



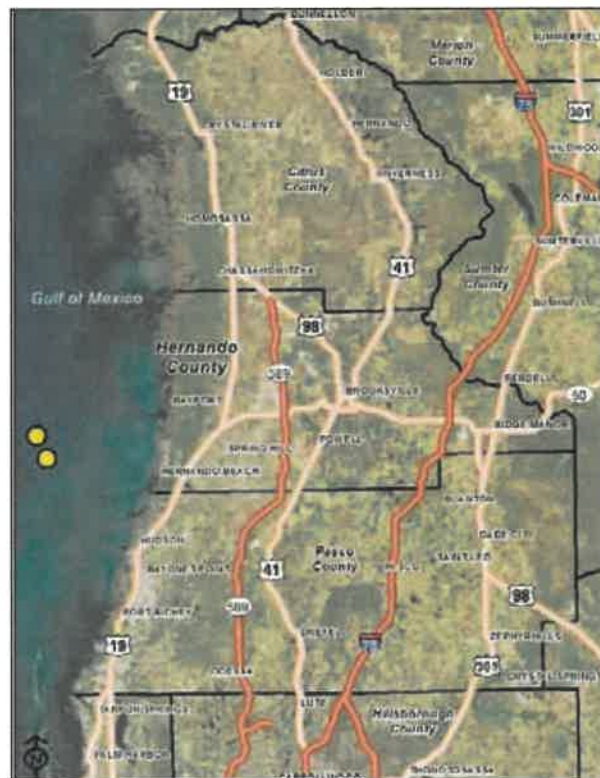
## Project Description

### OVERVIEW AND LOCATION

This program involves the installation of 10 artificial reefs at selected locations to expand upon the existing permitted artificial reefs in Hernando County's nearshore and offshore waters. **Figure 14-1A** shows the general location of the artificial reef sites offshore of Hernando County.

### 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 thus 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).



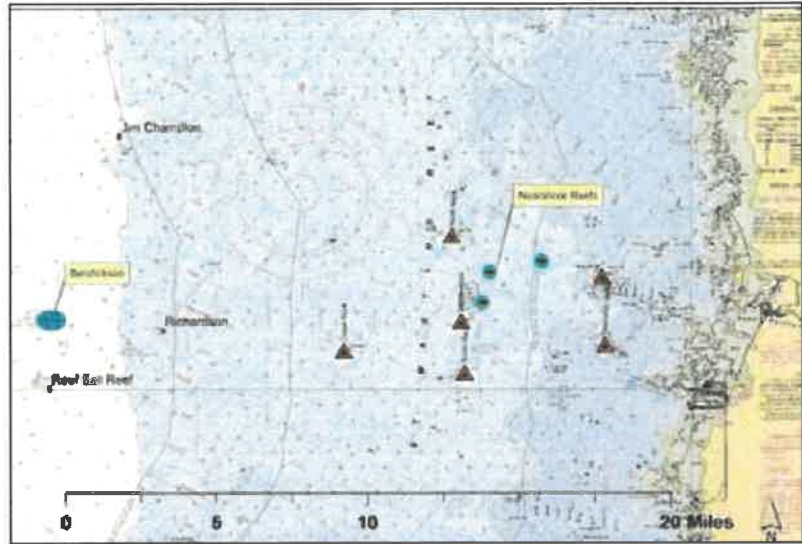
**Figure 14-1A.** Location of artificial reef sites offshore of Hernando County.

### 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. Objectives are consistent with those outlined by the Florida Fish and Wildlife Conservation Commission's (FWC's) 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
6. Do no harm to fishery resources, essential fish habitat (EFH), or human health.



**Figure 14-1B.** Detailed location map of existing and planned Hernando County artificial reefs.

### PROJECT COMPONENTS

A total of 10 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 structures and other appropriate material
- Deployment of artificial reef material by boats and barges at years 2–4 and 9–10
- 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 that 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.

Hernando County will also develop a research plan in support of the artificial reef program. This plan will be in addition to the monitoring data for the specific reef sites and will be applicable to the entire region, benefitting Citrus and Pasco Counties as well. Hernando County will collect baseline data, which may include taxonomic surveys of natural hardbottom, mapping of critical habitat (deepwater corals, etc.), side scan and acoustic tagging for fisheries, and sea turtle surveys. In addition to biological research studies, Hernando County will conduct an economic analysis of the artificial reef program's impact on the local economy. Information gathered in these studies will help staff make informed decisions about later phases and future funding of the program.

## SECTION V: Proposed Projects, Programs, and Activities

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

Hernando County has become a destination for ecotourism 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.

### 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:

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

### Implementing Entities

Hernando County will be the main implementing entity and grant sub-recipient responsible for the permitting, construction, and success monitoring of the program. SeaGrant, FWC, and the University of Florida could be additional sub-recipients as Hernando County looks to cooperatively pool resources for research and monitoring efforts.

### 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 limited 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 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; and (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 that 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 project 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
- Increase in recreational usage.

The proposed project will be constructed consistent with the Gulf States Marine Fisheries Commission's *Guidelines for Artificial Reef Materials* (2004). In the project 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 total estimated time horizon of this project is approximately 12 years. It is expected to start in 2018 and to end in 2029. Implementation of this project has been divided into eight milestones as shown in the following chart.

RESTORE Act Compliance

Public Participation

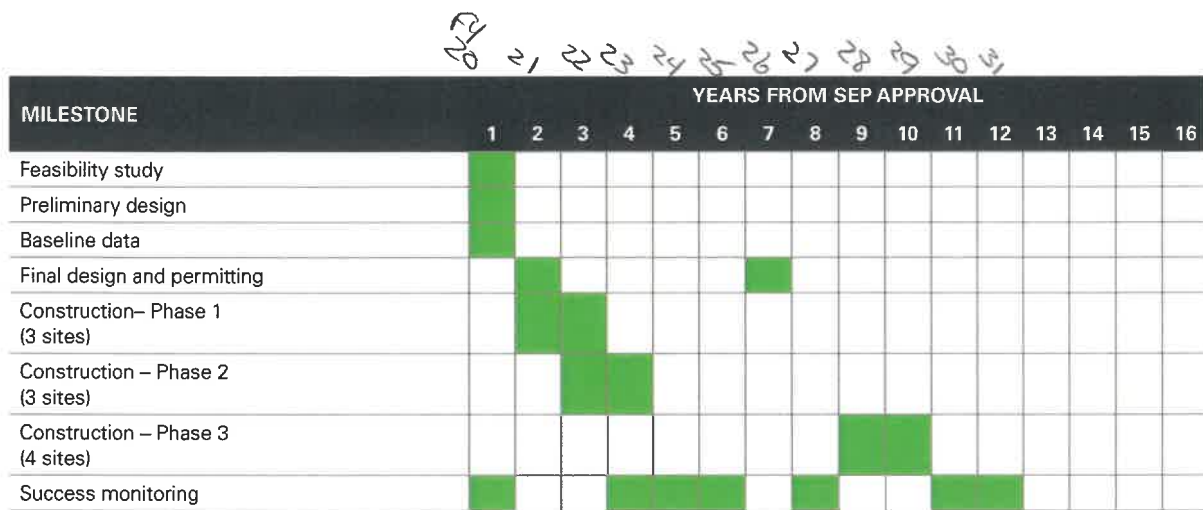
Financial Integrity

Overall Consistency

Proposed Projects

Implementation

SECTION V: Proposed Projects, Programs, and Activities



**Budget and Funding Sources**

Hernando County has estimated the total cost of this project to be approximately \$2,350,000, and is committed to allocating \$2,350,000 of its share of the Florida Spill Impact Component to this project. A summary of the project budget and funding sources is provided in the table below.

