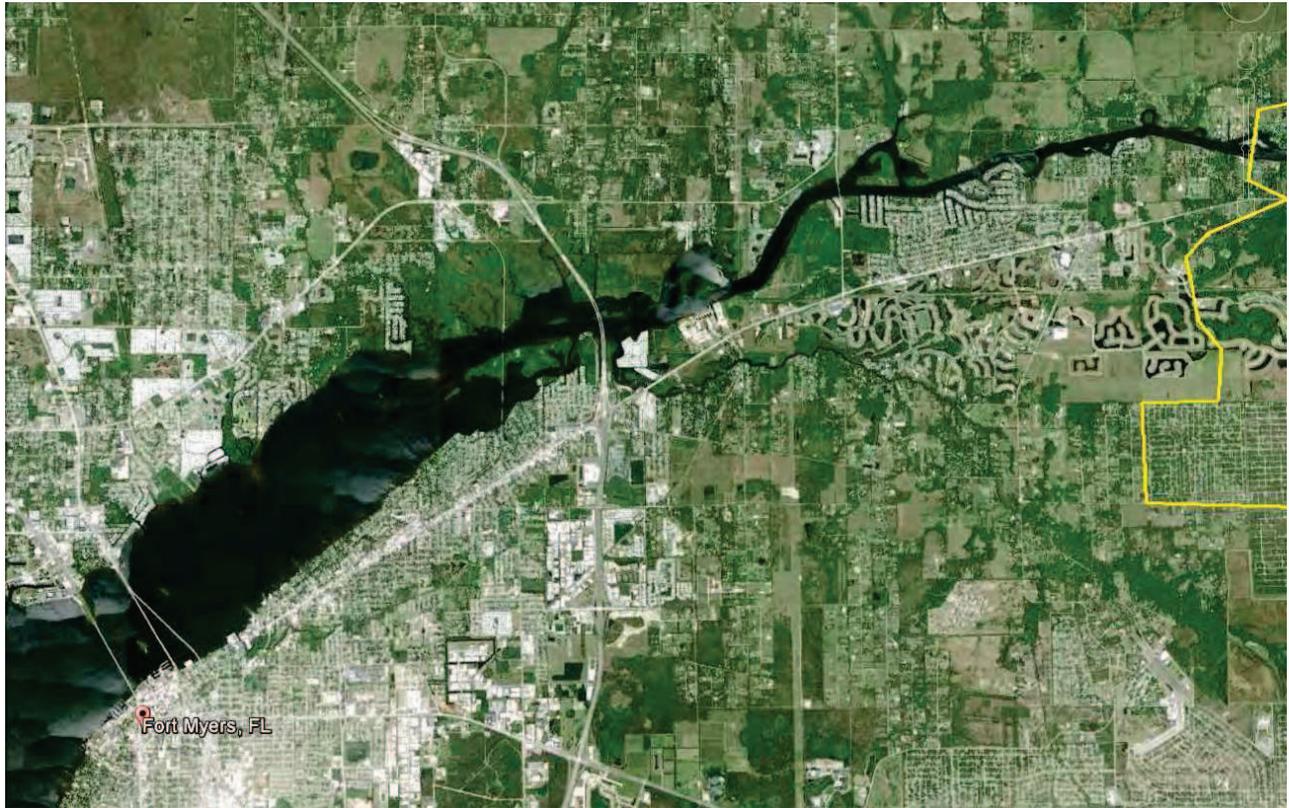


**B. PROJECT LOCATION MAP**

Include a project location map no larger than 8½” x 11”.

**(10 pts.)\***



\* NOTE: The maximum number of points for scored application components is indicated in each section.

**C. WORK PLAN** (Expand text boxes as needed, keeping within the 10-page Work Plan limit)

This section describes the project and cannot exceed 10 single sided pages or 5 double sided pages. If letters of support or other materials are submitted to address the Work Plan components below, these items will count toward the maximum 10 pages of the application Work Plan; any additional pages or Appendices will be discarded and not considered in the evaluation of the application. The Title Page, Location Map, Budget and Budget Narrative do not count toward the 10-page limit of the Work Plan.

