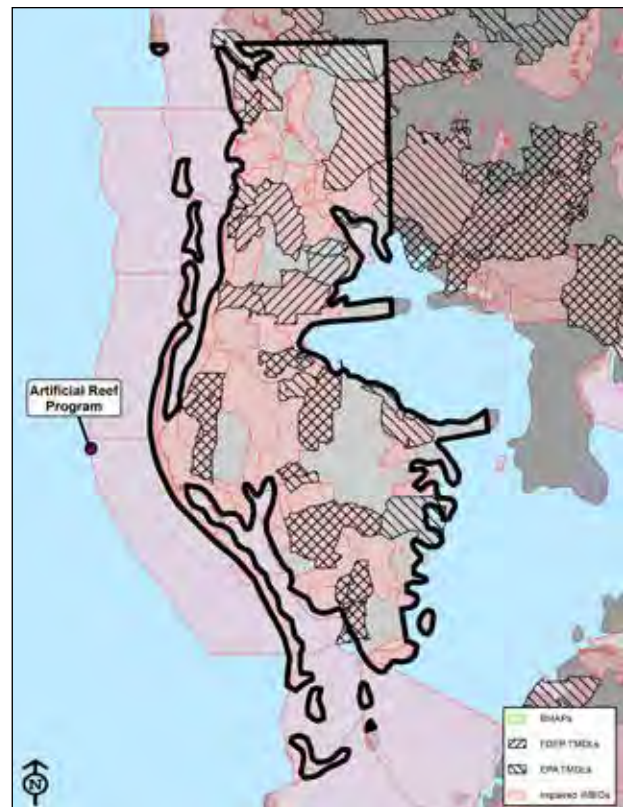
This project involves stockpiling clean concrete material and transporting it to existing permitted Pinellas County artificial reef sites. The general location of the Pinellas County artificial reefs is shown in **Figure 16-5A**.

### NEED AND JUSTIFICATION

Natural hardbottom habitats in Pinellas County offshore waters are relatively rare and sparsely distributed. To meet the increasing recreational demand for offshore bottom fishing and scuba diving opportunities, Pinellas County started their artificial reef program in 1975. There is a continuing need to augment existing permitted artificial reef sites, and to create new sites, to support the demand of recreational fishing and diving enthusiasts, both residents and tourists. In addition to enhancing recreational opportunities and associated economic benefits, artificial reefs can also provide ecological benefits. Hard substrate and vertical structure are limited habitats in the Gulf of Mexico (Fikes, 2013) and artificial reef habitats can provide: 1) hard substrate to support encrusting and colonial benthic organisms such as sponges and corals; 2) niche space for small marine invertebrates; and 3) shelter for larval and juvenile fishes. The project is justified by the demonstrated benefits of artificial reefs, i.e., increased economic activity (i.e., expenditures, incomes, and jobs) (Adams et al., 2011).

### PURPOSE AND OBJECTIVES

The purpose of this project is to augment existing permitted Pinellas County artificial reef sites with clean concrete and other suitable construction materials, as well as manufactured artificial reef balls. The objectives of the project are to: 1) support the increasing recreational demand for offshore reef fishing and scuba diving opportunities; and



**Figure 16-5A.** Project location in Pinellas County.

## SECTION V: Proposed Projects, Programs and Activities

2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in the county's coastal waters. Objectives are consistent with those of the Florida Fish and Wildlife Conservation Commission's (FFWCC) artificial reef program outlined below:

1. Enhance private recreational and charter fishing and diving opportunities;
2. Provide a socio-economic benefit to local coastal communities;
3. Increase reef fish habitat;
4. Reduce user conflicts;
5. Facilitate reef related research; and
6. While accomplishing objectives 1-5, do no harm to fishery resources or human health.

### PROJECT COMPONENTS

This project involves two primary components. The first component is to identify and acquire a sufficient amount of clean concrete material, either waste stream recovered second-use concrete or manufactured artificial reef modules, or both, and then to prepare (e.g., removal of rebar) and stockpile this material at the existing Pinellas County Artificial Reef Program staging area. The second component is to transport these materials to currently permitted artificial reef locations off the coast of Pinellas County via a barge, and then to strategically deploy the materials to create high quality fish habitat. The locations will be published to the public and will remain available for public use for recreational fishing and diving. Post construction monitoring will also be conducted to ensure the deployment of this material produced high quality habitat that supports important reef fish species (e.g., grouper, snapper).

Pinellas County currently manages 13 permitted artificial reef sites, as shown in Figure 16-5B. Material acquired through this project will be distributed on the following five of the 13 permitted sites:

- Pinellas South Reef - "27°43.375 N - 082°58.500 W"
- Indian Shores Reef - "27°51.691 N - 083°01.817 W"
- Veteran's Reef - "28°03.000 N - 083°00.750 W"
- Rube Allyn Reef - "27°55.924 N - 083°01.403 W"
- Treasure Island II Reef - 27°41.695 N - 083°17.485 W

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Pinellas County is the most densely populated county in Florida, and the beaches and aquatic resources of the county support an enormous tourism industry. This project will: 1) support the increasing recreational demand for offshore reef fishing and scuba diving opportunities by both residents and tourists; and 2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in Pinellas County offshore waters.



**Figure 16-5B.** Location of existing permitted artificial reef sites in Pinellas County.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing (primary);
- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region.

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 5: Restore and Revitalize the Gulf Economy (primary);
- Goal 1: Restore & Conserve Habitat;
- Goal 3: Replenish & Protect Living Coastal & Marine Resources

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary);
- Objective 1: Restore, Enhance and Protect Habitats; and
- Objective 3: Protect and Restore Living Coastal and Marine Habitats.

## Implementing Entities

Pinellas County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction and success monitoring of the program.

## Best Available Science and Feasibility Assessment

Artificial reefs in the Gulf of Mexico have been extensively studied with regard to the habitat and economic benefits they provide. The scientific literature on the ecological benefits is somewhat controversial (Lindberg et al., 2014, Fikes, 2013, Bortone et al. 1994, others). Some experts argue that artificial reefs are functionally comparable to natural reefs, and that they augment fish populations by providing habitat that is naturally limiting in the Gulf of Mexico. Others argue that artificial reefs simply attract and aggregate existing fish populations, but do not enhance overall fish stocks. While those arguments may be debatable, the economic benefits of artificial reefs are not. Artificial reefs provide significant recreational opportunities and associated benefits along the Gulf coast of Florida (Adams et al. 2011). In addition, research has produced best practices guidance on site selection, design features, and construction methods; criteria that are now part of the Florida Fish and Wildlife Conservation Commission (FWC) regulations for permitting. Key literature that forms the basis for the Pinellas County Artificial Reef Program are cited below:

- Adams, C., et al., 2011. The economic benefits associated with Florida's artificial reefs. EDIS document FE649 (2011): 1-6.
- Bortone, S.A., Martin, T., Bundrick, C.M. 1994. Factors affecting fish assemblage development on a modular artificial reef in a northern Gulf of Mexico estuary. Bull. Mar. Sci. 55 (2-3), 319-332.
- Fikes, R., 2013. Artificial Reefs of the Gulf of Mexico: A Review of Gulf State Programs & Key Considerations. National Wildlife Federation.

## SECTION V: Proposed Projects, Programs and Activities

- Lindberg, W.J., et al., 2014. Rationale and Evaluation of an Artificial Reef System Designed for Enhanced Growth and Survival of Juvenile Gag, *Mycteroperca microlepis*. Proc.66th Gulf and Caribbean Fisheries Institute November 4 – 8. Corpus Christi, TX. Pages 320-325.
- Swett et al., 2011. Economic Impacts of Artificial Reefs for Six Southwest Florida Counties. Florida Sea Grant.

This project is feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; 3) effectively operate and maintain the project components over the long term. The permitting of Pinellas County offshore artificial reef sites has been facilitated through Nationwide U.S. Army Corps of Engineers (USACE) permits and through the Florida Fish and Wildlife Conservation Commission (FWC) for site specific state criteria. Furthermore, this project is consistent with the National Artificial Reef Plan published in 1985, the Florida Artificial Reef Strategic Plan (FWC, 2003), and the Pinellas County Artificial Reef Management Plan update (Pinellas County, 2013). Additional planning assistance will be required for permitting, design, and implementation of the proposed project.

### Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this project that would preclude project implementation. Pasco County will ensure design to limit damage from tropical storms. Controls for lionfish and other nuisance/exotic species may be required. Regulatory constraints will address issues such as spatial boundaries for navigation, channels, marine habitat resources, historic areas, sand borrow areas, existing structures and leases, etc. Success monitoring is critical in a fisheries management context given these reefs have not previously been used as fisheries management tools.

### Success Criteria and Monitoring

This and all artificial reef projects involve the placement of hard substrate to: support recreational demand for offshore reef fishing and scuba diving opportunities; and enhance the abundance, distribution, and structural diversity of hardbottom habitat in the affected waters. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Increase in the coverage of new artificial reef habitat;
- Metrics on the recruitment of benthic encrusting organisms and fish; and
- Increase in recreational usage.

The proposed project will be constructed consistent with the Gulf States Marine Fisheries Commissions Guidelines for Artificial Reef Materials (2004). In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Pinellas County, is committed to conducting the monitoring necessary to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project is approximately 4 years. The expected start date is 2018, and the expected end date is 2021. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Public Outreach and Surveys												
Collect, Prepare and Stage Reef Materials												
Transport Material to Permitted Reef Sites												
Success Monitoring												

## Budget and Funding Sources

Pinellas County has estimated the total cost of this project to be approximately \$500,000. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$25,000
Implementation	\$425,000
Monitoring	\$50,000
<b>Total Cost</b>	<b>\$500,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$380,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$380,000</b>
<b>Budget Shortfall</b>	<b>\$120,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
FWC Artificial Reef Construction Grants	

## Partnerships/Collaboration

The Pinellas County Artificial Reef Program routinely collaborates with the Florida Artificial Reef Program managed by the Florida Fish and Wildlife Conservation Commission. This collaboration includes representatives from nearly all coastal counties in Florida and assists with material collection resources, technical construction assistance, artificial reef construction best practices, and outreach.



## HILLSBOROUGH COUNTY

# Delaney Creek / Palm River Heights Septic to Sewer Conversion

PROJECT NO. 17-1

## Project Description

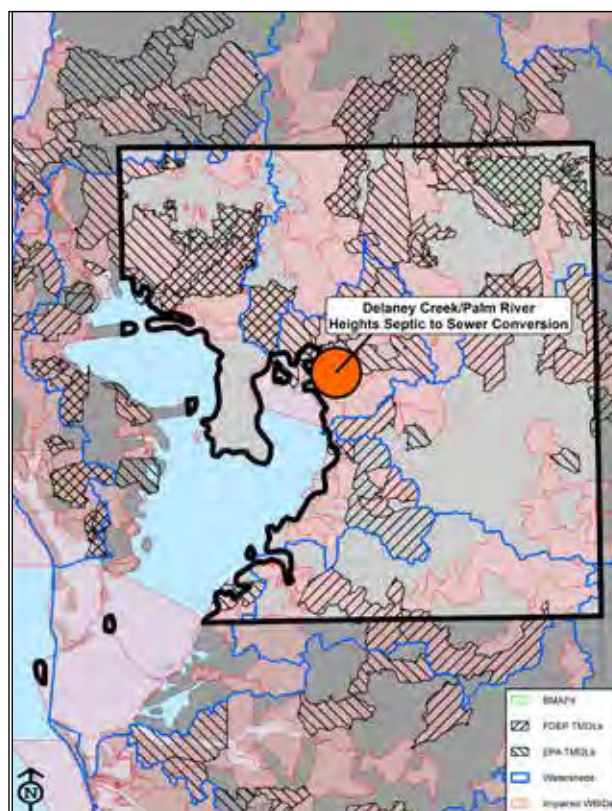
### OVERVIEW AND LOCATION

The Delaney Creek/Palm River Heights Septic to Sewer Conversion Project will reduce nutrient loads to McKay and Hillsborough Bays by taking an estimated 700 onsite sewage treatment and disposal systems (septic tanks) offline and preventing the installation of more as parcels in this older neighborhood build out. It will address and eliminate non-point pollution sources by expanding wastewater infrastructure to a portion of Hillsborough County (County) that is currently served by septic tanks. The project is in west central Hillsborough County on the eastern side of McKay Bay between the Palm River and Delaney Creek; these watersheds are segments of the Tampa Bay estuary (see **Figure 17-1A**).

### NEED AND JUSTIFICATION

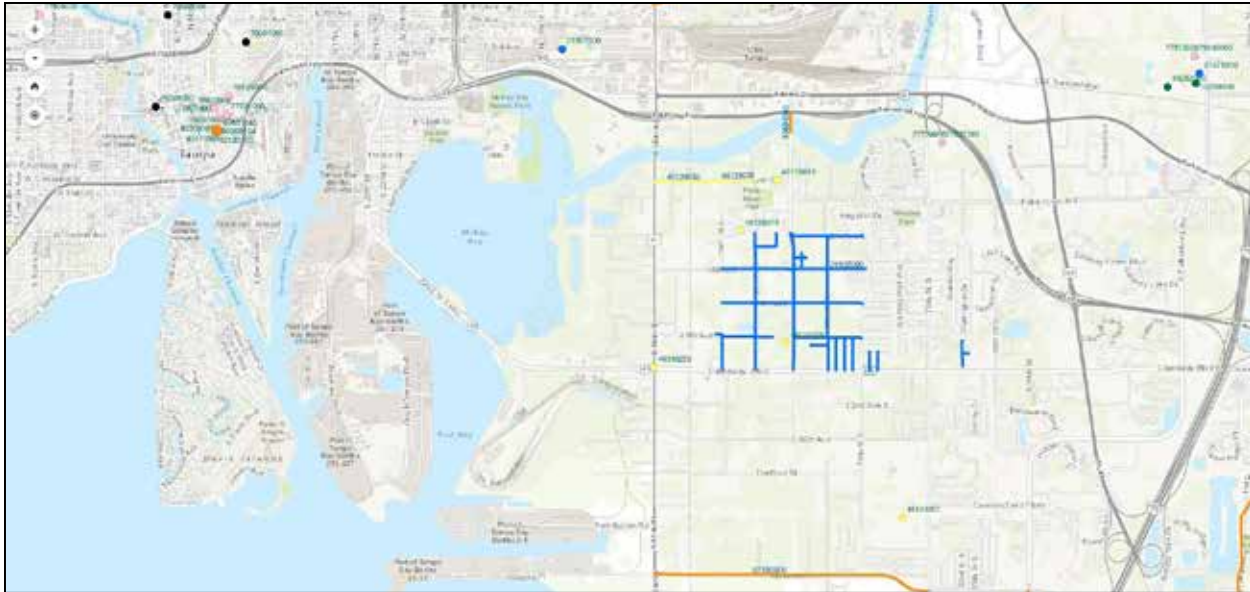
McKay Bay, East Bay, Delaney Creek, and the Palm River are currently listed as impaired waterbodies for nutrients and nutrient response variables by FDEP under section 303(d) of the Federal Clean Water Act. In addition, the tidal portion of Delaney Creek is listed as impaired for fecal coliform bacteria. Septic systems are contributing sources of nutrients and bacteria and Hillsborough County has identified the need to reduce non-point

source contributions for nutrients and bacteria from septic systems in these watersheds. It is not known exactly how many septic tanks exist in the project area, but the County is adding water service to 700 parcels of land in the Palm River Utilities Service Area that are currently on private shallow wells (see **Figure 17-1B**), so one can estimate that at least 700 septic tanks exist. No wastewater infrastructure exists in the Palm River and Delaney Creek watersheds which are currently served by septic tanks. A large percentage of these septic tanks are old, failing, and/or do not meet the current standard for construction. As discussed above, some of the project area parcels are also currently



**Figure 17-1A.** Project location in Hillsborough County.





**Figure 17-1A. Approximate Septic to Sewer Project Area.**

served by private shallow wells. The well owners desire better water quality because they are currently dealing with relatively high sulfide concentrations. If the septic tanks stay in place and new ones are added to the area due to lack of sewer infrastructure, drinking water safety could be compromised at these wells.

Hillsborough County plans to expand its existing wastewater infrastructure to the Palm River Utilities Service Area and remove the septic tanks there. The County wants to provide this service using either traditional gravity sewer, Low Pressure Sewer (LPS), or vacuum sewer, although no study or design work has been completed on this project. The County has an adequate wastewater collection system, wastewater treatment, and effluent disposal capacity to provide service to the Palm River area at the Falkenburg Wastewater Treatment Plant (WWTP), which has 12 million gallons per day annual average daily flow. Falkenburg WWTP provides Advanced Wastewater Treatment for its reclaimed water customers and surface discharges to the Palm River for wet weather effluent disposal. This project will help improve water quality in the Delaney Creek, as well as downstream in East Bay, by moving wastewater from aging septic systems to advanced wastewater treatment, thereby reducing nutrient and bacteria loads to the system.

### PURPOSE AND OBJECTIVES

Older septic systems are contributing sources of water pollution to the environment, impacting health and safety of humans and marine life habitat. The purpose of the project is to install central wastewater infrastructure needed to abandon existing septic tank systems in the Palm River Utilities Service Area. The objectives of this project are: 1) to reduce nutrient and fecal coliform bacteria concentrations and improve water quality in the Palm River and Delaney Creek; 2) to reduce nutrient and fecal coliform bacteria concentrations in local groundwater in vicinity of private potable wells; and 3) to reduce nutrient and fecal coliform bacterial loads discharged from the Palm River and Delaney Creek to McKay Bay and East Bay, which are segments of the Tampa Bay Estuary.

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

The project consists of the following components:

1. This project will expand the County's existing wastewater infrastructure to Delaney Creek/Palm River Area to provide sanitary sewer service using either traditional gravity sewer, LPS, or vacuum sewer and remove the septic tanks in this area. A hybrid of these systems may be required but will not be known until the feasibility study (alternative analysis) and preliminary design is complete.
2. Add connections to the existing sewer system including new lines and lift/pumping stations as needed.
3. Develop a water monitoring program to retrieve and analyze water quality data to demonstrate the potential improvements improve water quality in the McKay Bay.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will improve water quality conditions in water bodies that contribute to Tampa Bay, an economically and ecologically important waterbody. The wastewater treatment will be provided at an advanced wastewater treatment plant.

The expansion of sanitary sewer to these residential areas will contribute to economic growth in the County. This expansion will help the County to grow, improve its economy, and grow the tax base. The proposed project will increase workforce development and job creation in both public and private sectors. Local engineering efforts will be required for the survey, design, and permitting components and locally, skilled workers will be needed for construction efforts of abandoning septic tanks and installing the sewer collection system. The proposed project requires experienced and technically skilled positions often associated with a full-time salary, higher wage and benefits.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity
- Goal 3: Replenish and Protect Living Coastal and Marine Resources
- Goal 1: Restore and Conserve Habitat

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources
- Objective 3: Protect and Restore Living Coastal and Marine Resources
- Objective 1: Restore, Enhance, and Protect Habitats

## Implementing Entities

Hillsborough County will be the sole implementing entity and grant sub-recipient responsible for the feasibility studies, design, permitting, construction, operation and maintenance, and monitoring of this project.

## Best Available Science and Feasibility Assessment

This project is consistent with the following natural resource management and restoration plans:

- Tampa Bay Estuary Program, 2006. Charting the Course: The Comprehensive Conservation and Management Plan (CCMP) for Tampa Bay.
- Tampa Bay Estuary Program (TBEP), Sarasota Bay Estuary Program (SBEP), and Charlotte Harbor National Estuary Program (CHNEP), 2013. Southwest Florida Regional Ecosystem Restoration Plan.

The County has not completed a project-specific feasibility study for this project and very little engineering details are known. If soils are permeable, water table is high and/or septic tanks are not performing as efficiently as originally intended (i.e. leaking, damaged, etc.), then the project is justified from a receiving water quality improvement standpoint. This type of project can be engineered for the types of conditions present in this locale. Finally, there is available right-of-way for the new sanitary sewer system and the County owns a parcel of land that can be used for a proposed sanitary sewer pumping (lift) station. Once engineering has commenced the requirements to attain feasibility (i.e. permissibility, constructability, etc.) will become apparent. At that time the County can determine how to proceed.

## Risks and Uncertainties

This project is in the conceptual phase; there have been no study or design work completed on this project. The risks will be identified during the feasibility and design phases.

## Success Criteria and Monitoring

This project will affect water quality in adjacent freshwater and estuarine systems. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for

- Changes in ambient water quality (nutrient and bacterial concentrations) in Delaney Creek;
- Changes in the frequency and/or duration of algal blooms (as measured by chlorophyll-a) in the Delaney Creek

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Hillsborough County currently implements a water quality monitoring program and is committed to conducting the necessary monitoring and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project - from feasibility study through construction and subsequent success monitoring - is approximately 7 years. The expected start date is 2018, and the expected end date is 2025. Implementation of this project has been broken down into five phases, as shown in the milestone chart below.

## SECTION V: Proposed Projects, Programs and Activities

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
Water Quality Monitoring Program												
Feasibility Study/Preliminary Design												
Final Design/Permitting												
Construction												

### Budget and Funding Sources

The preliminary budget is indicated in the table below. The County has estimated a rough cost for service at \$20,000 per connection for 1,750 units. The total project cost is estimated be \$35M. The county has been spending about \$2M per year on this work, this grant will be an important funding source.

The County would be interested in funding for feasibility study to evaluate different sewer conversion options, confirm permissibility, and develop a more detailed estimate of probable cost. The County proposes a \$100,000 budget for this study and BC concurs.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$100,000
Implementation	\$34,150,000
Success Monitoring	\$750,000
<b>Total Cost</b>	<b>\$35,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$5,000,000
Direct Component	
Other Grants or Co-Funding	
Other County Funds	
<b>Total Secured Funding</b>	<b>\$5,000,000</b>
<b>Budget Shortfall</b>	<b>\$30,000,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES	

### Partnerships/Collaboration

Hillsborough will work and collaborate with other agencies as required. Some potential partners are:

- Florida Department of Environmental Protection (FDEP)
- Southwest Florida Water Management District (SWFWMD)
- US Environmental Protection Agency (EPA)
- Gulf RESTORE Council

## HILLSBOROUGH COUNTY

# Cockroach Bay Aquatic Preserve Land Acquisition and Ecosystem Restoration

PROJECT NO. 17-2

## Project Description

### OVERVIEW AND LOCATION

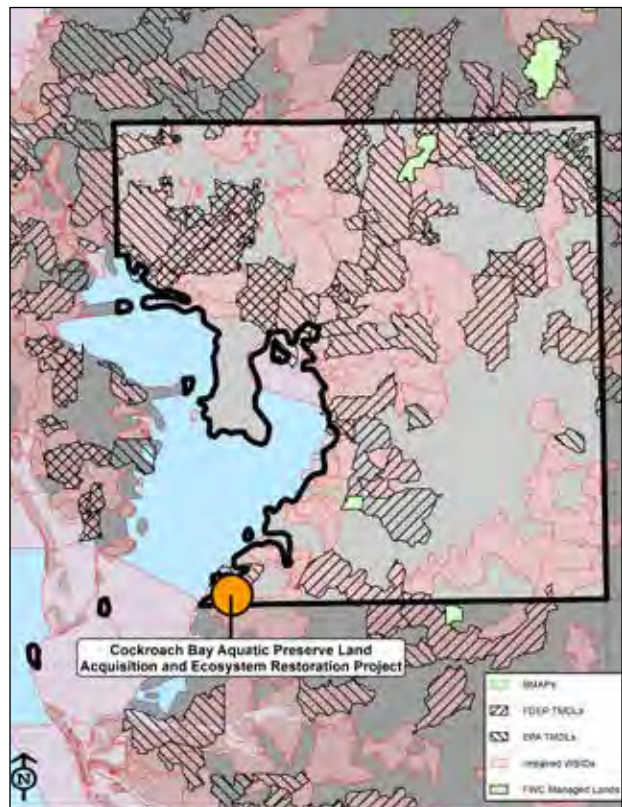
This project involves public acquisition of privately-owned agricultural parcels in the watershed of the Cockroach Bay Aquatic Preserve, followed by habitat restoration on the acquired parcels. The location of the Cockroach Bay Aquatic Preserve is shown in **Figure 17-2A**.

### NEED AND JUSTIFICATION

The Cockroach Bay Aquatic Preserve, located along the southeastern reaches of Tampa Bay, was officially designated as an Aquatic Preserve by the State of Florida in 1976. In the 1990s, a modification of that lease expanded the offshore boundary of the Aquatic Preserve and added the Little Manatee River up to U.S. Highway 301, for a total of nearly 5,000 acres of aquatic resources that are protected today. Since the expansion of the preserve, Hillsborough County, in partnership with the Southwest Florida Water Management District (SWFWMD) and the Florida Department of Environmental Protection (FDEP), has been acquiring and consolidating privately-owned parcels in the preserve watershed and conducting habitat restoration projects on the acquired parcels.

The Cockroach and Piney Point Creek Ecosystem

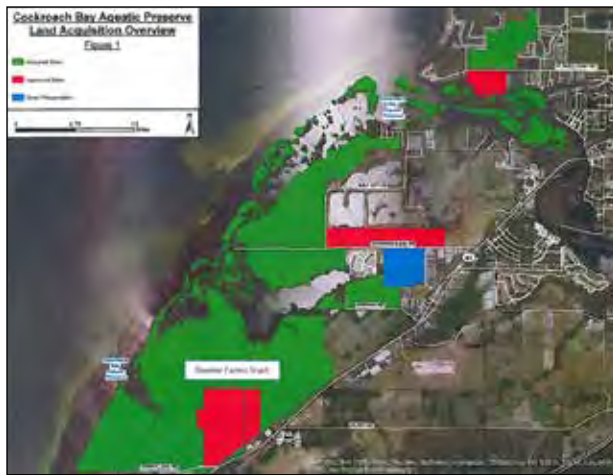
Restoration Project is the largest coastal restoration project ever performed in Tampa Bay. The project is located on 2,531 acres of preserved lands known as the Cockroach Bay and Piney Point Creek Preserve. The preserve was jointly acquired by the Hillsborough County Environmental Lands Acquisition and Protection Program (ELAPP) and SWFWMD in 2003, and is adjacent to, and in the watershed of, the Cockroach Bay Aquatic Preserve. Prior to public acquisition, conversion of the upland areas, and some wetland areas, to agricultural uses (e.g., row crops) and



**Figure 17-2A.** Project location in Hillsborough County.



## SECTION V: Proposed Projects, Programs and Activities



**Figure 17-2A.** Overview of acquired sites and sites approved for acquisition in the Cockroach Bay Aquatic Preserve watershed.



**Figure 17-2A.** Location of the Reeder Farms tract in relation to other restored public lands in the Cockroach and Piney Point Creek Preserve.

rock mining resulted in the loss of native habitats and alteration of the natural hydrology in these areas. The Phase I restoration project was completed in 2012 and involved the reestablishment of native coastal pine flatwoods, hardwood hammocks, and various estuarine and freshwater habitats, as well as the restoration of more natural drainage patterns and hydrology, on 1,043 acres (1.6 square miles) of disturbed lands.

Spill Impact Component funding is being requested to implement Phase II of the Cockroach and Piney Point Creek Ecosystem Restoration Project. Phase II consists of the acquisition and restoration of a 388-acre parcel known as the “Reeder Farms” tract. A majority of this parcel is currently under row crop cultivation, with agricultural runoff flowing directly into the adjacent Cockroach Bay Aquatic Preserve. Restoration of the Reeder Farms parcel will tie in seamlessly with the completed Phase I improvements. Benefits of acquiring and restoring the Reeder Farms parcel include the removal of a direct pollution source to the Cockroach Bay Aquatic Preserve, restoration of estuarine and freshwater wetland habitats, restoration of coastal uplands, and improved wildlife habitat for a variety of wading birds, fish, invertebrates, and mammals. In addition, public acquisition and restoration/conservation of this parcel will prevent future commercial and residential development within the watershed of the Cockroach Bay Aquatic Preserve, and will create buffer areas to accommodate future sea level rise.

### PURPOSE AND OBJECTIVES

The purpose of this project is to publicly acquire and restore habitats and hydrology on privately-owned agricultural lands within the watershed of the Cockroach Bay Aquatic Preserve. Project objectives include: 1) restoration of coastal uplands, freshwater wetlands, and estuarine wetlands; 2) eliminate agricultural runoff pollutant discharges to the Aquatic Preserve; 3) enhance habitats for fish and wildlife populations.