MILESTONE	ESTIMATED TOTAL DOLLARS	ESTIMATED POT 3 ALLOCATION
Feasibility study	\$100,000	\$100,000
Preliminary design	\$100,000	\$100,000
Baseline data	\$450,000	\$450,000
<b>Planning Subtotal</b>	<b>\$650,000</b>	<b>\$650,000</b>
Final design and permitting	\$100,000	\$100,000
Phase 1 reef construction (3 sites)	\$400,000	\$400,000
Phase 2 reef construction (3 sites)	\$400,000	\$400,000
Phase 3 reef construction (4 sites)	\$450,000	\$450,000
<b>Implementation Subtotal</b>	<b>\$1,350,000</b>	<b>\$1,350,000</b>
Monitoring	\$350,000	\$350,000
<b>Total Cost</b>	<b>\$2,350,000</b>	<b>\$2,350,000</b>
<b>COMMITTED FUNDING SOURCES</b>		
Spill Impact Component		\$2,350,000
Direct Component		\$0
Other grants or co-funding		\$0
Other County funds		\$0
<b>Total Committed Funding</b>		<b>\$2,350,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
<b>POTENTIAL LEVERAGED FUNDING SOURCES</b>		
Natural Resource Damage Assessment		
F40 Coastal and Marine Habitat Restoration Grants		
O.18 FishAmerica Foundation		
S.41 Artificial Reef Construction and Monitoring		
S.49 Sport Fish Restoration Program		

## Partnerships/Collaboration

Hernando County plans to partner with neighboring Citrus County and Pasco County to implement a Regional Artificial Reef Program to ensure coordination of monitoring, design, and permitting efforts and to 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:

- Southwest Florida Water Management District
- Florida Fish and Wildlife Conservation Commission
- Florida Department of Environmental Protection
- National Marine Fisheries Service
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service.

RESTORE Act  
Compliance

Public Participation

Financial Integrity

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# HERNANDO COUNTY Coastal Habitat Enhancement Program

PROJECT NO. 14-2

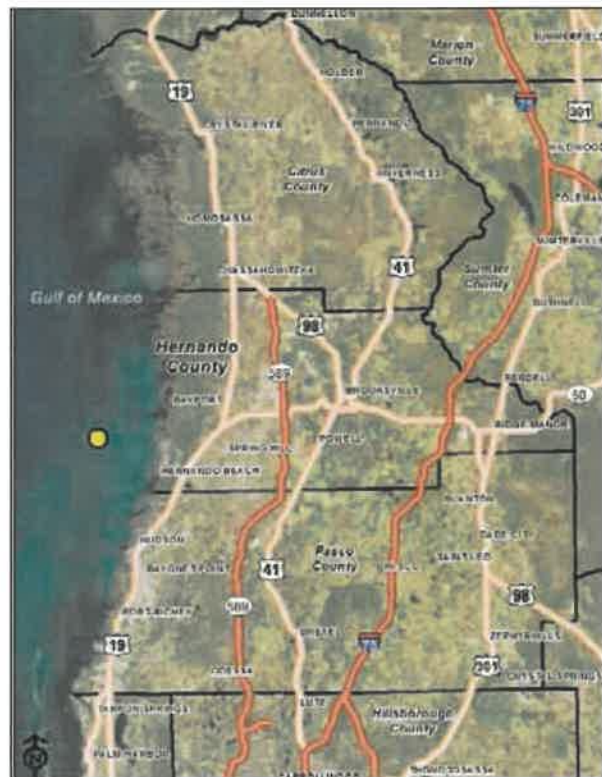
## Project Description

### 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 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 for residential development. The Hernando Beach community (see **Figure 14-2B**), which began construction in the 1950s, 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.



**Figure 14-2A.** Nearshore coastal habitat restoration sites in Hernando County.

**PURPOSE AND OBJECTIVES**

The purpose of this program is to restore, create, and enhance nearshore coastal habitats to address multiple objectives, including: (1) enhance fish and wildlife habitat; (2) stabilize shoreline erosion in vulnerable areas; (3) improve water quality; and (4) support and augment public recreational uses. The project will also include an educational component with plans to engage students and residents in assisting with the installation of oyster shells and planting of marsh grasses, and to incorporate project monitoring into coastal and marine curriculums at local high schools and colleges.

**PROJECT COMPONENTS**

Hernando County has identified eight nearshore oyster reef sites (see **Figure 14-2B**) where coastal habitat enhancement will 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 larvae and growth in these areas will be favorable. In addition to nearshore oyster habitat, the County plans to construct living shorelines at three sites 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.

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 to the public for use as an educational amenity.



**Figure 14-2B. Proposed Hernando County living shoreline and oyster reef project sites.**

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## SECTION V: Proposed Projects, Programs, and Activities

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

This program will enhance nearshore fish and wildlife habitat, stabilize shoreline erosion in vulnerable areas, improve water quality, and augment public recreational uses. The construction and enhancement of nearshore oyster reefs and living shorelines will provide a number of ecological benefits, including the provision of substrate for oyster spat settlement and new oyster larvae production, as well as micro-benthic habitats for numerous small organisms such as amphipods, isopods, burrowing shrimp, crabs, and oyster dwelling fish. These organisms in turn support recreationally important fish species, including redfish, snapper, sheepshead, and black drum.

As mentioned above, the program will also include an educational component with plans to engage students and residents in assisting with the installation of oyster shells and planting of marsh grasses, and to incorporate project monitoring into coastal and marine curricula at local high schools and colleges. The program is also expected to provide economic benefits to Hernando County in the form of increased ecotourism. Coastal Hernando County has become a destination for kayak and stand-up paddleboard tours of the Weeki Wachee River, activities that are expanding throughout the coastal areas of the county. This program will enhance ecotourism opportunities and associated economic activity.

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

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

- Objective 3: Protect and Restore Living Coastal and Marine Resources (primary)
- Objective 1: Restore, Enhance, and Protect Habitats
- Objective 4: Restore and Enhance Natural Processes and Shorelines
- Objective 6: Promote Natural Resource Stewardship and Environmental Education.

