

Project Name: Fruit Farm Creek Mangrove Restoration Project
Project Sponsor (your organization): Coastal Resources Group, Inc. (CRG) (Federal 501(c)3 Not-For-Profit) partnering with the Rookery Bay National Estuarine Research Reserve

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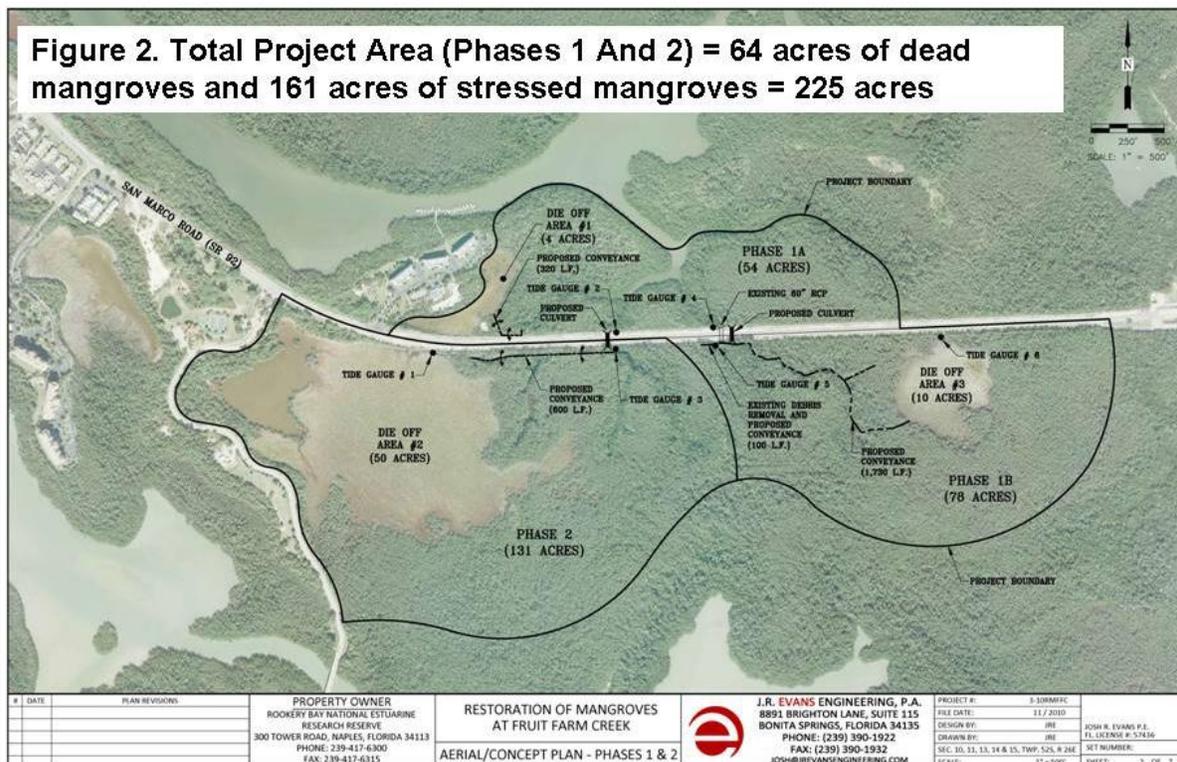
Project Type according to the Allowable Uses for RESTORE Act Funds:

- *Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region*
- *Mitigation of damage to fish, wildlife, and natural resources*
- *Implementation of a federally approved marine, coastal, or comprehensive conservation management plan, including fisheries monitoring*
- *Workforce development and job creation*
- *Improvements to or on State parks located in coastal areas affected by the Deepwater Horizon oil spill*
- *Infrastructure projects benefitting the economy or ecological resources, including port infrastructure*
- *Coastal flood protection and related infrastructure*
- *Activities to promote tourism and seafood in the Gulf coast region*

