RESTORE Act Ecosystem Restoration Project Proposals
for consideration in the Gulf Coast Ecosystem Restoration Council's Comprehensive Plan 2012

<table>
<tr><td colspan="3">Contact Information:

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rleins@gfnet.com</td><td>Date of Submittal:
October 31, 2012</td></tr>
<tr><td colspan="3">Name of Project:

WQ Management & Seagrass Restoration Bokeelia Island- Back Bay Estuary</td><td>Org and Rank:
CHNEP</td></tr>
<tr><td colspan="4">Project Description: Phase I – Feasibility Study for a Design-Build Facility

The proposed project is called the Tidal Activated Water Exchange System (TAWES) which was developed by Gannett Fleming to expedite water quality improvement in bays and estuaries by managing the residence time and increasing photosynthetically active radiation (PARS) to restore seagrass meadows and biodiversity. TAWES pumps water from offshore in to the estuary strategically during the ebb tide at null points and uses flood tide mixing when pumps are off. Models show rapid improvement in water quality, particularly when compared to slow incremental improvements to water quality from retrofits in surrounding developed areas.

The project will be performed in several phases, including feasibility study, design, construction, commissioning, and performance verification/validation of environmental offset credits. Phase I - Feasibility Study will include review of existing programmatic plans, archived water quality and hydrological data, and meteorological records to define input variables for hydrodynamic modeling in support of Phase II - Design. The results of modeling will determine the location of the intake pipeline and identify project specifications and constraints.</td></tr>
<tr><td colspan="4">Project Location: Charlotte County, FL

The Back Bay on Bokeelia Island situated at the north end of Pine Island; this estuary is the receiving water for Bokeelia community development</td></tr>
<tr><td colspan="2">Responsible Party: To be determined</td><td colspan="2">Partners: To be determined</td></tr>
<tr><td>NEP: Charlotte Harbor</td><td colspan="2">Project Cost: $23,750,000</td><td>Dollars Needed: $400,000</td></tr>
<tr><td colspan="2">Start: January 2013</td><td colspan="2">Completion: May 2013</td></tr>
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Status of Project Design and Permitting:

This project is in the planning stage. Water quality modeling will utilize data previously collected by TBNEP, county, SWFWMD and state agencies to identify engineering constraints and design parameters for construction and operation.

What Date or Year could Construction Feasibly Begin: January 2014

Your Proposed Timing of Funding (given permits, phasing, staging, etc.)

FY	12/13	13/14	14/15	15/16	16/17	17/18	Total
	$400,000	$17,300,000	$5,600,000	$150,000	$150,000	$150,000	$23,750,000

FY 12/13 – Prepare Feasibility Study including environmental, hydrology, hydraulics, and 30% Plans.
FY 13/14 – Procurement of construction services, permitting, project construction, establishment of permanent sampling stations, and baseline sampling.
FY 14/15 – Project construction, commissioning, and onset of quarterly sampling and measurement of seagrass, benthos and nutrients.
FY 15/16 – Quarterly sampling and analysis (grass, benthos, nutrients)
FY 16/17 - Quarterly sampling and analysis (grass, benthos, nutrients)
FY 17/18 - Quarterly sampling and analysis (grass, benthos, nutrients)

Assumptions:
1. Public hearings, permitting, and funding will be complete in 3 months.
2. Project will be in existing roadway and access easements, minimizing/eliminating real estate acquisition.