### 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, and 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 T.K., A.K. Volety, K. Chartier, F.J. Mazzotti, and L. Pearlstine, 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., J. Furlong, L.A. Brown, B.P. Piazza, K. Brown, 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 J.R., W.E. Pine, 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). doi:10.1890/es11-00205.1.
- Scyphers S.B., S.P. Powers, K.L. Heck, and D. Byron, 2011. Oyster Reefs as Natural Breakwaters Mitigate Shoreline Loss and Facilitate Fisheries. *Plos One* 6 (8). doi:10.1371/journal.pone.0022396.
- Allen M., T. Ankerson, E. Pistole, S. Sanders, and A. Barshel, 2017. *Hernando County Marine Area Plan Interim Report*. Levin College of Law and Nature Coast Biological Station, University of Florida. Gainesville, Florida.

The proposed restoration methods are also 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*.

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

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 of the oyster reefs and living shorelines will be completed to evaluate the ecological benefits and ecosystem services gained from these projects, and to provide recommendations for future similar projects. Site footprints will be surveyed, and at each of the eight reef locations and the three

## SECTION V: Proposed Projects, Programs, and Activities

living shorelines sites, bi-annual and quantitative sampling will be conducted along predetermined transects with high-definition video. It is anticipated that success criteria will include the following:

- Linear and square feet of living shoreline created
- Linear and square feet of oyster habitat created
- Fish and wildlife utilization of the created habitats.

In the project 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 using in-house staff.

### Milestones and Schedule

The total estimated time horizon of this project, from design and permitting through success monitoring, is approximately 6 years. It is expected to start in 2018 and end in 2023. Permitting, implementation, and monitoring will be completed for half the sites within the first 3 years, with the remaining sites to be completed during the subsequent 3 years.

Hernando County will use an adaptive management approach to project design and implementation, which will entail ongoing monitoring from constructed sites to inform the design of future implementation activities. Implementation of this project has been divided into eight milestones/phases, as shown in the milestone chart below.

MILESTONE	YEARS FROM SEP APPROVAL															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<i>Oyster Reef Project</i>																
Feasibility study and preliminary design	█		█													
Construction – Phase 1 (2 Sites)		█														
Construction – Phase 2 (2 Sites)				█												
Success monitoring	█		█	█	█	█										
<i>Living Shoreline Project</i>																
Feasibility study and preliminary design	█		█													
Construction – Phase 1 (3 Sites)		█														
Construction – Phase 2 (3 Sites)				█												
Success monitoring	█		█	█	█	█										

## Budget and Funding Sources

A preliminary total cost estimate of \$900,000 has been developed for this program using available information from comparable projects and certain assumptions. Hernando County is committed to allocating \$750,000 of its share of the Florida Spill Impact Component to this program, and \$150,000 of other County funds and in-kind services, but will also be seeking other leveraged funding sources to supplement these monies. If additional leveraged funds are secured, they will be used to expand the extent of the program to include additional restoration sites. A summary of the project budget and funding sources is provided in the table below.

MILESTONE	ESTIMATED TOTAL DOLLARS	ESTIMATED POT 3 ALLOCATION
<i>Oyster Reef Project</i>		
Feasibility study and preliminary design	\$150,000	\$75,000
<b>Planning Subtotal</b>	<b>\$150,000</b>	<b>\$75,000</b>
Construction - Phase 1 Oyster Reef	\$110,000	\$110,000
Construction - Phase 2 Oyster Reef	\$110,000	\$110,000
<b>Implementation Subtotal</b>	<b>\$220,000</b>	<b>\$220,000</b>
<b>Total</b>	<b>\$370,000</b>	<b>\$295,000</b>
<i>Living Shoreline Project</i>		
Feasibility study and preliminary design	\$150,000	\$75,000
<b>Planning Subtotal</b>	<b>\$150,000</b>	<b>\$75,000</b>
Construction - Phase 1 Living Shoreline	\$110,000	\$110,000
Construction - Phase 2 Living Shoreline	\$110,000	\$110,000
<b>Implementation Subtotal</b>	<b>\$220,000</b>	<b>\$220,000</b>
<b>Total</b>	<b>\$370,000</b>	<b>\$295,000</b>
Monitoring	\$160,000	\$160,000
<b>Total Cost</b>	<b>\$900,000</b>	<b>\$750,000</b>
<b>COMMITTED FUNDING SOURCES</b>		
Spill Impact Component		\$750,000
Direct Component		\$0
Other grants or co-funding		\$0
Other County funds - in kind services		\$150,000
<b>Total Committed Funding</b>		<b>\$900,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>
<b>POTENTIAL LEVERAGED FUNDING SOURCES</b>		
Natural Resource Damage Assessment		
F32 Fisheries Finance Program		
F33 Sea Grant National Marine Aquaculture Initiative - Integrated Projects to Increase Aquaculture Production		
F34 Sea Grant National Marine Aquaculture Initiative - Addressing Impediments to Aquaculture Opportunities		
F40 Coastal and Marine Habitat Restoration Grants		
F47 Estuary Habitat Restoration Program		
F54 Southeast Region Coastal Program		
O.24 Gulf of Mexico Oyster Aquaculture Small Grants		
O.42 Shell Marine Habitat Program		

RESTORE Act Compliance

Public Participation

Financial Integrity

Overall Consistency

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## SECTION V: Proposed Projects, Programs, and Activities

### 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) to help guide science-based planning of the County's enhancement projects, create research opportunities, and 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 hired a full-time Sea Grant agent who will assist with developing education component of the program. Partnerships have also 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 Coastal Public Access Program

PROJECT NO. 14-3

## Project Description

### OVERVIEW AND LOCATION

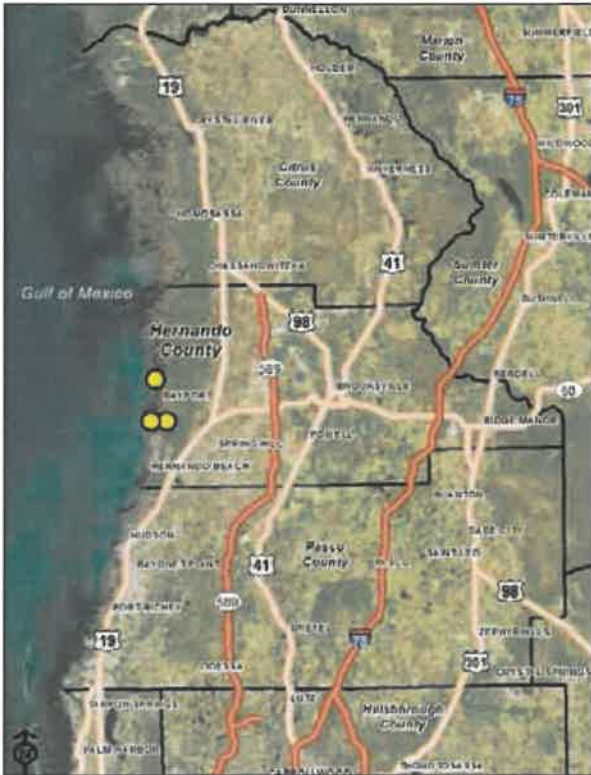
This program involves improvements and enhancements to existing coastal parks and boat ramps in Hernando County to increase public access to nearshore waters and the Gulf of Mexico. Improvements include shoreline protection and enhancement, and the elevation and expansion of boat ramps, docks, and parking facilities. In addition, channel maintenance dredging is needed at Pine Island, Hernando Beach, and Bayport. **Figure 14-3A** shows the general of proposed improvements in coastal Hernando County.