The Board of County Commissioners has adopted Guiding Principles relating to project proposals:

1. *Projects provide positive environmental and economic benefits, including job creation.*
2. *Projects are consistent with local government comprehensive plans and community priorities.*
3. *Projects incorporate other funding partners to fully leverage grant resources.*
4. *Projects meet the funding criteria set forth in the RESTORE Act.*
5. *Projects selected will be diverse and address all our community's eligible needs, including coastal and ecosystem restoration and development, flood protection, and tourism promotion.*

Project location (attach map if applicable):



Project Location (cont'd): Rookery Bay National Estuarine Research Reserve (RBNERR), Collier County, Florida, County Road 92 (CR 92 also known as San Marco Road) approximately one mile west of the town of Goodland (Township 52 South, Range 26 East, and primarily Sections 14 and 15 but also portions of Sections 10, 11, 13) between Latitude 25.9397 and 25.9242, Longitude 81.6552 and 81.6866 (See Figure 1-3).

Project Description:

RBNERR is located in the West Florida subregion of the West Indian Biogeographic Region and within the physiographic region of the Ten Thousand Islands. The mangrove die-off area of concern is located along County Road 92 (CR 92 also known as San Marco Road) approximately one mile west of the town of Goodland, in Collier County, in southwest Florida (Township 52 South, Range 26 East, and primarily Sections 14 and 15 but also portions of Sections 10, 11, 13) between Latitude 25.9397 and 25.9242, Longitude 81.6552 and 81.6866 (See Figure 1).

Three clearly visible mangrove die-off areas have been identified comprising 64 acres (Figures 1-3), but are expanding. These areas are characterized by dead trees that remain standing and are most visible south of CR 92, but also exist on the north of CR 92. The area surrounding the visibly dead forest is stressed from extended flooding and has been estimated to be 161 acres in size and is expanding in area, again predominately on the south side of CR 92. The estuarine mangrove area to benefit from complete hydrological restoration of the site is estimated to be approximately 1,025 acres. 4

Tasks Completed To Date

Task 1. Establish Restoration Steering Committee

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At the onset of the project the Restoration Team consisting of the project investigators met and formed a Restoration Steering Committee comprised of stakeholders and project partners. These included RBNERR staff and representatives from USFWS South Florida Ecological Services Office, the Conservancy for Southwest Florida, the Florida Fish and Wildlife Conservation Commission and the City of Marco Island, as well as representatives of the adjacent residential developments, Key Marco and Stevens's Landing. This Restoration Team has worked with the Steering Committee to confirm the project goals and roles of each partner/stakeholder. Subsequent meetings have been held during the development of the project.

Task 2. Gather and synthesize existing information on the Fruit Farm Creek restoration area and prepare a restoration plan.

A topographic and bathymetric survey has been completed in order to characterize the existing conditions of the site. Hydrology and tidal flow within the areas of concern have been modeled based upon the placement of six hydrologic monitor devices (Hobo Meters) in: (1) the closest unimpacted (control) creek systems, the flow way into the mangroves from the existing single culvert, and a three more in the dead mangrove areas. In addition, other biological, physical and permitting constraints within the project site have been identified, including the presence of non-native vegetation that will be removed as part of the final restoration plan. Restoration alternatives have been analyzed using a hydrologic model and evaluated based on cost efficiency and likelihood of meeting project goals. A preferred alternative was selected and permit drawings prepared.

Task 3: Permitting

Based on the preferred alternative, a Joint Environmental Resource Permit (ERP) and Federal Dredge and Fill permit application was prepared and submitted to the South Florida Water Management District SFWMD and the U.S. Army Corps of Engineers (USACOE). Coordination with the U.S. National Marine Fisheries Service is regarding the endangered smalltooth sawfish (*Pristis pectinata*) was initiated and resulted in a "no impact expected" decision. All permits have been issued.