Quantify Environmental Results and How to Measure Them:

1. Restoration of estuarine WQ (Nitrogen, Phosphorus, PAR, Chlorophyll A, and Turbidity) will be measured quarterly by standard laboratory methods to determine conformance with the optimum parameter range for seagrass growth established by NOAA DAS No. 12: http://www.cop.noaa.gov/pubs/das/
2. Restoration of seagrasses will be measured using the SWaPS method developed by NOAA-RSMAS for Biscayne Bay and annually compared to the pre-project baseline acreage and blade density: http://yyy.rsmas.miami.edu/groups/SWaPS/index.html
3. Sequestration of GHGs (CO2, CH4, N2O) will be measured using the Verified Carbon Standard (VCS)- Wetlands Restoration and Conservation (WRC) project category for seagrasses: http://v-c-s.org/wetlands_restoration_conservation

Economic Benefits (including ecosystem services):

The project area from the west mouth of Jug Creek east to the inlet adjacent to Porto Bello Street encompasses approximately 633 acres of water surface area. Using the FDEP's estimated valuation of $20,500/acre results in the maximum valuation at 100% seagrass coverage of $12,981,00/year. (http://www.sms.si.edu/IRLSpec/Seagrass_Habitat.htm)

Estimated number of Jobs Created or Preserved: 260 ($12,981,000/yr @ $50,000/yr/job)

How much Habitat will be restored and conserved?:

FDEP-SWFWMD data indicate patchy and continuous seagrass coverage of about 50% or 317 acres. The project seeks to achieve increased seagrass coverage and blade density of approximately 90% or 570 acres. The area of any dredged channel is not expected to support seagrass growth. WQ will be improved throughout the project area by reducing nutrient concentration and increasing PAR value.

Quantify pollutant reductions:

This project intends to attain and maintain WQ requirements for seagrass as identified in NOAA-DAS No. 12 (http://www.cop.noaa.gov/pubs/das/) by regulated introduction of low nutrient/high clarity seawater at the tidal node, affecting flow north and south to existing inlets. The project complements upland efforts to mitigate estuary impacts from stormwater runoff emanating from a fully-developed watershed and to aid compliance with TMDLs that could be established at specific locations in the estuary. Additionally, carbon sequestration by seagrass may be quantifiable to identify the project's contribution to reducing atmospheric CO2.

What living coastal/marine resources will be improved and by how much?:

The project intends to restore the 633 acres and volume of the defined estuary limits to the recommended optimal range of WQ variables established by NOAA in DAS No. 12. Seagrass meadows are expected to expand coverage to 570 acres and increase diversity of biota dependent on this aquatic habitat. As a fully-functional nursery, the restore estuary will contribute to recruitment of offshore stocks. Attainment and maintenance of these local goals are integral to restoration of the greater Gulf of Mexico ecosystem, which is the focus of both NRDA and the RESTORE Act.

How will community resilience be enhanced?

Management of water quality will enhance the nursery function of seagrass habitats to improve bay and coastal fisheries. The local community will benefit from improved commercial fishing and tourist-based activities, which will contribute to economic resiliency.
Physical resiliency of the estuarine ecosystem is enhanced by the versatility of TAWES to allow immediate response to rapid freshwater inflows during storm events and to allow alteration of seawater pH that may result over time from ocean acidification.

Additional Justification:

The proposed project is called the Tidal Activated Water Exchange System (TAWES.) developed by Gannett Fleming. TAWES addresses water quality problems resulting from both the watershed and barrier islands. Preliminary evaluations based upon the estuary configuration, hydraulic constraints, and area indicate that one TAWES facility should be capable of meeting

the desired WQ criteria.

TAWES includes a screened inlet pipe in the Gulf of Mexico, pumping station on the barrier island, and discharge pipe and diffusers in the estuary. The inlet and discharge pipelines are installed with modern directional drilling methods, which have been used to install many types of cables and pipelines across the barrier islands of the U.S. for the past 20 years. The Palm Beach Inlet sand by-pass pipeline is an example of a large diameter HDD installation. Attached is a generic cross-section presenting two example configurations for the TAWES facility.

TAWES is typically located at an historic, remnant flood shoal of a former natural inlet and/or at the estuarine null zone. By delivering Gulf seawater of high clarity and low nutrient concentration only during the ebb tide phase, up to ten times the pumped-volume of estuarine water can be improved. Natural mixing of these waters occurs on the flood tide phase when the pumps are off. Components of this proposed project also include real-time monitoring of Gulf, estuary and watershed parameters as input variables to a software platform for decision-based facility operation and performance evaluation. Maintaining the WQ criteria established by NOAA-DAS No.12 within the estuary will provide optimal conditions for seagrass growth.

