I. Project Information

a. Project Site Description and Factors Contributing to Restoration Needs (See Map)

Restoration Site 1: Mashes Sands, FL (29.970148°,- 84.334194°)

Description: Mashes Sands is a Wakulla County recreational area and park situated north of Ochlockonee Bay and overlooking Apalachee Bay. There are approximately 400 acres in the Wakulla County leased Park from the Florida Department of Environmental Protection (FDEP).

Restoration Need: Approximately 0.3 miles of the south portion of Mashes Sands recreational area shoreline is currently designated as critically eroding by FDEP (2009). Recent hard structures have been place as a bulkhead to slow erosion and flow of sand into a County maintained canal. An additional 0.4 miles of shoreline is also eroding but currently designated as non-critical.

Contribution to Project: Mashes Sands is an excellent candidate for a soft structure approach or "Living Shoreline" demonstration and education project. This site is easily accessible for school service learning projects and workshops for waterfront contractors and homeowners. There is also the opportunity to establish restoration evaluation study sites in conjunction the Florida State University (FSU) Marine Laboratory (29.916594°, -84.511091°). Relatively little or no disturbance from current recreational activities and adjacent property owners would be anticipated.

Restoration Site 2: Shell Point Beach, FL (30.057766°, -84.290545°)

Description: Shell Point Beach is small Wakulla County Park, approximately 4 acres located just east of Oyster Bay.

Restoration Need: One mile of the Shell Point shoreline, including the County Park, is classified as critically eroded by FDEP (2009). Based on rudimentary analysis of aerial photo graphs between 2007 and 2009 approximately 100+ feet of shoreline has been lost. Recent winter storms (2009 – 2010) have further exacerbated erosion-observed problems removing several sections of buffering grasses such as *Spartina alterniflora*.

Contribution to Project: Concerned County Citizens and resident property owners continue to be a model for engaged public participation in restoration projects. Building on this momentum will provide a model project for other Northwest Florida Communities and a hands-on opportunity to experience to the performance of "Living Shoreline" alternatives to seawalls, bulkheads and other hard structures for local residents. Where wave energies are high, a combination of structure and plants may be implemented and demonstrated.

b. On-the-Ground Restoration Activities:

1. Construction of a coastal plant nursery as a source for plant restoration material capable of restoring 10 acres of salt marsh annually. 2. Community restoration of portions of critically eroding shoreline in Wakulla County, as designated by FDEP in 2009. 3. Restoration of 20 acres. 3. Establishment of oyster reefs to complement emergent grass planting, provide habitat, and improve water quality.

c. Long-Term Success/Lasting Benefits

Project Benefits to Community and Science

1. Establish new Service Learning Education Projects in partnership with Florida Department of Environmental Protections LIFE (Learning in Florida's Environment) program. 2. Study and address critically eroding shoreline in Wakulla County, FL. 3. Evaluate restoration methods integrating *Spartina alterniflora* and seaward substrate and report finding in peer reviewed literature. 4. Evaluate the role of genetic diversity in successful Spartina alterniflora restoration and report findings in peer reviewed literature. 5. Compare the relative growth of oysters used in restoration on various substrates and report findings in peer reviewed literature. 7. Provide restoration demonstration sites for workshops and other field activities directed at contractors and property owners as an alternative to sea walls and other hard structures. 8. Provide additional educational materials for students related to oysters and oyster reef construction from yard waste.