Task 4. Implement Restoration Plan

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The complete restoration plan includes installation of three 54 inch diameter culverts in addition to the retention of the existing 60 inch culvert under CR 92. Phase 1a (Figure 4) has been funded by the second grant from the USFWS Coastal Program (\$25,000), public donations of \$10,000, and \$90,000 in donated materials and labor to construct a tidal channel. The restoration team will work with the City of Marco Island to plan, design and install the minimum cost effective means of restoring tidal flows and allowing natural restoration processes to begin per the principles of Ecological Mangrove Restoration (EMR) as outlined in Lewis (2005, 2009) and Lewis et al. (2006) when full funding is available (estimated to be \$1.4 million).

Task 5: Environmental Review and Compliance Monitoring

The complete restoration plan includes a full restoration monitoring program including a Time Zero report, and Time Zero plus 3, 6, 9, 12, 18, 24, 36, 48 and 60 months reports (10 total). Twelve 5m (16.5 ft) X 5m permanent plots would be established within both the dead mangrove area and in reference areas. The restoration site data would be compared to reference sites located within basin black mangroves (*Avicennia germinans*) located adjacent to the project site. It is expected that 80% cover by a mixture of volunteer saltwort (*Batis maritima*) and mangroves would be naturally established after 24 months), and 80% mangrove cover established within 60 months through volunteer mangrove recruitment. No planting of mangroves is needed nor planned based upon previous work at locations like Clam Bay in the City of Naples where volunteer mangroves established on their own. Regular sampling for fish using Breder traps will take place during the regular sampling for vegetative cover within the fixed plots.

Economic Benefits (including ecosystem services): \$5,000 per acre per year restored or preserved = \$5,125,000. Keep in mind that the ecosystem services benefits are yearly on a per acre basis. Remember that real estate values are positively affected by the presence of healthy surround natural resources not just for the immediately surrounding housing but for all of Marco Island and its surrounding communities. Much of Collier counties economy depends heavily on tourism and recreation and folks don't want to visit or recreate in areas with unhealthy, ugly, smelly natural surroundings. The restoration of these dead and dying areas of mangrove will have a huge positive effect on the local economy.

Estimated number of Jobs Created or Preserved: 10. Five full time three years, five part-time three years. This is not counting the jobs that are supported for fisheries and also other jobs in the surrounding community that are supported when a community is seen to have natural resources that are healthy, beautiful, and productive.

How much Habitat will be restored and conserved?: 1,025 acres

How is this project consistent with local government comprehensive plans and community priorities? The Fruit Farm Creek Restoration Project is described in and is part of the Rookery Bay National Estuarine Research Reserve's newly approved 5 year management plan. This plan has been assessed and approved by the State of Florida Division of State Lands & Governor and Cabinet, by NOAA, and also has been approved by Collier County as consistent with their LDC codes and plans.

How does this project incorporate other funding partners to fully leverage grant resources?

The principle investigator from the Coastal Resources Group, Inc. (CRG) Mr. Roy R. Lewis III, Professional Wetland Scientist (PWS) will donate half of his time spent on the project and Dorothea Zysko, PWS, co- investigator from The Ecology Group will donate one-quarter of her time spent on the project

RBNERR staff is committed to contribute staff time and technical support with each task involved in reaching the project goals, including playing a primary role on the core restoration team, assisting in the topographic survey, creation of mapping documents throughout the planning and implementation phases using information generated during the topographic and other surveys, and monitoring the biological resources, including fish and bird species. In addition, the RBNERR's Trimble GeoExplorer® unit, GIS computer, and statistical software for data analysis have been used during survey work and the preparation of the restoration plan. Jeff Carter, Stewardship Coordinator is contributing specifically 0.75 man months per year for the

three year project as part of this proposal.