### PROJECT COMPONENTS

The components of this project are: 1) public acquisition; 2) design and permitting of restoration activities; 3) implementation of restoration activities; and 4) success monitoring. **Figure 17-2B** shows the location of the Reeder Farms tract, and other parcels approved by ELAPP for acquisition, relative to the Cockroach Bay Aquatic Preserve.



**Figure 17-2C** shows a close-up of the Reeder Farms tract showing its location within the boundaries of the Cockroach and Piney Point Creek Preserve, as well as adjacent restored coastal uplands and created wetlands. From this figure, it can clearly be seen that the Reeder Farms tract is a critical central piece in the restoration of the preserve.

Spill Impact Component funds are being requested to acquire the Reeder Farms tract. Restoration design and construction costs will be shared between Hillsborough County and the Southwest Florida Water Management District.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will result in the restoration of native habitats, hydrology, and water quality in a critical portion of Tampa Bay. The project builds upon the extensive public acquisition and restoration activities completed under Phase I of the Cockroach and Piney Point Creek Ecosystem Restoration Project.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat;
- Goal 2: Restore Water Quality and Quantity; and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 2: Restore, Improve, and Protect Water Resources; and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

Hillsborough County will be the sole implementing entity and grant sub-recipient responsible for public acquisition of the Reeder Farms tract. Hillsborough County will coordinate extensively with the Southwest Florida Water Management District in the design, permitting, construction, and monitoring of the restoration activities on the parcel.

## Best Available Science and Feasibility Assessment

As stated above, the Cockroach and Piney Point Creek Ecosystem Restoration Project Phase I is the largest coastal restoration project ever performed in Tampa Bay. The project has been highly lauded in the Tampa Bay area, and has won numerous national awards. Furthermore, continued public acquisition, consolidation, and restoration of

## SECTION V: Proposed Projects, Programs and Activities

agricultural lands within the watershed of the Cockroach Bay Aquatic Preserve have been recommended as projects in the following documents:

- Tampa Bay National Estuary Program. 2017. Charting the Course: The Comprehensive Conservation and Management Plan for Tampa – August 2017 Revision.
- Tampa Bay National Estuary Program. 2010. Tampa Bay Estuary Program Habitat Master Plan Update. TBEP Technical Report #06-09. Final report prepared by PBS&J.

### Risks and Uncertainties

The most significant risk or uncertainty associated with this project is the ability to publicly acquire the Reeder Farms tract. The Hillsborough County ELAPP has evaluated and approved the site for acquisition, and the County has been in negotiations with the property owners. However, the property owners are in mediation to resolve internal conflicts related to their disposition of the property. Should the sale of the Reeder Farms property fall through, the County would use Spill Impact Component funds to acquire and restore other approved parcels in the Cockroach Bay Aquatic Preserve (identified in **Figure 17-2B**).

### Success Criteria and Monitoring

This project involves the public acquisition of privately-owned agricultural parcels, and habitat restoration on the acquired parcels. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Acres of privately-owned agricultural lands acquired for conservation and restoration;
- Acres of impacted agricultural lands restored to functional native habitats; and
- Changes in surface water quality discharged to the Cockroach Bay Aquatic Preserve.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Hillsborough County is committed to coordinating the necessary monitoring to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project is approximately four years. The expected start date is 2018, and the expected end date is 2021. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Property Appraisal and Acquisition												
Restoration Design and Permitting												
Restoration Construction												
Success Monitoring												

## Budget and Funding Sources

The Hillsborough County ELAPP has estimated the parcel acquisition cost to be approximately \$3.5 million. The cost to restore this parcel is estimated at \$3-4 million, depending on the complexity of the restoration design and construction. With monitoring, the total project cost is estimated to be \$7,100,000. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning (property appraisal)	\$500,000
Implementation (acquisition, restoration design and construction)	\$6,500,000
Monitoring	\$100,000
<b>Total Cost</b>	<b>\$7,100,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$5,000,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$5,000,000</b>
<b>Budget Shortfall</b>	<b>\$2,100,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
Southwest Florida Water Management District	\$2,100,000

## Partnerships/Collaboration

Hillsborough County has collaborated with the Southwest Florida Water Management District on previous restoration activities conducted on the Cockroach and Piney Point Creek Preserve, where SWFWMD provided all funding for the restoration design, permitting, and construction. The County will work with SWFWMD to secure the necessary funding for all unfunded restoration elements associated with this project.

## MANATEE COUNTY

# Manatee River Oyster Habitat Restoration Project

PROJECT NO. 18-1

## Project Description

### OVERVIEW AND LOCATION

The Manatee River Oyster Habitat Restoration Project (see Figure 18-1A) focuses on cultch (natural shell and/or other suitable material) placement in estuarine portions of the Manatee River from Fort Hamer Road Bridge to Tampa Bay, including the Braden River, Wares Creek, and Warner's and McLewis bayous to restore oyster reefs lost and degraded due to primarily impacts of development, including both urbanization and runoff from upstream agriculture and historic dredging for construction materials.

### NEED AND JUSTIFICATION

The project is needed to restore lost and degraded oyster reefs in the estuarine (lower) portions of the Manatee River and its tributaries in lower Tampa Bay. The Manatee River was known as the Oyster River as late as the 1800s (Williams 1837), however, oysters and oyster reefs are limited in both extent and distribution in the lower river. Oyster losses in southwest Florida have been attributed to activities associated with the heavily urbanized coast, i.e., nutrient and contaminants from overland runoff, surplus water from upstream regulated releases that results in salinities too low for successful oyster recruitment and growth, and historic dredge of live and dead oysters for road and other material. Water quality has declined along this heavily urbanized coast and no longer meets state standards for shellfish harvest.

### PURPOSE AND OBJECTIVES

The purpose of the proposed project is to restore nearshore oyster reef habitat and associated ecological functions for estuarine dependent species, in support of ecological sustainability of the estuarine portion of the Manatee River,

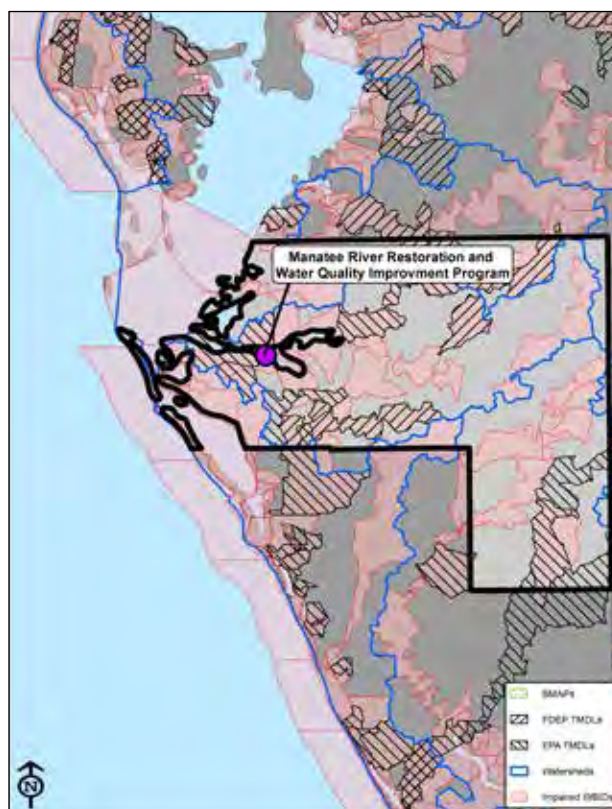
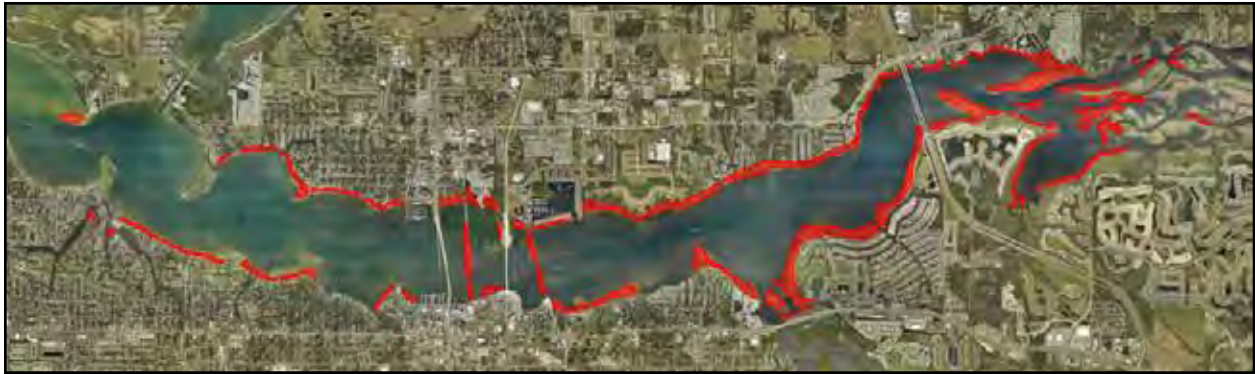


Figure 18-1A. Project location in Manatee County.



**Figure 18-1B.** Areas highlighted in red represent conceptual location of potential oyster reef restoration sites along the lower Manatee River.

via placement of cultch material in nearshore areas to create, expand, or enhance oyster abundance at existing or former reefs. The objectives of the project are to:

- Provide suitable habitat for oyster settlement;
- Provide three-dimensional living structural habitat for oysters and associated species; and
- Improve water quality

These objectives, and the proposed approach for restoration, are consistent with those developed for oyster restoration for the Gulf of Mexico by NOAA (2016) as part of the *Final Programmatic Damage Assessment and Restoration Plan* and *Final Programmatic Environmental Impact Statement*.

### PROJECT COMPONENTS

The proposed project includes nearshore reef restorations that, combined projects along Florida's Gulf coast farther north, will have regional benefits in terms of oysters, oyster reef, and associated fisheries habitat. Cultch will be placed in areas determined suitable for future oyster habitat, including on existing and/or former nearshore oyster reefs along the lower Manatee River and its tributaries, thereby providing the substrate on which oysters can settle and eventually provide structural habitat for numerous other recreationally and commercially important species. Approximately 26,500 cubic yards (cy) of suitable oyster reef substrate will be placed in appropriate locations along the lower Manatee River. Tentative locations have been selected (see **Figures 18-1B and 18-1C**) and will be confirmed and/or revised pending early monitoring results.

Components of the proposed project include:

- Site selection confirmation;
- Cultch placement at appropriate locations of oyster reefs at appropriate depths salinities; historic hydrology etc.
- Pre- and post- monitoring and data collection.

Data for in-situ water quality and bottom characteristics will be collected to inform site selection, cultch volumes, and monitoring. The proposed will include a public participation and education component with plans to engage the local community in the installation of oyster shells and other parts of the proposed project which may be appropriate.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The proposed project will contribute to the recovery of the oyster reefs and the ecological sustainability of the lower Manatee River and the greater Tampa Bay, given that:

“Healthy, interconnected oyster populations form reefs that provide the hard substrate needed for oyster larvae to settle, grow, and sustain the population. In addition to providing habitat for oysters, oyster reefs:

1) serve as habitat for a diversity of marine organisms, from small invertebrates to large recreationally and commercially important species such as stone crab, blue crab, red drum, and black drum; 2) provide structural integrity that reduces shoreline erosion; and 3) improve water quality and help recycle nutrients by filtering large quantities of water.” (Grabowski et al. 2012; NOAA 2016)

The proposed project will serve as a de facto oyster sanctuary for future oyster recruitment because shellfish harvesting within the proposed project site is prohibited pursuant to current FDACS regulations. Water quality improvements and reduced shoreline erosion may also be anticipated as consequences of the proposed project.

Economically, oyster reef habitats, associated fisheries, and ocean resources in general are also important to sustained tourism and economic health in Manatee County. Tourism is the largest producing industry in Manatee County and the North Port-Sarasota area, inclusive of Manatee County, was responsible for more than ten percent of the gross regional product from ocean resources along Florida’s Gulf coast (Florida Ocean Alliance, 2013).

### Eligibility and Statutory Requirements

The proposed project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region (primary); and
- Activity 2: Mitigation of damage to fish, wildlife, and natural resources (secondary).

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources; and
- Goal 4: Enhance Community Resilience.



Figure 18-1C. Typical potential oyster reef restoration area.





**Figure 18-1D.** Nearshore oyster reefs restored at Robinson Preserve, at the mouth of the Manatee River.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 2: Restore, Improve, and Protect Water Resources
- Objective 3: Protect and Restore Living Coastal and Marine Resources; and
- Objective 5: Promote Community Resilience.

## Implementing Entities

Manatee County will be the implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring for the proposed project. County staff will coordinate with appropriate agencies during planning and implementation of this project and may collaborate with agencies or other entities via leveraging and other funding agreements.

## Best Available Science and Feasibility Assessment

Oysters along Florida's southwest coast differ from those farther north and may occur as extensive nearshore reefs, isolated clusters, or form the basis of reef/mangrove islands due to sediment accumulation at low tide. Benefits of oysters and oyster reef restoration are well-documented and include enhanced estuarine habitats, shoreline stabilization, reduced storm surge and erosion, water quality improvements, and shelter for more than 300 species, which in turn are consumed by recreationally and commercially important finfish and crustaceans (NOAA, 2016). Water quality benefits are also well documented (Grabowski et al. 2012) and there are reports of a single oyster filtering up to 50 gallons/day (Chesapeake Bay Program, n.d.), although more recent estimates report smaller volumes (less than 25 gallons/day) and conclude that the volume filtered depends on the species, size, temperature, sediment load, and salinity (zu Ermgassen et al. 2013).

The proposed project approach is justified by the use of traditional cultching of degraded reefs as a management technique allowing resource managers "to mitigate resource losses, increase oyster production, and contribute direct economic benefit to fisheries-dependent communities," used previously in Apalachicola Bay (Arnold and Berrigan,

## SECTION V: Proposed Projects, Programs and Activities

2002). Local Tampa Bay projects demonstrating successful reef restoration in terms of increased oyster size include the McKay Bay (3,170 linear feet of oyster reef) and MacDill Air Force Base (137 tons of oyster shell) projects, and the Robinson Preserve at the mouth of the Manatee River (7,500 square feet of oyster beds) (see **Figure 18-1D**). The proposed project is consistent with Gulf-wide objectives and restoration techniques outlined in the science-based Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS), which presents detailed information supporting the value of oyster reef restoration (NOAA, 2016). Project implementation will be consistent with Best Management Practices, as outlined by the Florida Department of Agriculture and Consumer Services (FDACS).

Based on preliminary information from regulating agencies such as the Florida Department of Environmental Protection (FDEP) and FDACS, construction costs for similar projects, and operation and maintenance of other projects, the proposed project is considered feasible with respect to: 1) permitting; 2) construction within the proposed budget; and 3) effective long term operation and maintenance of the project components. Key literature reviewed in the evaluation of this project includes the following:

- Arnold, W. and M. Berrigan, 2002. A summary of the oyster (*Crassostrea virginica*) fishery in Florida. A Report to the Division of Marine Fisheries, Florida Fish and Wildlife Commission, St. Petersburg, Florida, USA.
- Baggett, L. P. et al., 2015. Guidelines for evaluating performance of oyster habitat restoration. *Restoration Ecology* 23: 737–745. doi:10.1111/rec.12262
- Grabowski, J.H. et al., 2012. Economic valuation of ecosystem services provided by oyster reefs. *BioScience* 62: 900–909.
- NOAA. 2016. Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>
- Whitfield, W., 1975. Mining of submerged shell deposits: history and status of regulation and production of the Florida industry. Florida Marine Research Publications Number 11. 55 pages.
- Harding, J.M., et al., 2012. Comparison of *Crassostrea virginica* (eastern oyster) recruitment on constructed reefs and adjacent natural oyster bars over decadal time scales. *Northeastern Naturalist* 19(4):627-646.
- Volety, A.K., et al., 2009. Eastern oysters (*Crassostrea virginica*) as an indicator for restoration of everglades ecosystems. *Ecological Indicators* 9S:S120- S136.
- zu Ermgassen, P. et al., 2013. Quantifying the Loss of a Marine Ecosystem Service: Filtration by the Eastern Oyster in US Estuaries. *Estuaries and Coasts* (2013) 36: 36.

## Risks and Uncertainties

Establishing monitoring goals and success criteria are critical to reducing and managing risk and uncertainty for the proposed project (see **Success Criteria and Monitoring**). The proposed project is downstream from a regulated dam and heavily developed watersheds, making continued surface water monitoring and regulation for surface water quality important to the success of the proposed project. Shellfish harvest is prohibited in the project area, which will improve the potential for success of the project and provide a de facto sanctuary for future recruitment. The need for continued reef replenishment to maintain restored reefs, based on a decline in recruitment seven years after restoration (Harding et al., 2012), is also a consideration. Monitoring data will be used to assess the effects of restoration methods and are critical to managing project risks and uncertainties.

## Success Criteria and Monitoring

Potential success criteria for the proposed project include:

- Increases in areal extent of oyster reefs;
- Increases in average reef height;
- Increases in oyster density, and
- Oyster size-frequency distribution representative of a sustainable oyster population.

More specific quantitative criteria will be developed within planning and monitoring frameworks developed for oyster reef restoration or enhancement in the Gulf (NOAA, 2016). Criteria for three environmental variables (water temperature, salinity, and dissolved oxygen) are also recommended (Baggett et al., 2014). Well-defined goals and objectives, statistically sufficient monitoring designs, and project documentation are critical to the success of the proposed project. The implementation grant request will include a detailed monitoring program design that addresses goals, objectives, data collection, and data assessment and evaluation for these success criteria.

## Milestones and Schedule

Construction completion is anticipated within two years following planning, design, and permitting. Monitoring is planned to inform and support this and future restoration projects and will continue for the life of the proposed project.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Project Design and Permitting												
Permitting Complete												
Contractor Selected												
Restoration/ Barge Shelling												
Complete Cultch Placement												
Certification												
Success Monitoring												

### Budget and Funding Sources

The project budget was developed based on previous oyster restoration specific to Florida's west coast, with estimates ranging from about \$75 to \$120 per cubic yard of material and \$15,000 to \$25,000 per acre of material placed. Planning deliverable is permitting and manatee river restoration for estuary and river.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$300,000
Implementation		\$1,500,000
Success Monitoring		\$200,000
<b>Total Cost</b>		<b>\$2,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$2,000,000
Direct Component		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$2,000,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA		\$0

If additional leveraged funds become available, they would be applied to the areal expansion of the reef restoration project as well as the development of a shellfish hatchery to provide a source of oyster larvae to local oyster reefs and others along the Gulf Coast.

### Partnerships/Collaboration

Potential project partners include University of Florida/Institute of Food and Agricultural Sciences, Florida Fish and Wildlife Conservation Commission (FFWCC), Tampa Bay Estuary Program, Sarasota Bay Estuary Program, Tampa and Sarasota Bay Watch programs, Gulf of Mexico Shellfish Initiative, Gulf Shellfish Institute, Mote Marine Lab, and the Nature Conservancy. Coordination with the following agencies is anticipated: FDACS, FFWCC, FDEP, Southwest Florida Water Management District, National Marine Fisheries Service, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service.

## MANATEE COUNTY

# Robinson Preserve Expansion and Upland Restoration

PROJECT NO. 18-2

### Project Description

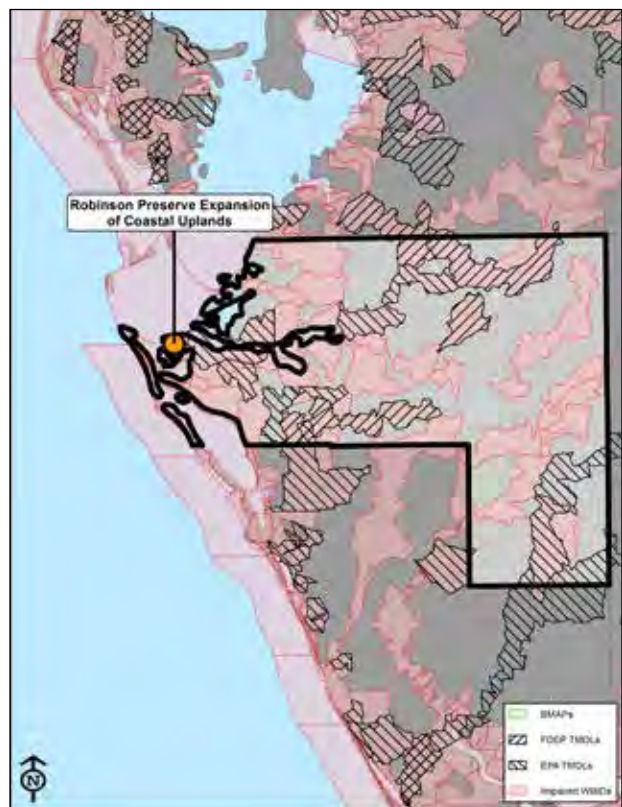
#### OVERVIEW AND LOCATION

This project involves the expansion of the coastal upland portions of the Robinson Preserve, a major habitat restoration project located in both the Tampa Bay and Sarasota Bay watersheds. The general location of Robinson Preserve is shown in **Figure 18-2A**.

#### NEED AND JUSTIFICATION

Robinson Preserve is a 487-acre preserve that was created through the transformation from disturbed farmland to coastal wetland and upland habitats. To restore the land to its natural state, the Manatee County Natural Resources Department has partnered with a number of state and local agencies. Funding for Robinson Preserve was provided by Florida Communities Trust Florida Forever Program as well as the Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, Sarasota Bay Estuary Program, Florida Communities Trust, Army Corps of Engineers, and Southwest Florida Water Management District. The project was initiated in 2005, and most of the proposed restoration has been completed.

To date, numerous exotic invasive plants have been removed, effectively opening up the land for native plants to flourish. The preserve's new waterway system will help restore the tidal flow within the coastal habitats. Robinson Preserve also features numerous recreational opportunities for the community. Resources for low-impact environmental activities include hiking and biking trails and a canoe/kayak launch. Additional amenities include observation towers and platforms, picnic areas, and a visitor's center.



**Figure 18-2A.** Project location in Manatee County.



## SECTION V: Proposed Projects, Programs and Activities

Spill Impact Component funds are needed to complete the approximate 150 acres of coastal uplands in the Preserve. Most of these areas were recently filled to upland elevations and re-graded to increase the long-term resiliency of the Preserve by providing coastal uplands to accommodate sea level rise.

### PURPOSE AND OBJECTIVES

The purpose of this project is to complete the coastal uplands portion of the Robinson Preserve.

The objectives of the project are:

- 1) enhance native upland coastal habitats in the Preserve; and,
- 2) increase the resiliency of the Preserve by providing coastal uplands to accommodate sea level rise.



**Figure 18-2B.** Aerial photograph of the Robinson Preserve and the proposed upland restoration areas.

### PROJECT COMPONENTS

The project involves: 1) procurement of plant materials; 2) planting of upland areas; and, 3) monitoring and maintenance of the restored areas. Grading and planting plans have been completed, and necessary permits have been obtained by Manatee County. **Figure 18-2B** shows an aerial photograph of the Robinson Preserve and the proposed upland restoration areas.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will restore native coastal upland habitats in the Robinson Preserve which will complement the created wetland habitats to create a mosaic of habitat within the Preserve.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 1: Restore and Conserve Habitat.

This project is consistent with, and addresses, the following Comprehensive Plan Objective:

- Objective 1: Restore, Enhance, and Protect Habitats.



## Implementing Entities

Manatee County will be the sole implementing entity and grant sub-recipient responsible for the construction, and success monitoring of the project.

## Best Available Science and Feasibility Assessment

The planting design for the upland restoration areas of the Robinson Preserve were based on well-established guidelines for native coastal habitats. A key reference utilized in the development of coastal planting plans is cited below:

- Barnett, E.R. and D.W. Crewz, 1997. Common Coastal Plants in Florida: A Guide to Planting and Maintenance. University of Florida Press; ISBN 13: 978-0-8130-1551-4.

This project is considered to be feasible in terms of the ability: 1) construct the project within the proposed budget; and 2) effectively maintain the project components over the long term.

## Risks and Uncertainties

In the evaluation of this project no significant risks or uncertainties with identified. Manatee County and its project partners have demonstrated a high level of success in the restoration of the Robinson Preserve.

## Success Criteria and Monitoring

This project will improve upland habitat quality and diversity in a large restoration project. It is anticipated that quantitative success criteria will be developed for:

- Acres of coastal upland habitats restored;
- Percent cover of invasive nuisance and exotic species post-restoration.

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Manatee County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of these project is approximately five years. The project components have been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Procure Planting Materials												
Construction (plantings)												
Success Monitoring												

## Budget and Funding Sources

Manatee County has developed a preliminary total cost estimate of \$960,000 for this project, based on available unit costs for similar projects in the area. The project budget and secured funding sources are shown in the table below:

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$0
Implementation		\$900,000
Monitoring		\$60,000
<b>Total Cost</b>		<b>\$960,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$960,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$960,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		

## Partnerships/Collaboration

Manatee County may partner with the Southwest Florida Water Management District for additional funding through District's cooperative funding program.

## MANATEE COUNTY

# Living Shoreline Creation – Portosueno Park

PROJECT NO. 18-3

## Project Description

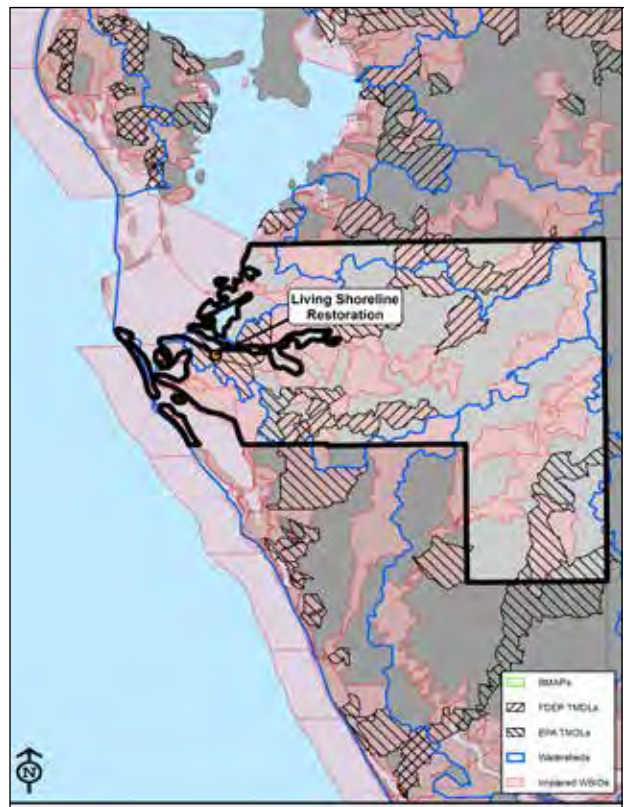
### OVERVIEW AND LOCATION

This project involves the construction of a living shoreline along an existing vertical seawall at Portosueno County Park, on the east side of Palma Sola Bay. The general location of the park is shown in **Figure 18-3A**.

### NEED AND JUSTIFICATION

Portosueno Park is a small embayment on the east side of Palma Sola Bay. The park was developed originally by dredging the basin and filling the adjacent areas for residential development. Vertical seawalls were constructed along the entire perimeter of the park. There is no functional intertidal habitat in the park, and water quality is impacted by residential runoff. **Figure 18-3B** shows an aerial photograph of the existing park.

This project will replace the seawall in with a linear living shoreline, as well as marsh plantings on the east end of the basin, to both improve habitat quality and diversity, as well as water quality. Palma Sola Bay is a designated Outstanding Florida Water (OFW) under the management purview of the Sarasota Bay National Estuary Program. Pursuant to Florida law, pollutant discharges that cause a degradation in water quality in an OFW are prohibited. Therefore, restoring the natural habitats and associated water quality treatment functions in the park are justified to protect the estuarine receiving waters.



**Figure 18-3A.** Project location in Manatee County.

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of this project is to partially restore natural intertidal wetland habitats in Portosueno County Park. The objectives of the project are to: 1) restore fish and wildlife habitat functions; 2) reduce pollutant loadings to Palma Sola Bay by treating stormwater runoff from adjacent residential areas; and 3) improving fishing and aesthetics for park users.



**Figure 18-3B.** Aerial photograph of Portosueno County Park.

### PROJECT COMPONENTS

The project involves: 1) modifications to, or replacement of, the existing seawall; 2) backfilling with clean sand and natural lime rock rip-rap; and 3) planting with native species, including both mangroves and salt marsh species. A conceptual restoration plan for Portosueno Park is shown in **Figure 18-3C** below.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will partially restore natural intertidal habitats in a dredged and hardened urban basin, and will enhance water quality treatment of surface waters to reduce pollutant loads to Palma Sola Bay.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat (primary); and
- Goal 2: Restore Water Quality and Quantity.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats (primary); and
- Objective 2: Restore, Improve, and Protect Water Resources.