Project Benefits to Coastal Ecosystems

1. Promote establishment of Best Management Practices (BMPs) of soft alternatives using natural vegetation for shoreline protection as an alternative to hardening of the shoreline. (N.E.P.A.) 2. The planting of shoreline vegetation aids in the uptake of nutrients and/or pollutants from runoff thus preventing these components from entering the waterbody thereby contributing to improved water quality. (The Clean Water Act and the Federal Insecticide, Fungicide, and Rodenticide Act). 3. The root systems of vegetation help stabilize the soil along a shoreline protecting it from waves and soil erosion. (The Clean Water Act) 4. Natural shoreline vegetation provides shelter and food for wildlife as well as supporting spawning beds for fish. (The Endangered Species Act) 5. Natural shoreline vegetation shades and cools water discouraging the growth of algae. (The Clean Water Act)

II. Implementation Information

a. Planning and/or Engineering and Design:

Engineering and coastal analysis will be conducted utilizing available data to determine the design water level, wave height and direction, predominant sand transport direction, and alignment of any potential substrate structure location to account for coastal processes. Coastal

analysis will consist of identifying existing data sources and collecting new water level data to supplement those sources. Analyses included: Tidal Analysis, Fetch Analysis, Oyster Recruitment Analysis, Topographic Surveys, and Bathometric Surveys.

Site data will be analyzed and a design will be tailored to conditions. Additional design strategies and enhancements will be created based on literature review and previous restoration projects including those in this proposal.

b. Environmental Compliance: All phases of this project will be conducted with proper permitting and in cooperation of federal, state, and local regulators. FDEP is issuing a permit for field collection of donor *Spartina alterniflora* plants necessary for the establishment of coastal native nursery in Crawfordville.

Principal investigator of this proposal understands and is experienced with required permits. A similar shoreline restoration project was planned, engineered, permitted, and successfully completed in Walton County in 2008. This proposal builds on past experiences and seeks to provide improved restoration methods and reduced environmental impacts through the use of natural materials.

Shoreline stabilization and/or restoration projects meets the criteria as set forth in 18-1.005(1)(c) 5, F.A.C. (Florida Administrative Code) Forms of Authorization, Letter of Consent for use of Sovereignty Submerged Lands. The applicant will obtain, upon approval of the grant proposal, a Standard Short Form Permit as outlined in 62-312.060, F.A.C. from Florida's Department of Environmental Protection. In addition, planting along the shoreline for shoreline stabilization, would qualify for a Nationwide (NW) 13 under the jurisdiction of the U.S. Army Corps of Engineers.

Wakulla County Recreation and Parks has granted access sites and is a partner in restoration activities. Additional cooperation and support has been expressed by Educational portions of the FDEP with LIFE (Living in Florida's Environment) program.

c. Construction & Implementation:

1. Donor Site collection of Spartina alterniflora (Summer 2010). Bare root plants and seeds will be collected according to FDEP permit from the two areas in Alligator Harbor. All sites occur within the Alligator Harbor Aquatic Preserve. Harvest areas will be accessed by foot. A maximum of 1,300 *S. alterniflora* plants will be taken from the donor sites. No more than 5% of *S. alterniflora* coverage in a square meter will be removed. Additionally, no more than 45 total square meters will be removed from a single donor site at any time. Donor Site 1 (29.925333°, -84.425607°) – There is extensive salt marsh just off a trail from Highway 98. Donor Site 2 (29.923811°, -84.415850°) – Another area of large stands of Spartina. The marsh areas themselves are within the Aquatic Preserve, and access to this site is via a public access location that residents often use to launch small boats.

2. Preliminary Restoration Site Evaluation and Substrate Investigation (Summer 2010)

3. Construction of a Community Native Nursery at the new Wakulla County Community Center (30.184171°, -84.362297°) (Fall 2010). A 16' X 16' emergent grass nursery capable of producing 25,000 – 50,000 plants each year. This nursery is capable of providing enough smooth cordgrasses to restore 10 acres of salt marsh annually. Additionally, a 10 x 20 greenhouse capable of producing coastal native species will be constructed and planted for producing restoration plants such as *Spartina bakeri*, *Spartina patens*, *Panicum sp.*, *Baccharis sp.*, *Galardia sp.*, *Helianthus debilis*, *and Uniola paniculata*. Utilizing and participating in this education program will be middle students engaged in the Florida Department of Environmental Protection Learning in Florida's Environment (LIFE) Program; Wakulla County 4-H Marine Science Clubs and Junior Master Gardeners; and community groups interested in environmental science and horticulture. (See attached letter of Support, Greg Ira, FDEP)

4. Service Learning Projects and Evaluation of Restoration methods using coastal vegetation and off-shore substrate at Mashes Sands (May 2011 – May 2012).