TAWES more rapidly and cost-effectively achieves the estuarine WQ goals of the NEP CCMPs to benefit restoration of the greater Gulf of Mexico Ecosystem. Models indicate significant water quality improvements within six to twelve months of activation of the TAWES system. This is a major enhancement to upland watershed mitigation components which often take decades to implement and obtain water quality improvements.

Once the TAWES is installed and activated, verification of seagrass restoration will be performed by using the SWaPS seagrass monitoring method developed by NOAA & RSMAS for Biscayne Bay.

The Gannett Fleming Team's (Team) approach to the implementation of the project includes development of a feasibility study; identification of a project sponsor/owner; implementation of the project; and monitoring and quantification of water quality and biotic improvements. The feasibility study will include environmental evaluation; hydrology, hydraulics and water quality modeling; 30% design/procurement documents; identification of permitting requirements and evaluation of public support for the project. During the course of the feasibility study, the Team will work with the local community to assist in identification of a local project sponsor/owner. The Team will work with the local project sponsor/owner through the final design, permitting and construction procurement process. It is anticipated that the Team will assist the project sponsor by providing administrative, procurement, construction inspection and engineering services, and assistance in quantification of the water quality and biotic improvements realized by the project. The Team envisions that the final design and construction of the project will be implemented by a competitive design/build procurement process to accelerate the project completion and thereby realize the environmental benefits almost immediately. Under this process, final design, permitting, land acquisition/easements, construction and commissioning would be the responsibility of the design/build contractor.

The proposed project is one element of a regional solution to estuary water quality issues. Nine other projects are proposed separately and include (North to South):

Project/Proposal Name	Estuary Program	Location	Acreage Impacted
The Narrows	TBEP	Belleair Bluffs Bridge south to the 150th Ave. Bridge	1,749
Roberts Bay	SBEP	ICW – Big Sarasota to Midnight Pass	1,470
Casey Key	SBEP	ICW – Midnight Pass to Venice Inlet	1,511
Lemon Bay	CHNEP	ICW – Red Lake to Stump Pass	4,450
Bocilla Island	CHNEP	ICW – Stump Pass to Gasparilla Pass	2,646
Estero Bay	CHNEP	Deadend Canals - Matanzas Pass to Big Carlos Pass	100
Little Hickory	CHNEP	Fish Trap & Little Hickory Bays	1,749
Naples Park	CHNEP	Harbor Basin	333
Park Shores	CHNEP	Multi Bay Area – Clam Pass to Doctors Pass	340

USEPA administers four National Estuary Programs in Florida (six NEPs are on the coast of the five Gulf states) under Section 320 of the 1987 Clean Water Act to protect and restore the water quality and ecological integrity of estuaries of national significance. NOAA administers four National Estuarine Research Reserves in Florida (five NERRS are on the coast of the five Gulf states). The Florida DEP Office of Coastal and Aquatic Managed Areas (CAMA) manages a total of 41 aquatic preserves, which includes the NEP and NERR Florida sites. These programs recognize that over 70% of commercially important marine fish and shellfish species are dependent on estuaries and that restoring and managing estuarine water quality is paramount to optimizing the quality of these aquatic ecosystems.

Seagrass meadows provide an important nursery habitat for thousands of species. In the most recent FFWC-FWRI report on Florida seagrass mapping and monitoring (Yarbro & Carlson, March 2011at http://myfwc.com/media/1591147/fullsimm1.pdf) it is noted that seagrasses in all estuaries remain well below the acreage and blade density known to exist prior to the 1970's. Restoration efforts to date have been focused on identifying pollutant sources in the watershed and designing mitigation systems. This upland corrective activity is expensive and requires decades for implementation with long-term compliance and enforcement obligations for operating permits.