### NEED AND JUSTIFICATION

The coastline of Hernando County is characterized by naturally shallow waters, extensive salt marshes and mangroves, and low-lying pine forests, resulting in limited public access to nearshore waters and the Gulf of Mexico. Existing older boat ramps and coastal park facilities are now frequently inundated during “king-tides” and storm events, rendering them inaccessible and increasing county maintenance costs. In addition, a few existing navigational channels were dredged prior to current environmental regulations, and are now in need of maintenance dredging. Improvements to existing coastal parks and boat ramps, and maintenance dredging of existing navigational channels, are needed to improve both public access and community resilience in coastal Hernando County.

### PURPOSE AND OBJECTIVES

The purpose of this program is to improve and enhance facilities at existing public parks, boat ramps, and navigation channels. The objectives of the program include: (1) improve public access to nearshore waters and the Gulf of Mexico for residents and visitors; (2) improve local nearshore fishing and water quality conditions; and (3) enhance the community resilience of coastal Hernando County.



**Figure 14-3A.** General locations of proposed waterway improvements in coastal Hernando County.

- RESTORE Act Compliance
- Public Participation
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## SECTION V: Proposed Projects, Programs, and Activities



Figure 14-3B. Proposed Amenities at Linda Pedersen Park.

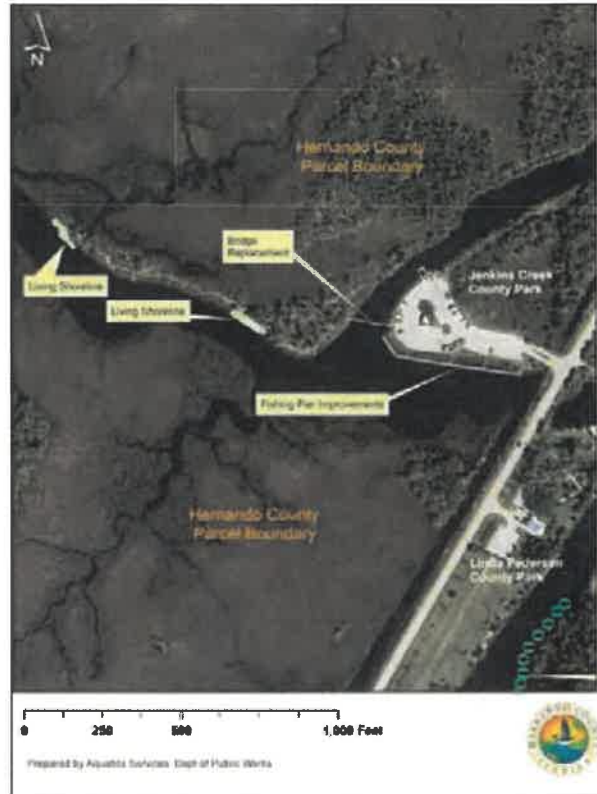


Figure 14-3C. Proposed Amenities at Jenkins Creek Park.

### PROJECT COMPONENTS

The key components of this program include: (1) facility improvements and enhancements at Linda Pedersen Park, Jenkins Creek Park, and Pine Island Beach Park, and (2) limited maintenance dredging of existing navigation channels at Pine Island, Hernando Beach, and Bayport.

At the coastal parks, facility improvements and enhancements will include the following elements:

- Footbridge replacement
- Fishing pier improvements
- Access road improvements
- Seawall and boardwalk replacement
- Parking area expansion and elevation
- Construction of canoe/kayak launch
- Posting of paddling trail signage and educational kiosks
- Culvert replacement to increase circulation and flushing
- Shoreline structural habitat enhancements for improved fishing
- Construction of living shorelines for erosion protection and habitat enhancement.

These program elements will improve public access for pedestrians as well as motorized and non-motorized vessels. Seawalls, docks, and fixed hardscape elements will be raised to account for sea-level rise and storm surge, thus

reducing future maintenance costs and improving the resiliency of county assets. Where possible, floating docks will be used to account for seasonal and storm-induced fluctuations in water levels. **Figures 14-3B** and **14-3C** show proposed improvements to Linda Pedersen Park and Jenkins Creek Park, respectively.

Navigational channel maintenance dredging is an ongoing activity in Hernando County due to naturally shallow water depths. The primary navigational access to the open waters of the Gulf of Mexico is via the existing Hernando Beach channel, which is a federally authorized channel maintained by the U.S. Army Corps of Engineers. This program will address minor channel maintenance and improvements in the Hernando Beach channel as well as smaller channels adjacent to the county park facilities and in Bayport.

Hernando County will work to use a combination of in-house staff, Sea Grant staff, and local consultants to complete feasibility studies, conduct engineering design, obtain permits, and monitor the projects. As part of the planning and feasibility process for the maintenance dredging projects, bathymetric surveys and sediment sampling will be performed to delineate project areas and quantities. In addition, potential hazards to navigation will be mapped during the process and designated for removal. Finally, dredged spoil material will be used beneficially wherever feasible for fill material and habitat creation.

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

This program will improve public access to nearshore waters and the Gulf of Mexico for residents and visitors, improve local nearshore fishing and water quality conditions, and enhance community resilience. Coastal Hernando County is largely natural with very limited public access to coastal waters. For this reason, there is increasing demand for nature-based recreational opportunities, including kayaking, fishing, and bird watching. The improved amenities will increase daily and seasonal usage, and will relieve pressure on other coastal parks in the region 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 (see Project 14-2), presenting the opportunity for environmental education and nonprofit organization sponsored events.

## 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 Goals:

- Goal 5: Restore and Revitalize the Gulf Economy (primary)
- Goal 1: Restore and Conserve Habitat.

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)
- Objective 1: Restore, Enhance, and Protect Habitats.



## SECTION V: Proposed Projects, Programs, and Activities

### Implementing Entities

Hernando County will be the sole implementing entity and grant sub-recipient responsible for the design, permitting, construction, operation and maintenance, and monitoring of this program.