**1. PROJECT DESCRIPTION.**

**a. Describe in detail the activity or work to be conducted; include project location information. (15 pts.)**

Tape Grass (*Vallisneria americana*) and Ruppia (*Ruppia maritima*) will be grown and monitored in protective cages in the Tidal Caloosahatchee River by citizens recruited by the Charlotte Harbor National Estuary Program (CHNEP) and the Caloosahatchee River Citizens Association (Riverwatch). Within the protective cages the mixture of seagrasses will be grown from nursery stock to establish seed-source colonies for restoration throughout the 13 mile reach of the river and tributaries between downtown Fort Myers and the Franklin Lock.

The seed-source colonies will be created at 6 locations by planting Tape Grass and Ruppia shoots protected from herbivory (one of the limiting factors for seagrass success in the river) by mesh enclosures. The technical aspects of the project include selecting 6 locations where the herbivore enclosures will be deployed and planting the seagrass shoots within the enclosures. The project is targeting 3 sites on the north side of the river and 3 sites on the south side of the river. At each of the sites, 5 herbivore exclusion cages, available from Sea and Shoreline as GrowSAV will be installed. Each exclusion cage measures 0.9 m in diameter by 0.7 m in height and covers an area of 0.7 m<sup>2</sup>. The total area of seagrass shoots protected within the 6 project sites, with 5 cages per site, will be 21 m<sup>2</sup>. Within each exclusion cage, 5 shoots of Tape Grass grown at a local native seagrass nursery operated by Sea and Shoreline. The exclusion cages will remain in place for the 2 years. Approximately 150 seagrass shoots will be planted within the 30 herbivore exclusion cages. Similar Tape Grass restoration projects within the local region have been very successful. Based on 10% of the success rate of a restoration project in nearby Lake Trafford, it is anticipated that the 21 m<sup>2</sup> of Tape Grass and Ruppia shoots included in the 6 restoration sites (30 cages) will expand to provide an area as large as 7.5 acres of seagrass.

The six sites will be selected within the study area for good Tape Grass and Ruppia restoration conditions, where restoration success will be monitored and homeowners are willing to install and steward the exclusion cages adjacent to their property.

The community stewardship component of the project includes recruiting and training both citizen volunteers to perform “seagrass gardening” and university and high school students to conduct monitoring of the restoration sites. Riverwatch has committed to recruiting the “Adopt a Tape Grass Bed” volunteers from their membership and other community and homeowner groups. Florida Gulf Coast University (FGCU) Environmental Studies Department will be asked to assist in recruiting university students to conduct monitoring of the seagrass restoration success. A project brochure describing the values of seagrass and the need for restoration and community stewardship will be developed and used to recruit volunteers and educate the public. Articles about the project will also be included in the CHNEP quarterly magazine “Harbor Happenings”.

The seagrass restoration success monitoring will be based on methods utilized by Johnson Engineering to assess the results of an on-going Tape Grass restoration above the Franklin Lock. A project monitoring methods Standard Operating Procedures (SOPs) manual will be developed to guide consistent, technically sound monitoring. The monitoring components will include seagrass (abundance and blade height), water

quality (clarity, salinity, temperature and dissolved oxygen)). The monitoring data will be entered into a project data base via the CHNEP Water Atlas through a web page designed for the project.

The project results will be presented to a variety of university, high school and community groups by the project partners. The exclusion cages will be removed at the end of the project period.

The City of Fort Myers has signed a letter of support and current researchers have stated that the existing permit will accommodate this project.

- b. Describe specific project objectives, tasks, and deliverables and related timelines for each. Objectives and tasks should clearly relate to the project description.

(20 pts.)