The Conservancy for Southwest Florida staff have conducted work and made important contacts over the past several years characterizing the mangrove-die off areas. They have agreed to participate as a member of a restoration steering committee and in this regard will contribute staff time and technical support over the course of the project, including conducting all the required compliance and monitoring data collection. These donated efforts are valued at \$150,000.

The City of Marco Island is expected to contribute staff time and technical expertise in characterizing the existing biological conditions of the site and in the public education and outreach components of the project.

Representatives of the residential developments adjacent to the die-off areas have expressed concern and willingness to participate in resolving the mangrove die-off problem because it has direct visual and odor impacts on their properties. These representatives have been contacted and engaged to become members of the steering committee. In addition, the developments have been requested to make cash donations to the implementation phase of work and directly assist in the public education outreach component of residents living in their communities. To date these groups have contributed \$10,000 that has been used as part of the required match for the Phase 1a implementation funding from the USFWS. A total match of \$439,000 in in-kind cash donations and services, including \$75,875 in USFWS Coastal Program grants has been provided to date to match the requested grant. Total-non-federal match is \$365,000 to date.

What living coastal/marine resources will be improved and by how much?: Mangrove forests and associated tidal creeks totaling 1,025 acres through the restoration of 64 acres of dead mangroves, permanent prevention of future immediate death of 161 acres of severely stressed mangroves, and conservation and forestalling the death of an additional 800 acres of mangroves until further work could be undertaken (During Phase 3 not described here).

How will community resilience be enhanced? Improved resilience to sea level rise due to restored hydrology and health of mangroves to allow for better natural increases in soil and plant elevations over time as sea level rises within the 1,025 acre project area. Also, the resiliency of the local communities economy will also be enhanced.

Additional Justification: The project will restore fisheries habitat for many fish and wildlife species. Mangrove and estuarine habitats provide critical nursery areas for a number of larval and juvenile finfish and shellfish species of commercial and recreational importance. Many adult fish species take shelter and feed within mangrove habitats as well. Some fish species that will benefit from this project include the endangered fish species the smalltooth sawfish (*Pristis pectinata*) which is reported at its smallest sizes using shallow (<2.4 m) protected mangrove areas, and important recreational and commercial fish and shellfish species such as snook (*Centropomus undecimalis*), sheepshead (*Archosargus probatocephalus*), mangrove snapper (*Lutjanus griseus*), tarpon (*Megalops atlanticus*), red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), stone crabs (*Menippe mercenaria*), blue crabs (*Callinectes sapidus*), pink shrimp (*Farfantepenaeus duorarum*) and oysters (*Crassostrea virginicus*). An estimated 75% of the [game fish](#) and 90% of the [commercial fish](#) species in south Florida depend on mangrove systems.

Restoration of the mangrove die-off areas and the associated mangroves and estuarine system will provide additional foraging and roosting areas for shore and wading birds such as the roseate spoonbill (*Platalea ajaia*), frigatebird (*Fregata magnificans*), double-crested cormorant (*Phalacrocorax auritus*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), green heron (*Butorides virescens*), reddish egret (*Egretta rufescens*) and migratory birds such as the brown pelican (*Pelecanus occidentalis*).

Total Cost:

Total costs to implement this proposal is \$1.94 million.

Additional Funding Partners or sources of matching funding if available:

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(RESTORE Act funds): Total requested RESTORE funding is \$1.4 million over three years.

Suggested implementation timeline:

Start: September 2012 Phase 1A completed				Completion of all areas: December 2015			
Status of Project Design and Permitting: Designed and fully permitted							
What Date or Year could Construction Feasibly Begin: Phase 1A has been completed. Further phases could begin with two-months of funding during early 2013. Construction drawings need to be prepared and the work bid and awarded for construction to begin (60-90 days) .							
Proposed Timing of Funding (given permits, phasing, staging, etc.)							
FY	12/13	13/14	14/15	15/16	16/17	17/18	Total
	\$500, 000	\$500,000	\$400,000				\$1.4 million