### Best Available Science and Feasibility Assessment

A Best Available Science (BAS) 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 primary focus of this program is public recreational access and tourism promotion; therefore, BAS does not apply.

This program is considered to be feasible with respect to the ability to: (1) obtain necessary permits; (2) construct recreational amenities; and (3) effectively operate and maintain recreational amenities in perpetuity. Regulatory permitting will address potential impacts to marine habitats and living resources, and cultural resources, as appropriate.

### Risks and Uncertainties

No significant risks or uncertainties were identified during the evaluation of this program that would preclude project implementation. Hernando County will ensure the designs to limit damage from tropical storms and accommodate sea-level rise. Regulatory permitting will address issues such as spatial boundaries for navigational channel dredging, affected marine habitats and living resources, historic areas, sand borrow areas and spoil disposal areas, existing structures and leases, etc.

### Success Criteria and Monitoring

This program addresses the improvement of public access to the Gulf. It is anticipated that quantitative success criteria will be developed for:

Recreational amenities completed

- Linear feet and square feet of living shoreline and habitat improvements constructed
- Linear feet of channel maintenance dredged
- Increase in recreational use.

In the project grant request, a detailed monitoring program 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 total estimated time horizon of this program is approximately 13 years. It is expected to start in 2021 and end in 2033. Implementation of this program has been divided into six milestones, as shown in the chart below.

MILESTONE	YEARS FROM SEP APPROVAL															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Feasibility study and preliminary design																
Final design and permitting																
Boat ramp/park amenities construction																
Channel improvements construction																
Paddling trail construction																
Success monitoring																

## Budget and Funding Sources

Hernando County has estimated the cost of this program to be approximately \$4,660,000, based on a preliminary needs assessment as well as the cost of other completed County projects. Hernando County is committed to allocating \$4,560,000 of its share of the Florida Spill Impact Component to this program and \$100,000 of other County funds, but will also be seeking other leveraged funding sources to supplement these monies. If additional leveraged funds are secured, they would be used to expand the extent of the program to include additional restoration sites. A summary of the project budget and funding sources is provided in the table below.

MILESTONE	ESTIMATED TOTAL DOLLARS	ESTIMATED POT 3 ALLOCATION
Feasibility study and preliminary design	\$80,000	\$80,000
<b>Planning Subtotal</b>	<b>\$80,000</b>	<b>\$80,000</b>
Final design and permitting	\$185,000	\$85,000
Boat ramp/park amenities construction	\$1,000,000	\$1,000,000
Channel improvements construction	\$3,000,000	\$3,000,000
Paddling trail construction	\$260,000	\$260,000
<b>Implementation Subtotal</b>	<b>\$4,445,000</b>	<b>\$4,345,000</b>
Monitoring	\$135,000	\$135,000
<b>Total Cost</b>	<b>\$4,660,000</b>	<b>\$4,560,000</b>
COMMITTED FUNDING SOURCES		
Spill Impact Component		\$4,560,000
Direct Component		\$0
Other grants or co-funding		\$0
Other County funds – in kind services		\$100,000
<b>Total Committed Funding</b>		<b>\$4,660,000</b>
<b>Budget Shortfall</b>		<b>\$0</b>

RESTORE Act Compliance

Public Participation

Financial Integrity

Overall Consistency

Proposed Projects

Implementation

## SECTION V: Proposed Projects, Programs, and Activities

### POTENTIAL LEVERAGED FUNDING SOURCES

Natural Resource Damage Assessment

S.10 Community Planning Technical Assistance Grants

S.19 Coastal and Estuarine Land Conservation Program (CELCP)

S.20 Coastal Partnership Initiative - Florida Coastal Management Program

S.23 Florida Recreation Development Assistance Program (FRDAP)

S.26 Land and Water Conservation Fund (LWCF)

S.45 Florida Boating Improvement Program (FBIP)

S.49 Sport Fish Restoration Program

### Partnerships/Collaboration

Hernando County will continue to work with Florida Sea Grant as well as the Southwest Florida Water Management District and the Florida Fish and Wildlife Conservation Commission in the implementation of this program.

# HERNANDO COUNTY Weeki Wachee Springshed Septic to Sewer Conversion Program

PROJECT NO. 14-4

## Project Description

### OVERVIEW AND LOCATION

This program is a septic-to-sewer conversion in the springshed of Weeki Wachee Springs complex. The program is a long-term commitment by Hernando County to provide centralized sewer collection, treatment, and disposal services to approximately 30,000 lots in older residential portions of the county. In accordance with the overall program, District A is the first area where the septic-to-sewer conversion will take place. Existing septic systems will be removed from 717 lots and sewer hookups will be provided to all 899 lots in District A. **Figure 14-4A** shows the location of the project in southeast Hernando County.

### NEED AND JUSTIFICATION

The Weeki Wachee River is a 7.5-mile spring-fed river that flows to the Gulf of Mexico. The majority of flows in the Weeki Wachee River originate from the Weeki Wachee Springs complex, a first-magnitude spring that has an average discharge of 172 cubic feet per second (111 million gallons per day). Several smaller springs also add to the river's flow. Over the past several decades, Weeki Wachee Springs and the Weeki Wachee River have experienced significant water quality degradation and associated ecological shifts. The Florida Department of Environmental Protection (FDEP) has determined that increases in nitrate in spring discharges is the primary cause of the observed ecological imbalances, which are characterized by excessive algal growth in Weeki Wachee Springs. Accordingly, the FDEP has established a total maximum daily load (TMDL) for nitrate nitrogen in the system.

Weeki Wachee Springs is fed from a large reservoir of the Floridan aquifer under approximately 260 square miles of urbanized areas, agricultural lands, and forested uplands. This springshed underlies portions of Hernando and Pasco Counties. Nitrogen enrichment, particularly in the inorganic form nitrate, is an issue because nitrate is



**Figure 14-4A.** Location of the District A septic-to-sewer conversion project.

RESTORE Act  
Compliance

Public Participation

Financial Integrity

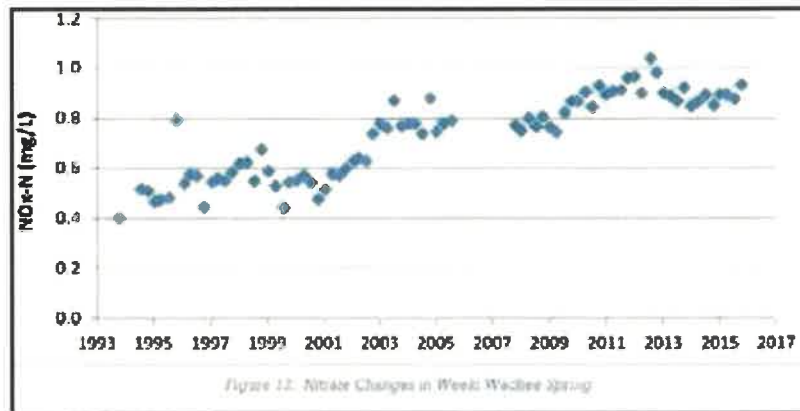
Overall Consistency

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## SECTION V: Proposed Projects, Programs, and Activities

mobile and conservative once it reaches the groundwater. Nitrate concentrations have been increasing in the water discharging from Weeki Wachee Springs from 0.1 milligram per liter (mg/L) or less historically (SWFWMD, 2017) 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 currently under way.