5. Community Restoration Shell Point (May 2012).

d. Pre- and Post-Restoration Monitoring: Baseline water quality, oyster recruitment, and sand transport data will be investigated and established at each restoration site. Preliminary investigations of substrate material will be initiated comparing recruitment on oyster shell and waste tree / shrub material.

Information gathered will be used in designing a shoreline stabilization project utilizing replicate treatments of *S. alterniflora* and substrate materials, evaluating: 1.The role of genetic diversity. 2. The oyster recruitment and performance of substrate types. 3. The interaction of genetic diversity and various oyster substrate strategies.

Genetic Treatment	**Oyster Substrate Treatment**
Limited Genotypes	None
Multiple Genotypes	Oyster Shell
	Tree / Shrub

Post Restoration evaluation will include: 1. Shoreline erosion or accretion. 3. Plant Growth (Stem and Root length). 4. Oyster Recruitment. 5. Oyster Size. 6. Water Quality Analysis

e. Long Term Management & Stewardship: Site management of the restoration project will remain with Wakulla County throughout the life of the projects. Shell Point Site is a county park purchased through Florida's Community Trust, " Florida Forever" funding in 1994. Mashes Sands is a 50 year lease agreement with FDEP Internal Board of Trustees. Currently, 24 years remain until expiration.

f. Project Transferability: Investigators and project coordinators will provide on-site training and written instruction to the Wakulla County Parks and Recreation Director and or department designee responsible for long-term management of the restoration sites.

III. County and Community Outreach and Education

a. Level of County Involvement: This proposal is collaborative effort of three Wakulla County departments of the Board of County Commissioners. BOCC departments include the Office of Management and Budget, Recreation and Parks, and Cooperative Extension (UF-IFAS / Sea Grant) taking leading and administrative roles. The Board of County Commissioners Met March 15, 2010 and approved submission of this grant and providing suggested direction and activities they deemed a priority (see attached letter from BOCC Chairman Dr. Howard Kessler).

b. Watershed or County Conservation Plan: Wakulla County's Comprehensive Plan has codes and policies in place protecting surface waters with specific regulations for stormwater and vegetated shoreline. Where mitigation cannot be achieved to offset impacts, the code requires development will not be approved. Additional County planning policies and codes also encourage the adoption of water quality Best Management Practices related to lawn-care services, silviculture, golf courses, and new development.

c. Contributing Partners: Wakulla County BOCC (OMB, Recreation and Parks, Cooperative Extension – University of Florida-IFAS);4-H, Florida Sea Grant, Gulf Coast Marine Specimen Lab, INC., Florida State University Marine Lab, Florida Department of Environmental Protection LIFE Program and associated local students and teachers.

d. Community Outreach and Education: This project will build on the existing network of engaged citizens, community organizations, and quality environmental education programs for youth found in Wakulla County. Recently, Keep Wakulla Beautiful partnered with Wakulla Recreation and Parks, and Cooperative Extension to complete community restoration of upland areas at Shell Point. This occurred in conjunction with Ocean Conservancy's Coastal Cleanup in September, 2009 and another event in October 2009. Involved in planting activities were local residents, landscape professionals, a county commissioner, and 4-H Marine Science Club members, leaders, and their families. Wakulla County Cooperative Extension (UF-IFAS / FL Sea Grant) provided educational instruction related plants and the habitat they create. Currently 4-H youth are growing additional plants for upland stabilization at Shell Point this summer with support of a local nursery while learning more about coastal ecosystems in club meetings and field investigations.

Learning in Florida's Environment (LIFE) is an initiative to establish a series of field-based, environmental-science, education programs around the state. Each program will represent a partnership between the Florida Department of Environmental Protection and a local school district. The goal of each LIFE Program site is increased student achievement and teacher professional development in science.