## Implementing Entities

Manatee County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the project.



**Figure 18-3A.** Portosueno conceptual restoration plan.

## Best Available Science and Feasibility Assessment

The benefits of living shoreline applications along hardened urban shorelines are well documented. A key document used as the basis for this project is cited below:

- NOAA, 2015. Guidance for Considering the Use of Living Shoreline. National Oceanic and Atmospheric Administration Living Shorelines Workgroup.

Based on local precedents, this project is considered to be feasible in terms of the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

## Risks and Uncertainties

In the evaluation of this project no significant risks or uncertainties with identified. As part of the engineering design and permitting of this project it is likely that hydraulic modeling will be required to calculate maximum inflow velocities, and to design the project to prevent scouring and erosion of the restored areas.

## Success Criteria and Monitoring

This project will affect habitat quality, marine living resources, and water quality. Therefore, a range of success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Change in percent cover of native intertidal species; and
- Changes in ambient surface water quality within the park basin.

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Manatee County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of these project is approximately four years. The expected start date is 2018, and the expected end date is 2021. Implementation of these projects has been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Engineering Design & Permitting												
Construction												
Success Monitoring												

## Budget and Funding Sources

Manatee County has developed a preliminary total cost estimate of \$1,000,000 for this project, based on available unit costs for similar projects in the area. The project budget and secured funding sources are shown in the table below:

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$30,000
Implementation		\$950,000
Monitoring		\$20,000
<b>Total Cost</b>		<b>\$1,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,000,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$1,000,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		

## Partnerships/Collaboration

Manatee County may partner with the Southwest Florida Water Management District for additional funding through District's cooperative funding program, as well as with the Sarasota Bay National Estuary Program.



## MANATEE COUNTY

# Preserve Management Plans

PROJECT NO. 18-4

## Project Description

### OVERVIEW AND LOCATION

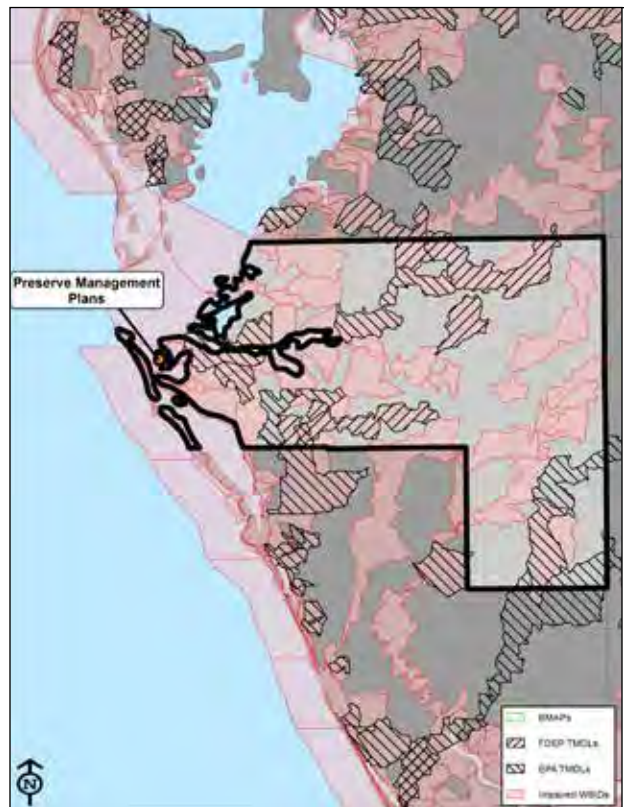
This project involves the development of natural resource plans for preservation lands owned and managed by Manatee County. The locations of the county-owned preserve lands to be addressed by this project is shown in **Figure 18-4A**.

### NEED AND JUSTIFICATION

Manatee County has acquired more than 27,000 acres of natural areas under the management responsibility of a county land management team. However, several sites are operating under older management plans that require significant updates that take into account advancements in the science of conservation lands management, and the ever evolving needs of its diverse user groups. The largest site to be addressed under this project is the Duette Watershed Preserve, which is a 21,000-acre tract in the headwaters of the Manatee River, a major tributary to Tampa Bay. In addition, the Rye Preserve, located in the tidal Manatee River, will also be addressed. **Figure 18-4A** shows the location of these two preserves in Manatee County.

### PURPOSE AND OBJECTIVES

The purpose of this project is to develop updated natural resource management plans for preservation lands owned and operated by Manatee County. The objectives of the project are to restore and/or protect habitat quality and resource management in county-owned preserve lands in the headwaters of coastal tributaries.



**Figure 18-4.** Project location in Manatee County.

## SECTION V: Proposed Projects, Programs and Activities

### PROJECT COMPONENTS

For each preserve site, the following components will be addressed: 1) current resource assessments of plant communities, and fish and wildlife resources; 2) stakeholder input; and 3) the development of natural resource management plans. These plans will consider land management activities that restore: native habitat quality and diversity (e.g., controlled burns), including exotic species eradication and management; fish and wildlife resources; and hydrology and water quality (e.g., ditch blocks). In addition, the plans will include measures to improve public access for appropriate passive recreational activities.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will restore, preserve and protect native habitats, fish and wildlife resources, and natural hydrology and water quality in the headwaters of coastal watersheds in Manatee County.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat (primary); and
- Goal 2: Restore Water Quality and Quantity.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats (primary); and
- Objective 2: Restore, Improve, and Protect Water Resources.

### Implementing Entities

Manatee County will be the sole implementing entity and grant sub-recipient responsible for the implementation and success monitoring of this project.

### Best Available Science and Feasibility Assessment

The development of preserve management plans will be informed by the most current literature on Florida exotic species management, controlled burns, species management, and hydrologic restoration. Where applicable, experts from Florida resource management agencies, including the Florida Forest Service and Florida Fish and Wildlife Conservation Commission.

This project is considered to be feasible in terms of the ability to: 1) complete the project components within the proposed budget; and 2) execute the preserve management plans.

## Risks and Uncertainties

In the evaluation of this project no significant risks or uncertainties with identified.

## Success Criteria and Monitoring

This project will generate updated natural resource management plans which, upon plan execution, are expected to improve or enhance natural resources in priority preserves. Therefore, a range of success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Acres of county-owned preserve lands addressed by updated management plans
- Acres of native habitats improved or enhanced by activities proposed in the preserve management plans.

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Manatee County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of these project is approximately six years. The project components are broken down in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Complete Resource Assessments												
Stakeholder Input												
Preparation of Management Plans												
Success Monitoring												

### Budget and Funding Sources

Manatee County has developed a preliminary total cost estimate of \$300,000 for this project. Implementation in this case is the completion of the preserve management plans. The project budget and secured funding sources are shown in the table below:

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$100,000
Implementation		\$280,000
Monitoring		\$20,000
<b>Total Cost</b>		<b>\$300,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$300,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$300,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		

### Partnerships/Collaboration

Manatee County may partner with the Southwest Florida Water Management District for additional funding through District's cooperative funding program.

# MANATEE COUNTY Project Title

PROJECT NO. 18-5

## Project Description

### OVERVIEW AND LOCATION

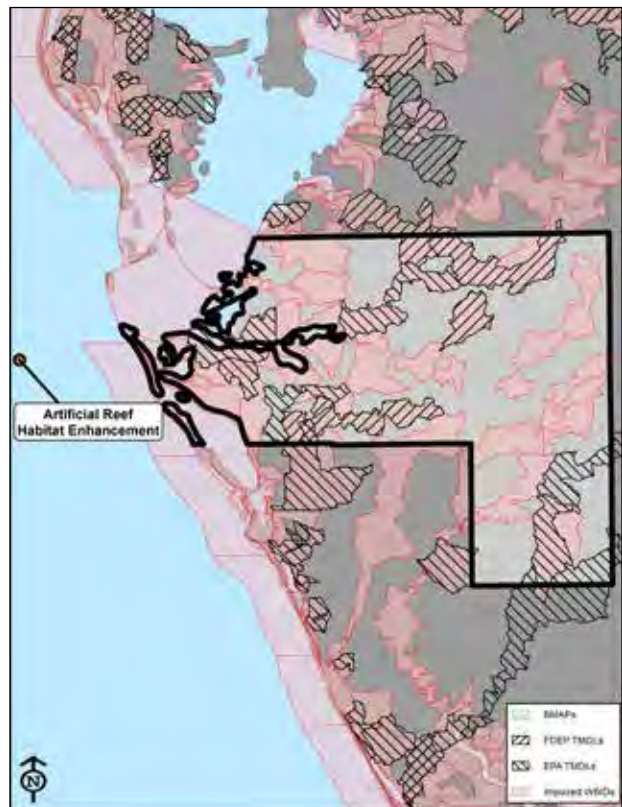
The proposed project includes acquisition, transport, and deployment of natural limestone boulders into an existing permitted Manatee County artificial reef site located approximately seven nautical miles offshore (see **Figure 18-5A**).

### NEED AND JUSTIFICATION

Manatee County has a need to expand its existing artificial reef program in response to the increasing recreational demand for offshore bottom fishing and scuba diving opportunities in its coastal waters. On a daily basis, an average of more than 540 persons in Manatee County – residents and visitors included – use artificial reefs (Adams 2011). The County's artificial reef program began in the 1960s and has deployed a total of 11 artificial reefs, focusing on activities such as fishing and diving with resource conservation. Hard substrate and vertical structure are limited habitats in the Gulf of Mexico (Fikes, 2013) and artificial reef habitats can provide: 1) hard substrate to support encrusting and colonial benthic organisms such as sponges and corals; 2) niche space for small marine invertebrates; and 3) shelter for larval and juvenile fishes. The project is justified by the demonstrated economic benefits of artificial reefs (Adams et al., 2011).

### PURPOSE AND OBJECTIVES

The purpose of this project is to augment an existing permitted Manatee County artificial reef site with natural limestone boulders. The objectives of the project are to: 1) support the increasing recreational demand for offshore reef fishing and scuba diving opportunities; and 2) enhance the abundance, distribution, and structural diversity of

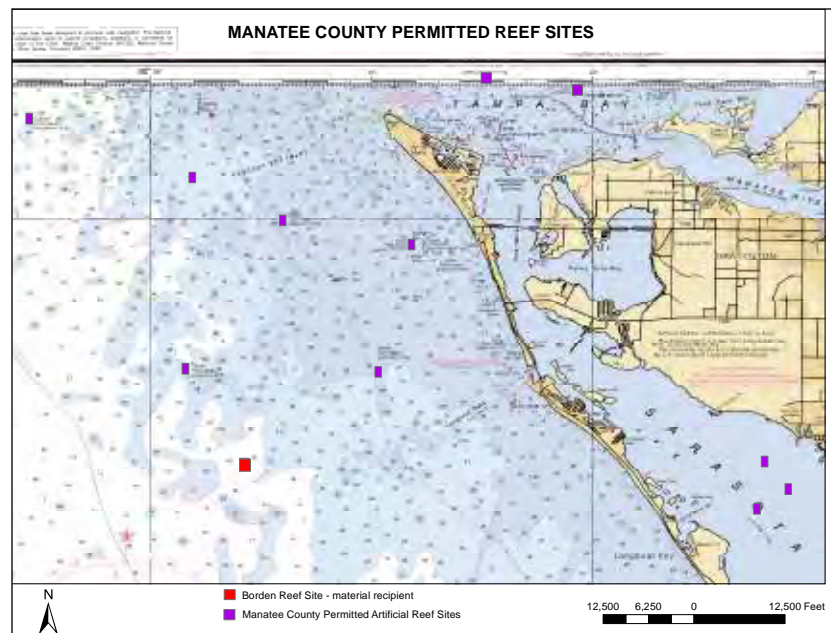


**Figure 18-5A.** Project location in Manatee County.

## SECTION V: Proposed Projects, Programs and Activities

hardbottom habitat in the county's coastal waters. Objectives are consistent with those of the Florida Fish and Wildlife Conservation Commission's (FWC) artificial reef program outlined below.

1. Enhance private recreational and charter fishing and diving opportunities;
2. Provide a socio-economic benefit to local coastal communities;
3. Increase reef fish habitat;
4. Reduce user conflicts;
5. Facilitate reef related research; and
6. While accomplishing objectives 1-5, do no harm to fishery resources...or human health.



**Figure 18-5B.** Location of existing permitted artificial reef sites in Manatee County.

### PROJECT COMPONENTS

This project involves two primary components. The first component is to identify and acquire a sufficient amount of natural limestone boulders, and then to prepare and stockpile this material at an existing staging area. The second component is to transport these materials to the currently permitted artificial reef location off the coast of Manatee County via a barge, and deploy the materials to create high quality fish habitat. The locations will be published to the public and will remain available for public use for recreational fishing and diving. Post construction monitoring will also be conducted to ensure the deployment of this material produced high quality habitat that supports important reef fish species (e.g., grouper, snapper).

Manatee County currently manages 11 permitted artificial reef sites, as shown in **Figure 18-5B**. Material acquired through this project will be distributed at the Borden Reef site, with its center point located at the latitude/longitude coordinates: 27.407883° / -82.797383°. Additional planning assistance will be required for permitting, design, and implementation of the proposed project.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

Manatee County's beaches and coastal waters support an enormous tourism industry. This project will: 1) support the increasing recreational demand for offshore reef fishing and scuba diving opportunities by both residents and tourists; and 2) enhance the abundance, distribution, and structural diversity of hardbottom habitat in offshore waters of Manatee County.



## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activity:

- Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing (primary);
- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region; and
- Activity 8: Planning assistance.

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 5: Restore and Revitalize the Gulf Economy (primary);
- Goal 1: Restore & Conserve Habitat; and
- Goal 3: Replenish & Protect Living Coastal & Marine Resources.

This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (primary);
- Objective 1: Restore, Enhance and Protect Habitats; and
- Objective 3: Protect and Restore Living Coastal and Marine Habitats.

## Implementing Entities

Manatee County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction and success monitoring of the program.

## Best Available Science and Feasibility Assessment

Artificial reefs in the Gulf of Mexico have been extensively studied with regard to the habitat and economic benefits they provide. The scientific literature on the ecological benefits is somewhat controversial (Lindberg et al., 2014, Fikes, 2013, Bortone et al. 1994, others). Some experts argue that artificial reefs are functionally comparable to natural reefs and they augment fish populations by providing habitat that is naturally limiting in the Gulf of Mexico. Others argue that artificial reefs simply attract and aggregate existing fish populations, but do not enhance overall fish stocks. While those conclusions may be debatable, the economic benefits of artificial reefs are not. Artificial reefs provide significant recreational opportunities and associated benefits along the Gulf coast of Florida, including annual expenditures associated with reefs of Manatee County (**Figure 18-5C**) of more than \$23M (Adams et al., 2011, Swett et al., 2011). Research has produced best practices guidance on site selection, design features, and construction methods, criteria that are now part of the FWC permitting regulations. Key literature that forms the basis for the Manatee County Artificial Reef Program are cited below.

- Adams, C., et al., 2011. The economic benefits associated with Florida's artificial reefs. EDIS document FE649 (2011): 1-6.

## SECTION V: Proposed Projects, Programs and Activities

- Bortone, S.A., Martin, T., Bundrick, C.M. 1994. Factors affecting fish assemblage development on a modular artificial reef in a northern Gulf of Mexico estuary. *Bull. Mar. Sci.* 55 (2-3), 319-332.
- Fikes, R., 2013. Artificial Reefs of the Gulf of Mexico: A Review of Gulf State Programs & Key Considerations. National Wildlife Federation.
- Lindberg, W.J., et al., 2014. Rationale and Evaluation of an Artificial Reef System Designed for Enhanced Growth and Survival of Juvenile Gag, *Mycteroperca microlepis*. *Proc. 66th Gulf and Caribbean Fisheries Institute* November 4 – 8. Corpus Christi, TX. Pages 320-325.
- Swett et al., 2011. Economic Impacts of Artificial Reefs for Six Southwest Florida Counties. Florida Sea Grant.



**Figure 18-5C.** Manatee County artificial reef site (source: Manatee County Artificial Reef Program).

This project is feasible with respect to the ability to: 1) use currently open permits; 2) construct the project within the proposed budget; 3) effectively operate and maintain the project components over the long term. The permitting of the offshore artificial reef sites has been facilitated through Nationwide U.S. Army Corps of Engineers (USACE) permits and through the FWC for site specific state criteria. Furthermore, this project is consistent with the National Artificial Reef Plan published in 1985, the Florida Artificial Reef Strategic Plan (FWC, 2003).

### Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this project that would preclude project implementation. Manatee County will ensure design to limit damage from tropical storms. Controls for lionfish and other nuisance/exotic species may be required. Regulatory constraints will address issues such as spatial boundaries for navigation, channels, marine habitat resources, historical areas, sand borrow areas, existing structures and leases, etc. Success monitoring is critical in a fisheries management context given these reefs have not previously been used as fisheries management tools.

### Success Criteria and Monitoring

This and all artificial reef projects involve the placement of hard substrate to: support recreational demand for offshore reef fishing and scuba diving opportunities; and enhance the abundance, distribution, and structural diversity of hardbottom habitat in the affected waters. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Increase in the areal extent of new artificial reef habitat;
- Metrics on the recruitment of benthic encrusting organisms and fish; and
- Increase in recreational usage.

The proposed project will be constructed consistent with the Gulf States Marine Fisheries Commissions Guidelines for Artificial Reef Materials (2004). In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Manatee County, is committed to conducting the monitoring necessary to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this project is approximately four years. The expected start date is 2018, and the expected end date is 2021. The anticipated project milestones and schedule are shown in the chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Public Outreach and Surveys												
Collect, Prepare and Stage Reef Materials												
Transport Material to Permitted Reef Sites												
Success Monitoring												

## Budget and Funding Sources

Manatee County has estimated the total cost of this project to be approximately \$1,000,000. The project budget and secured funding sources are shown in the table below.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$100,000
Implementation	\$800,000
Monitoring	\$100,000
<b>Total Cost</b>	<b>\$1,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$1,000,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$1,000,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
FWC Artificial Reef Construction Grants	

## Partnerships/Collaboration

The Manatee County Artificial Reef Program routinely collaborates with the Florida Artificial Reef Program managed by the FWC. This collaboration includes representatives from nearly all coastal counties in Florida and assists with material collection resources, technical construction assistance, artificial reef construction best practices, and outreach.

## MANATEE COUNTY

# Palmetto Greene Bridge Fishing Pier Replacement

PROJECT NO. 18-6

## Project Description

### OVERVIEW AND LOCATION

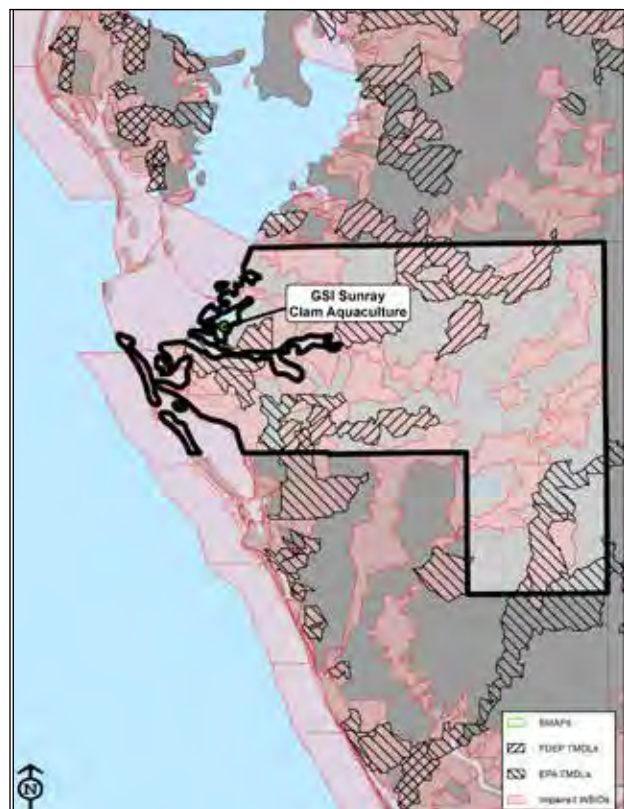
This project involves the demolition and replacement of an old concrete highway bridge, which is functioning as a public fishing pier, with a new wooden fishing pier. The project is located in the Manatee River, between the cities of Palmetto and Bradenton. The Manatee River is a major tributary to Tampa Bay. The project location is shown in **Figure 18-6A**.

### NEED AND JUSTIFICATION

The original Greene bridge was constructed in the 1940s as a two-lane highway crossing the Manatee River, connecting the cities of Palmetto and Bradenton. The bridge was replaced in 1986 with a new four-lane span. The southern half of the original bridge was demolished while the northern half of the bridge was retained and retrofitted to serve as a public fishing pier. It is a popular local fishing amenity; however, the old concrete bridge is no longer structurally sound. Due to liability concerns, the bridge needs to be decommissioned and demolished within the by 2022. **Figure 18-2B** shows an aerial photograph of the old bridge, immediately west of the new bridge, while **Figure 18-2C** shows a ground level photograph of the existing concrete fishing pier.

### PURPOSE AND OBJECTIVES

The purpose of this project is to replace the old concrete bridge with a new wooden structure designed specifically to serve as a public fishing pier, with supporting amenities. The objective of the project is to improve recreational fishing opportunities on the Manatee River.



**Figure 18-6A.** Project location in Manatee County.

## PROJECT COMPONENTS

Project components include: 1) permitting and demolition of the old bridge; and 2) design, permitting, and construction of the new fishing pier and amenities; and 3) monitoring public usage of the pier. Manatee County manages an artificial reef program (see Project 18-6), and intends to utilize debris from the demolition of the old bridge on permitted offshore artificial reef sites. This project may also include additional habitat enhancement features such as a living shoreline.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will contribute to improved public recreation and enhanced fishing opportunities in a densely urbanized area. The project is also expected to have a positive economic impact on Manatee County measured in terms of increased fishing trips and related tourism and recreational revenues.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Activity 10: Promotion of tourism in the Gulf Coast region, including recreational fishing.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 5: Restore and Revitalize the Gulf Economy.

There is no Comprehensive Plan Objective that addresses economic projects. However, this project is consistent with the following adopted Gulf Consortium objective:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.

## Implementing Entities

Manatee County will be the sole implementing entity and grant sub-recipient responsible for the engineering design, permitting, construction, operation and maintenance, and success monitoring of this project.



**Figure 18-6B.** Aerial photograph of the old bridge, immediately west of the new bridge.





**Figure 18-6C.** Ground level photograph of the existing concrete fishing pier.

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### Best Available Science and Feasibility Assessment

Appropriate Best Available Science criteria related to fishing pier designs will be addressed in the implementation grant request. This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the pier within the proposed budget; and 3) effectively operate and maintain the pier over the long term.

### Risks and Uncertainties

In the evaluation of this project, no significant risks have been identified that would preclude implementation. The project design will consider sea level rise and sustainability. This project is ready to begin planning, design, and permitting.

### Success Criteria and Monitoring

The objective of this project is to improve recreation fishing opportunities, so the appropriate success criteria is:

- Changes in the number of annual fishing trips between the old and new fishing piers.

It may also be possible to measure economic impacts of the new fishing pier. In the implementation grant request, a monitoring program will be described that addresses data collection and assessment methodologies for the above listed criteria.



## Milestones and Schedule

The total estimated time horizon of this project, from planning through success monitoring, is approximately eight years. The expected start date is 2018, and the expected end date is 2025. The County will operate and maintain the facility in perpetuity. Implementation of this project has been broken down into five milestones, or phases, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Conceptual Design												
Engineering and Permitting												
Demolition of the Old Bridge												
Construction of the New Fishing Pier												
Monitoring												

## Budget and Funding Sources

Manatee County has estimated the cost of this project to be approximately \$5,000,000, based on comparable projects. The project will be appropriately sized and designed to fit within the proposed budget.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$500,000
Implementation	\$4,400,000
Monitoring	\$100,000
<b>Total Cost</b>	<b>\$5,000,000</b>
<b>SECURED FUNDING SOURCES</b>	
Spill Impact Component	\$3,000,000
Direct Component	\$0
Other Grants or Co-Funding	\$0
Other County Funds	\$0
<b>Total Secured Funding</b>	<b>\$3,000,000</b>
<b>Budget Shortfall</b>	<b>\$2,000,000</b>
<b>POTENTIAL LEVERAGED FUNDING SOURCES</b>	
FDOT	\$1,000,000
SWFWMD Cooperative Funding	\$1,000,000

If additional leveraged funds become available, they will be used to design and construct habitat enhancement features such as a living shoreline.

## Partnerships/Collaboration

It is anticipated that Manatee County will coordinate closely with the Florida Department of Transportation, as well as the cities of Palmetto and Bradenton. In addition, habitat enhancement components may be co-funded by the Southwest Florida Water Management District.

## MANATEE COUNTY

# Gulf Coast Shellfish Institute: Applied Research for Shellfish Aquaculture and Habitat Restoration

PROJECT NO. 18-7

## Project Description

### OVERVIEW AND LOCATION

This project will provide funding to the Gulf Shellfish Institute, Inc. (GSI), a non-profit organization, to conduct an applied research program to increase the production and availability of locally grown, and sustainably produced shellfish for local markets. The focus of this project would be on approved shellfish harvesting areas in Manatee County (see **Figure 18-7A**).

### NEED AND JUSTIFICATION

The United States imports 91 percent of its seafood from other countries, resulting in an annual seafood trade deficit of over \$11 billion, and yet the nation currently ranks 15th in aquaculture production in the world (NMFS, 2016). Increased development of the aquaculture industry in the U.S. would have several economic benefits, including a reduction of the trade deficit, the establishment of new businesses, the creation of new jobs, and the revitalization of working waterfronts and coastal economies. This would be spurred by the need for more hatcheries, more processing facilities, and more equipment manufacturers and suppliers of goods and equipment for working on and in the water. According to Rubino (2008), if U.S. aquaculture production were doubled, 50,000 additional jobs and \$1 billion in additional farm-gate revenue would be produced. An added advantage of greater local production would be the knowledge of where and how seafood is being produced and processed, information that is often lacking for imported seafood products. We would be able to ensure that locally grown seafood products are safe, fresh, and sustainably-produced.



**Figure 18-7A.** Project location in Manatee County.

In spite of this tremendous economic opportunity, aquaculture in the U.S. has not realized its potential for a number of reasons. First, aquaculture is seen as a threat to traditional users of the coastal zone, where most marine aquaculture would occur. This includes both commercial harvest fisheries and recreational uses. In addition, the regulatory climate in the U.S. does not favor aquaculture development. Most coastal states have mechanisms for acquiring leases, but there are also numerous local, state and federal agencies to comply with. Most importantly, funding for research and development of aquaculture in this country has been inadequate for effectively stimulating its growth.

Increased funding for research can help the industry become more efficient, productive, and profitable. To date, however, federal funding for aquaculture research since 1990 has totaled only \$1 billion compared to the U.S. Department of Agriculture expenditure on research (for agriculture) of \$41 billion (Love et al., 2017). In spite of the small amount of funding devoted to aquaculture research, it has resulted in increased production. Since 2000, federal funding for aquaculture research has had a 37-fold return on investment (Love et al. 2017). A related study examining policy options for expanding oyster aquaculture in Virginia found that research focused on increasing growth rates, reducing mortality rates, and reducing the cost of seed would significantly increase returns to oyster aquaculture (Bosch et al., 2010). This has been proven true by the rapid expansion of oyster aquaculture in Virginia.

Florida ranks sixth in aquaculture production in the U.S., with total sales of \$77.9 million in 2013 (USDA, 2014). The largest segment of the Florida aquaculture industry is ornamental fish (\$26 million); however, hard clams are the most important food item produced (\$11.6 million). Production of shellfish, especially marine bivalves, is one area where Florida could significantly expand its production. In addition to the hard clam, *Mercenaria mercenaria*, there is considerable potential for expanding the production of oysters, *Crassostrea virginica*, given the decline of natural populations in Apalachicola Bay (and throughout the United States). Adding new species, such as the sunray venus, *Macrocallista nimbosa*, would help diversify the industry. The bay scallop, *Argopecten irradians*, is an important recreational fishery along the central west coast of Florida. Hatchery production of this species has also been used to enhance natural stocks.