**Figure 14-4B.** Nitrate concentrations in Weeki Wachee Springs, 1993–2016.

Portions of the Weeki Wachee Springs springshed have a

discontinuous confining layer, making it particularly vulnerable to nutrient discharges from septic systems. Groundwater flow velocities in the aquifer have been estimated at 2 feet per day based upon hydraulic conditions. Nitrate discharged from the septic systems in District A (see **Figure 14-4C**) have the shortest travel time to reach Weeki Wachee Springs (about 5 years). Hernando County has prioritized the septic-to-sewer program based on the proximity of the septic systems to the springs, the shortest travel times, and the nitrogen load contribution. The District A project will remove the septic systems nearest Weeki Wachee Springs, resulting in an estimated nitrogen load reduction of about 11,000 pounds per year. This program, and the first projects aimed at District A, are critical to the ecological restoration of the Weeki Wachee River.

### PURPOSE AND OBJECTIVES

The purpose of this project is to remove the highest-density septic systems in areas most proximal Weeki Wachee Springs and replace them with centralized sewer facilities. The objectives of the project are to: (1) reduce nitrogen loads to Weeki Wachee Springs and (2) restore water quality and ecological conditions in the Weeki Wachee River.

### PROJECT COMPONENTS

The overall septic-to-sewer conversion program has been divided into a large 30,000-parcel area encompassing the springshed of Weeki Wachee Springs complex into 19 districts (designated A to S), as shown in **Figure 14-4C**.

In accordance with the overall program, District A is the first area where the septic-to-sewer conversion will take place due to its proximity to the spring system. The project involves the removal of existing septic systems from 717 lots and construction of centralized sewer facilities to serve all 899 lots in District A. This project will provide conventional gravity sewer to District A. The existing wastewater infrastructure was modeled to determine whether existing force mains and pump stations could handle additional flows from new sewer connections, and modeling results indicated that they could. The conversion in District A will take place in two phases.



Figure 14-4C. Septic-to-sewer conversion Districts A-S with location of Weeki Wachee Springs.

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

Nitrogen enrichment is an ongoing management issue in Weeki Wachee Springs and the Weeki Wachee River, resulting in the stimulation of excessive filamentous algal growth in the spring system, and phytoplankton growth in the river. Excessive algal growth has in turn decreased water clarity and light penetration, contributing to the loss of native submerged aquatic vegetation (SWFWMD, 2017). Reduction of nitrogen loads is the primary focus of water quality management actions for the Weeki Wachee River. The District A project is the first step in a long-term comprehensive septic-to-sewer conversion program aimed at retrofitting centralized sewer services into the highly vulnerable Weeki Wachee springshed. The District A project alone is expected to reduce nitrogen loads to the springshed by approximately 11,000 pounds per year (Coastal Engineering Associates, 2016).

Weeki Wachee Springs and the Weeki Wachee River are priority Surface Water Improvement and Management (SWIM) waterbodies, as designated by the Southwest Florida Water Management District (SWFWMD). These systems support a diverse ecological community of aquatic vegetation, fish, and wildlife, and are important economic resources for Hernando County and the Springs Coast region. Weeki Wachee Springs was first developed as a water park tourist attraction in 1947, and today the spring system is a state park managed by the Florida Park Service. The Weeki Wachee River is a scenic and popular recreational resource highly used by kayakers. Accordingly, restoration of degraded water quality and ecological conditions in the springs and river will clearly benefit the local ecotourism economy of Hernando County. In addition, the expansion of the sewer system will increase property values for the parcels it will ultimately serve, and sewer availability will encourage development on currently unimproved parcels in the project area. This will, in turn, grow Hernando County's tax base. The proposed project components will also increase workforce development and job creation in both the public and private sectors.

RESTORE Act  
Compliance

Public Participation

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## SECTION V: Proposed Projects, Programs, and Activities

### Eligibility and Statutory Requirements

This program 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 program 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.

This program 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
- Objective 3: Protect and Restore Living Coastal and Marine Resources.

### Implementing Entities

The 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 FDEP and numerous other agencies in the development of the wastewater 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 relationship between septic systems and water quality in Weeki Wachee Springs and potential pollutant load reductions associated with septic-to-sewer conversions in this area have been well studied. Key references are cited below.

- *Coastal Engineering Associates and Legette Brashears & Graham, 2016. Septic to Sewer Conversion Study. Final report prepared for the Hernando County Utility Department.*
- *FDEP, 2014. Nutrient TMDLs for Weeki Wachee Spring and Weeki Wachee River (WBIDs 1382B and 1382F). Final TMDL Report.*

This project is consistent with the goals and objectives of the following natural resource management plan:

- *SWFWMD, 2017. Weeki Wachee River Surface Water Improvement and Management (SWIM) Plan, A Comprehensive Conservation and Management Plan.*

Based on Hernando County's master planning efforts, 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 development of the Hernando County Sewer Master Plan, no significant risks or uncertainties have been identified that would preclude implementation of the District A project discussed above. This is the first project associated with a much larger program, and long-term funding of the overall program may be a challenge.

## Success Criteria and Monitoring

This project will affect the surface waters and living resources of Weeki Wachee Springs and the Weeki Wachee River. Therefore, a range of success criteria will be developed and described in the project grant request. It is anticipated that quantitative success criteria will be developed for:

- Number of septic systems taken off-line
- Estimated reduction in nutrient and bacteria loads attributable to the wastewater improvements
- Changes in ambient water quality (nutrients, bacteria, chlorophyll-a) in Weeki Wachee Springs, and the Weeki Wachee River in the vicinity of wastewater improvements.

In the project grant request, a detailed monitoring program will be described that addresses data collection and assessment methodologies for the above-listed criteria. Hernando County in collaboration with SWFWMD is committed to conducting the monitoring necessary to quantify project benefits.

## Milestones and Schedule

The total estimated time horizon for the District A septic-to-sewer conversion project is approximately 9 years. It is expected to start in 2019 and end in 2027. Master planning is complete, and this project is ready to begin engineering design. The project will be constructed in two phases using a design-build approach. The time to implement each phase includes an 18- to 24-month period for lift station site land acquisition. Water quality monitoring is expected to continue in perpetuity through spring and river monitoring will be conducted by SWFWMD. Implementation of this project has been divided into five milestones, as shown in the chart below.