The barrier island component of estuaries is typically missing from restoration plans. Dredging of intra-coastal waterway channels and hardening of inlets has radically altered natural estuarine hydraulics. Commercial, residential and road construction on the barrier island has eliminated the natural processes of coastal erosion and island inlet breaching, which may be a natural cycle on the order of 100 years or more that renewed these habitats by affecting residence time and location of the hydraulic null zone.

This project improves upon the design and operation of the Destin, Florida Old Pass Lagoon Flushing Station sponsored by the Northwest Florida Water Management District (NWFWMD) and funded by the Florida Legislature. This facility has been manually operated by the City of Destin since 1996.

Other examples of existing active and passive seawater controls used to manage coastal water quality include:

- Gowanus Canal Flushing Station, sponsored by USEPA, USACE, State of New York and New York City: under construction in Brooklyn, NY
- Coastal Impoundments for Wildlife Habitat Management, sponsored by USFWS and five Gulf state environmental agencies
- Seawater Intake Pipeline and Flow-through, Mote Marine Laboratory, Sarasota, FL as representative of all coastal marine laboratories and public marine aquariums
- Coastal Commercial Mariculture farms and hatcheries, multi-decade operations worldwide for production of fish, shrimp, crabs, bivalves, mollusks and alga utilizing seawater/bay intake pump stations and passive tide gates

The three NEPs utilize utilizes a set of criteria to evaluate the effectiveness of basin activities and the proposed estuary restoration project meets these criteria as follows:

South Florida Regional Ecosystem Plan Documents Checklist

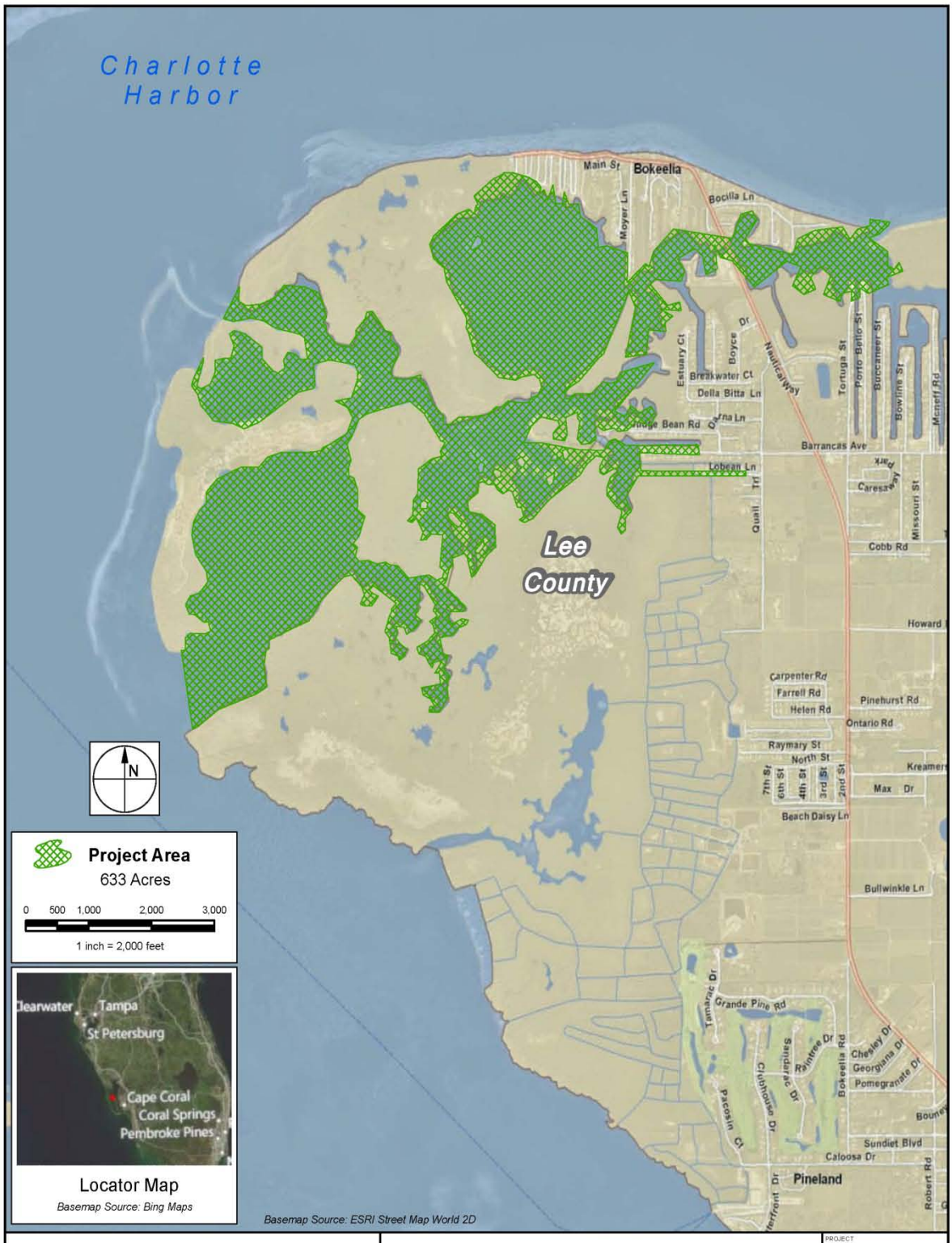
Priority Project Criteria	**Yes/No/Unknown**
Multiple Natural Resources	Yes
Science-based Plan, w/monitoring	Yes
Multi-faceted	Yes
Enhances WQ/Especially Impairments	Yes
Range of Bio-diversity Protected	Yes
Enhances Hydrology of the Gulf	Yes
Links to Ongoing Restoration Planning Efforts	Yes
In Permitting, Shovel-ready	No
Dollar Value Ratio, Including Ecosystem Services	Yes
Enhances Critical Habitat of Impaired Wildlife	Yes
Demonstrable Outcomes	Yes
Opportunity for Public to Participate	Yes
Leverage Other Sources of Funding	Unknown
Enhances Existing Plans or Projects	Yes
Enhances Local Economy	Yes