The 3 objectives of the project are to:

1. Restore the distribution of Tape Grass (*Vallisneria americana*) and *Ruppia* grass in the Tidal Caloosahatchee River by establishing seed-source colonies protected from herbivores (a primary factor limiting Tape Grass distribution in the tidal river).
2. Monitor the success of the seagrass restoration methods and create transferable restoration success monitoring procedures.
3. Enhance public understanding and stewardship of seagrass within the CHNEP estuaries.

Tasks, Deliverables and Timeline

**Task 1:** Develop the project design and location details and ensure permits validity.

Grantee and project partners will conduct pre-planting monitoring to establish baseline conditions and will mark the project sites.

Deliverable and Timeline: Project design, location maps, pre-planting monitoring sheets and photos. Month 1

**Task 2:** Recruit homeowners and monitoring volunteers.

The grantee and project partners will recruit volunteers, contact partners for potential volunteers, initiate volunteer recruitment, conduct volunteer recruitment events, develop, publish and distribute recruitment flyers, social media inserts; develop project contacts email list (constant contact list). Volunteers will be performing monitoring tasks, reviewing proposed SOPs for monitoring. Based on past experience, volunteers are retired professionals, including engineers, executives, teachers, scientists, professors, and infrequently college students.

Deliverable and Timeline: Recruitment materials describing project, participate in outreach events, 6 homeowners and 12 monitoring volunteers recruited. Months 1 through 4.

**Task 3:** Develop restoration monitoring standard procedures (SOPs) for seagrass and water quality.

The grantee and project partners will develop, review, test and finalize: Standard Operating Procedures as described in the scope of work.

Deliverable and Timeline: Copy of Standard Operating Procedures for seagrass and water quality monitoring. Months 1 through project end.

**Task 4:** Train project monitoring volunteers, test SOPs and revise as needed.

The grantee and project partners will conduct volunteer citizen scientist monitoring trainings during pre-planting monitoring, planting and deploying the cages and post planting through end of project. Volunteers

will be performing monitoring tasks, reviewing proposed SOPs for monitoring Based on past experience, volunteers are retired professionals, including engineers, executives, teachers, scientists, professors, and infrequently college students.

Deliverable and Timeline: Copy of training session agendas and materials, attendance sheets and summary. Months 2 through project end.

**Task 5:** Install plants and cages.

The grantee will acquire the exclusion cages and Tape grass and Ruppia shoots. With assistance from recruited citizen scientist and project partners, pre-planting monitoring will be completed, Transport to project sites as determined in Task 1, and plant the shoots, install the cages

Deliverable and Timeline: Photographs of planting and installation, attendance sheets and summary. Completed by Month 3

**Task 6:** Develop data entry and public data access page on the CHNEP Water Atlas.

Grantee will coordinate with its contractor to develop, test and utilize an online data entry page that enables volunteers to enter monitoring data and the public to view the data.

Deliverable and Timeline: Online data entry form. Completed by Month 9.

**Task 7:** Monitoring of seagrass success and water quality.

Grantee, partners and citizen scientists will conduct monitoring of seagrass growth, density and water quality parameters monthly.

Deliverable and Timeline: Copies of monitoring data sheets or online data entry. Months 3 through end of project.

**Task 8:** Outreach - Develop project brochure and newsletter articles describing seagrass restoration value.

Grantee and project partners will develop a 2-sided brochure for distribution at recruiting events, training and to the public at outreach events and presentations. The brochure will provide information about project goals and purpose and provide information about the importance of seagrass to the Caloosahatchee and illustrate the project location and provide steps the reader can do to help seagrasses flourish.

Deliverable and Timeline: Brochure and list of locations where it is distributed. Months 2 through 8.

**Task 9:** Present project results.

Grantee and project partners will present the project to a variety of audiences, including FGCU students, Riverwatch and other community groups and CHNEP Management Conference committees (Technical Advisory, Citizens Advisory, Management and Policy). In addition, quarterly reports will be submitted and a Final overall project report.