## Budget and Funding Sources

The cost estimate for the District A project is \$22,950,000, which is the first project in the overall \$690 million program. Hernando County is committed to allocating \$2,600,000 of its share of the Florida Spill Impact Component to this project for design services and early construction, and will also be seeking other leveraged funding sources such as FDEP State Revolving Fund loans. Hernando County is committed to providing additional county funding, as may be needed; however, the program elements are scalable and can be implemented incrementally as funding allows. A summary of the project budget and funding sources is provided in the table below.



## SECTION V: Proposed Projects, Programs, and Activities

MILESTONE	ESTIMATED TOTAL DOLLARS	ESTIMATED POT 3 ALLOCATION
Feasibility study (Completed 2016)	\$0	\$0
Design Criteria Package (Phase 1)	\$250,000	\$250,000
Design Criteria Package (Phase 2)	\$250,000	\$250,000
<b>Planning Subtotal</b>	<b>\$500,000</b>	<b>\$500,000</b>
Design-Build (Phase 1)	\$11,100,000	\$925,000
Design-Build (Phase 2)	\$11,100,000	\$925,000
<b>Implementation Subtotal</b>	<b>\$22,200,000</b>	<b>\$1,850,000</b>
Monitoring	\$250,000	\$250,000
<b>Total Cost</b>	<b>\$22,950,000</b>	<b>\$2,600,000</b>
<b>COMMITTED FUNDING SOURCES</b>		
Spill Impact Component		\$2,600,000
Direct Component		\$0
Other grants or co-funding		\$0
Other County funds		\$0
<b>Total Committed Funding</b>		<b>\$2,600,000</b>
<b>Budget Shortfall</b>		<b>\$20,350,000</b>
<b>POTENTIAL LEVERAGED FUNDING SOURCES</b>		
Natural Resource Damage Assessment		
F.03 Rural Community Development Initiative Grants		
F.07 Water and Waste Disposal Systems for Rural Communities		
F.08 Water and Waste Disposal Technical Assistance and Training Grants		
F.11 Community Facilities Direct Loan and Grant Program in Florida		
F.13 Community Facilities Guaranteed Loan Program		
F.17 Grant Program to Establish a Fund for Financing Water and Wastewater Projects		
O.22 Florida Rural Water Association Loan Program		
O.40 Southeast Rural Community Assistance Project, Inc. (SERCAP) Loan Fund Program		
O.43 Southeast Aquatics		
O.46 Water/Wastewater Loans		
S.14 Small Cities Community Development Block Grant (CBDG) Program		
S.15 Small Cities CBDG Section 108 Loan Guarantees		
S.18 Clean Water State Revolving Fund (CWSRF)		
S.21 CWSRF Small Community Wastewater Construction Grants		
S.27 Nonpoint Source Management Program (NPSM): Section 319		
S.34 TMDL Water Quality Restoration Grants		
S.52 SWFWMD Cooperative Funding Initiative		

### Partnerships/Collaboration

The septic-to-sewer conversion study was conducted with financial assistance provided by the Fish and Wildlife Foundation of Florida, Inc., through the Protect Florida Springs program. Hernando County will continue to collaborate with the Florida Department of Environmental Protection and the Southwest Florida Water Management District with regard to water quality improvement and associated success monitoring.

# HERNANDO COUNTY Coastal Stormwater Improvement – Calienta Street

PROJECT NO. 14-5

## Project Description

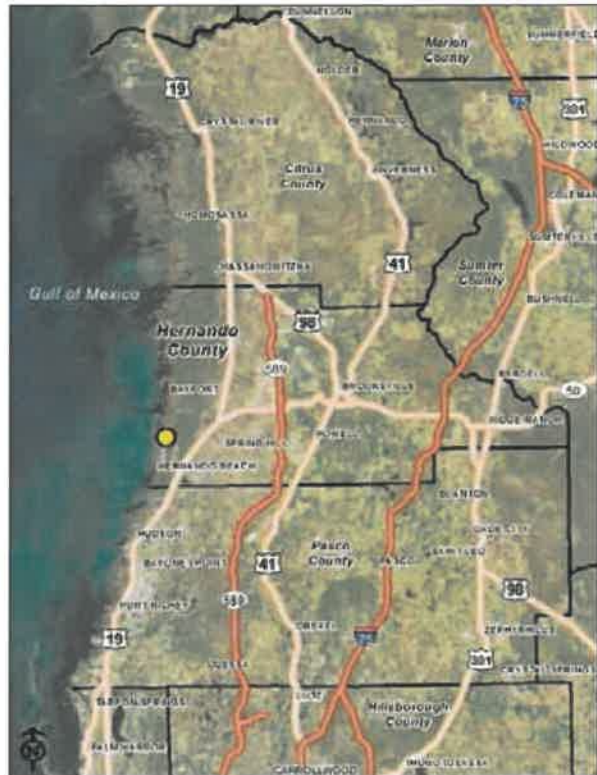
### OVERVIEW AND LOCATION

This project involves drainage infrastructure improvements and the construction of stormwater treatment systems along Calienta Street adjacent to the Hernando Beach canal system to reduce flooding and improve water quality. The general location of the project is shown in **Figure 14-5A**. Although this project addresses water quality improvement, the primary focus of the project is on coastal flood protection. For this reason, this project is classified as infrastructure with respect to the 25 percent infrastructure limitation.

### NEED AND JUSTIFICATION

The Hernando Beach community is an older residential area on the coast of Hernando County that was mostly developed prior to the enactment of current state stormwater treatment regulations. Calienta Street is a major roadway located on the eastern edge of Hernando Beach that provides access to a highly used public boat ramp, a marina, numerous commercial establishments, and dockage for commercial and recreational fishing vessels. Hernando County has identified that an approximately 1-mile-long segment of this roadway, from Shoal Line Boulevard north to Maplewood Drive,

is in need of substantial drainage infrastructure improvements. This roadway segment is characterized by dense commercial and industrial use, which entails an almost entirely impervious surface lacking any stormwater detention or water quality treatment facilities. In addition, because of increased use of the public boat ramp associated with recent improvements to the Hernando Beach navigational channel, the roadway surface is cracking and eroding, resulting in sedimentation in the adjacent channel system. Finally, this segment of roadway is low-lying and subject to coastal flooding and storm surge. This project is needed to improve and upgrade failing drainage infrastructure along the proposed roadway corridor. **Figure 14-5B** shows the project limits.



**Figure 14-5A.** Location of the Hernando Beach Calienta Street stormwater improvement project.

RESTORE Act  
Compliance

Public Participation

Financial Integrity

Overall Consistency

Proposed Projects

Implementation

## SECTION V: Proposed Projects, Programs, and Activities

### PURPOSE AND OBJECTIVES

The purpose of this project is to rehabilitate and upgrade failing drainage infrastructure along a densely developed segment of Calienta Street in the Hernando Beach coastal community. The objectives of the project include: (1) reduce sediment and contaminant loadings to the adjacent channel system from untreated stormwater runoff; (2) improve water quality and habitat conditions in receiving waters; (3) mitigate the severity of coastal flood events; and (4) improve the resilience of the Hernando Beach coastal community.