The content and delivery of each program will vary from site to site, however, each LIFE Program will share a core set of guiding principles: Alignment with Florida Sunshine State standards; Multi-day, field experiences emphasizing current technologies for environmental science will serve as the entry-point for learning; Emphasis on observation and inference as critical components of the scientific method; Long-term partnerships between DEP and a local schooldistrict(s) that include teacher professional development; Program content derived primarily from teacher-identified needs and priorities; Integration of all subject areas by connecting field experiences with pre- and post- classroom lessons; Focus on underrepresented and underserved audiences.

Wakulla County (UF-IFAS) Cooperative Extension 4-H Agent has the leading role in the local county LIFE program. Extension coordinates school field-trips, provides teacher resources, and trains volunteers to provide hands-on field education activities.

Upon grant approval, Extension will work with FDEP Office of Environmental Education and local teachers to incorporate "service learning" objectives creating a new learning exercise related to shoreline restoration. This new "lab" will be coded to Florida Department of Education's Next Generation Sunshine State Standards. This educational program will be appropriate for use in coastal counties across Florida and the nation.

IV. Organizational Information

a. Overall Mission and Goals: 1. To stabilize Wakulla County salt marsh habitat in critically eroding areas utilizing engaged community volunteers. 2. Provide stewardship opportunities for youth through "service learning" restoration projects. 3. To improve restoration methods through scientific study and evaluation utilizing appropriate genetic plant materials and environmentally friendly substrates.

b. Composition of Governing Board: Dr. Howard Kessler – Wakulla Co. BOCC-Chairman; Eva Thorpe –Wakulla Co. BOCC – OMB; Ray Gray – Wakulla Co. BOCC-Director, Recreation and Parks; Dr. Andrea Carter –Board of Directors, Gulf Coast Marine Specimen Lab; Dr. David Kimbro – Researcher, FSU Marine Lab; Scott Jackson-Wakulla Co. (UF-IFAS)-BOCC- County Extension Director; Greg Ira-FDEP Office of Environmental Education-Director.

c. Qualification of Applicant: Wakulla County is a member of the National Association of Counties (NACo) and miles of coastal shoreline in the northern Gulf of Mexico.

V. Project Budget

Category	Funds Requested from CCRI	Anticipated Matching Partner Contributions	Anticipated Non-Matching Partner Contributions	Justification
Salaries	24,000	52,300		For Curriculum Specialists, Graphic Artist, to Develop Materials
Benefits		1,000		
Travel	2,500	600		Field Trips for Students to Restoration Sites
Equipment	11,960	18,500		Green House, Construction Materials, Evaluation
Supplies/Materials	20,640	1,000		Soil, Nursery Construction Materials, Shell
Contractual Services	8,200	13,500		Engineering & Site Analysis
Other Direct Project Expenses	20,000	400		Graduate Student Intern Funding - Analysis and Educational Resources
Administrative & Overhead	5,000	5,000		Reporting, Oversight, and Grant Execution
Total	92,300	92,300		

VI. Partner Contributions

Partner Contributions				
Project Partner	**Amount**	**Dedicated Non-federal Matching**	**Secured or Pending**	**Cash/In-Kind**
1. Wakulla County Board of County Commissioners – OMB	5,000	5,000	Secured	In-Kind
2. Wakulla County / University of Florida-IFAS Cooperative Extension	39,500	39,500	Secured	In-Kind
3. Wakulla County Recreation and Parks Department	15,300	15,300	Secured	In-Kind
4. Florida State University Marine Laboratory	4,000	4,000	Secured	In-Kind
5. Gulf Specimen Marine Lab, INC	24,500	24,500	Secured	In-Kind
6. FDEP LIFE Program Office of Envinronmental Education	4,000	4,000	Secured	In-Kind
Total Partner Contributions:	**92,300**	**92,300**		