Deliverable and Timeline: Copy of any PowerPoint presentations, list of presentation venue and audience, number in audience and copies of reports. Months 2 through project end.

2. PROJECT NEED AND BENEFIT.

a. Explain the demonstrated need, which the project addresses. **(25 pts.)**

The Charlotte Harbor National Estuary Program (CHNEP) identified seagrass as an environmental indicator. In October 2014, the CHNEP Technical Advisory Committee confirmed the need for restoration tape grass in the Caloosahatchee River based on the comparison of current and historic mapping of seagrass beds. This project implements the CHNEP's Comprehensive Conservation and Management Plan,

specifically Priority Action FW-A: restore submerged and intertidal habitats, FW-D: Enhance fish and wildlife habitat along shorelines including riverine systems, SG-F: Provide events that involve people in the stewardship of their local natural resources and opportunities to connect them to their watershed, and SG-Q: Build capacity for communities and their local leadership to mitigate and adapt to the effects of climate change through joint efforts, and .

One of the major restrictions on the restoration of seagrass in the Caloosahatchee is the lack of seed source. In other estuaries, for example the Chesapeake Bay, volunteers harvest sea grass seeds and cultivate seagrass on land for transplant. For a number of reasons, the Caloosahatchee River no longer has a naturally occurring seed source (one likely cause is herbivory of the seagrass before it is sufficiently mature to produce seeds).

The USACE and South Florida Water Management District currently manage Lake Okeechobee and the Caloosahatchee River for competing objectives such as flood control, water supply (potable and agricultural), navigation (the Lake Okeechobee Waterway), and ecological restoration (the Comprehensive Everglades Restoration Plan). This results in occasional releases of fresh water to the tidal Caloosahatchee River from Lake Okeechobee that are not compatible with natural flow levels and salinity regimes. The submerged aquatic vegetation is negatively impacted by the sudden, large freshwater infusions, resulting in the loss of seagrass and creating conditions that make it difficult to re-establish seagrass from existing seed banks.

The restoration of seagrass in the tidal Caloosahatchee River is not being addressed through other funding resources. The tidal Caloosahatchee is a watershed within the Charlotte Harbor estuary which flows into the eastern Gulf of Mexico.

The Florida Department of Environmental Protection (FDEP) identified the Caloosahatchee Estuary to be impaired by nutrients (chlorophyll-a [chl<sub>a</sub>]). In August 2009, FDEP adopted the Caloosahatchee Estuary TMDL for total nitrogen (TN), which has been linked to high chl<sub>a</sub> concentrations in the Caloosahatchee River and Estuary downstream of the Franklin Lock and Dam (S-79). The TMDL accounts for the total load at the estuary, inclusive of loads from the upstream freshwater portions of the Caloosahatchee River as well as Lake Okeechobee, and requires a 23% reduction in this total TN load.

b. Explain how the proposed project meets the purpose of at least one CPI priority area. **(10 pts.)**

This project meets the purpose of the Coastal Resource Stewardship CPI priority area.

Citizen Seagrass Gardening is a targeted community-based project that encompasses resource monitoring, education about coastal resources and habitat, training of volunteers in citizen scientist techniques and increase citizen stewardship of coastal resources. The project will recruit existing and new volunteers. Based on past experience, a number of these new volunteers will become active in the CHNEP Management Conference. The project enhances the connection of current volunteers to the coastal resources and reinforces citizen commitment to sustainable stewardship of coastal ecosystems. Finally, the CHNEP experience is that volunteer citizen scientist projects increase outreach to resource users that are not reached through traditional efforts.

The project activities will directly involved residents and students in the restoration of a valuable coastal resource – seagrass. Project participants will have direct, hands-on opportunities to monitor seagrass growth and density and water quality. Collected data will be entered into the WaterAtlas for access by the public. Based on the CHNEP’s experience with the Volunteer Oyster Habitat Monitoring project, the participants will develop into ambassadors for seagrass restoration and stewards of the resource.

