Charlotte County RESTORE Act Funding Application

General Project Information			
Applicant Name	Florida Sea Grant Charlotte County		
Was the proposed activity included in any claim for compensation paid out by the Oil Spill Liability Trust Fund after July 6, 2012? If "Yes," the project is not eligible for funding		Yes ☐	No ☑
Person to be contacted regarding application	Name: Capt. Betty Staugler		
	Title: Florida Sea Grant Agent		
	E-mail: staugler@ufl.edu		
	Phone: 941.764.4346		
Proposal Title	Restoring bay scallops in Charlotte Harbor		

Project Executive Summary: Provide a concise project summary or abstract in the space below (250 words max)

Florida Sea Grant/Charlotte County Extension Service has dedicated considerable effort to developing an active bay scallop program in Charlotte Harbor since 2008. This valuable program enhances quality of life for Charlotte County residents through participation in natural resource protection and restoration. The bay scallop program represents a collaborative effort led by Charlotte County Extension and involves private citizens, local businesses, and state agencies. The bay scallop program has also increased awareness of Charlotte County's dedication to natural resource conservation through positive press including in nationally distributed magazines.

Active efforts to restore bay scallop populations have been part of the Charlotte County program since 2012. Large-scale restoration efforts initiated in the 1990s contributed to the reopening of a recreational scallop harvest in the Crystal River area in 2002. This reopening provided an estimated economic impact of over $1.6 million to Citrus County in 2003 (Stevens et al, UF/IFAS EDIS #FE493) and the fishery has remained open since. In addition, Pine Island Sound bay scallop restoration contributed to a population rebound in the mid-2000s. The proposed project would significantly increase the scale of restoration efforts in Charlotte Harbor. For each of two annual spawning cycles, controlled releases of bay scallop larvae and juveniles will double numbers from previous annual releases. In addition, University of Florida researchers will quantitatively assess contributions of stocked bay scallops to Charlotte Harbor populations. Charlotte County RESTORE Act funding for bay scallop restoration will provide critical support for a successful existing program working towards natural resource restoration goals.

Project Location			
	Street:		
	City: State:		
	Zip Code:		
	If no street address is available, please provide longitude/latitude	26deg47min North	82deg15min West

Project Eligibility

Select the one primary RESTORE Act eligible activity of the project in the first column and any others that apply in the second column by placing an X in the row corresponding to the qualifying eligible activity. Project must fulfill one eligible activity at a minimum to be eligibile for funding.

RESTORE Act Eligible Activity

Primary activity	All others that apply	Eligible Activity
☑	☐	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
☐	☑	Promotion of tourism in the Gulf Coast Region including recreational fishing
☐	☐	Promotion of the consumption of seafood harvested from the Gulf Coast Region

Project Eligibility

Select the one primary Charlotte County goal met by the project in the first column and any others that apply in the second column by placing an X in the row corresponding to the appropriate County goal. Project must meet a minimum of one County goal to be eligible for funding.

Charlotte County Goals

Primary Goal Met	All others that apply	Charlotte County Goal
☐	☑	Water Resource Protection: protects or restores water quality and quantity
☐	☐	Efficient and Effective Government: facilitates organization's capacity to govern and manage effectively
☑	☐	Quality of life: enhances community life through the conservation of wildlife, protection or restoration of natural resource and providing community amenties
☐	☐	Fiscal/ Financial Planning: increases effectiveness of local government and maintains strong financial condition
☐	☐	Growth Management: manages growth and change consistent with County's comprehensive plan
☐	☐	Public Safety: maintains a safe and healthy community
☐	☑	Economic Development: create a business climate that promotes a diversified, growing economy consistent with growth management plans and enhanced quality of life.
☐	☐	Human Services: pursue available funding sources to facilitate providing services to meet community needs.
☐	☐	Infrastructure: stabilize and maintain County-wide infrastructure.

Project Cost

Project Cost	Value	Percent of project cost
Total Cost	$ 200274	100 %
RESTORE Request	$ 110121	55 %
Secured Match (include documentation)	$ 1,500	1 %
In-kind match value	$ 78,653	39 %
Funding Gap	$ 0	%
Anticipated Cash Match	$ 10,000	5 %

Project Timeline

Estimated Project Start Date	upon release of funds
Estimated Project Completion Date	2 years after start

Range of Project Benefit		
Select the range of benefit project is anticipated to have	Select One	Range of Benefit
	☐	Local
	☐	County-wide
	☑	Regional
	☐	Gulf-wide

Provide brief description of project scale in the space below (100 words max)
The proposed project would immediately benefit bay scallop populations in Charlotte Harbor. Because of spawning and recruitment dynamics, it is possible that scallops produced in this project would contribute to future generations with the potential to increase scallop abundance on a region-wide scale.