The project team is comprised of:

Prime Contractor: Gannett Fleming, Inc. - Design-Build Engineers for Constr. & Ops.
Coastal Engineering: Taylor Engineering, Inc. - Modeling & Permitting
Justification & Valuation: Environmental Services, Inc.- Data Review & Baseline Condition
Offset Credits Verification: York RSG, Inc.-Environmental – Seagrass Monitoring & Reporting

Add any photos or maps that explain project:

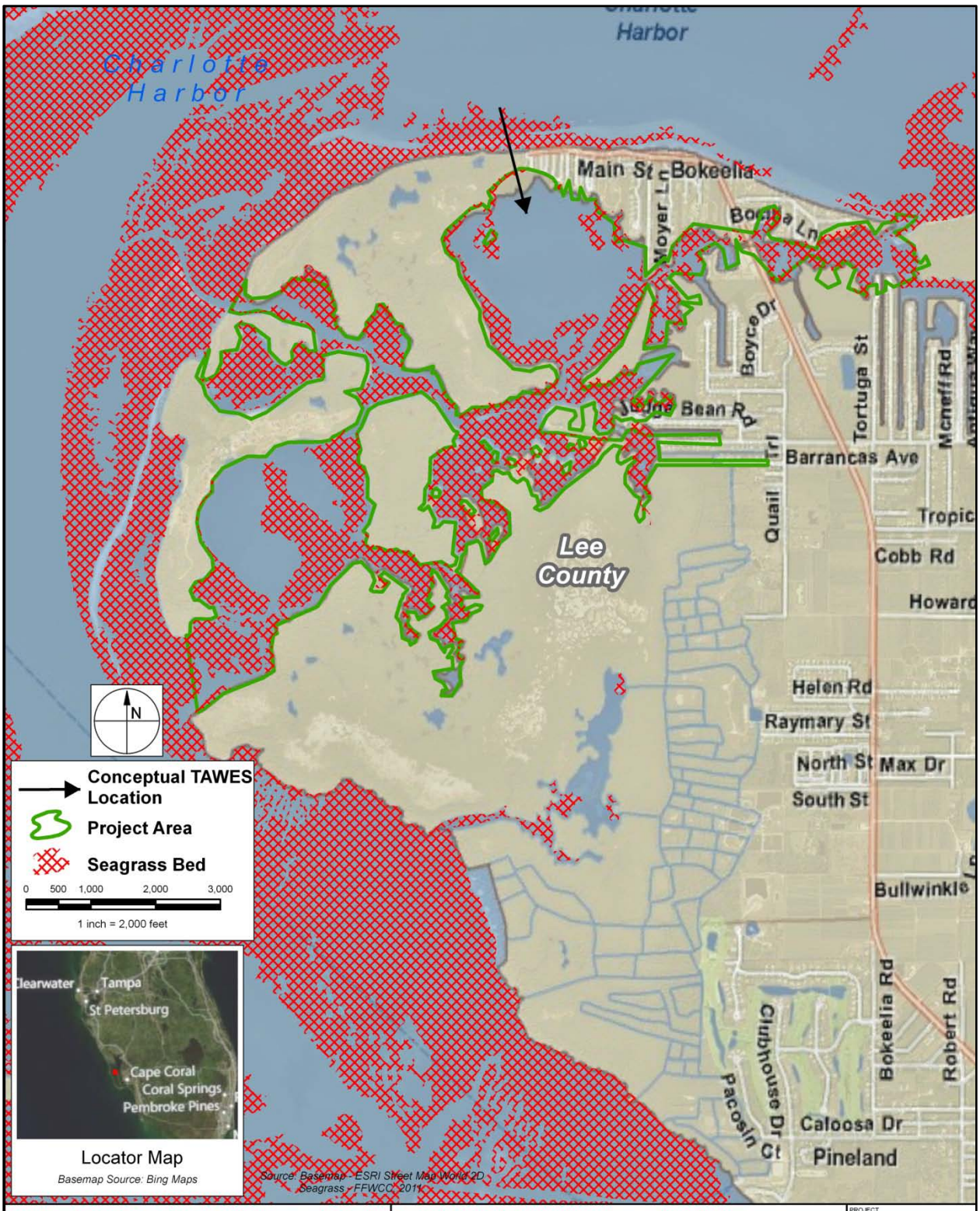
1. Restore Act Area
2. Existing Seagrass Coverage
3. General TAWES Configuration
4. TAWES Brochure



Taylor Engineering Inc.
10151 Deerwood Park Blvd.
Bldg. 300, Suite 300
Jacksonville, FL 32256