- c. Discuss the extent to which the project will improve the management and protection of coastal resources. **(25 pts.)**

The Restoration of seagrass in the Tidal Caloosahatchee River and tributaries project will restore submerged aquatic vegetation (tape grass) habitat, which is a component of living shorelines for the benefit of species (manatee, turtles, fish and invertebrates), intertidal communities and shoreline resilience to wave action and sea level rise. This project will improve the resiliency of the Gulf coastal watershed (in particular the southeast Gulf Coast) by implementing the CHNEP's Comprehensive Conservation and Management Plan strategy to fill the gap of tidal seagrass restoration needs in the Charlotte Harbor estuary. Restoration of seagrasses in the tidal Caloosahatchee will provide additional foraging for manatees and reduce the migration of manatees back and forth through highly travel boating channels.

The project is located within the CHNEP Study Area and implements the following CHNEP CCMP Priority Actions:

FW-A: Restore submerged and intertidal habitats (seagrass, oyster and unvegetated bottoms) from the effects of anthropogenic stresses.

FW-C: Restore freshwater and estuarine wetland areas.

FW-D: Enhance fish and wildlife habitat along shorelines including riverine systems,.

FW-E: Restore and protect a balance of native plant and animal communities

FW-P: Support public involvement programs in habitat and wildlife issues

SG-B: Provide people with opportunities to be involved in research, monitoring and restoration activities.

SG-F: Provide events that involve people in the stewardship of their local natural resources and opportunities to connect them to their watershed

SG-K: Present scientific information in a form readily understood by the majority of people.

SG-Q: Build capacity for communities and their local leadership to mitigate and adapt to the effects of climate change through joint efforts.

The Citizen Seagrass Gardening project supports Riverwatch's goals to:

1. To strive to improve the River from its source to its mouth, including its impacts on riparian and estuarine systems, wildlife habitat, and marine life
2. To promote public education concerning the historical significance, present condition, and future of the River and its watershed.
3. To increase public awareness of the importance of the River to our quality of life.
4. To monitor and work to improve the River's water quality, quantity, and flow characteristics.

- d. Discuss how project is feasible and can be completed within one year. **(10 Pts.)**

CHNEP has gained directly relevant experience recruiting, training and retaining volunteers through its Volunteer Oyster Habitat Monitoring project within the one-year timeframe. Riverwatch is volunteer-based organization and has extensive experience mobilizing volunteers.

The necessary permit for the project is already held by one of the project supporters. Prior projects confirm that planting and deployment of the cages is feasible within one year with associated water quality and seagrass monitoring.

At the end of the project period, project partners will discuss with FDEP staff, given the project data and results, the feasibility of maintaining the cages in their original locations or recruiting new homeowners to relocate the cages and plant with seagrass stock grown through the project.

IFAS has established that “both volunteers and researchers can potentially benefit from citizen science programs. Volunteers can increase their knowledge and understanding of the scientific process, gain deeper understanding of natural phenomena and issues of local importance, strengthen their attitudes toward their natural environment, and participate in making science-based recommendations. Citizen science programs can also provide scientists with an opportunity to increase public awareness concerning their areas of study across local or global scales and can make it possible to answer research questions that require observations spread over time or space or that otherwise would not have sufficient resources to address.”

The Charlotte Harbor region has a history of successful long-term volunteer citizen scientist program. For example, CHAP's Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network (CHEVWQMN) has been operating for over 20 years and provides data used by both the State of Florida and the US EPA while also providing researchers an invaluable, broad temporal perspective.

Southwest Florida, as a retirement region, is fortunate to have (based on previous experience) numerous citizens that are eager to engage in scientific studies, have workplace experience with technical data and are willing to provide long term commitments to monitoring programs.