There are several factors that make expansion of the shellfish (clams, oysters, scallops) aquaculture industry in Florida desirable. First, the advantage of growing shellfish instead of finfish is that nothing is added to the water. They obtain their food (phytoplankton) from the natural environment. Thus the culture of shellfish is truly sustainable. In fact, their feeding activity actually helps clean the water by removing suspended particulate organic matter (phytoplankton, detritus) and making it available to the benthos (see **Figure 18-7B**). A review of the ecological

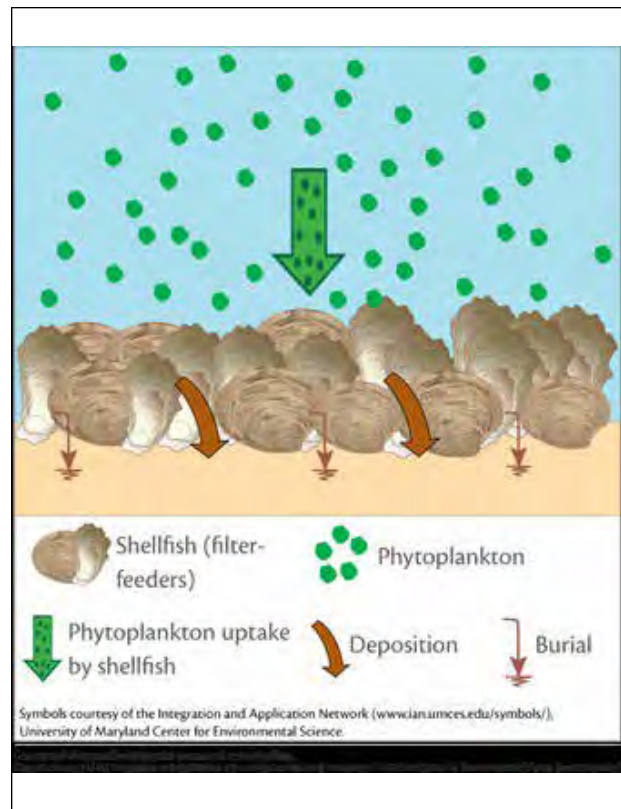


Figure 18-7B. Illustration of the process of benthic-pelagic coupling and its positive effects on water quality.

## SECTION V: Proposed Projects, Programs and Activities

services provided by filter feeding bivalves was provided, along with estimates of economic value, was provided by Northern Economics, Inc. (2009). Second, since shellfish live on the bottom, shellfish farms are not visible from the surface. Third, there is an abundance of optimal habitat in Florida, especially on the shallow west coast (including Manatee County), where three estuaries have been designated as part of the National Estuary Program. This means that Tampa Bay, Sarasota Bay, and Charlotte Harbor all have Comprehensive Conservation Management Plans to address water quality and living resource issues. Thus, it makes sense to encourage the expansion shellfish farming for both economic and ecological reasons.

At present, however, Florida is only utilizing a small proportion of available habitat. There are 280,000 acres of approved shellfish harvesting waters, but at present there are only 2,250 acres of leased bottom being used for shellfish culture (S. Rocco, FDACS, Pers. Comm.), or less than one percent of available submerged land. From this standpoint alone, current shellfish aquaculture production could be increased one hundred-fold over current levels to help meet local demand and reduce the domestic seafood trade deficit.

### PURPOSE AND OBJECTIVES

The purpose of this research program is to increase the production and availability of locally grown, sustainably produced shellfish for local markets. The benefits will be the increased availability of fresh, high quality seafood, an improved local economy and a healthier coastal environment.

This goal will be accomplished through applied research objectives that addresses current bottlenecks or limitations in the commercial production cycle. These potentially include aspects of:

- Hatchery production of seed organisms;
  - Conditioning and spawning of broodstock
  - Microalgal production
  - Larval rearing
  - Probiotics
  - Nursery production
- Growout and harvesting;
- Genetic selection and polyploids;
- Predation and disease; and
- Environmental threats
  - Harmful algal blooms
  - Climate change.

### PROJECT COMPONENTS

The Gulf Shellfish Institute, Inc. (GSI) is a non-profit organization, whose mission is to facilitate, support and encourage increased production of shellfish in Florida and the Gulf region for both economic and environmental benefit through cooperative, industry-driven research and outreach. Although GSI's mission is regional, it will utilize RESTORE funds to focus on increasing the production of sustainably produced shellfish (oysters, clams and scallops) in Manatee County. In turn, this will strengthen the coastal economy as well as improve nearshore water quality and habitats in southwest Florida through the ecological services provided by shellfish.

Phase 1 of this program will be initiated with a Department of Treasury planning grant, funded with Manatee County Direct Component monies. GSI will solicit input from the shellfish industry to determine the most critical

technical issues that currently limit shellfish production in Florida. These issues will be prioritized and an approach for addressing the issues through applied research will be developed. Phase 2 will involve collecting preliminary data and applying for research funding to local, state and federal funding agencies. Spill Impact Component funds will be utilized as match (where appropriate) and to conduct research for which other funding is not available. Phase 3 will involve conducting the research (in collaboration with industry partners); synthesizing data; and transferring information directly to the industry. Application for research funding will be an ongoing process. Spill Impact Component monies will be utilized directly for research and as match for external grant applications throughout the life of the program.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will contribute to the expansion of shellfish aquaculture investment and operations in southwest Florida, which in turn will contribute to the reduction in the U.S. seafood trade deficit. In addition, the project will increase local employment in the seafood industry and support working waterfronts in Manatee County. Finally, expansion of shellfish aquaculture in southwest Florida will improve local water quality and clarity conditions through the filter feeding ecosystem services provided by bivalves, which in turn will support the expansion of submerged aquatic vegetation.

## Eligibility and Statutory Requirements

This proposed program is consistent with, and addresses, the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast (primary);
- Activity 2: Mitigation of damage to fish, wildlife, and natural resources;
- Activity 4: Workforce development and job creation; and
- Activity 10: Promotion of Gulf seafood consumption.

## Comprehensive Plan Goals and Objectives

This program is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and protect living coastal marine resources;
- Goal 4: Enhance community resilience; and
- Goal 5: Restore and revitalize the Gulf economy.

This program is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, enhance and protect habitats;
- Objective 3: Protect and restore living coastal and marine resources; and
- Objective 5: Promote community resilience.

## Implementing Entities

Manatee County will be the implementing entity, while GSI will be the sub-recipient responsible for the planning, design, implementation, and delivery of the proposed research program.

### Best Available Science and Feasibility Assessment

The importance of shellfish to both the economy and ecological health of coastal regions has been well established, as summarized above. Key literature citations include the following:

- Adams, C., L. Sturmer and A. Hodges, 2014. *Tracking the Economic Benefits Generated by the hard clam Aquaculture Industry in Florida*. IFAS/University of Florida EDIS Document No. FE961, 6 pp.
- Bosch, D., N. Kuminoff, K. Stephenson, A. Miller, J. Pope and A. Harris, 2010. *Evaluation of policy options for expanding oyster aquaculture in Virginia*. *Aquaculture Economics & Management* 14: 145-163.
- Doering, P.H., J.R. Kelly, C.A. Oviatt and T. Sowers, 1987. *Effect of the hard clam Mercenaria mercenaria on benthic fluxes of inorganic nutrients and gases*. *Marine Biology* 94: 377-383.
- Love, D.C., I. Gorski and J.P. Fry, 2017. *An analysis of nearly one billion dollars of aquaculture grants made by the US federal government from 1990 to 2015*. *Journal of the World Aquaculture Society*, doi: 10.1111/jwas.12425.
- NMFS 2016. *Fisheries of the United States 2015*. A. Lowther and M. Liddel (editors), National Marine Fisheries Service, Office of Science and Technology, Silver Spring, MD, 135 pp.
- Northern Economics, Inc., 2009. *Valuation of Ecosystem Services from Shellfish Restoration, Enhancement and Management: A Review of the Literature*. Prepared for the Pacific Shellfish Institute, 58 pp.
- Peterson, C.H., 1986. *Enhancement of Mercenaria mercenaria densities in seagrass beds: Is pattern fixed during settlement season or altered by subsequent differential survival?* *Limnology and Oceanography* 31: 200-205.
- Riisgard, H.U., 1988. *Efficiency of particle retention and filtration rate in 6 species of Northeast American bivalves*. *Marine Ecology Progress Series* 45: 217-223.
- Rubino, Michael (editor). 2008. *Offshore Aquaculture in the United States: Economic Considerations, Implications & Opportunities*. U.S. Department of Commerce, Silver Spring, MD. NOAA Technical Memorandum NMFS F/SPO-103, 263 pp.
- USDA, 2014. *2012 Census of Agriculture*. National Agricultural Statistics Service. Volume 3, Special Studies, Part 2. AC-12-SS-2.

This research program is considered to be feasible. GSI is an established organization with a Board of Directors and proper financial controls.

### Risks and Uncertainties

By definition, the outcome of research is uncertain; pre-conceived notions are not a part of the scientific method. The reason that research is conducted is to gain a greater understanding of an unknown process or to answer a specific question. Future sources of research funding for shellfish aquaculture are uncertain. Funding agencies alter their



priorities over time. The total amount of funding available for research varies from year to year depending on state and federal budgeting processes. Therefore, this project is anticipated to reduce funding uncertainties and support locally-focused applied research will contribute to the expansion of shellfish aquaculture investment and operations in southwest Florida.

## Success Criteria and Monitoring

The success of this research program will be monitored and quantified as:

- The number of research projects initiated;
- The amount of external funding acquired;
- The increase in submerged land leased for shellfish farming;
- The increase in shellfish farmers (jobs); and
- The increase in the value of shellfish produced (economic value).

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria.

## Milestones and Schedule

This project will be implemented over a six-year period with a start date of 2018 and an end date of 2023. The milestone chart below shows the anticipated work effort over this time period.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Determine research priorities												
Design experiments												
Collect and analyze data												
Technology transfer												

## Budget and Funding Sources

The total cost for this research program is \$400,000, \$100,000 of which will come from Manatee County Direct Component funds.

## SECTION V: Proposed Projects, Programs and Activities

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$100,000
Implementation		\$250,000
Monitoring		\$50,000
<b>Total Cost</b>		<b>\$400,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$300,000
Direct Component		\$100,000
Other Grants or Co-Funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$400,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
FDACS / Aquaculture Research Council		
NOAA / NMFS / Sea Grant		
NOAA / NMFS / SK		

### Partnerships/Collaboration

Manatee County and GSI will continue to work with the following agencies and partners in the implementation of this research program:

- Federal Agencies
  - Southeast Regional Aquaculture Center (USDA)
  - NOAA Southeast Regional Office
- State Agencies
  - Aquaculture Review Council, Florida Division of Aquaculture
  - Florida Marine Research Institute (Florida Wildlife Commission)
- Local Agencies
  - County Governments
  - County Cooperative Extension Service
  - Tampa Bay Estuary Program
  - Sarasota Bay Estuary Program
  - Charlotte Harbor Estuary Program
- Associations
  - Florida Aquaculture Association
  - Cedar Key Shellfish Association
  - Southwest Florida Shellfish Association
- Research Entities
  - University of Florida / Sea Grant / IFAS
  - University of South Florida
  - Mote Marine Laboratory
  - Stanford Research Institute (SRI)
  - Eckerd College

## MANATEE COUNTY

Trail and Boardwalk  
Enhancements on  
Manatee County Coastal Preserves

PROJECT NO. 18-8

## Project Description

## OVERVIEW AND LOCATION

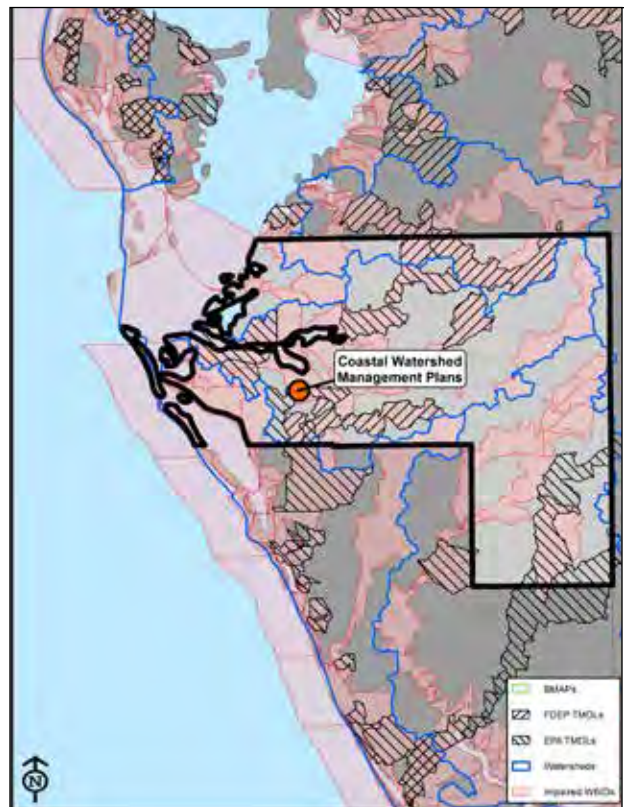
This project involves the construction of trails and boardwalks at three county-owned coastal preserves. The general location of the preserve lands addressed by this project is shown in **Figure 18-8A**.

## NEED AND JUSTIFICATION

Manatee County has acquired significant coastal land holdings for conservation and recreation. One of the most consistently praised elements of the recreational amenities that have been installed at these preserves are the trails, boardwalks, and observation decks which facilitate access across interior waterbodies and through mangrove swamps etc. They are one of the major draws to the preserves which receive over 800,000 visitors annually. In addition, where feasible, Manatee County is hoping to connect coastal preserves with pedestrian and/or bicycle trails to enhance the visitor experience. There is a need to expand these features in four county-owned coastal preserves including:

- Perico Preserve/Robinson Preserve Connector Trail;
- Ungarelli Preserve Boardwalks; and
- Hidden Harbor Preserve Trails and Boardwalks.

The locations of these preserves are shown in **Figure 18-8A** above.



**Figure 18-8A.** Project location in Manatee County.

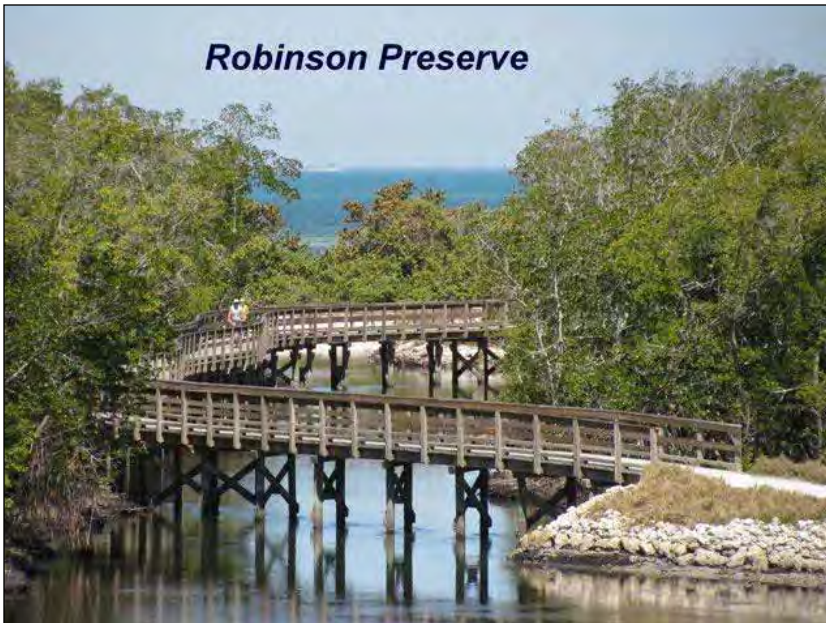
## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of this project is to construct trails and boardwalks on four county-owned coastal preserves. The objectives of the project are to: 1) enhance public access to the coastal zone in existing preserves; and, 2) promote eco-tourism in Manatee County.

### PROJECT COMPONENTS

The project involves two primary components: 1) engineering design and permitting; and 2) construction. Manatee County has developed conceptual plans and routes for the proposed trails and boardwalks, as well as design standards for these features. An example of an existing boardwalk at the Robinson Preserve is shown in **Figure 18-8B** below.



**Figure 18-8A.** Existing boardwalk in Robinson Preserve.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will enhance public access to the coastal zone in existing county-owned preserves, and promote eco-tourism in Manatee County.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

### Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Gulf Consortium Objective:

- Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.

## Implementing Entities

Manatee County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the project.

## Best Available Science and Feasibility Assessment

This project will be informed by guidelines developed by the State of Florida for the design and construction of elevated walkovers for dunes and other coastal habitats. Key literature citations include:

- Beach/Dune Walkover Guidelines, the Florida Bureau of Beaches and Coastal Systems, Florida Department of Environmental Protection, Revised January 1998.
- Beach/Dune Walkover Structures, SUSF-SG-76 by Todd L. Walton, Jr., and Thomas C. Skinner. Published by the Marine Advisory Program of the Florida Cooperative Extension Service and the Florida Sea Grant, March, 1983.
- Based on local precedents, this project is considered to be feasible in terms of the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the constructed facilities over the long term.

## Risks and Uncertainties

In the evaluation of this project no significant risks or uncertainties with identified.

## Success Criteria and Monitoring

This project will enhance public access to the coastal zone in existing county-owned preserves, and promote eco-tourism in Manatee County. Therefore, a range of success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Linear feet of new trails and boardwalks constructed; and
- Increases in public utilization of Manatee County coastal preserves.

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Manatee County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of these project is approximately four years. The estimated schedule for the project components have been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Engineering Design & Permitting												
Construction												
Success Monitoring												

## Budget and Funding Sources

Manatee County has developed a preliminary total cost estimate of \$1,000,000 for this project, based on available unit costs for similar projects in the area. The project budget and secured funding sources are shown in the table below:

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$30,000
Implementation		\$950,000
Monitoring		\$20,000
<b>Total Cost</b>		<b>\$1,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,000,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$1,000,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		

## Partnerships/Collaboration

Manatee County may partner with the Southwest Florida Water Management District for additional funding through District's cooperative funding program, as well as with the Tampa Bay Estuary Program and Sarasota Bay National Estuary Program.



# MANATEE COUNTY Coastal Watershed Management Plans

PROJECT NO. 18-9

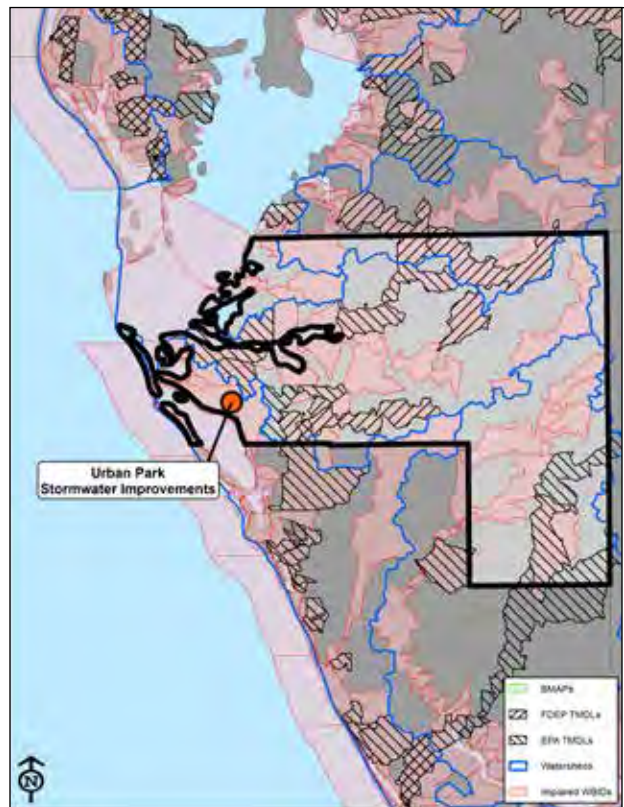
## Project Description

### OVERVIEW AND LOCATION

This program involves the development of Watershed Management Plans for priority tributaries and their watersheds in coastal Manatee County. The general location of the priority watersheds is shown in **Figure 18-9A**.

### NEED AND JUSTIFICATION

Manatee County has been cooperating with the Southwest Florida Water Management District (SWFWMD) in a multi-year program to study the hydrology, hydraulics, and water quality of small, coastal tidal tributary watersheds. These studies apply a structured Watershed Management Plan (WMP) template developed by SWFWMD aligned with agency responsibilities to protect water quality, improve flood protection, and enhance natural systems. These studies provide data, modeling, and Best Management Practice (BMP) engineering evaluations and project prescriptions needed to improve surface water management – both quality and quantity – in densely urbanized coastal watersheds. Projects are typically co-funded by SWFWMD and local governments as a 50/50 match split. Spill Impact Component funding will be used to provide Manatee County matching funds to support development of WMP's in priority coastal watersheds. Priority watersheds identified by Manatee County all drain to receiving coastal waterbodies that are part of the Tampa Bay Estuary Program and the Sarasota Bay National Estuary Program.



**Figure 18-9A.** Project location in Manatee County.

## SECTION V: Proposed Projects, Programs and Activities

### PURPOSE AND OBJECTIVES

The purpose of this program is to complete Watershed Management Plans for priority coastal tributary watersheds in Manatee County. The objectives of the program are to identify projects in the priority watershed that will: 1) improve water quality; and, 2) enhance flood control.

### PROJECT COMPONENTS

Manatee County has identified 11 priority coastal tidal creeks that are in need of WMP development, many characterized by older urban development without modern stormwater management systems.

Many of these waterbodies have significant water quality problems, with designated impairments for nutrients, dissolved oxygen, and/or bacteria. Two WMPs are currently in preparation - Pearce Drain and Bowlees Creek; while another - Mill Creek – is projected to start in 2019. Other priority watersheds are shown in **Figure 18-9B**.



**Figure 18-9B.** Priority Manatee County watersheds for WMP development.

The studies use SWFWMD's formulaic "WMP" study (drainage/flood protection and water quality) which Manatee County augments with more thorough water quality assessments and enhanced water quality treatment BMP's where feasible. The deliverable products from these studies include for each watershed: 1) completed hydrologic/hydraulic models; 2) inventory of existing stormwater infrastructure; and 3) project prescriptions to address identified flooding and water quality problems. Manatee County anticipates incorporating "green infrastructure" solutions to these problems to the greatest extent feasible.

Typical planning costs are \$45,000 per sq. mi. for a WMP plus \$6,000 per sq. mi. for water quality data collection and assessments. The SWFWMD has historically provided 50 percent match on these projects, and this co-funding level is expected to continue into the future.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This program will contribute to improved water quality and flood control in priority coastal watersheds in Manatee County. All of the identified priority watersheds drain to receiving coastal waterbodies that are part of the Tampa Bay Estuary Program and the Sarasota Bay National Estuary Program.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goal:

- Goal 2: Restore Water Quality and Quantity.

This project is consistent with, and addresses, the following Comprehensive Plan Objective:

- Objective 2: Restore, Improve, and Protect Water Resources.

## Implementing Entities

Manatee County will be the sole implementing entity and grant sub-recipient responsible for conducting the Watershed Management Plans (in collaboration with the Southwest Florida Water Management District), and monitoring the success of the program

## Best Available Science and Feasibility Assessment

The pollutant removal effectiveness of various stormwater best management practices (BMPs) implemented in Florida has been evaluated, and designs continue to be improved through the watershed management planning process. The design of the proposed stormwater improvements will consider the following reference document:

- Harper, H. and D. Baker, 2007. Evaluation of Current Stormwater Design Criteria Within the State of Florida. Final report prepared for the Florida Department of Environmental Protection (contract SO108) by Environment Research & Design, Inc., Orlando, FL.

Based on extensive precedents, this program is considered to be feasible in terms of the ability to: 1) obtain matching funding from the Southwest Florida Water Management District; and 2) complete WMPs for priority waterbodies. Funding for the implementation of projects contained in the WMP's will come from other County funds and co-operative funding.

## Risks and Uncertainties

In the evaluation of this project no significant risks or uncertainties with identified.

## Success Criteria and Monitoring

This project will affect surface water pollutant (e.g., nutrients; sediment; metals) loads leaving the site as well as on site water and habitat quality. Therefore, a range of success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Number of priority watersheds with completed Watershed Management Plans; and
- Change in pollutant loadings pre- and post-project implementation.

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Manatee County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon of this program is approximately 5 years. For this program, implementation is defined as the completion of Watershed Management Plans. Components of this program are shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Prepare WMP's												
Success Monitoring												

## Budget and Funding Sources

Manatee County has developed a preliminary total cost estimate of \$1,500,000 for this project, and is anticipating a 50 percent match from SWFWMD. The project budget and secured funding sources are shown in the table below:

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$0
Implementation		\$2,900,000
Monitoring		\$100,000
<b>Total Cost</b>		<b>\$3,000,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,500,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$1,500,000</b>
<b>Budget Shortfall</b>		<b>\$1,500,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
SWFWMD		\$1,500,000

## Partnerships/Collaboration

Manatee County will partner with the Southwest Florida Water Management District for match funding through the District's cooperative funding program. Funding for the implementation of projects contained in the WMP's will come from other County funds and co-operative funding.



## MANATEE COUNTY

# Manatee County Urban Park Stormwater Improvements GT Bray Park

PROJECT NO. 18-10

## Project Description

### OVERVIEW AND LOCATION

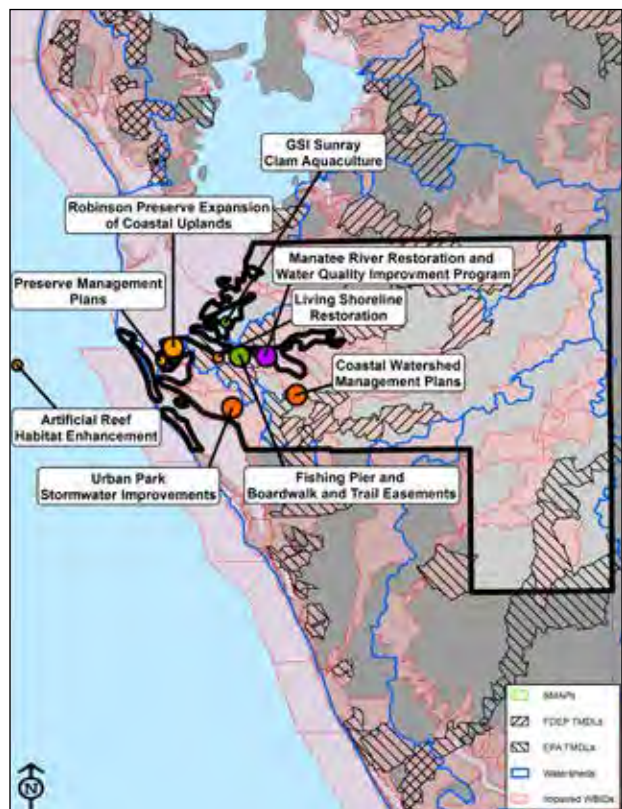
This project involves improvements to the surface water management system at GT Bray Park, the intent of which is to partially restore the natural hydrologic storage, water quality treatment, and habitat functions that existed on this site prior to development. The park is located at 2905 West 59<sup>th</sup> Street in Bradenton, Florida. The general location of the park is shown in **Figure 18-10A**.

### NEED AND JUSTIFICATION

At about 140 acres, GT Bray Park is the largest urban park in Manatee County. Historic aerial photographs dating back to 1940 show that this site was historically a freshwater herbaceous wetland slough, then named Cedar Hammock Creek. Sometime between 1973 and 1978 the site was excavated to enhance drainage, and filled to create more developable area. The natural hydrologic storage and water quality treatment functions were compromised by these alterations.

In addition, natural habitats were severely degraded. Major changes to the system included the loss of native vegetation and dense infestations of nuisance and exotic species. This has led to decreased native wildlife utilization, and an increase in nuisance “urban” species. For example, there have been issues with fecal coliform contamination of surface waters due to overuse of the area by Muscovy ducks.

The site is located in the West Cedar Hammock Drain water body identifier (WBID) which flows to Palma Sola Bay, which is a designated Outstanding Florida Water (OFW) under the management purview of the Sarasota Bay National Estuary Program. Pursuant to Florida law, pollutant discharges that cause a degradation in water quality in an OFW



**Figure 18-10A.** Project location in Manatee County.



**Figure 18-10B.** GT Bray Park conceptual restoration plan.

are prohibited. Therefore, restoring the natural hydrologic and water quality treatment functions in West Cedar Hammock Drain are justified to protect the estuarine receiving waters.

Today, the park has about 20 acres of impervious surface area for roads, parking lots, tennis/basketball courts, and buildings. The remainder of the site is pervious area used for grassed athletic fields, open space, drainage ditches, and wetlands. There are excellent opportunities for improvements to the existing surface water management systems to provide for greater hydrologic storage, enhanced water quality treatment, and native habitat restoration, without taking too much terrain away from park purposes. Manatee County is proposing to design and implement a “green infrastructure” system to at least partially restore the natural functions of this site, and to use the lessons learned from this project by applying a similar approach to other urban park sites in the county.