Restore Act Areas
Bokeelia Island Project Area
Lee County, FL

PROJECT	RESTORE ACT
DRAWN BY	PL
SHEET	
DATE	OCTOBER 2012

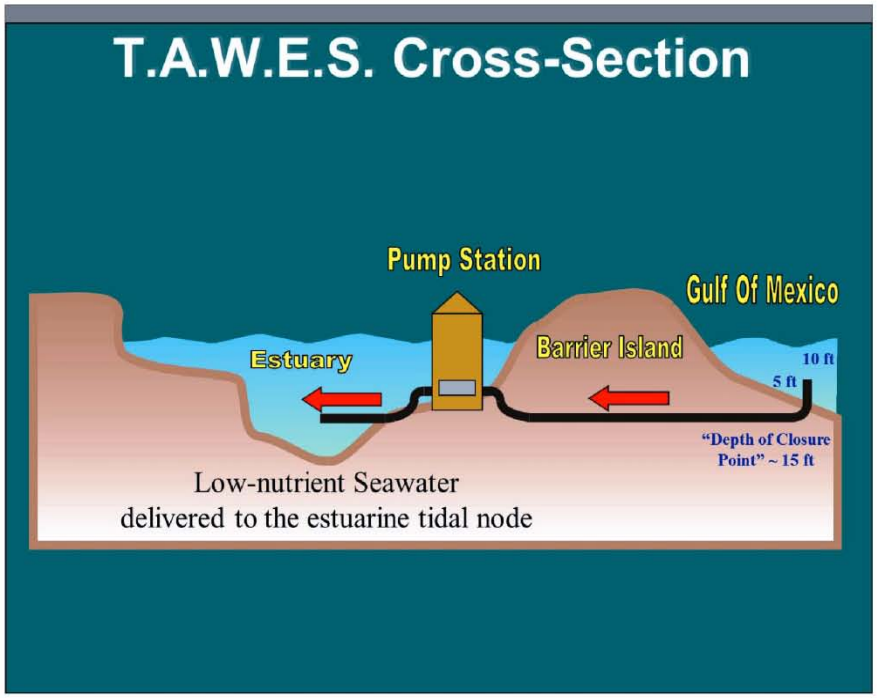


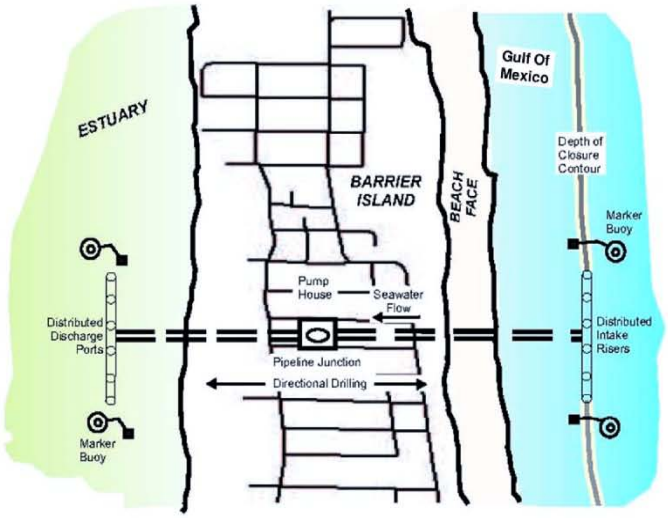
Gannett Fleming

10161 Centurion Parkway, Suite 300
Jacksonville, FL 32256

Restore Act Areas
Bokeelia Island Project Area
Lee County, FL

PROJECT	RESTORE ACT
DRAWN BY	PL
SHEET	
DATE	OCTOBER 2012

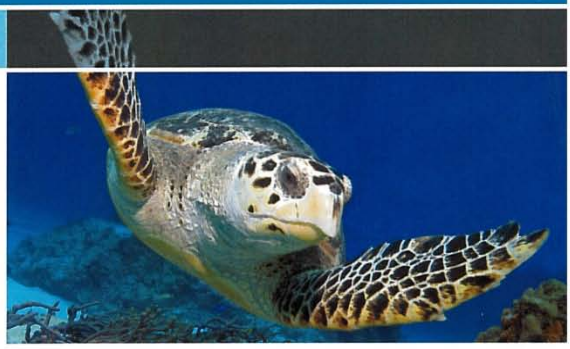




Bidirectional drilling from a land-based position allows installation of the subsurface pipeline in excess of 3,600 meters total length. The pump house serves as the junction point for the two HDD pipelines. Submerged distribution intake and discharge ports is one configuration that can be used to reduce velocity.

Gannett Fleming	**General T.A.W.E.S. Configuration**	PROJECT: RESTORE ACT DRAWN BY: SZ SHEET: DATE: OCTOBER 2012

Patented Technology for the Restoration and Preservation of the Ecological Integrity of Coastal Estuaries.



Improving Our Communities. Sustaining Our World.

Gannett Fleming is a global infrastructure firm focused on planning, design, and construction management for the environmental, water, transportation, and facilities industries. Across our 60 offices, more than 2,100 highly-qualified professionals are united in an unyielding commitment to deliver excellence to every client and every project, every day. Since 1915, Gannett Fleming has played a part in shaping infrastructure and improving communities worldwide, embracing sustainability and innovation for the responsible care of the environment.