### PROJECT COMPONENTS

This project is only in the conceptual planning phase; however, Hernando County has conducted a needs assessment and has explored various means of addressing the project objectives. Project components are likely to include:

- Replacement of failing drainage pipes and outfall structures
- Stabilization of failing and eroding seawalls
- Construction of backflow preventers to limit seawater flooding of the roadway during king tides and storm events
- Construction of roadside swales, underdrains, exfiltration boxes, and/or centrifugal treatment systems (e.g., Stormceptor) to remove sediment and contaminants from runoff prior to surface water discharge to the canal system.



**Figure 14-5B.** Project limits of the Calienta Street stormwater improvements.

Additionally, Hernando County is looking at structural improvements and biosorption facilities, or similar, to provide water quality treatment for the residential areas of Hernando Beach abutting the canal system; and parking lot improvements at Jenkins Creek Park to reduce sediment and nutrient loading to the receiving waters. It is expected that this program will develop a range of cost-effective stormwater best management practices (BMPs) that can be feasibly retrofitted into older coastal developments like Hernando Beach.

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

This project will improve local water quality conditions and alleviate flooding along a densely developed segment of Hernando Beach, an older coastal development lacking modern drainage infrastructure with water quality treatment BMPs. The project will focus on reducing sediment and contaminant loads to the adjacent canal system, as well as mitigating roadway flooding. These infrastructure improvements will in turn improve the local economy of Hernando Beach in the form of increased commercial and recreational fishing opportunities. 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 activity:

- 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)
- Goal 4: Enhance Community Resilience
- 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 5: Promote Community Resilience
- Consortium Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and Environmental Restoration Projects.

## 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

The pollutant removal effectiveness of various stormwater BMPs implemented in Florida, including wetland treatment systems, has been evaluated, and designs continue to be improved. The design of the proposed stormwater improvements will consider the following reference documents:

- *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.*
- *Florida Department of Transportation (FDOT) Drainage Handbook, 2012. Office of Design, Drainage Section.*

Based on extensive precedents for stormwater rehabilitation in southwest Florida, 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 were identified. A wide range of BMPs for the treatment of urban stormwater runoff are frequently permitted and constructed in Florida. However, this project will be constrained by the limited amount of surface area potentially available for the installation of BMPs.

## SECTION V: Proposed Projects, Programs, and Activities

### Success Criteria and Monitoring

This project will reduce flooding and surface water pollutant loads from untreated urban stormwater runoff. In addition, the project will also improve water quality conditions in adjacent receiving waters. Therefore, a range of success criteria will be developed in the project grant request. It is anticipated that quantitative success criteria will be developed for:

- Surface area retrofitted with BMPs
- Reduction in the frequency and severity of flood events
- Reduction in local sediment and contaminant loadings to adjacent surface waters.

In the project grant request, a detailed monitoring program will be designed that addresses data collection and assessment methodologies for the above-listed criteria. Hernando 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 is approximately 7 years. It is expected to start in 2018 and end in 2024. Implementation of this project has been divided into five milestones, as shown in the chart below.

MILESTONE	YEARS FROM SEP APPROVAL															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Feasibility study	█	█														
Preliminary design		█	█	█												
Final design and permitting			█	█	█											
Construction					█											
Monitoring				█		█	█									

### Budget and Funding Sources

Hernando County has estimated the cost of this program to be approximately \$4,900,000, based on a preliminary needs assessment as well as the cost of other completed County projects. Hernando County is committed to allocating \$2,400,000 of its share of the Florida Spill Impact Component to this project, and will also be seeking other leveraged funding sources to supplement these monies. Hernando County is also committed to providing additional county funding, as may be needed; however, the program elements are scalable and can be implemented incrementally as funding allows. A summary of the project budget and funding sources is provided in the following table.

MILESTONE	ESTIMATED TOTAL DOLLARS	ESTIMATED POT 3 ALLOCATION
Feasibility study	\$75,000	\$75,000
Preliminary design	\$75,000	\$75,000
<b>Planning Subtotal</b>	<b>\$150,000</b>	<b>\$150,000</b>
Final design and permitting	\$250,000	\$250,000
Construction	\$4,400,000	\$1,900,000
<b>Implementation Subtotal</b>	<b>\$4,650,000</b>	<b>\$2,150,000</b>
Monitoring	\$100,000	\$100,000
<b>Total Cost</b>	<b>\$4,900,000</b>	<b>\$2,400,000</b>
<b>COMMITTED FUNDING SOURCES</b>		
Spill Impact Component		\$2,400,000
Direct Component		\$0
Other grants or co-funding		\$0
Other County funds		\$0
<b>Total Committed Funding</b>		<b>\$2,400,000</b>
<b>Budget Shortfall</b>		<b>\$2,500,000</b>
<b>POTENTIAL LEVERAGED FUNDING SOURCES</b>		
Natural Resource Damage Assessment		
F.63 Water Infrastructure Finance and Innovation Act (WIFIA)		
S.27 Nonpoint Source Management Program (NPSM): Section 319		
S.34 Total Maximum Daily Load (TMDL) Water Quality Restoration Grants		
S.50 Water Projects Priorities Database		
S.52 SWFWMD Cooperative Funding Initiative		

### Partnerships/Collaboration

Hernando County has partnered with the Southwest Florida Water Management District in the past to complete similar stormwater retrofit projects. Hernando County plans to submit a funding request through Southwest Florida Water Management District’s cooperative funding program once the design plans are completed for this project.

RESTORE Act  
Compliance

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Gulf	St. Joseph Bay/Chipola River Sewer Improvement Program	6-1	7,000,000	19,750,000	2019
Hernando	Artificial Reef Program - Hernando	14-1	2,350,000	2,350,000	2019
Hernando	Coastal Habitat Enhancement Program	14-2	750,000	900,000	2019
Hernando	Coastal Stormwater Improvement - Calienta Street	14-5	2,400,000	4,900,000	2019
Hernando	Waterway/Gulf Access Program	14-3	4,560,000	4,660,000	2022
Hernando	Weeki Wachee Springhead Septic to Sewer Conversion Program	14-4	2,600,000	21,950,000	2020
Hillsborough	Cockroach Bay Aquatic Preserve Land Acquisition and Ecosystem Restoration	17-1	5,000,000	7,200,000	2019
Hillsborough	Delaney Creek/Palm River Heights Septic to Sewer Conversion	17-2	7,660,000	33,000,000	2019
Jefferson	Coastal Public Access Program - Jefferson	9-2	2,400,000	2,500,000	2020