### PURPOSE AND OBJECTIVES

The purpose of this project is to partially restore the natural wetland slough that historically flowed through the GT Bray Park site. The objectives of the project are to: 1) restore a more natural hydrologic regime and surface water storage capacity; 2) enhance water quality treatment of surface waters and reduce pollutant loads to Palma Sola Bay; 3) restore native vegetation communities and wildlife utilization on the site.

### PROJECT COMPONENTS

The project involves two main components: 1) re-grading and interconnecting drainage ditches on the site; and 2) excavation and planting of a wetland treatment area. A third potential component is exotic species control in upland forested areas.



The first component will include regrading of drainage ditch slopes to shallower grades to allow for wetland plantings, as well as the interconnection of minor ditches/swales and isolated drainage ponds and to create an integrated surface water management system. Native aquatic species will be planted in along the regrades slopes.

The second component will involve the excavation of a ~5-acre wetland treatment area at the confluence of the two main drainage ditches on the eastern side of the site. The wetland treatment area will be excavated to a level lower than the existing ditch bottoms. Proposed baseflow diversion structures would divert water into the wetland treatment area where there would be a series of low and high marshes, open water, and pools. **Figure 18-10B** shows a conceptual design of the wetland treatment area. Hydrologic modeling will be required to develop a final design based on actual flow records (e.g., wetland size and volume); however, the resulting design will demonstrably improve downstream water quality.

Finally, the nearby forested uplands which abut the main drainage ditch to the north are infested with nuisance and exotic species, primarily Brazilian pepper (*Schinus terebinthifolia*). As part of this project, nuisance and exotic species will be removed and replanted with native vegetation, where feasible. Combined, the projects would improve the quality of water which reaches Palma Sola Bay, provide habitat for fish and wildlife within the park, reduce the nuisance and exotic seed source and enhance a popular recreational amenity for the community.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will restore a more natural hydrologic regime and surface water storage capacity on an urban park, and enhance water quality treatment of surface waters to reduce pollutant loads to Palma Sola Bay. In addition, the project will restore native aquatic and upland vegetation communities and wildlife utilization on the site.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 1: Restore and Conserve Habitat.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 1: Restore, Enhance, and Protect Habitats.

## Implementing Entities

Manatee County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the project.

### Best Available Science and Feasibility Assessment

The pollutant removal effectiveness of various stormwater best management practices (BMPs) implemented in Florida has been evaluated, and designs continue to be improved. The design of the proposed stormwater improvements will consider the following reference document:

- Harper, H. and D. Baker, 2007. Evaluation of Current Stormwater Design Criteria Within the State of Florida. Final report prepared for the Florida Department of Environmental Protection (contract SO108) by Environment Research & Design, Inc., Orlando, FL.

Based on extensive precedents, this project is considered to be feasible in terms of the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

### Risks and Uncertainties

In the evaluation of this project no significant risks or uncertainties with identified. As part of the engineering design and permitting of this project it is likely that hydraulic modeling will be required to calculate maximum inflow velocities, and to design the project to prevent scouring and erosion of the restored areas.

### Success Criteria and Monitoring

This project will affect surface water pollutant (e.g., nutrients; sediment; metals) loads leaving the site as well as on site water and habitat quality. Therefore, a range of success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Change in pollutant loadings pre- and post-restoration;
- Change in percent cover of nuisance and exotic species.

In the implementation grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above listed criteria. Manatee County is committed to implementing the necessary monitoring program and coordinating with other regional water quality monitoring entities to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of these project is approximately four years. The expected start date is 2018, and the expected end date is 2021. Implementation of these projects has been broken down as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Engineering Design & Permitting												
Construction												
Success Monitoring												

## Budget and Funding Sources

Manatee County has developed a preliminary cost estimate of \$2,030,000 for this project, based on available unit costs for similar projects in the area. The project budget and secured funding sources are shown in the table below:

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$200,000
Implementation		\$1,800,000
Monitoring		\$30,000
<b>Total Cost</b>		<b>\$2,030,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$1,600,000
Direct Component		
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$2,030,000</b>
<b>Budget Shortfall</b>		<b>\$430,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
SWFWMD Cooperative Funding		\$430,000

## Partnerships/Collaboration

Manatee County may partner with the Southwest Florida Water Management District for additional funding through District's cooperative funding program.

## SARASOTA COUNTY

# Dona Bay Hydrologic Restoration Program

PROJECT NO. 19-1

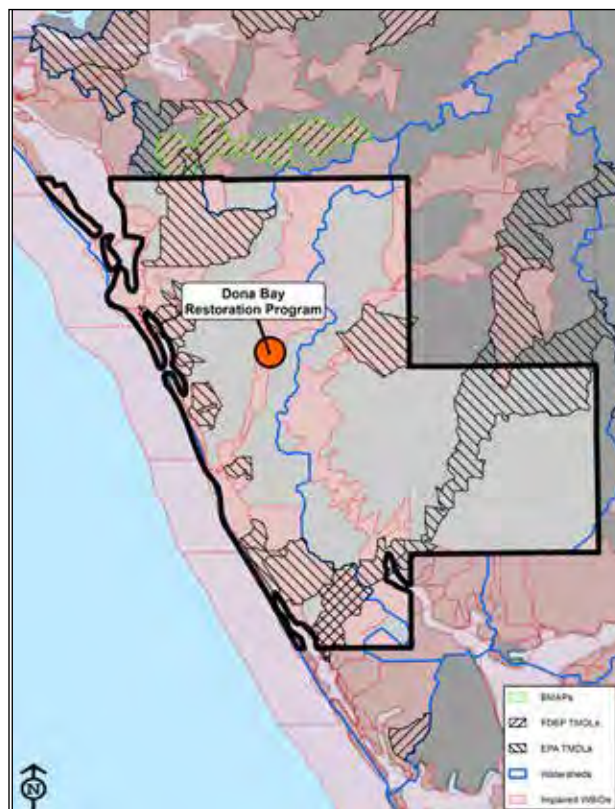
## Project Description

### OVERVIEW AND LOCATION

This program involves the reconstruction of portions of the Cow Pen Canal, the construction of a 380-acre surface water storage and treatment facility, and a number of other hydrologic modifications designed to reduce excessive freshwater inflows into Dona Bay and restore more natural salinity patterns and living resource distributions. The overall program involves multiple sequential phases. Phase I has been completed, while some components of Phase II are currently under construction. Spill Impact Component funds are being requested for certain future phases. The project is located in Sarasota County, in the Dona Bay watershed (see **Figure 19-1A**).

### NEED AND JUSTIFICATION

The Cow Pen Canal was constructed in the late 1960s with the purpose of improving drainage for agriculture and residential development. Construction of the canal had the effect of diverting freshwater out of the Myakka River watershed and shunting it westward to Dona Bay, historically a small tidal creek estuary which discharges to the Gulf via Venice Inlet. Construction of the Cow Pen Canal resulted in the expansion of the Dona Bay watershed from 15 square miles to approximately 75 square miles, a 500 percent increase in surface drainage area (see **Figure 19-1B**).



**Figure 19-1A.** Project location in Sarasota County.

As a result of these hydrologic modifications, the amount of freshwater inflow to Dona Bay is far in excess of what occurred historically. The excess freshwater inflow has been accompanied by an increase in nutrient loads to levels far greater than the waters of Dona Bay can effectively assimilate. In addition, salinity in Dona Bay is lower and much more variable than it was historically, and organic loads to the bay are sufficiently elevated that levels of dissolved oxygen in the bay are frequently lower than they were prior to the construction of the Cow Pen Canal. The percent of oysters that are healthy is much lower in Dona Bay than in adjacent estuaries without similar hydrologic alterations in their watershed, and seagrass coverage is lower and more than in the adjacent systems of Lyons Bay and Roberts Bay.

### PURPOSE AND OBJECTIVES

The primary purpose of the Dona Bay Restoration Program is to restore the natural volume and timing of freshwater inflows to Dona Bay, as well as to provide a number of other public benefits. Sarasota has identified the following five program objectives: 1) provide a more natural freshwater/saltwater regime in the tidal portions of Dona Bay; 2) provide a more natural freshwater flow regime pattern for the Dona Bay watershed; 3) protect existing and future property owners from flood damage; 4) protect existing water quality; and 5) develop potential alternative surface water supply options that are consistent with, and support other plan objectives.

### PROJECT COMPONENTS

The overall Dona Bay Hydrologic Restoration Program is described in the 2007 **Dona Bay Watershed Management Plan** (Kimley-Horn & Associates, 2007) co-funded by Sarasota County and the Southwest Florida Water Management District. The program involves multiple sequential phases. Phase I has been completed, while some components of Phase II are currently under construction. Spill Impact Component funds are being requested for certain future phases.

Phase I components involved modifications to the watershed that diverted flows out of Cow Pen Canal into a series of channels, open water features and created wetlands to treat freshwater inflows and reduce nutrient and total suspended solids loads to Dona Bay. However, Phase I efforts were not designed to substantially reduce the excessive freshwater inflows to Dona Bay, but rather to treat those excessive flows to reduce nutrient and sediment loads to Dona Bay.

Phase II components involve the reduction of flows to Dona Bay, by diverting approximately three million gallons per day from the Dona Bay watershed back towards the historical destination of the Myakka River, while also using



**Figure 19-1B.** Expanded Dona Bay watershed resulting from the construction of the Cow Pen Canal (source: Kimley-Horn & Associates, 2007).





**Figure 19-1C.** Schematic of Phase I and II program components (source: Kimley-Horn & Associates, 2007).

a portion of the diverted water for public water supply. The surface water storage facility is designed to retain freshwater inflows from Cow Pen Slough, after they have been treated through the extensive wetland features that were created in Phase I. The storage facility will accommodate excess freshwater inflows from the upper reaches of the artificially expanded Dona Bay watershed, and then release flows over a period of time (in excess of the period of inflow) back to the Myakka River. Flows will be released from the storage facility through a series of shallow spreader canals. After leaving the spreader canals, water will then sheet flow across an extensive natural floodplain prior reaching the historical destination of these flows, the Myakka River. **Figure 19-1C** shows a schematic of the Phase I and II program components.

Phase III components include additional features to augment the storage and beneficial use of excess freshwater diversions. These components potentially include: 1) an aquifer storage and recovery (ASR) well; 2) a surface water storage reservoir; and 3) augmentation of the County reclaimed water system supply. Phase IV activities are anticipated to include living resource restoration activities in Dona and Roberts Bays, including dredging of accumulated muck sediments, oyster reef restoration, and seagrass and saltmarsh restoration.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

Extensive hydrologic and water quality monitoring and modeling work has concluded that Phase II components are likely to improve the salinity regime in Dona Bay over an area of approximately 77 acres. These 77 acres represent the area for which the project is expected to moderate the current water quality conditions, wherein salinities are both too low and too variable to allow for the development and/or persistence of healthy oyster reefs in the upper reaches of Dona Bay. Furthermore, freshwater will be redirected from the Cow Pen Canal to historical watershed storage areas that were drained by the canal, many of which have now been acquired by Sarasota County. As a result, 80 percent or more of the excess freshwater is expected to flow through the historical flow path and storage areas. Subsequent phases propose to increase and enhance the storage capacity of the historical watershed even more.

In addition to hydrologic restoration, Phase II components are expected to reduce nutrient loads to Dona Bay by approximately 940 pounds per year, which should improve water clarity (by decreasing phytoplankton growth in Dona Bay) and allow for the expansion of seagrass meadows in downstream waters. At the same time, extensive



modeling and the collection and analysis of water quality data sets have led to the conclusion that the diversion of three million gallons per day back to the Myakka River would not be expected to have an adverse impact on the receiving water quality, as the added nutrient load is less than one-half of one percent of the Myakka River's existing nutrient loads to downstream waters. In addition, the extensive wetland treatment processes included in both Phase I and Phase II projects are expected to nutrient concentrations in flows entering the Myakka River to less than ambient nutrient concentrations in the receiving waters.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat;
- Goal 2: Restore Water Quality and Quantity; and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 2: Restore, Improve, and Protect Water Resources; and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

Sarasota County will be the prime implementing entity and grant sub-recipient responsible for the engineering design, permitting, construction, operation and maintenance, and success monitoring for this program. Sarasota County has coordinated extensively with the Southwest Florida Water Management District and other agencies in the design and permitting for the program to date, and will continue to do so in future phases.

## Best Available Science and Feasibility Assessment

Assessments of the ecological problems in Dona Bay that date back more than 40 years. Several studies and conceptual restoration plans have been developed for Dona Bay by various local, regional and state agencies, and there is broad-based consensus that the restoration of Dona Bay is dependent on a substantial reduction in the excess freshwater inflows caused by historical hydrologic alteration. Documents that include either conceptual restoration plans for Dona Bay, or more detailed assessments of the project components of this effort include the following:

## SECTION V: Proposed Projects, Programs and Activities

- The Ecological Status of Dona and Roberts Bays and its Relationship to Cow Pen Slough and Other Possible Perturbations (Mote Marine Lab, 1975)
- Charlotte Harbor SWIM Plan (SWFWMD, 2000)
- Dona Bay Watershed Management Plan (Kimley-Horn & Associates, 2007)
- Comprehensive Conservation and Management Plan for the Greater Charlotte Harbor Watershed (CHNEP, 2008)

As part of these efforts, various flow diversion scenarios were proposed and modeled, and the conceptual designs of both Phase I and Phase II projects were conducted. In addition, the benefits and possible impacts (to the Myakka River) of Phase II project components have been reviewed by permitting agencies, and permits received for Phase II from the Southwest Florida Water Management District. This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget, and 3) effectively operate and maintain the project components over the long term.

### Risks and Uncertainties

No significant risks or uncertainties have been identified that would preclude project implementation. The issue of the impact of diverted volumes to the Myakka River on receiving water quality has been investigated and resolved to the satisfaction of the regulatory staff of the Southwest Florida Water Management District.

### Success Criteria and Monitoring

This project will benefit the Dona Bay estuary as well as watershed freshwater wetlands that have been excessively drained by the Cow Pen Canal. Success criteria will be developed and described in the implementation grant request, and it is anticipated that quantitative criteria will be developed for:

- Changes in salinity and water clarity in Dona Bay;
- Changes in the distribution and persistence of healthy oyster reefs in Dona Bay;
- Changes in the distribution and persistence of seagrass beds in Dona Bay; and
- Changes in the distribution of native wetland species in restored watershed storage areas.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Sarasota County is committed to an adaptive management approach to the project, and to conducting the monitoring necessary to support this approach and to quantify project benefits.

### Milestones and Schedule

Sarasota County has already completed implementation of Phase I, which included the construction of the water conveyance and treatment systems that treat inflows from the Cow Pen Canal. Funds are requested for the remaining portions of this second phase of the implementation of the Dona Bay Watershed Management Plan. The total estimated time horizon of this project – from engineering design and permitting through success monitoring.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Phase 2 Planning												
Phase 2 Engineering & Permitting												
Phase 2 Construction												
Phase 3 Planning												
Success Monitoring												

## Budget and Funding Sources

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$600,000
Implementation	\$27,500,000
Monitoring	\$300,000
<b>Total Cost</b>	<b>\$28,400,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$12,660,000
Direct Component	\$6,700,000
Other Grants or Co-Funding	\$XX
Other County Funds	
<b>Total Secured Funding</b>	<b>\$19,360,000</b>
<b>Budget Shortfall</b>	<b>\$9,040,000</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
SWFWMD	\$X

## Partnerships/Collaboration

Efforts to reduce the adverse impacts to Dona Bay from excessive freshwater inflows have included the original identification of the impacts of freshwater inflows, and the development of conceptual restoration projects to address those impacts. These efforts have involved a number of local, regional, state and federal agencies, including:

- Southwest Florida Water Management District;
- Florida Department of Environmental Protection;
- Charlotte Harbor National Estuary Program;
- U.S. Environmental Protection Agency; and
- Mote Marine Laboratory.

## CHARLOTTE COUNTY

# Charlotte Harbor Septic to Sewer Conversion Program

PROJECT NO. 20-1

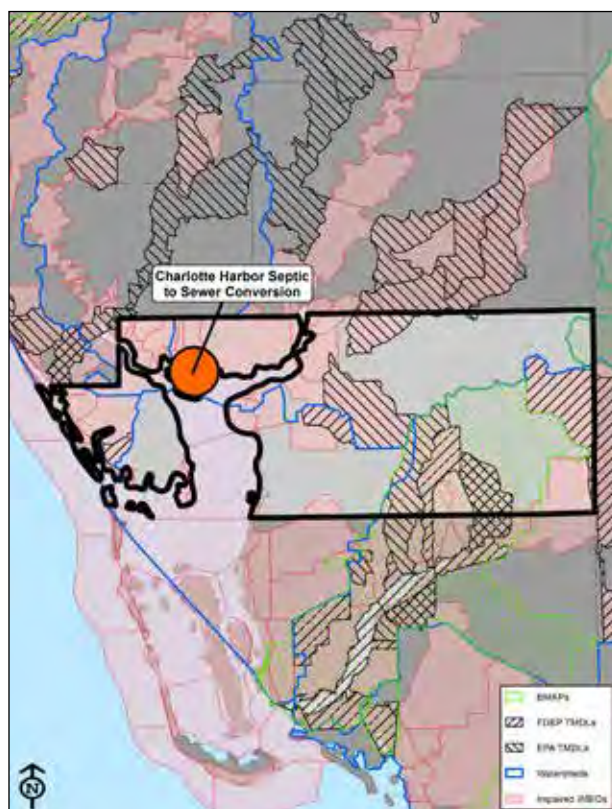
## Project Description

### OVERVIEW AND LOCATION

The Charlotte Harbor Septic to Sewer Conversion Program is a continuation of an ongoing effort to remove an estimated 27,000 onsite sewage treatment and disposal systems (OSTDS) in Charlotte County. This project is the first 5-year phase of a 20-year program to provide sewer service in areas draining to Charlotte Harbor, remove the OSTDS, and improve the existing sanitary sewer system and wastewater treatment and effluent disposal to accommodate the increased flows. It will address and eliminate non-point pollution sources by installing the central sewer infrastructure needed to abandon 6,166 existing OSTDS in mid-County and prevent the installation of new 2,805 OSTDS on vacant parcels in this unsewered, developed area, located between the Peace and Myakka Rivers (see **Figure 20-1A**).

### NEED AND JUSTIFICATION

Existing septic systems, in conjunction with current storm water drainage systems, have been identified as contributing sources of water pollution to Charlotte Harbor, impacting the health and safety of humans and marine life and habitat. OSTDS have been specifically identified as significant contributors of nutrient and bacterial pollution of surface waters and groundwaters in this locale. Increases in Charlotte County's human population correlate strongly with rising concentrations of nitrogen, phosphorus, and chlorophyll *a*. The human wastewater source of the nutrient pollution was confirmed by sampling for stable nitrogen isotopes ( $^{15}\text{N}$ ) and the chemical tracer, sucralose. In addition, high concentrations of total nitrogen, nitrate, ammonia, biochemical oxygen demand, and enteric bacteria were consistently found downgradient of OSTDS. The limited vertical separation between the ground surface and seasonally high water tables in the area



**Figure 20-1A.** Project location in Charlotte County.



Figure 20-1B. Overall Septic to Sewer Plan Environmental Scoring and First Five Year Interval (Mid-County).

means that maintaining the wet season required distance (>2 ft.) between septic systems and groundwater is not possible.

This project will improve local water quality through the removal of pollution sources by conversion of OSTDS to centralized sewers in areas impacting Charlotte Harbor, Myakka River, and the Peace River. The Mid County project selection was based on project prioritization scoring developed in the Charlotte County Sewer Master Plan, which was based on environmental criteria, economic factors, and project sequencing considerations. The environmental scoring process used proximity to the surface waters, age of OSTDS, and nitrogen loading (see **Figure 20-1B**). Based upon these criteria a series of five year plans were developed for the mid, west and south county service areas. The first five-year interval for the plan is shown in **Figure 20-1B**. The project also involves modification of the existing sewer system by adding new force mains and lift stations to accommodate increased flow from the OSTDS areas (See **Figure 20-1C**). Additional capacity will be added at the East Port Wastewater Reclamation Facility (WRF) to accommodate the additional flows from removal of the OSTDS in the Mid County area.

### PURPOSE AND OBJECTIVES

The program is a comprehensive, multi-year partnership program designed to restore, improve and protect the waters of Charlotte County (including Charlotte Harbor, the second largest estuary in the State of Florida) by reducing nutrient pollutant loading from OSTDS, implementing best management practices, establishing centralized sewers and abandoning, crushing and backfilling existing OSTDS.

### PROJECT COMPONENTS

The project consists of the following components:

1. Provide sanitary sewer service to portions of Charlotte County located near Charlotte Harbor, crushing and backfilling remove the onsite sewage treatment and disposal systems (OSTDS) in this area.
2. Improve the County's existing sanitary sewer system so that the new sanitary vacuum sewer collection system will connect to by installing new force mains and lift stations.
3. Develop a water monitoring program to retrieve and analyze water quality data to demonstrate the expected improvements to water quality in the Charlotte Harbor.



### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project is part of an ongoing regional partnership effort to improve and protect water quality in Charlotte Harbor and addresses goals and objectives that are consistent with components of other complementary resource management plans such as:

- The Charlotte Harbor National Estuary Program (CHNEP) Comprehensive Conservation and Management Plan (CCMP, 2013);
- The Joint Florida Gulf National Estuary Programs Southwest Regional Ecosystem Restoration Plan (SWFRERP, 2013); and
- The Southwest Florida Water Management District (SWFWMD) Surface Water Improvement and Management (SWIM) Plan (2000).

The overall objective of the partnership program is to improve water quality of Charlotte Harbor and surrounding waterways through the development of a regional long term initiative to re-establish pristine waters by installing the central sewer infrastructure needed to abandon existing OSTDS. Several drainage basins have been identified for their negative impact on the ecology of Charlotte Harbor. The areas selected are located closest to the Peace River, Myakka River, Upper Charlotte Harbor, and Charlotte Harbor which are listed by the EPA as impaired water bodies. Charlotte Harbor has been identified as an impaired water body for bacteria, nutrients, dissolved oxygen and mercury. This program will reduce bacterial and nutrients contributions to the receiving waters, with the secondary benefit of benefitting dissolved oxygen as ecosystem health improves.

Sanitary sewer expansion in this residential area will also contribute to growth of the economy due to increase number of jobs as average of 1.7 million dollars is planned to be spent on sanitary sewer infrastructure annually for the next 15 years to design and construct the proposed projects using SEP funds. These jobs will help improve its economy, grow its tax base, and foster development of new businesses and employment opportunities.

### Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.



Figure 20-1B. Mid County Five-Year Septic to Sewer and Related Sewer Improvements Plan.



## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources; and
- Goal 1: Restore and Conserve Habitat.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

Charlotte County Utilities Department (CCUD) will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this project. CCUD has coordinated with Florida Department of Environmental Protection and numerous other agencies in the development of the Charlotte County Sewer Master Plan, and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

## Best Available Science and Feasibility Assessment

The relationship between septic systems and water quality in Charlotte Harbor has been well studied and have been described in the following report (and references cited therein):

- Charlotte County Water Quality Assessment, Phase I: Data Analysis and Recommendations for Long-Term Monitoring. B. Lapointe, et al. 2016. Prepared for the Charlotte County Board of County Commissioners, Charlotte County Utilities Department.

This project is feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

## Risks and Uncertainties

In the evaluation of this program, it was determined that a preliminary design report was completed for El Jobean and Area 1. Master planning has also been completed in the other areas of the program. The project is feasible and there are no significant risks or uncertainties that have been identified that would preclude implementation. Charlotte County has identified the highest priority areas and is ready to proceed with permitting and final design.

## Success Criteria and Monitoring

This project will affect water quality in an adjacent estuarine system. Specific success criteria will be developed in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in ambient water quality (nutrient and bacterial concentrations) downstream of removed septic tanks in waterbodies which contribute to Charlotte Harbor;

## SECTION V: Proposed Projects, Programs and Activities

- Changes in the frequency and/or duration of algal blooms (as measured by chlorophyll-a) in receiving waterbodies which contribute to Charlotte Harbor; and
- Changes in nutrient loads to Charlotte Harbor from non-point sources; and
- Changes in seagrass coverage in Charlotte Harbor.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Charlotte County currently implements a water quality monitoring program and is committed to conducting the necessary monitoring and coordinating with other regional water quality monitoring entities to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project - from permit modification through success monitoring - is approximately six years. The expected start date is 2018, and the expected end date is 2023. Monitoring will extend for another six years beyond project completion. Implementation of this project has been broken down into five phases, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Planning and Project Management												
Water Quality Monitoring Program												
Preliminary Design												
Final Design												
Construction												

### Budget and Funding Sources

The initial Mid County 5-year forecast for the sewer improvement plan includes 6,166 existing developed units out of 8,971 total parcels. The annual project costs during the forecast range from \$17 million to \$30 million for a 5-year total cost of \$105 million, or an average cost per parcel of \$11,747. These estimated project costs do not include the on-site costs of decommissioning the homeowner's septic tank or the cost for lateral connection installation. This cost is proposed to be paid by the property owner when removal of the septic tank is required.

The major sources of funding for this project are:

- General County Capital Improvement Program (CIP)
- Municipal Service Benefit Units (MSBU) Assessments
- Florida Department of Environmental Protection State Revolving Fund Loan

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$660,000
Implementation	\$11,880,000
Monitoring	\$120,000
<b>Total Cost</b>	<b>\$12,660,000</b>

SECURED FUNDING SOURCES	
Spill Impact Component	\$12,660,000
Direct Component	
Other Grants or Co-Funding	
Other County Funds	
<b>Total Secured Funding</b>	<b>\$12,660,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
Pot 1	
Pot 2	
DEP TMDL Grants	
Centers of Excellence Research Funding	
Legislative Appropriations	
Sea Grants	
IFAS	
Fish & Wildlife Service	
NRDA	
NFWF	

## Partnerships/Collaboration

This program will build upon other efforts to eliminate pollution in the waters of Charlotte County through expanding current partnerships with estuaries & ecological entities, research centers of excellence, universities, fisheries, tourism entities, marine & wildlife groups and beaches & coastal groups. Some of the partners are listed below:

- Englewood Water District (EWD)
- Charlotte Harbor National Estuary Program (CHNEP)
- Charlotte Harbor Environmental Center, Inc. (CHEC)
- Charlotte County Extension through the Florida Yards and Neighborhoods
- And Sea Grant Marine Extension Programs (EES)
- Charlotte Harbor Community Redevelopment Area Advisory Committee (CRAAC)
- Florida Department of Environmental Protection (FDEP)
- University of Florida-Institute of Food and Agricultural Sciences (IFAS)
- Natural Resource Damage Assessment and Restoration (NRDA)
- Florida Fish and Wildlife Conservation Commission (FWC)
- Florida Department of Health (FDOH)
- National Fish and Wildlife Foundation (NFWF)
- Southwest Florida Water Management District (SWFWMD)
- Florida Atlantic University (FAU)
- Florida Sea Grant
- Lemon Bay Conservancy
- Bonefish & Tarpon Association
- Peace River Valley Citrus
- Southwest Shellfish Association
- Charlotte County Chamber of Commerce

## LEE COUNTY

# Bob Janes Preserve Hydrologic Restoration and Water Quality Treatment

PROJECT NO. 21-1

## Project Description

### OVERVIEW AND LOCATION

This project involves the restoration of natural wetland and upland habitats, and the construction of surface water storage, treatment areas, and recreational amenities on the Bob Janes Preserve (the Preserve), a contiguous 5,620-acre conservation area owned by Lee County. The Preserve abuts, and is located just north of, the Caloosahatchee River in northwestern Lee County (see **Figure 21-1A**).

### NEED AND JUSTIFICATION

Prior to its public acquisition, the Preserve was part of a 91,361-acre working ranch known as the Crescent B Ranch. In 2006, the State of Florida acquired the ranch property, one of the single largest purchases of conservation land in Florida's history. During the property transaction, a portion of the original Crescent B Ranch acreage was reserved for private residential development (Babcock Ranch Community), while the remaining 73,239 acres was sold to the state.

The portion of the acquisition in Charlotte County was renamed as the Babcock Ranch Preserve (Babcock Ranch). This area is managed under the auspices of a unique public-private partnership which will help sustain Babcock Ranch as a working ranch, and a timbering and ecotourism operation. In 2009, the portion of the acquisition in Lee County was transferred to county ownership and renamed as the Bob Janes Preserve in recognition of Lee County Commissioner Bob Janes. Commissioner Janes, who passed away in 2010, was instrumental in the county's efforts to successfully acquire the land for the Preserve.