Nearly 100 Years of Environmental Stewardship

For nearly a century, Gannett Fleming has been recognized as a leader in controlling environmental hazards, reducing environmental impacts, protecting wildlife habitats, and conserving natural resources. Our firm provides a comprehensive range of services in support of ecosystem management and restoration planning, design, and construction. We develop strategies that minimize the degradation of existing resources through planning, protection, and regulation. When necessary, we also guide the recovery and management of damaged ecosystems. Our staff brings technical, scientific, regulatory, and management expertise, with a focus on:

- Aquatic habitat assessment and enhancement
- Wetland identification, delineation, & mitigation
- Erosion and sedimentation control
- Habitat evaluation procedures
- Threatened and endangered species surveys
- Hydrologic and water quality studies
- Waterway conservation planning
- Stormwater management
- Watershed management & planning.

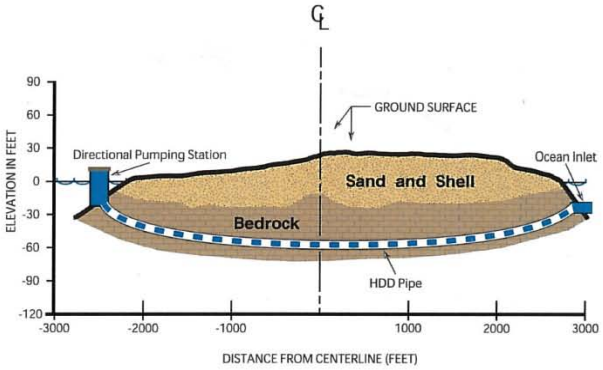
Meeting the Challenges of Today with Solutions for Tomorrow

Gannett Fleming brings excellence, innovation, and sustainable approaches to environmental management, with a focus on the maintenance, restoration, and preservation of ecological integrity related to ecosystem structure and function. Our worldwide experience includes ecological engineering solutions to water and related land

resource challenges using an integrated resources and ecosystem approach. Gannett Fleming's team of technical professionals provides viable solutions that meet the challenges of today and that also make way for a thriving environment in the future. Representative water quality projects include:

- Design and construction inspection of a 48-inch horizontal directional drilling project on the Virginia coastline
- Preparation of the Coastal Marinas Handbook for the U.S. Environmental Protection Agency (EPA)
- Technical support to the EPA on the development of a Programmatic Environmental Impact Statement on implementation of the Florida Everglades Program
- Engineering support to the South Florida Water Management District for its Everglades Restoration and Capital Projects Resource Area Program.

A Typical HDD Pipe Installation Under a Barrier Island



Patented Technology for Sea Grass Growth

Gannett Fleming has developed an approach to improving the water quality of estuarine ecosystems by increasing flushing rates, salinity, and water clarity, and at the same time reducing nutrient concentrations in the water, thereby stimulating the growth of sea grasses. Our patented Tidal Activated Water Exchange System (TAWES™) acts as an ocean inlet to facilitate ecosystem management. Such an inlet is not constructed by the traditional "cut and cover" or dredge methods. Rather, underground pipes are installed using state-of-the-art horizontal directional drilling (HDD) to create the inlets. TAWES features HDD pipes ranging from 24 to 60 inches in diameter that can exceed 5,000 feet in length. Aesthetically-designed, soundproof pump stations are used to control the direction and rate of flow during ebb or flood tide.

Healthy Sea Grass—A Valuable and Important Resource

Sea grasses play an important role in the health of coastal ecosystems, including stabilizing the sea bottom, maintaining water quality, providing food and a habitat for marine organisms, and supporting local economies. A critical part of the marine ecosystem, the Florida legislature has established the replacement value of damaged sea grass at $43,560. Recent studies estimate the annual economic benefit value of healthy sea grass habitat to be $20,500 per acre.