**Figure 21-1A.** Project location in Lee County.



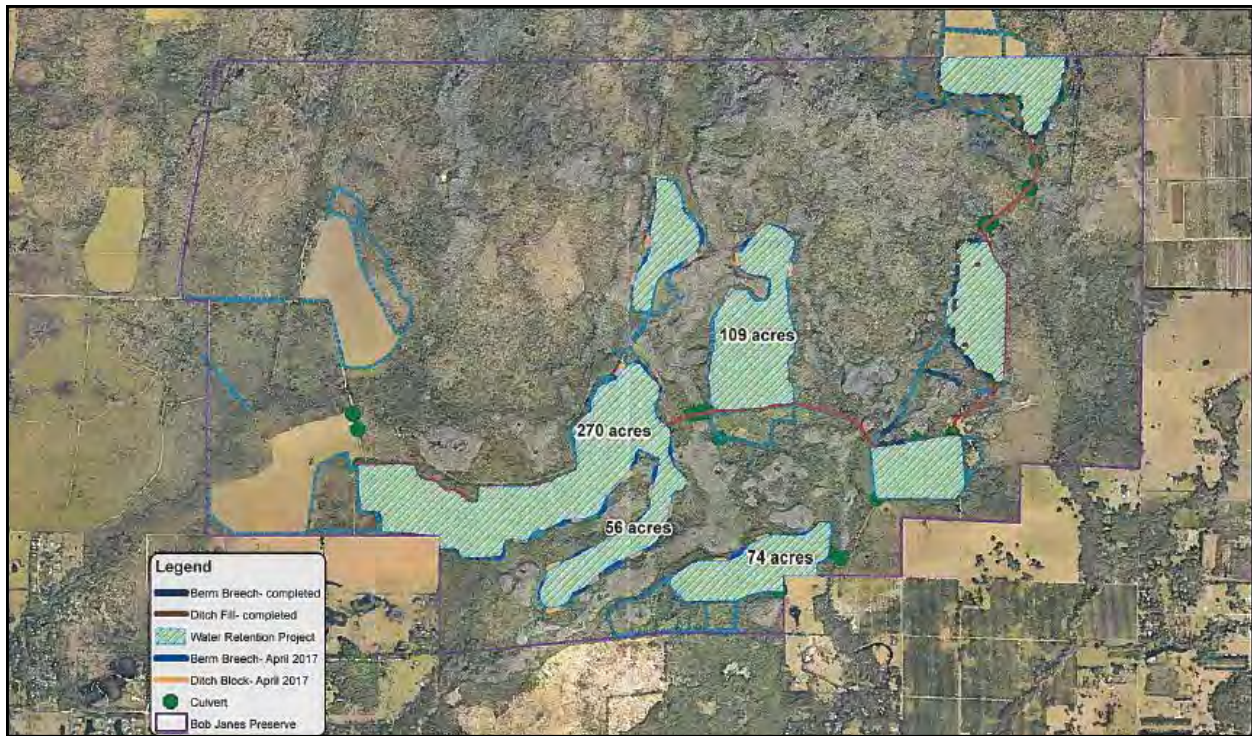


Figure 21-1B. Aerial of Bob Janes Preserve from 2016.

The combined area of the Babcock Ranch and the Preserve has resulted in the conservation of a large contiguous area containing regionally important water resources, diverse natural habitats and wildlife populations, scenic landscapes, and historic and cultural resources in the rapidly developing southwest Florida corridor. The Preserve was originally managed in conjunction with the adjacent Babcock Ranch; however, in August 2016, the Lee County Board of County Commissioners voted to transfer management of the Preserve back to the county.

The Preserve includes large swaths of cypress swamp, wet prairie, stream, freshwater marsh, and wet pine flatwoods habitats. In addition, the area provides rich recreational opportunities including hunting, hiking, wildlife viewing, bicycling, fishing, camping, and horseback riding. However, past drainage alterations have impacted natural surface water flow patterns. The Preserve receives water from natural areas and agricultural operations to the north which in turn flow relatively unimpeded into the Caloosahatchee River.

The hydrology of the Caloosahatchee River has been substantially impacted by controlled wet weather discharges from Lake Okeechobee. Excessive wet season freshwater inflows to Caloosahatchee River estuary and the Pine Island Sound Aquatic Preserve have resulted in adverse impacts to water quality, oyster reefs, and seagrasses in those receiving waters. In addition, the tidal Caloosahatchee River has been determined as impaired for total nitrogen, and a Total Maximum Daily Load (TMDL) and Basin Management Action Plan (BMAP) have been developed by the Florida Department of Environmental Protection (FDEP) to reduce nitrogen loads to the River (FDEP, 2012).

The Preserve has more than 700 acres of ditched, drained, and cleared lands that were previously altered for cattle grazing and other agricultural activities. The opportunity exists to create substantial hydrologic storage through the excavation and impoundment of these areas. In addition, the natural surface water flow patterns across the Preserve can largely be restored through the filling of old drainage ditches and the reestablishment of historical intermittent

## SECTION V: Proposed Projects, Programs and Activities

sloughs and streams. Increasing onsite water storage will also provide for significant water quality benefits, contributing to nitrogen load reductions to the tidal Caloosahatchee River. Finally, native habitats on the site will be restored and enhanced through hydrologic restoration.

### PURPOSE AND OBJECTIVES

The purpose of this project is to restore more natural hydrology and surface water flow patterns on the Preserve, while also providing enhanced hydrologic storage and water quality treatment of discharges to the Caloosahatchee River. The objectives of the project are to: 1) reduce excessive wet season flows and nitrogen loads to the tidal Caloosahatchee River; 2) restore natural hydrology and habitat function in onsite wetlands; 3) recover dry season flows in onsite and adjacent streams and sloughs; 4) improve public recreational amenities and opportunities on the Preserve.

### PROJECT COMPONENTS

The project primarily involves the design, permitting, construction, and monitoring of water storage and treatment areas, as shown in **Figure 21-1B**. Initially, approximately 500 acres of cleared lands would be excavated, to a shallow depth (one to three feet), with the resulting fill material being used to create low berms around the excavated storage areas. Surface water flows would be stored during the wet season and released slowly during the dry season to onsite streams, sloughs, and wetlands to more closely simulate the natural hydrology and flow patterns of the Preserve lands. The water storage areas would also be planted with native wetland species in appropriate areas to provide water quality treatment (nutrient uptake), and fish and wildlife habitat functions. Later components of the project will include the construction of recreational amenities.

## Contributions to the Overall Economic and Ecological Recovery of the Gulf

Implementation of this project will restore more natural hydrology, surface water flow patterns, and habitat functions on the Preserve, while also providing enhanced hydrologic storage and water quality treatment of discharges to the Caloosahatchee River, a nutrient impaired water body. In addition, the project will preserve the contiguity of water resources and native habitats extending from the Caloosahatchee River north to include Babcock Ranch. Finally, the project will improve public recreational amenities and opportunities in Lee County.

## Eligibility and Statutory Requirements

This project is consistent with and addresses the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region (primary); and
- Activity 2: Mitigation of damage to fish, wildlife, and natural resources.

## Comprehensive Plan Goals and Objectives

This project is consistent with and addresses the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.



This project is consistent with and addresses the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve and Protect Water Resources (primary);
- Objective 3: Protect and Restore Living Coastal and Marine Habitats.

## Implementing Entities

Lee County will be the primary implementing entity and sole grant sub-recipient responsible for the design, permitting, construction and success monitoring of the program.

## Best Available Science and Feasibility Assessment

This project is consistent with the ecological and recreational management of adjacent Babcock Ranch to the north. In addition, the project will contribute to the implementation of the Basin Management Action Plan (BMAP) for the tidal Caloosahatchee River. Key references supporting this project are cited below:

- Babcock Ranch Preserve Recreation Master Plan, 2009. Final report prepared by the Florida Fish & Wildlife Conservation Commission.
- Final Basin Management Action Plan for the Implementation of Total Maximum Daily Loads for Nutrients Adopted by the Florida Department of Environmental Protection for the Caloosahatchee Estuary Basin. 2012. Final report prepared by the Florida Department of Environmental Protection.

This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

## Risks and Uncertainties

In the evaluation of this project, no significant risks or uncertainties were discovered that would preclude further planning and implementation of this project. Yet to be determined are: 1) the potential volume of surface water that can be safely stored and released on the site; 2) the potential nutrient load reductions that can be expected; and 3) detailed implementation costs. These uncertainties will be addressed in the planning stage of the project though the completion of a comprehensive conceptual design and feasibility study.

## Success Criteria and Monitoring

The primary objectives of this project are to restore more natural hydrology and surface water flow patterns on the Preserve, while also providing enhanced hydrologic storage and water quality treatment of discharges to the Caloosahatchee River. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in seasonal surface water flows from the Preserve to the Caloosahatchee River from existing conditions;
- Reductions the nutrient loads discharged from the Preserve to the Caloosahatchee River from existing conditions; and
- Changes in wetland and stream habitat metrics on the Preserve over existing conditions.

## SECTION V: Proposed Projects, Programs and Activities

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Lee County is committed to conducting the success monitoring necessary to quantify project benefits.

### Milestones and Schedule

The planning, implementation, and success monitoring of this project is anticipated to be spread over an eight-year period, as shown in the milestone chart below. Anticipated start date is 2018.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Conceptual Design & Feasibility Study												
Engineering Design & Permitting												
Phase 1 - Storage Area Construction												
Phase 1 - Storage Area Construction												
Recreational Amenities and Habitat Rest.												
Success Monitoring												

### Budget and Funding Sources

A total cost estimate has been developed by Lee County based on the best available information and a number of assumptions. This preliminary cost estimated is shown in the budget table below. The completion of the comprehensive conceptual design and feasibility study is expected to result in a detailed cost estimate.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$500,000
Implementation		\$18,000,000
Monitoring		\$500,000
<b>Total Cost</b>		<b>\$22,300,000</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$12,660,000
Direct Component		\$6,758,000
Other Grants or Co-Funding		
Other County Funds		
<b>Total Secured Funding</b>		<b>\$19,458,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA Water Quality Component		

## Partnerships/Collaboration

Lee County will continue to coordinate with the Florida Forest Service and the Florida Fish & Wildlife Conservation Commission in the contiguous management of the Preserve and Babcock Ranch. In addition, Lee County will work closely with the Florida Department of Environmental Protection on the implementation of the Caloosa-hatchee Estuary Basin Management Action Plan. Finally, Lee County will coordinate with the South Florida Water Management District with regard to cooperative funding for the construction of the hydrologic storage and water control facilities, and for habitat restoration activities.

RESTORE Act  
Compliance

Public Participation

Financial Integrity

Overall Consistency

Proposed Projects

Appendices

## COLLIER COUNTY

# Comprehensive Watershed Improvement Program

PROJECT NO. 22-1

## Project Description

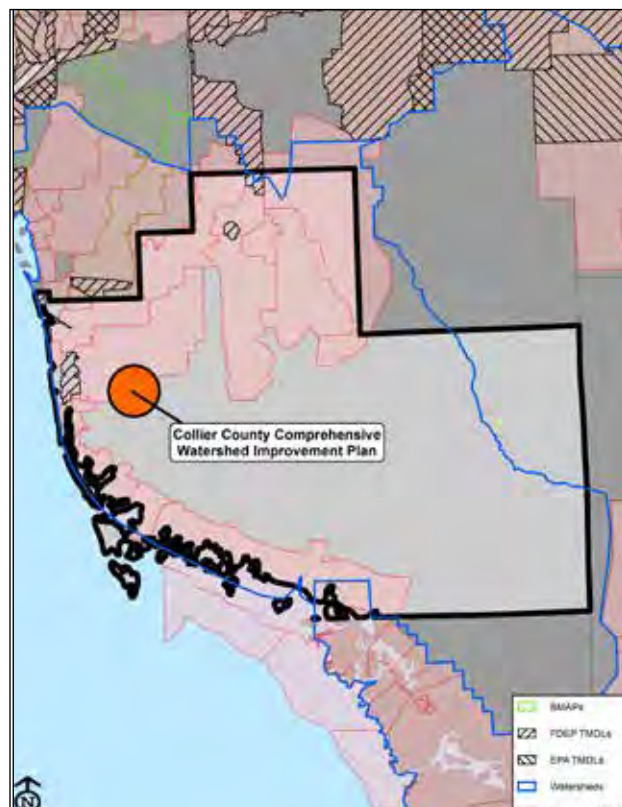
### OVERVIEW AND LOCATION

The Collier County Comprehensive Watershed Improvement Program (CCCWIP) is a series of linked surface water management projects with the objectives of restoring the hydrology and ecology of both Naples Bay and Rookery Bay, as well as the Belle Meade area of the Picayune Strand State Forest. The projects to be conducted as part of the overall CCCWIP are located in a large area of coastal Collier County, as shown in **Figure 22-1A**.

### NEED AND JUSTIFICATION

Over the past 70 years, extensive canal construction for urban and agricultural drainage improvements has substantially changed the volume and timing of freshwater inflows to Collier County estuaries. In particular, these hydrologic changes have significantly impacted the water quality and living resources in Naples Bay and Rookery Bay – two important southwest Florida estuaries, the latter being a designated National Estuarine Research Reserve (NERR). The construction of the Golden Gate Canal (GGC) in the 1960s increased the surface area of the Naples Bay watershed from about 10 square miles to over 120 square miles, and decreased the surface area of the Rookery Bay watershed by approximately the same amount. **Figure 22-1B** shows the current extents of these watersheds in Collier County.

As a result of these drainage alterations, Naples Bay now receives a much greater volume of freshwater inflow, while Rookery Bay now receives proportionately less freshwater inflow, than these estuaries did historically. These hydrologic alterations have resulted in drastic disruptions to natural salinity patterns in both Naples Bay and to a lesser extent Rookery Bay; as well as increased sediment and pollutant loads to Naples Bay. Consequently, the historic areal



**Figure XX-1A. Project location (map)**

extents of oyster bars and seagrass beds have been impacted in both estuaries, and altered freshwater inflows has been identified by the Rookery Bay NERR as the greatest threat to biodiversity in the Reserve.

In addition to the water quality and ecological impacts to Naples Bay and Rookery Bay caused by the drainage alterations, the hydrology and natural systems of the Belle Meade area (see **Figure 22-1B**) within the Picayune Strand State Forest (PSSF) have also been impacted by the above described drainage modifications. In 1985, Conservation and Recreation Land (CARL) funds under the Save Our Everglades project were used to initiate the purchase of properties which later became the PSSF in 1996. These lands were purchased to help promote hydrologic and ecologic restoration and encourage passive recreation in this area.



**Figure 22-1B.** Current extent of the Naples Bay and Rookery Bay watersheds and location of the Belle Meade area (source: Atkins, 2016).

## PURPOSE AND OBJECTIVES

The Collier County Comprehensive Watershed Improvement Program (CCCWIP) was developed to address two primary objectives: 1) restore more natural freshwater inflows – both volume and timing - and salinity patterns in Naples Bay and Rookery Bay; and 2) recover groundwater levels, freshwater wetlands, and listed species populations in the Belle Meade area of the PSSF.

## PROJECT COMPONENTS

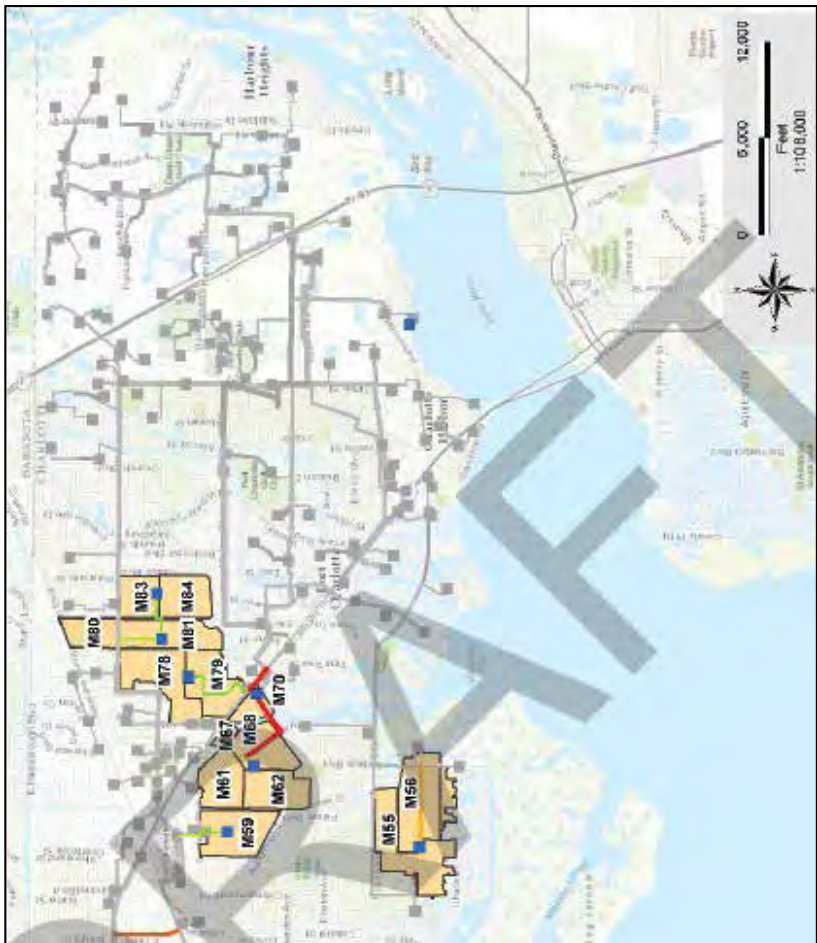
The CCCWIP involves a series of linked surface water management modifications designed to meet the project objectives. These surface water management modifications have been modeled and conceptually designed to effect the desired changes to the hydrology of both the receiving water estuaries and the PSSF. **Figure 22-1C** below presents an overview of the project components that encompass the CCCWIP.

The projects start in the north where a 100 cfs pump station (Pump Station A) will be constructed on County-owned property along the GGC, approximately one mile east of Collier Blvd. and upstream of the existing GG-3 structure. The pump station would start pumping when the gate for the GG-3 structure is lowered to elevation 6.5 feet NAVD88, which roughly corresponds to elevation 8.0 feet NAVD88 in the GGC. The pump station would pump water to a one-mile long channel flow-way (linear pond) controlled by outfall structures. The linear pond flow-way would be designed with wetland plantings to improve water quality and have a multi-use recreational trail amenity. This would divert flows south, under White Lake Blvd. to the north I-75 cross canal. Once flows enter the I-75 north canal, flows would be conveyed through the existing box culverts under this section of I-75 to the south canal. Operational structures or ditch blocks would be designed to contain the flows within the west segment of the canals. The I-75 south canal is not contiguous, so portions between the ditch segments would need to be excavated to convey flows the to the next pump station intake.



## SECTION V: Proposed Projects, Programs and Activities

A second pump station (Pump Station B) would be constructed on the south side of the I-75 south canal, also with a 100 cfs capacity, and would start pumping when water begins flowing into the north I-75 canal. The pump station would pump into a 4,000 foot (dry) channel flow-way which would convey flows south to a spreader swale that would discharge flows south through the Belle Meade wetland area flow-way. This flow would continue south to Sabal Palm Road where additional siphon culvert cross drains would be constructed to convey the additional flow under the road and south through the flowway. As diverted flow continues south, it would flow in one of three directions. Some flow could circumvent the Six Ls agricultural lands to the west, while the majority would flow into one of two control structures, each with a designed flow-way that would take flows through the Six Ls lands. All flows would continue to the existing north US-41 drainage system, where additional culverts would be installed under US-41. From there the flows would continue south through the Fiddler's Creek residential area stormwater system and ultimately to Rookery Bay.



**Figure 22-1C.** Overview of the CCCWIP linked surface water management projects (source: Atkins 2016).

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

This project will restore more natural freshwater inflows and salinity patterns in Naples Bay and Rookery Bay – two important southwest Florida estuaries, the latter being a designated National Estuarine Research Reserve (NERR). The restoration of more natural freshwater inflows and salinity patterns is expected to support the recovery of degraded oyster bars and seagrass beds in these estuaries, thus contributing to the enhancement of fish and shellfish resources in the Gulf of Mexico. In addition, this project will also recover groundwater levels, freshwater wetlands, and listed species populations in the Belle Meade area of the Picayune Strand State Forest.



## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activity:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 1: Restore and Conserve Habitat;
- Goal 2: Restore Water Quality and Quantity (primary); and
- Goal 3: Replenish and Protect Living Coastal and Marine Resources.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 1: Restore, Enhance, and Protect Habitats;
- Objective 2: Restore, Improve, and Protect Water Resources (primary); and
- Objective 3: Protect and Restore Living Coastal and Marine.

## Implementing Entities

Collier County will be the sole implementing entity and grant sub-recipient responsible for the engineering design, permitting, construction, operation and maintenance, and success monitoring of this project. Collier County has coordinated with numerous other agencies in the development of the CCCWIP, and may collaborate with other entities in the implementation of the project through leveraging and other cooperative funding agreements.

## Best Available Science and Feasibility Assessment

This project is the culmination of over 30 years of study by numerous agencies, and in 2016 Collier County completed conceptual design and feasibility study for the project, as cited below:

- Atkins, 2016. Collier County Comprehensive Watershed Improvement Plan. Final Report prepared for Collier County and the Rookery Bay National Estuarine Research Reserve.

As part of this study, various flow diversion scenarios were proposed and modeled, and conceptual design of the various project components were conducted. In addition, initial permitting discussions were held with federal and state regulatory and resource management agencies. This document also cites the relevant previous studies.

This project is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct the project within the proposed budget; and 3) effectively operate and maintain the project components over the long term.

### Risks and Uncertainties

In the evaluation of this project, no significant risks have been identified that would preclude implementation. There is some uncertainty with regard to a potential increase in nutrient loads to Rookery Bay; however, this will be evaluated in the design phase. This project is ready to begin engineering design and permitting.

### Success Criteria and Monitoring

This project will affect estuaries, freshwater wetlands, and terrestrial systems. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in the distribution of salinity, oysters, and seagrass beds in Naples Bay and Rookery Bay from current conditions; and
- Changes in groundwater levels, and the distribution of vegetation and listed species in the Belle Meade area of the Picayune Strand State Forest from current conditions.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Collier County is committed to an adaptive management approach to the project, and to conducting the monitoring necessary to support this approach and to quantify project benefits.

### Milestones and Schedule

The total estimated time horizon of this project - from engineering design and permitting through success monitoring - is approximately 8 years. The expected start date is 2018, and the expected end date is 2026. Implementation of this project has been broken down into eight milestones, or phases, as shown in the milestone chart below.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Phase 1 Engineering & Permitting	■	■	■									
Construction Phase 1 (Golden Gate)			■	■	■							
Project Monitoring & Modifications					■	■						
Phase 2 Engineering & Permitting				■	■							
Phase 2 Construction (Six Ls/US-41)					■	■						
Phase 3 Improvements (Belle Meade)						■	■					
Success Monitoring & Certification		■	■	■	■	■	■	■				

## Budget and Funding Sources

As part of the project feasibility study (Atkins, 2016), a preliminary opinion of probable construction engineering, permitting, construction, and monitoring costs for the project was developed, based on best available information for quantities and unit prices for the year 2016. The total project cost was estimated to be \$32,000,000.

Collier County has committed to allocating all of its Direct Component funds - approximately \$5,400,000 - towards this project to supplement its entire \$12,700,000 share of the Florida Spill Impact Component. Collier County has the financial capacity to make up project funding shortfalls with other County funds. A summary of the funding sources for this project is provided in the table below.

PROJECT BUDGET	ESTIMATED DOLLARS
Planning	\$320,000
Implementation	\$31,616,000
Monitoring	\$64,000
<b>Total Cost</b>	<b>\$32,000,000</b>
SECURED FUNDING SOURCES	
Spill Impact Component	\$12,660,000
Direct Component	\$5,400,000
Other Grants or Co-Funding	\$0
Other County Funds	\$13,900,000
<b>Total Secured Funding</b>	<b>\$32,000,000</b>
<b>Budget Shortfall</b>	<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES	
NRDA	\$300
Council Selected Component	
South Florida Water Management District Cooperative Funding	

Collier County has requested consideration from the Florida Department of Environmental Protection (FDEP) to apply leveraged funds from both the Natural Resource Damages portion of the State's settlement as well as Council Selected Component funds in collaboration with FDEP, as part of a future Funded Priority List. If leveraged funds become available, they would be used to offset County expenditures.

## Partnerships/Collaboration

The development of the CCCWIP, and completion of the feasibility study, was co-sponsored by the Rookery Bay NERR, which has been involved from the beginning of project development and has provided technical support. In addition, Collier County has worked diligently to gain the support and partnership of other interested local groups/organizations, including:

- City of Naples;
- South Florida Water Management District – Big Cypress Basin;
- Florida Fish and Wildlife Conservation Commission;
- Florida Department of Environmental Protection;
- Florida Forest Service;
- U.S. Fish and Wildlife Service;
- U.S. Army Corps of Engineers;

## MONROE COUNTY

# Canal Management Master Plan Implementation

PROJECT NO. 23-1

## Project Description

### OVERVIEW AND LOCATION

This program entails the implementation of the Monroe County Canal Management Master Plan (CMMP). The CMMP was developed to address the restoration and management of water quality and living resources in the extensive network of man-made dredged canals throughout the Florida Keys (see **Figure 23-1A**).

### NEED AND JUSTIFICATION

Beginning in the late 1800s, the Florida Keys have been substantially altered and adversely impacted by dredge and fill activities to support development and human population growth. Approximately 170 linear miles of canals were dredged to create over 37,000 acres of filled lands, resulting in 312 miles of waterfront property (AMEC Environment & Infrastructure, Inc., 2013). While these alterations created extensive new real estate, and associated wealth and prosperity, they also significantly impacted native habitats, as well as nearshore water quality and living marine resources.

To maximize the volume of fill material, many of the canals were dredged to depths of 10 to 20 feet, with some as deep as 40 feet. Furthermore, most of the created canals are long, dead-end networks with little or no tidal flushing. These hydrographic alterations, combined with the addition of untreated residential stormwater runoff and wastewater effluent from leaky septic tanks, fostered persistent toxic algae blooms, low dissolved oxygen, and poor water clarity. Accordingly, living resources - including seagrass, benthic invertebrates, and fish – cannot tolerate these conditions, and many canals have become “dead zones.” **Figure 23-1B** shows a poorly flushed canal with excessive decaying vegetation.



**Figure 23-1A.** Project location in Monroe County.

While ecological conditions within most of the canals are highly degraded, the impacts extend beyond just the canals themselves. The canals discharge surface waters directly to the nearshore Florida Keys National Marine Sanctuary (FKNMS), which is also a designated Outstanding Florida Water (OFW) pursuant to Florida Statutes. Accordingly, the waters of the FKNMS are regulated to the State's anti-degradation policy, meaning that no degradation of existing water quality is allowable. Yet many of the canals have been identified as impaired, exhibiting exceedances of water quality criteria for nutrients and dissolved oxygen.

In 2008, the Florida Department of Environmental Protection (FDEP) prepared a Florida Keys Reasonable Assurance Document (FKRAD) which recognized the extensive ongoing wastewater and stormwater restoration activities being implemented by Monroe County to address nutrient and dissolved oxygen impairments. The FKRAD was prepared as an alternative to a Total Maximum Daily Load (TMDL) which would have required regulatory pollutant load reductions. In the 2011 FKRAD document update, the FDEP stated that a canal restoration program would likely be needed to comply with dissolved oxygen standards.

Most of the damage from rampant dredge and fill was done prior to the passage of major federal environmental laws such as the Clean Water Act, leaving a legacy of environmental degradation that will require a substantial commitment of resources to fully remediate.

## PURPOSE AND OBJECTIVES

Monroe County collaborated with numerous stakeholders to develop the Canal Management Master Plan (CMMP). The purpose of the CMMP is to reverse the legacy environmental degradation caused by historical residential canal construction. The objectives of the CMMP are to: 1) restore water quality and habitat in much of the approximate 170 miles of dredged canals throughout the Florida Keys; 2) make the canals habitable for living marine resources, thus improving recreational opportunities and aesthetics for residents; and 3) protect water quality in the Florida Keys National Marine Sanctuary.

## PROJECT COMPONENTS

The development and implementation of the CMMP is part of a multipronged strategy to improve and protect surface water quality in the Florida Keys, dating back to the early 1990s. In 1992, Congress directed the U.S. Environmental Protection Agency and the State of Florida to develop a Water Quality Protection Program (WQPP) for the Florida Keys National Marine Sanctuary. The WQPP recommended major upgrades to domestic wastewater facilities, and after decades of work most of the Florida Keys is now served by central sewage collection and treatment facilities, replacing tens of thousands of failing septic tanks. However, while the wastewater treatment upgrades have reduced nutrient and bacterial loads, they did not address the poor tidal flushing characteristics of the canals, and canal water quality has been slow to improve. As a result, the WQPP Steering Committee recommended



**Figure 23-1B.** Poorly flushed canal with excessive decaying vegetation.

## SECTION V: Proposed Projects, Programs and Activities

the development of a plan to prioritize canal restoration projects and identify funding sources for these projects. In response to this recommendation, Monroe County and its partners completed the CMMP in September 2013. The CMMP utilized a two-step process to develop an action plan:

1. Engineering and Science-Based Assessment and Evaluation; and
2. Outreach, Management, and Program Development.

Step one involved: 1) preparation of a comprehensive county-wide map of residential canals; 2) a field study and assessment of canal hydrography and water quality; 3) development of a system for classifying and ranking canals based on their characteristics; 4) evaluation of various canal restoration technologies; and, 5) preparation of a ranked priority list of canal restoration projects. Step two included: 1) development, distribution, and analysis of a homeowner questionnaire; 2) development of a homeowner's best management practices manual; and, 3) inventory of potential funding sources to fully implement the plan.

A total of 502 residential canals, or canal segments, were identified, mapped, and assessed. Of those, 229 were determined to have poor or fair water quality. Those 229 canals were subsequently classified and ranked for priority restoration in the CMMP. The canal restoration techniques evaluated were those that primarily address quality degradation related to depleted dissolved oxygen and poor tidal flushing. Five primary technologies were evaluated including:

- Removal of accumulated organic sediments in canals;
- Installation of weed gates, air curtains, or other physical barriers to minimize external inputs of excess organic matter;
- Construction of culvert connections to facilitate tidal flushing and circulation
- Backfilling to prevent the occurrence of stratification and deep stagnant zones; and
- Installation of water pumping systems to facilitate flushing when culvert connections are not feasible.

To test the efficacy of these various technologies, Monroe County developed a Canal Restoration Demonstration Program, the purpose of which was to: 1) implement various CMMP technologies; 2) evaluate the effectiveness of those technologies; and, 3) obtain realistic permitting, scheduling and cost information for future project implementation. Since 2014, Monroe County has funded approximately \$5 million for the implementation of six canal restoration demonstration projects to evaluate various combinations of five different technologies. The results of the demonstration projects have shown that various technologies have been largely successful when properly applied to address the unique characteristics of each canal. Figure 23-1C shows a canal shallowing demonstration project under construction.

The CMMP describes a clear road map for canal restoration in Monroe County, and Spill Impact Component funding will be used to implement priority canal restoration projects identified in the CMMP.

### Contributions to the Overall Economic and Ecological Recovery of the Gulf

The canal restoration program specified in the Monroe County CMMP will directly contribute to the improvement of water quality conditions in nearshore coastal waters. Clean coastal waters are absolutely essential to the economy and ecology of the Florida Keys. The Florida Keys coral reef tract is the third largest barrier reef in the world, and the only living barrier reef adjacent to the continental U.S. Coral reefs are very sensitive to pollution, and the health of the Florida Keys coral reef tract, and the Florida Keys National Marine Sanctuary are very much dependent on excellent



water quality. With regard to the economy, more than two million individuals per year visit the Florida Keys per year to enjoy water related activities including snorkeling, scuba diving, and fishing. These water-based recreational activities support 70 percent of the tourism in the Florida Keys, and generate more than 70,000 jobs and over \$6 billion in economic activity annually.

## Eligibility and Statutory Requirements

This project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast region (primary);
- Activity 2: Mitigation of damage to fish, wildlife, and natural resources; and
- Activity 3: Implementation of a federally-approved marine, coastal, or comprehensive conservation management plan, including fisheries monitoring.



**Figure 23-1C.** A canal shallowing demonstration project under construction.

## Comprehensive Plan Goals and Objectives

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 2: Restore Water Quality and Quantity (primary);
- Goal 1: Restore and Conserve Habitat;
- Goal 3: Replenish and Protect Living Coastal and Marine Resources; and
- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 2: Restore, Improve, and Protect Water Resources (primary);
- Objective 1: Restore, Enhance, and Protect Habitats; and
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

## Implementing Entities

Monroe County will be the sole implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of all projects conducted under this program.

### Best Available Science and Feasibility Assessment

As described above, the CMMP was developed to address recommendations specified in both federal and state management and regulatory documents related to water quality and living resource protection of the Florida Keys National Marine Sanctuary. The CMMP solicited input from stakeholders and the public, and followed a methodical approach to project identification and prioritization. Furthermore, Monroe County has undertaken a demonstration program to field test various canal restoration technologies, and obtain realistic information on permitting constraints and project costs. This program is considered to be feasible with respect to the ability to: 1) obtain necessary permits; 2) construct canal restoration projects; and 3) effectively operate and maintain constructed canal restoration technologies. The CMMP is fully described in the following document:

- AMEC Environment & Infrastructure, Inc., 2013. Monroe County Management Master Plan (CMMP). Final report prepared for: Monroe County, the U.S. Environmental Protection Agency, and the Water Quality Protection Program Steering and Advisory Committees.

This document also describes the consistency and compliance of the CMMP with other federal and state management and regulatory documents.

### Risks and Uncertainties

In the evaluation of this program, no significant risks or uncertainties have been identified that would preclude implementation. Monroe County has identified priority projects and is ready to proceed with design, permitting and construction.

### Success Criteria and Monitoring

Projects implemented under this program will primarily affect water quality in the restored canals. Therefore, a range of success criteria will be developed and described in the implementation grant request. It is anticipated that quantitative success criteria will be developed for:

- Changes in water clarity, as well as dissolved oxygen, nutrient, and bacteria concentrations from existing conditions in the restored canals;
- Changes in the abundance and distribution of seagrass and benthic invertebrates from existing conditions in the restored canals.

In the implementation grant request, a detailed monitoring program design will be described that addresses data collection and assessment methodologies for the above listed criteria. Monroe County is committed to an adaptive management approach to the project, and to conducting the monitoring necessary to support this approach and to quantify project benefits.

### Milestones and Schedule

Due to funding constraints Monroe County will implement the CMMP program incrementally over the next 10-20 years. However, Monroe County has identified priority projects to be paid for using RESTORE Act funds and is ready to proceed with design, permitting and construction. The total estimated time horizon of these projects - from engineering design and permitting through success monitoring - is approximately 8 years. The expected start date is 2018, and the expected end date is 2026.

MILESTONE	YEARS TO COMPLETE											
	1	2	3	4	5	6	7	8	9	10	11	12
Design and permitting												
Construction												
Success monitoring												

## Budget and Funding Sources

The estimated total cost to implement appropriate restoration projects in all 229 impaired canal is \$671,100,000.

Monroe County is proposing to utilize its full allocation of both Direct Component and Spill Impact Component funds to implement priority projects in the CMMP.

PROJECT BUDGET		ESTIMATED DOLLARS
Planning		\$0
Implementation		\$18,748,690
Monitoring		\$300,000
<b>Total Cost</b>		<b>\$19,048,690</b>
SECURED FUNDING SOURCES		
Spill Impact Component		\$12,660,000
Direct Component		\$6,388,690
Other Grants or Co-Funding		\$0
Other County Funds		\$0
<b>Total Secured Funding</b>		<b>\$19,048,690</b>
<b>Budget Shortfall</b>		<b>\$0</b>
POTENTIAL LEVERAGED FUNDING SOURCES		
NRDA Water Quality		?

### Partnerships/Collaboration

Monroe County has coordinated with a wide range of stakeholders in the development of CMMP, including:

- Federal agencies
  - U.S. Environmental Protection Agency
  - National Park Services
  - National Oceanic and Atmospheric Administration
  - Florida Keys National Marine Sanctuary
- State agencies
  - Florida Department of Environmental Protection
  - Florida Fish and Wildlife Conservation Commission
  - South Florida Water Management District
- Incorporated cities
  - Village of Islamorada
  - City of Marathon
  - City of Key Colony Beach
  - City of Layton
  - City of Key West
- Non-government organization
  - The Nature Conservancy

RESTORE Act Compliance
Public Participation
Financial Integrity
Overall Consistency
Proposed Projects
Appendices







## V.d. Cumulative Benefits of Proposed Projects, Programs and Activities

### EVOLUTION OF THE PROJECT NOMINATION PROCESS

As discussed in Section II above, the original approach proposed to develop the Florida SEP involved a process whereby the consultant team would review the universe of projects contained in the Deepwater Horizon project portal developed by the Florida Department of Environmental Protection, conduct benefit/cost analysis of those project, and then select and rank a small subset (e.g., 6-12) regional projects that were determined to be most cost-effective and provide the greatest overall benefits to the State of Florida.

Early in the SEP development process, the Gulf Consortium held a one-day goal setting workshop to deliberate on Florida-specific goals, objectives, and guiding principles for the Florida SEP. In addition, this workshop addressed two key questions: 1) should there be a pre-determined geographic allocation of funds; and 2) should there be a pre-determined allocation of funds for environmental vs. economic projects. As the debate of the geographic distribution of funds advanced, a strong consensus began to evolve amongst the Gulf Consortium that each county should have the ability to sponsor projects and participate in Gulf restoration through the implementation of the SEP, and that there should be no pre-determined allocation of funds for environmental vs. economic projects.

At its November 18, 2015 meeting, the Gulf Consortium formally voted to approve an “even steven” distribution of Florida’s Spill Impact Component allocation amongst the 23 member counties. That is, each member county would receive an equal amount of the allocation, without consideration of factors such as miles of shoreline, distance from the spill, population, etc. The Consortium considered several alternative approaches to geographically distributing the funds for projects along the Florida Gulf coast, but it was determined that the most equitable solution was to divide the available Spill Impact Component funds equally so that each county could equally participate in Gulf restoration, and self-determine their own projects. Once this decision was made, the consultant team was requested to revise their scope of work to implement a “county-driven” process to project nomination and evaluation whereby they would work closely with each county to identify and refine their proposed projects for inclusion in the Florida SEP.

Initially, representatives of the State agencies involved with the administration of Deepwater Horizon funding streams expressed concerns about this county-driven process, and whether it would generate projects that were in the best interest of the majority of Florida Gulf coast stakeholders. However, those concerns were resolved when the consultant team presented a summary of the initial SEP project list to representatives from the Florida Department of Environmental Protection, the Florida Fish & Wildlife Conservation Commission, and Florida Governor’s representative on the Restoration Council on January 26, 2017. These representatives expressed strong support for the initial SEP project list, and stated that there was great potential to use funds from other DWH funding streams to leverage many of the SEP projects during implementation.

### BENEFITS OF THE COUNTY-DRIVEN PROCESS

The county-driven project nomination process resulted in a number of benefits that would not have been derived had the initial proposed approach been used. These benefits are listed and discussed below:

- Bottom up vs. top down process;
- Even distribution of funding across the Florida Gulf coast;
- Projects address local and regional priorities;
- Highly diverse range of projects; and
- Regional collaboration.

## SECTION V: Proposed Projects, Programs and Activities

### Bottom Up vs. Top Down Process

Compared to the other four Gulf states, Florida is unique with regard to the development and implementation of their SEP. In the other four states these processes are administered by a designated state agency or group of agencies; whereas in Florida these processes have been delegated to a federation of the Florida Gulf coast counties – the Gulf Consortium. Accordingly, the process for nominating projects for inclusion in the Florida SEP was very much a “bottom up” versus a “top down” approach. As a result, the Florida SEP includes a wide range of projects that address local and regional needs and priorities, rather than priorities identified by a particular state agency. It is likely that the SEP project list would have been quite different had it been developed by a state agency, which may have been biased towards addressing a particular agency mission. For this reason, it can be argued that the “bottom up” process used by the Consortium was more responsive to the overall body of stakeholders along the Florida Gulf coast, than a process driven by a single state agency would have been.

### Even Distribution of Funding

The “even steven” distribution of Florida’s Spill Impact Component allocation ensures that each Consortium member county will receive an equal amount of the allocation, without consideration of factors such as miles of shoreline, distance from the spill, population, etc. In addition, it confirms that each county will have the opportunity to equally participate in Gulf restoration, and self-determine their own projects. This approach results in an even distribution of Florida’s Spill Impact Component funds across the Florida Gulf coast, rather than focusing those funds in a few select locations. However, this does not necessarily mean that total spending for SEP implementation will be evenly distributed along the coast. Some counties have proposed to utilize all or portions of their Direct Component, and commit other county funds, to support their SEP projects; while others have only committed Spill Impact Component funds. In addition, some projects have the potential to attract significant leveraged monies from other DWH funding streams, while others do not. Nonetheless, the even distribution of Spill Impact Component funding across the Florida Gulf coast is a clear benefit to the overall body of stakeholders.

### Local and Regional Priorities

While the more insidious effects of the Deepwater Horizon oil spill on Florida’s marine resources is still under investigation, significant overt ecological damage was fairly limited compared to other Gulf states. Therefore, the Consortium member counties have chosen to use Spill Impact Component funds to address other legacy environmental damage, or unique regional challenges to their coastal economies. In reviewing the SEP project list, several common and regionally-specific project types emerge.

The most numerous SEP project type proposed along the entire Florida Gulf coast is water quality improvement. Florida has a very active Total Maximum Daily Load (TMDL) program administered by the Florida Department of Environmental Protection, as well as the U.S. Environmental Protection Agency. Florida has also been uniquely diligent in the collection of ambient water quality data, by both state agencies and local governments, from which impaired waters determinations can be made and addressed. In addition, Florida has a great deal of older coastal development that was constructed prior to the implementation of the Clean Water Act and related state regulations.

The most common project type proposed in the SEP is the replacement of failing or inadequate septic tanks in these older coastal developments with central sewer collection and treatment facilities. While the provision of adequate wastewater collection and treatment facilities has typically been the responsibility of local governments, retrofitting old development is very costly and counties have struggled to find adequate funding. Therefore, many of the Consortium member counties are committing all or part of their Spill Impact Component allocations to address these legacy problems, and requesting leveraging from other DWH funding streams to maximize these benefits.

Another type of water quality improvement project is the removal of legacy contaminated sediments from bayous and coastal water bodies that have been polluted by historical industrial and agricultural uses. Bayou Chico in Escambia County is a small urban bayou with a long history of industrial pollution dating back to the early 1800's, and during the response to the Deepwater Horizon oil spill, the Bayou served as a staging/cleaning location for vessels that deployed oil boom and dispersants. Lake Seminole in Pinellas County was historically an estuarine bayou that was impounded in the 1940's to create an irrigation water source for surrounding citrus groves. Decades of nutrient laden runoff have resulted in an accumulated sediment mass that releases nitrogen and phosphorus to adjacent Boca Ciega Bay. Both counties are proposing major dredge projects to remove contaminated sediments and improve coastal water quality.

The Florida Keys and southwest Florida are naturally low-lying and poorly drained, and older development there relied upon substantial channelization and dredge and fill to make conditions habitable for humans. Accordingly, Monroe, Collier, Lee, and Sarasota counties are proposing SEP projects aimed at reversing legacy environmental damage from extensive dredge and fill and/or channelization to drain wetlands and reroute natural surface water flow patterns. The canal and hydrologic restoration projects proposed by these counties are significant in their scope, and will result in the restoration of both water quality and associated living resources affected by these historical alterations.

The counties of the Big Bend and Nature Coast regions of Florida (Hernando, Citrus, Levy, Dixie, Taylor and Jefferson) are relatively rural, with limited coastal development. One of the most significant impediments to the coastal economic development in these counties is the wide and very shallow continental shelf, which offers very little natural deep water access. Although marine living resources (e.g., seagrasses, clams, scallops, oysters, reef fish) in this region are rich and extensive, these counties struggle to provide adequate public access to the coastal zone for residents, tourists and commercial fisherman. Therefore, common project types proposed by these counties include: land acquisition for public access; improved boat ramps and coastal recreational facilities; and the enhancement of both offshore artificial reefs and nearshore oyster reefs.

Finally, a common theme that all Consortium member counties have promoted is that Florida's economy is inextricably linked to the environmental quality of its coastal zone. The vast majority of Florida's economic activity occurs in its coastal counties where residents, tourists, and commercial fisherman seek out white sand beaches, clear waters, natural wetland habitats, and rich living marine resources. For these reasons, Consortium member counties in nominating their respective projects did not make clear distinctions between environmental and economic projects

### **Diversity of Project Types**

Perhaps the greatest benefit of the county-driven project nomination process is the diversity of projects proposed by the Consortium member counties. As presented in Section V.c. above a total of 71 projects have been proposed addressing a wide range of RESTORE Act eligible activities, Council goals and objectives, and project types defined by the Florida Department of Environmental Protection (FDEP).

The following pie charts provide a summary of the proposed SEP project list. Figure V.d.1 below shows the project breakdown by primary RESTORE Act eligible activity. The SEP project list represents four of the eleven RESTORE Act eligible activities; however, it should be noted that classifying projects into a single activity was in several cases difficult due to multiple and overlapping project benefits. Nonetheless, it is clear that the top two activities represented include:

## SECTION V: Proposed Projects, Programs and Activities

- Restoration and protection of natural resources of the Gulf Coast Region; and
- Promotion of tourism in the Gulf Coast, including recreational fishing.

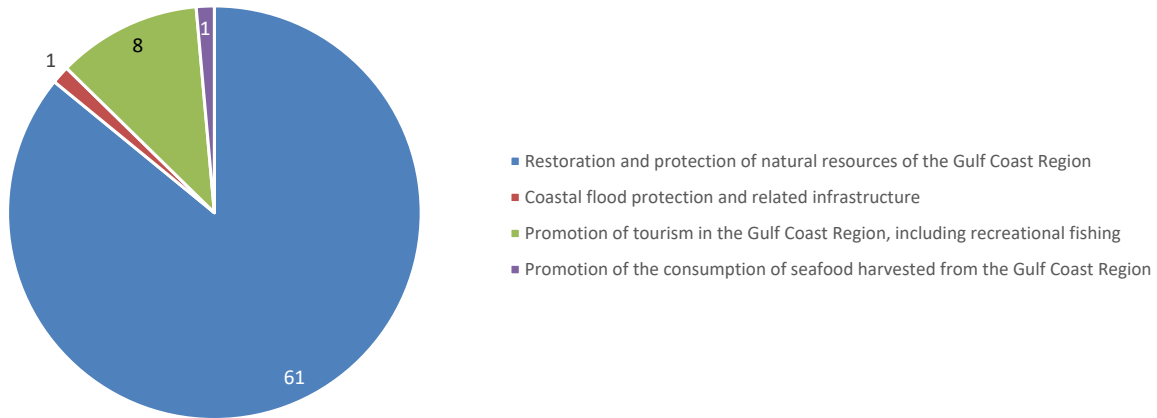


Figure V.d.1 – Project breakdown by RESTORE Act Eligible Activity.

Figure V.d.2 below shows the project breakdown by Council Objective. Again, classifying projects into a single project objective was often difficult due to multiple and overlapping project benefits. The top four objectives represented include:

- Restore, Improve and Protect Water Resources (41%);
- Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects (32%); and
- Restore and Enhance Natural Processes and Shorelines (10%).

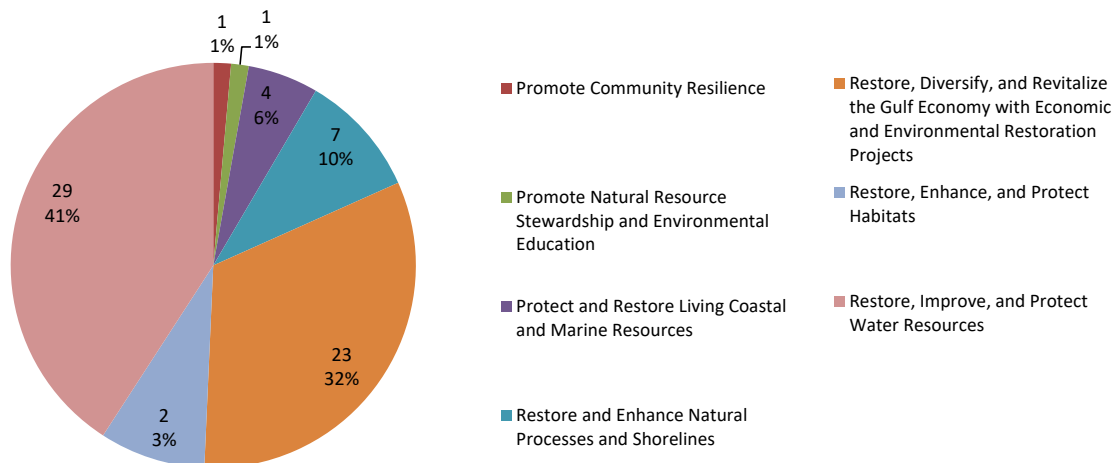


Figure V.d.2 – Project breakdown by Council Objective.

Figure V.d.3 shows the project breakdown by project type as defined by the Florida Department of Environmental Protection (FDEP). Using this categorization scheme, the diversity of projects is more evident; however, Water Quality/Quantity is the most dominant project type at 40 percent.

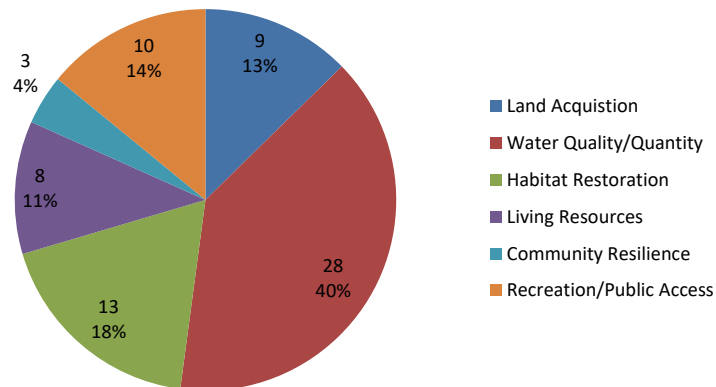


Figure V.d.3 – Project breakdown by FDEP project type.

Figure V.d.4 below shows the project breakdown by FDEP project type dollars. Although the top three project types are the same as in Figure V.d.3, projects that fall into the Water Quality/Quantity category account for 60% of the total budget. This is because wastewater and stormwater infrastructure projects tend to be very costly compared to other project types.

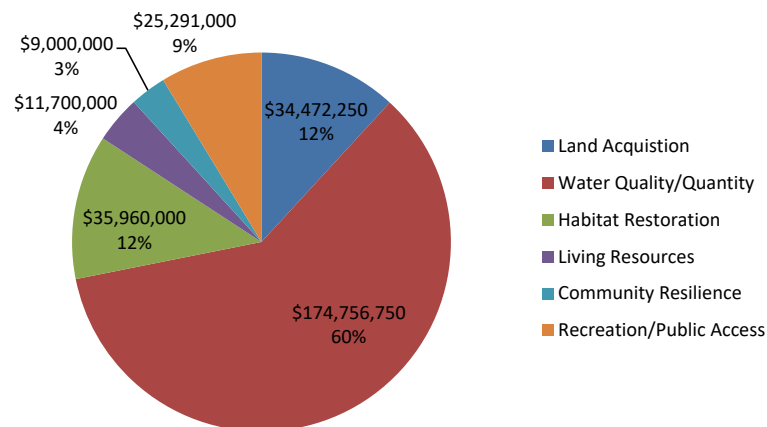


Figure V.d.4 – Project breakdown by FDEP project type dollars.

## SECTION V: Proposed Projects, Programs and Activities

Figure V.d.5 below shows the project breakdown by stage of readiness. This shows that 14% of the projects proposed by the counties are in the concept stage only, and have undergone little or no conceptual design, feasibility analysis, or detailed cost estimating. About 49% of the projects have undergone some planning activity, while 24% have had some level of feasibility analysis. Only 6 of the 71 total projects (9%) have undergone design and permitting and are close to shovel ready for implementation. Therefore, the majority of proposed projects need further definition and refinement in terms of conceptual design, feasibility analysis, and realistic detailed cost estimating sufficient for future implementation grants.

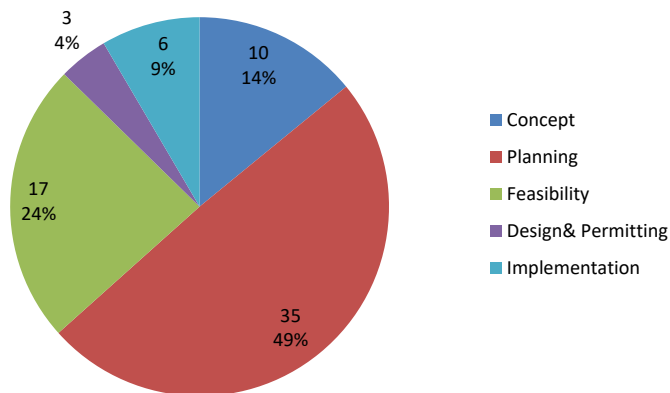


Figure V.d.5 – Project breakdown by stage of readiness.

### Regional Collaboration

One potential weakness of the county-driven process was the relative lack of regional collaboration that occurred during project nomination. A few counties participated in multi-county discussions about cross-jurisdictional collaboration; however, the only project type for which this proved to be fruitful was offshore artificial reefs. It was determined that there was some potential economy of scale benefits for sharing artificial reef materials and staging sites between counties along the Springs Coast and Nature Coast regions (Pasco, Hernando, Citrus and Levy).

During the project nomination process the individual counties tended to focus on their own local needs and priorities without much consideration of multi-county participation on regional projects. However, it should be noted that the Gulf Consortium itself is the mechanism by which the 23 member counties collaborate and interact



## E. Leveraging Opportunities

### OVERVIEW OF LEVERAGING

The role of leveraging in developing Florida's State Expenditure Plan is to expand the total funding invested in the Gulf Coast beyond the Spill Impact Component allocation with the goal of maximizing the individual and cumulative benefits of SEP projects. In addition, leveraged funding can also increase flexibility in the implementation of project scopes of work. For example, RESTORE Act funds can be used to satisfy the Non-federal share that may be required in other federal grant programs, creating the ability to use the Spill Impact Component funds to attract a variety of other complementary funding sources, many of which are competitively awarded<sup>1</sup>. For these reasons, the Gulf Consortium has outlined and researched a wide range of complementary funding sources that could potentially be utilized to expand the scope, extent, magnitude, and positive impacts of many of the SEP projects.

The Gulf Consortium, as the entity responsible for the implementation of the Florida SEP, will coordinate with and assist the individual counties in the preparation of implementation grants for projects included in the SEP. A coordinated, centralized approach to leveraging will play a critical role in both filling project budget gaps, and in phasing projects over the multi-year payout period. Having a diversity of leveraging sources can help offset the burden of these potential restructuring needs if actual project costs exceed initial budget estimates, and the total Spill Impact Component request for a particular county exceeds the set amount of their even-stein allocation. This is an important consideration given the different stages of project readiness across the suite of projects, emphasizing the need for flexibility in project implementation to accommodate potential scope and budget changes, or re-prioritization of entire projects on counties project lists. The uncertainty of the 15-year payout period necessitates this level of forethought and preparation for all potential scenarios during the implementation phase.

#### Defining Various Funding Types

In the Individual Project Descriptions outlined in Section V.c. of this SEP, the budget table for each project shows a breakdown of the various "Secured" funding sources proposed to complete the scope as described. For each project, the proposed sources of funding include: 1) Spill Impact Component request; 2) Direct Component funds; 3) other grants and co-funding; and 4) other county funds. These funding sources are considered to be "secured" in that they represent actual committed funding that is available for project implementation at SEP approval.

The section of the budget table entitled "Potential Leveraged Funding Sources" lists additional competitive funding sources that could increase the overall scope, extent, magnitude and positive impacts of the particular project or program. These are funding sources that have been identified as potential matching funds as they are consistent with the objectives of the particular RESTORE eligible activities and are applicable to the projects. These potential funding opportunities will have to be separately applied for through either a competitive grant process, a cooperative agreement, a direct allocation, or some other funding mechanism pre-determined by each individual funding program.

### INCREASING THE IMPACT OF THE SPILL IMPACT COMPONENT

#### Synergy Across Deepwater Horizon Funding Streams

The RESTORE Act (RA) component of the Deepwater Horizon grand settlement has five different components, each with different targeted recipients, objectives and administrative procedures. Throughout the development of the

<sup>1</sup> 1 33 U.S.C. § 1321 t(1)N Cost Sharing (2012)

## SECTION V: Proposed Projects, Programs and Activities

SEP, many of the Florida counties have been working concurrently on the preparation and implementation of their Multi-Year Implementation Plans, as required under the Direct Component. Direct Component projects are being implemented through a grants program administered by the Department of Treasury whereby each individual County is working directly with Treasury staff. Some counties have chosen, or may choose in the future, to combine their Direct Component funds with their Spill Impact Component allocation to streamline priorities or to increase funding for certain key projects. Others are utilizing a more collective approach, reaching out to the incorporated cities and other stakeholders to identify projects to be funded by their Direct Component funds. In addition, some counties have collaborated with the Florida Department of Environmental Protection, Florida Water Management Districts, and/or National Estuary Programs to be included in Florida's funding request under the Council Selected Component funding stream.

In addition to the RESTORE Act, the Deepwater Horizon grant settlement also included funds secured through the Natural Resource Damage Assessment (NRDA) process embodied in the Oil Pollution Act of 1990, and through a separate lawsuit filed by the National Fish & Wildlife Foundation, which are deposited in the Gulf Environmental Benefit Fund (GEBF). The goals and objectives for the use of each of the Deepwater Horizon funding sources are similar, and there is a great deal of synergy and opportunity to leverage funds between the RA, NRDA, and GEBF funding streams. A synopsis of each of the Deepwater Horizon funding sources is detailed below.

RESTORE ACT COUNCIL-SELECTED RESTORATION COMPONENT	
<b>Money Available to Florida:</b>	There is no specific allocation for Florida, however the entire component is funded with \$1.6B to be competitively awarded by Council. The Initial Funded Priority List, published in 2015, awarded \$2,260,7406 in State and Federal sponsored planning and/or implementation projects in the State of Florida. The Council listed an additional \$10,212,175 in State and Federal sponsored projects for the State of Florida for future consideration.
<b>Managing Agency:</b>	The Restore Council administers the Council-Selected Restoration Component. The 11-member Restore Council is made up of the Governors of each affected state, or their respective designees, and the Secretaries of the Department of Agriculture, Department of the Army, Environmental Protection Agency, Department of Homeland Security, and the Department of the Interior, or their respective designees.
<b>Leverageable Projects:</b>	Successful proposals will be activities that align with the Council Goals and Objectives listed in the comprehensive plan. Generally, these are: Restore and Conserve Habitat, Restore Water Quality and Quantity, Replenish and Protect Living Coastal and Marine Resources, Enhance Community Resilience, Restore and Revitalize the Gulf Economy.
<b>Geographic Limitations:</b>	Projects are limited to the Gulf Coast Region. Projects with regional impact or that cross jurisdictional boundaries will be given priority.
<b>Funding Cycle:</b>	On July 13, 2017, the Council published the Draft 2017 Funded Priorities List: Comprehensive Commitment and Planning Support. Project proposals are currently being accepted through FDEP's website and successful proposals will be submitted to Council to be included in future drafts of the Funded Priority List and Comprehensive Plan.
<b>Process to Link to SEP:</b>	FDEP and FWC receive projects through the DWH project portal on FDEP's website. Selected projects will be submitted to Council for inclusion in future iterations of the Funded Priority List and Comprehensive Plan.

### NATURAL RESOURCE DAMAGE ASSESSMENT

<b>Money Available to Florida:</b>	Total restoration funding allocated is \$8.1B, plus \$700 million for unknown conditions and adaptive management. Restoration funds are divided among Trustee Implementation Groups (TIGs) for defined restoration areas, three of which may be leveraged with Florida's Spill Impact Component projects: Regionwide (\$350M), Open Ocean (\$1.24B) and Florida (\$680M). The Florida-specific TIG has spent \$144M thus far on restoration activities. The Florida TIG is the focus of this leveraging analysis.
<b>Managing Agency:</b>	The Florida TIG has six member agencies: FDEP, FWC, NOAA, USDA, EPA, and DOI. The Florida TIG develops, selects, and implements restoration projects on a consensus basis to accomplish the priorities of the Programmatic Damage Assessment and Restoration Plan (PDARP).
<b>Leverageable Projects:</b>	The Florida TIG is specifically soliciting proposals for: Habitat Projects on Federally Managed Lands, Nutrient Reduction, Water Quality, and Provide and Enhance Recreational Opportunities.
<b>Geographic Limitations:</b>	Projects are limited to the Gulf Coast Region. Early restoration was focused in the Panhandle; future restoration efforts will be state-wide. Exact geographic limitations have not been defined. Projects for the Habitat on Federally Managed Lands restoration type will seek to address habitat injuries at Gulf Islands National Seashore and St. Vincent National Wildlife Refuge.
<b>Funding Cycle:</b>	There is no deadline for submissions. Projects submitted before December 5th, 2016 were considered in the development of Florida's initial restoration plan, which is anticipated to cover the first two to three years of settlement funding. Projects submitted after this deadline will be considered for future planning.
<b>Process to Link to SEP:</b>	For Florida's NRDA process, FDEP and FWC receive projects through the DWH project portal on FDEP's website. Selected projects that align with the PDARP are then reviewed by Florida's TIG. Once approved by consensus at the TIG level, projects are included in project-specific restoration plans.

### GULF ENVIRONMENTAL BENEFIT FUND

<b>Money Available to Florida:</b>	Of the \$2.554B allocated to GEBF \$356M is allocated for projects in FL. As of FY17 approximately \$255.2M is still available for restoration activities in Florida.
<b>Managing Agency:</b>	National Fish and Wildlife Foundation manages the GEBF. The criminal pleas agreements require NFWF to consult with the appropriate state and federal resource managers; for Florida these include FDEP, FWC, FWS and NOAA. FWC and FDEP manage the project submission portal for Florida's GEBF funds and are the main partners in identifying priority restoration and conservation projects and evaluating and selecting proposals.
<b>Leverageable Projects:</b>	GEBF will fund projects specific to restoring or rehabilitating natural resources that suffered injuries resulting from the DWH oil spill. Florida projects should address high priority restoration and conservation needs. NFWF has outlined the following three funding priorities to delineate what restoration goals are emphasized for GEBF projects in Florida: "(1) Restore and maintain the ecological functions of landscape-scale coastal habitats and ensure their viability and resilience against existing and future threats; (2) Restore and maintain the ecological integrity of priority coastal bays and estuaries; and (3) Replenish and protect living resources, including oysters, red snapper, and other reef fish; Gulf Coast bird populations; sea turtles; and marine mammals."

## SECTION V: Proposed Projects, Programs and Activities

<b>Geographic Limitations:</b>	The GEBF Restoration Strategy will concentrate projects in the Panhandle and Big Bend regions of Florida, stretching from Escambia to Levy County. The rest of Florida's peninsular counties and offshore projects are restricted to migratory living resources.
<b>Funding Cycle:</b>	There is no deadline for submissions. Project proposals for each funding cycles are expected to be reviewed in the spring of each funding year.
<b>Process to Link to SEP:</b>	Projects are first submitted through the project portal, common to NRDA, Restore Pot 2 and GEBF, on FDEP's website. They are then screened by FWC and FDEP. Projects are considered for inclusion in Florida's GEBF Restoration Strategy, which will be a planning tool for the remaining GEBF investments in FL, to be finalized in late 2017. Selected project proposals are recommended to NFWF, who will then award grants to successful proposals.

It should be noted that each of these three funding sources have different legal bases, administrative processes, and funding cycles, making it infeasible to determine set amounts of leveraged funds for each project at the time of SEP approval.

In the process of developing the Florida SEP, the consultant team met with key representatives from the Florida Department of Environmental Protection, Florida Fish & Wildlife Conservation Commission and applicable Florida Water Management Districts. During these meetings the consultant team presented and discussed the projects nominated by the 23 member counties for inclusion in the SEP. These representatives indicated that there was a great deal of leveraging potential between SEP projects, and project priorities identified through the NRDA and GEBF planning processes. However, they also indicated that it was not possible to formally commit to specific leveraged funding amounts for specific projects until such funding sources were secured through their respective administrative processes. Therefore, the timing of matching SEP projects to specific leveraged funding sources cannot be predicted at this time, and will evolve over the implementation period. The Gulf Consortium will continue to communicate and collaborate with FDEP, FWC, the WMDs, and other applicable agencies to analyze the timing of funding cycles and the implementation schedule of SEP projects to optimize these synergies. A synopsis of the potential leveraging by organization can be found in the Leveraging Booklet attached as Appendix 3 of the SEP.

### Matchmaking Other Funding Sources with County Projects

The concept of leveraging financial resources essentially means using one resource to attract other resources. During the planning of the SEP an in depth evaluation and assessment of over 175 funding sources was conducted to optimize and maximize the potential funding available to the member counties of the Gulf Consortium. These potential funding sources were then matched with proposed projects in the SEP as a guiding consideration for the counties as the Gulf Consortium moves into the implementation phase. Each of these grant opportunities has a unique application structure, amount of funding available, and timeline for implementation that will need to be taken into consideration when applied for as leveraging toward Spill Impact Component funds.

## DEVELOPMENT OF LEVERAGING RESOURCES

### Collaboration with State Agencies and Other Partners

The Gulf Consortium sees the benefit in collaborating with key stakeholders across the state as it relates to the environmental and economic benefit of the Gulf Coast. Extensive and ongoing communication is occurring with several state agencies including; DEP, FWC, DOT and DEO as well as the four Gulf Coast serving Water Management Districts, Triumph Gulf Coast, Inc. and other relevant non-governmental organizations including; The Nature Conservancy and the Trust for Public Lands to discuss their priorities and future planning as it relates to Florida's Gulf Coast. The findings and potential synergies with these entities have been synthesized into summary documents located in the leveraging database to be utilized by the Counties to obtain additional funds for their projects during the implementation phase.

### Other Grants Inventory and Organizational Summaries

In the preparation of this SEP, a separate leveraging database deliverable was developed with the intention of creating a shareable format of archived information to assist County staff with the task of leveraging funding sources throughout SEP implementation. This database includes the Other Grants Inventory, which identifies over 175 federal programs, state programs, and other foundational or corporate sources of funding that could be used as leveraging for County projects. The deliverable also includes Organizational Summaries on the relevant federal, state, and regional agencies that are working with funding related to Deepwater Horizon, or who may be a partner in some of the projects as they are implemented, as well as, nonprofit organizations where their mission is aligned with the goals and objectives of the RESTORE Act and are working in the Gulf Coast. A hard copy booklet of this information was presented to the Gulf Consortium Board of Directors at their September 28, 2017 meeting, and is included as a standalone Appendix 3 to this SEP.

As many of these funding sources are federal or state programs, they are dependent upon, and thus greatly influenced by, political will. Within this leveraging database are programs that currently offer, or have offered in the recent past, funding connected to the mission of the RESTORE Act and the goals of Florida's suite of projects in the SEP. While this is an important resource for identifying potential current funding sources and priorities, it is necessary to note that due to the nature of legislative budgets and appropriations, their viability is not guaranteed. As Florida counties plan to execute their projects, the Other Grants Inventory will be a guide for finding additional appropriate funding sources with each source being detailed in eligibility and funding priority, as well as by RESTORE related keyword and RESTORE Council Goals and Objectives.

Leveraging has the potential to greatly impact the overall benefit of the Spill Impact Component funding to the State of Florida as a whole, by attracting collaborative funding and partner agencies, allowing for larger and more complex scopes of work to be conducted for County projects, and creating sustainability for projects and initiatives to be funded past the implementation phase of Florida's SEP. The Other Grants Inventory should be updated in conjunction with updates to the SEP to create continuity between the documents, and to increase effectiveness in the targeting of leveraging funds for specific projects.

### V.f. Project Sequencing and Implementation Strategy

#### UNIQUE CHALLENGES OF IMPLEMENTING THE FLORIDA STATE EXPENDITURE PLAN

As discussed in previous sections of this document, the proposed projects, programs, and activities included in this Florida SEP were developed through a “county-driven” process whereby each of the 23 member counties of the Gulf Consortium independently determined how they would use their “even steven” allocation of Florida’s Spill Impact Component. This process resulted in a large number of projects (70) covering a wide range of RESTORE Act eligible activities and project types.

The 15-year payout period of the DWH grand settlement presents significant challenges to developing a comprehensive implementation strategy to sequence the large number of projects proposed in the Florida SEP. In its deliberations, the Gulf Consortium has explored bonding opportunities at both the federal and state level that would allow Florida’s total Spill Impact Component allocation to be disbursed over a shorter time period (e.g., 4-5 years), but no such remedies are available at this time. One of the arguments in favor of the 15-year payout is that it meters out the funds incrementally, and prevents a flood of money that could potentially be misused. This approach may be more suitable to Gulf states that have proposed a few large projects that can be staged over 15 years. However, for the large number of projects proposed in the Florida SEP, this is an impediment to implementation.

In addition to there being a large number of projects, the projects included in this SEP vary substantially with regard to their degree of “readiness” for implementation. Some projects are concepts only, requiring conceptual design and feasibility studies to further determine their feasibility and refine their scopes and budgets. For other projects, engineering design and permitting have been completed, and a few are truly “shovel ready” at this time. Given the uncertainties associated with many of the proposed projects, it is likely that project modifications will need to be made as conceptual design and feasibility studies are completed. It is also likely that county priorities may change over the payout schedule, resulting in some projects being dropped from the list to be replaced by others.

Unlike the other four Gulf states, implementation of the Spill Impact Component in Florida is not administered by a designated state agency. A state agency has the flexibility to amend its SEP by modifying, dropping, or adding projects to adapt to its changing priorities. Conversely, the Gulf Consortium operates as a coordinating body for the 23 member counties, and the “county-driven” process voted upon by the Consortium members has conferred a high level of independence to the individual counties with regard to both the content and implementation of the SEP. While this approach has resulted in a wide range of project types addressing local and regional priorities, it also creates the potential for conflicts in how the SEP projects are sequenced over time. For example, if a particular county decides to amend its proposed project list by dropping a project in the planning phase and adding a project that is shovel ready, this change has the potential to affect the timing and sequencing of projects proposed by the other counties.

As the responsible entity for the development and implementation of the Florida SEP, the Gulf Consortium is the central coordinating body and grant recipient for all projects included in the SEP. Individual counties will be grant sub-recipients, and will not be able to engage independently with the Council with regard to applying for and managing grant funds for their specific projects. Therefore, it is critical that the Consortium develop a project sequencing strategy that accommodates both the large number of projects and their varying degrees of readiness.



## RESTORE ACT EXTENDED PAYOUT ASSUMPTIONS

In developing an overall implementation strategy, multiple alternatives for managing the accounting of Spill Impact Component funds amongst the 23 counties over the 15-year payout schedule have been evaluated under the following assumptions:

- The amounts available to each county according to the “even steven” split of Florida’s Spill Impact Component, minus project planning grant costs, is approximately \$12.66 million;
- Funds will be paid out over a 15-year period, and there is no ability at this time to use these funds for bonding and debt payments at the State nor Federal levels;
- At the time of Florida SEP approval (projected to be the second quarter of 2018) the Gulf Consortium will have accrued \$73,917,036 from the initial payment and first two years of annual allocations over the 15-year payout; and
- Every year thereafter the Gulf Consortium will receive \$16,713,931 annually until 2031.

A full breakdown of the Spill Impact Component Payout and funds available can be found in the Framework for the Allocation Tracking System attached as Appendix 4.

## GUIDING PRINCIPLES AND GOALS OF SEQUENCING

In the process of nominating their proposed project lists, most of the Consortium member counties expressed to the consultant team that their current and short-term (e.g. 3-5 years) priorities could be clearly defined, but that beyond about a 5-year horizon it was difficult to predict how their priorities and project prescriptions might change. Therefore, a key guiding principle used by the consultant team in developing a recommended sequencing and implementation strategy is that temporal flexibility across the 15-year payout period must be accommodated.

With the above described guiding principle in mind, the consultant team defined three overarching goals for project sequencing and the overall SEP implementation strategy, including:

1. Address urgent needs;
2. Demonstrate early successes; and
3. Ensure that every county is making progress.

The first goal addresses the need to capitalize on issues of timeliness that are embodied in the list of SEP projects. For example, if the acquisition of a parcel of land is needed to conduct a proposed restoration project, and that parcel of land is available now from a willing seller at an affordable price, then acquiring that parcel should be a high priority. Otherwise, the opportunity to conduct the dependent restoration activities on that parcel will be lost.

The second goal addresses the need to build confidence in the institutional ability of the Consortium to implement the SEP. For example, completing a few shovel-ready projects early during the implementation phase, and demonstrating attainment of success through project-specific monitoring, will build confidence with the Council, the Florida Governor, Florida state agencies, and the public at large. This confidence building will be critical to establishing the organizational credibility of the Consortium going forward, and should streamline future grant applications and implementation activities.

## SECTION V: Proposed Projects, Programs and Activities

The third goal addresses the need to ensure that each county is engaged and making progress during every year of the payout, regardless of the stage of project readiness. For some counties this would involve initiating conceptual design and feasibility studies, while for others this would include the completion of final engineering design and permitting. And for those counties that have proposed shovel-ready projects, at least some components could be initiated. This goal ensures that every county will be able to report to their stakeholders that they are making progress in the implementation of their portion of Florida's Spill Impact Component.

### DEVELOPMENT OF SEQUENCING MODELS

Given the large number of projects in the Florida SEP, their varying degrees of readiness, and the other complexities discussed above, the consultant team developed and evaluated three "models" or approaches to sequencing proposed projects over the 15-year payout schedule. The development of these models is discussed below.

#### Qualitative Factors Considered in Model Development

In addition to quantitative funding levels, three qualitative factors were identified for consideration in the development of the project sequencing models:

- **Project Readiness** - This factor addresses the stage of development of a particular project. Five levels of project readiness were identified:
  - Concept only;
  - Initial planning completed;
  - Conceptual design and feasibility analysis completed;
  - Engineering design and permitting completed;
  - Contractor bids completed – project is shovel-ready.
- **Project Timeliness** – This factor addresses external issues that could affect whether or not a project is ready of implementation. Examples include:
  - Does a parcel targeted for land acquisition have a willing seller and is it available at an affordable price?
  - Are co-funding grant opportunities or other leveraged funding sources available now that won't be available later?
  - Is the project waiting on the issuance of a permit(s) that has the potential to be denied?
- **County Self-Prioritization** – this factor addresses the county's self-determined prioritization and sequencing. In the process of nominating proposed project lists, the consultant team did request self-prioritization by the counties, though it was not mandatory.

The three sequencing models are presented and discussed below, with graphical examples of each.

### MODEL A – INDIVIDUAL COUNTY ALLOCATIONS

Model A can be described as follows. Each county accrues 4.3 percent (1/23rd) the annual allocation of Florida’s Spill Impact Component payout in its own separate “account” and executes its projects when adequate funds become available through a combination of sources, including Spill Impact Component funds, co-funding from other grants, other county funds, and leveraged funding sources. Under this approach each county essentially operates independently, with Consortium serving only as the coordinator of Council implementation grants.

This is the most equitable approach in that each county is treated exactly the same. However, it may not be the fairest approach in that it favors urban counties with larger revenue streams to self-fund until reimbursement funds are available. In addition, this model does not address all three of the overarching sequencing goals listed above. With funds limited to each county’s individual accrued allocation, the model may prevent the early completion of larger shovel-ready projects, and preclude the ability of the Consortium to demonstrate early project implementation successes. The pros and cons of Model A are summarized in the table below.

MODEL A – INDIVIDUAL COUNTY ALLOCATIONS	
PROS	CONS
Most equitable approach	May preclude the ability to address urgent needs
Allows each county to make progress during every year of the payout	Decreases the ability to implement larger early action projects
May allow some counties to bond using annual accruals as collateral	Eliminates the collective ability of the Gulf Consortium to leverage other DWH funds
	Penalizes rural counties that do not have comparable access to other funding sources
	May penalize counties with fewer larger projects

Figure V.f.1 below shows the projected funds available to each county for each year in the remainder of the 15-year payout period. Hypothetically, under Model A, a county seeking to implement a \$6 million project with only its Spill Impact Component funds could not do so until 2021, when adequate funds have been accrued in its “account.”

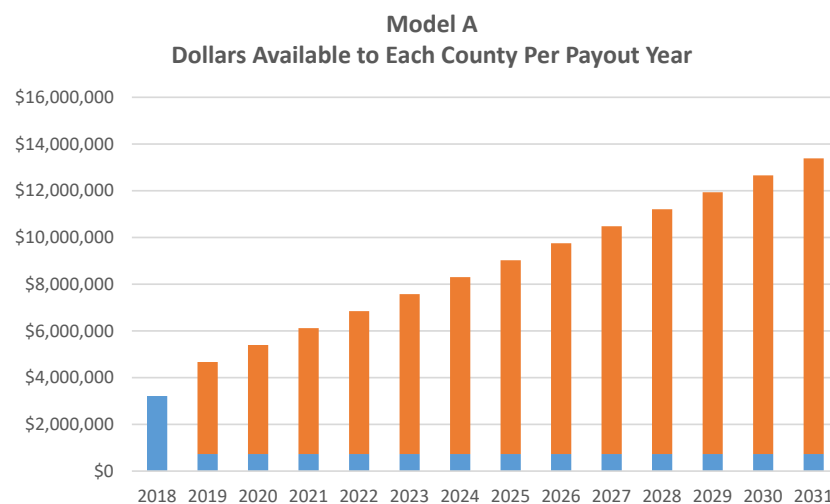


Figure V.f.1 - Dollars available to each county per payout year.

## SECTION V: Proposed Projects, Programs and Activities

### MODEL B – COLLABORATIVE PHASED ALLOCATIONS

Model B can be described as follows. The Consortium collaboratively would decide the sequencing of projects based on the qualitative factors of project readiness and timeliness, as well as the goals defined above, across a series of phased short-term work programs. Assuming a 4-year cycle beginning in 2018, the Consortium would develop a work program for the period 2018-2021, and then repeat the process for the periods 2022-2025 and 2026-2029. A final 2-year work program would complete the 15-year payout period.

For each 4-year work program the Consortium would have the discretion to sequence projects using the aggregate projected 2021 accrual, but no county could spend more than their individual projected 2021 accrual. However, under Model B some counties could potentially spend their entire projected 2021 accrual during the first year of the work program, prior to actually accruing that amount, if the Consortium decided that their project should be accelerated to meet certain goals.

Using Model B, all three overarching sequencing goals can feasibly be met, and this model is essentially a hybrid between Model A and C. The pros and cons of Model B are summarized in the table below.

MODEL B – COLLABORATIVE PHASED ALLOCATIONS	
PROS	CONS
Supports ability to address urgent needs.	Some counties will benefit by receiving more of their allocation before the others
Supports ability to implement larger early action projects while keeping equity over 15 year payout	May require “incentives” for counties who’s projects are sequenced later
Allows each county to make progress during every year of the payout	
Supports the collective ability of the Gulf Consortium to leverage other DWH funds	

Figure V.f.2 below shows the projected funds available to the Consortium for each work program period described above. Hypothetically, under Model B a county seeking to implement a \$6 million project with only its Spill Impact Component funds could do so in 2018 if the Consortium decided that their project should be accelerated to meet certain goals.

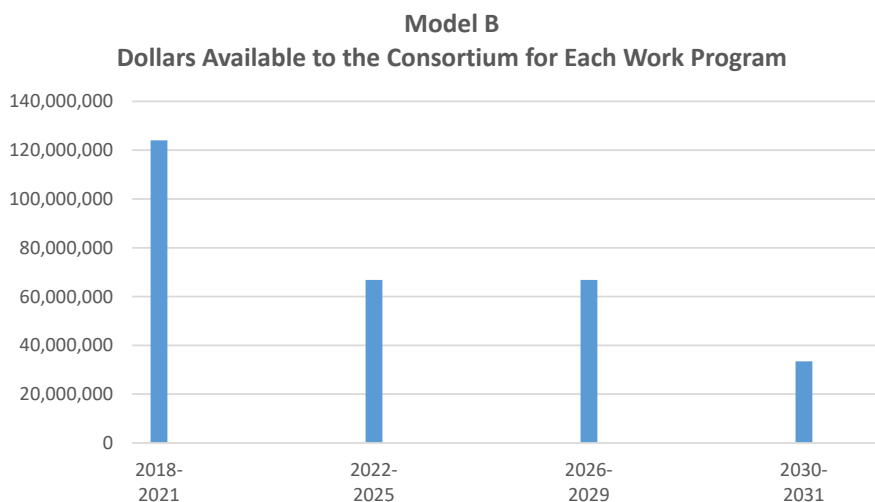


Figure V.f.2 - Dollars available to the Consortium for each work program.

### MODEL C – COLLABORATIVE FULL PAYOUT ALLOCATIONS

Model C can be described as follows. The Consortium would collaboratively decide the sequencing of projects based on the qualitative factors of project readiness and timeliness, as well as the goals defined above, across the entire payout period. The Consortium would have the discretion to sequence projects using the entire aggregate projected 2031 accrual amount, but no county could spend more than their total individual accrual of \$12.66 million. This model takes into account the total allocation to the Gulf Consortium, and would support a hypothetical scenario where the Consortium could collaboratively decide that certain large shovel-ready projects should be fully funded early in the payout period, while other counties wait to begin work.

Using Model C, the three overarching sequencing goals can be met, and this is the most flexible of the three models. However, some counties would clearly benefit by receiving more, or perhaps all, of their Spill Impact Component allocation before others. This would likely necessitate the development of “incentives” in form of allocation transfers, or the commitment of greater shares of leveraged funding, to encourage counties to support this model. The pros and cons of Model C are summarized in the table below.

MODEL C – COLLABORATIVE FULL PAYOUT ALLOCATIONS	
PROS	CONS
Supports ability to address urgent needs	Some counties will benefit by receiving more of their allocation before the others
Supports ability to fully implement larger early action projects	May require “incentives” for counties who’s projects are sequenced later in the payout
Allows each county to make progress during every year of the payout	
Supports the collective ability of the Gulf Consortium to leverage other DWH funds	

Figure V.f.3 below shows the projected funds available to the Consortium for each year in the remainder of the 15-year payout period. Hypothetically, under Model C, a county seeking to implement a \$12 million project with only its Spill Impact Component funds could do so in 2018 if the Consortium decided that their project should be accelerated to meet certain goals.

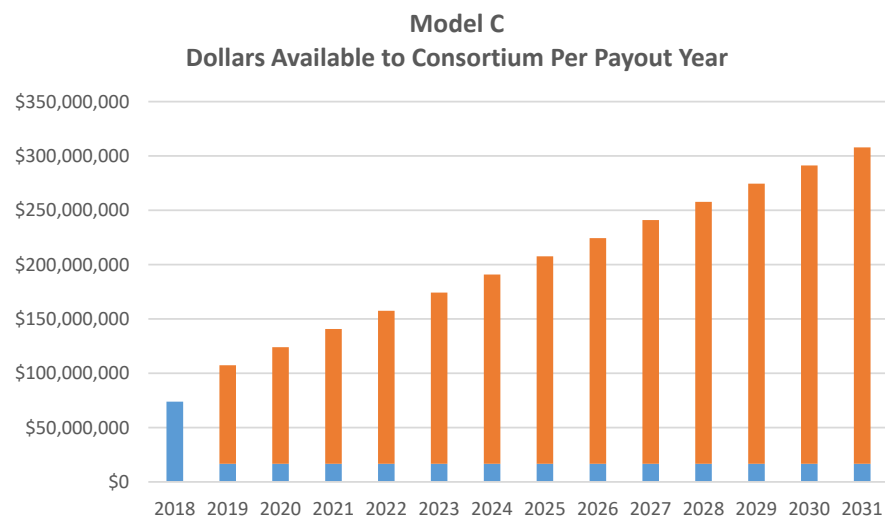


Figure V.f.3 - Dollars available to the Consortium for each remaining year in the payout.

## SECTION V: Proposed Projects, Programs and Activities

It should be noted that a short-term work program could also be overlain on both Models A and C to accommodate the guiding principle of maintaining temporal flexibility across the 15-year payout period. Accordingly, future amendments to the SEP would likely be desirable regardless of what approach is taken.

### ALLOCATION TRACKING SYSTEM

Regardless of which model is used in the sequencing process, there will clearly be a need to track each county's allocation, any incentive transfers, and project expenditures over time. A basic accounting system called the Allocation Tracking System (ATS) will be developed to track the timing of Florida's total allocation and county splits of Spill Impact Component funds, and how that will influence the sequencing of County projects over the payout period. The selected sequencing model will inform this initial internal system to track when each County will spend what percentage of their total allocation under the "even-steven" approach. This ATS will only to be used as an initial tracking system to provide clarity to the Gulf Consortium Board members with the understanding that more robust financial controls will be necessary as the Gulf Consortium moves into implementation.





RESTORE Act  
Compliance

Public Participation

Financial Integrity

Overall Consistency

Proposed Projects

Appendices