Does project provide added benefit when combined with	Yes/No	List projects in box below
Other **proposed** projects or programs?	Yes	Locally - Charlotte County Bay Scallop Program; Regionally - Sarasota Bay Watch and Mote Marine Laboratory Bay Scallop Programs in Sarasota Bay, and Sanibel Captiva Conservation Foundation Bay Scallop Program in Pine Island Sound
Other **completed** projects or programs?	Yes	

Project Feasibility	
	Yes/No
Does the project require federal, state, or local permits?	Yes

If yes, list permits required below

Permits required	Permit Type (federal, state, local)	Status (obtained, not obtained)
FWC_SAL	state	obtained
		annually

Existing Planning	Yes/No
Is the project part of an existing federally approved comprehensive conservation management plan?	yes
Is the project part of a County or state plan?	

If yes, list plan below
Charlotte Harbor National Estuary - CCMP

Budget Justification

Activity/Item	Cost	Requested RESTORE Funds	Cash Match	In Kind Match
Project Design				
Co-PI salary	$ 11,001.02			$ 11,001.02
Genetic validation	$ 10,000.00			$ 10,000.00
Indirect	$ 8,934.40	$ 6,184.14		$ 2,750.26
Subtotal	$ 29,935.42	$ 6,184.14	$ 0.00	$ 23,751.28
Project Permitting				
FWC-SAL	$ 50.00			$ 50.00
Subtotal	$ 50.00	$ 0.00	$ 0.00	$ 50.00
Project Activity				
Spawn & Restoration	$ 112,568.28	$ 82,568.28		$ 30,000.00
Subtotal	$ 112,568.28	$ 82,568.28	$ 0.00	$ 30,000.00
Monitoring				
Recruitment & Search	$ 57,720.28	$ 21,368.28	$ 1,500.00	$ 34,852.00
Subtotal	$ 57,720.28	$ 21,368.28	$ 1,500.00	$ 34,852.00
TOTAL	$ 200,273.98	$ 110,120.70	$ 1,500.00	$ 88,653.28

Costs are in 2015 dollars and do not account for inflation

Restoring bay scallops in Charlotte Harbor

Project Narrative:

1. SCOPE OF WORK

Project need and compatibility:

- The Florida bay scallop is a bivalve mollusk that grows and lives in seagrass beds in relatively shallow water, 2-6 feet deep. At one time scallops ranged abundantly from Palm Beach to Pensacola. Today, healthy populations can only be found in selected locations along Florida's West Coast - principally St. Joseph Bay, and the area between the St. Mark's and Weeki Wachee rivers. Bay scallops are an important species to both humans and the environment. When coastal waters are able to support bay scallops it is a sign of reasonably good water quality conditions.

  Bay scallops were once abundant in Southwest Florida waters and supported a mainly commercial fishery. By the mid-1960's bay scallop populations in Southwest Florida had collapsed (Geiger, 2015, Arnold et al. 2005). Written records of recreational scalloping are sparse to non-existent, though the tradition must have been strong; concern for dwindling state-wide resources prompted the Florida Fish and Wildlife Conservation Commission (FWC) to develop a scallop monitoring program in the early 1990's (Geiger 2015). From the mid-1990s, when monitoring began in Pine Island Sound, until the early 2000s bay scallops were virtually non-existent. In the 1st 11-years of monitoring, the population was always classified as collapsed (< 0.01 scallops per m2) and there was never a single stable patch detected (>0.1 scallops per m2) (Geiger 2015). Scientists are not sure what caused the disappearance but degraded water quality, overharvesting, and loss of seagrass habitat are suspected. In 1994 scallop harvesting was prohibited throughout much of the state, including Southwest Florida. In the last decade improvements to water quality and seagrass acreage combined with a reduction in harvest pressure have led to limited natural recruitment of bay scallops in Southwest Florida estuaries. The first big rebound in bay scallop populations in Pine Island Sound occurred in 2005, two years after a restoration project took place in the same location. The success of this restoration has led scientists and citizens to hope one day bay scallops may return to sustainable levels. As a result increased monitoring efforts and a few small scale projects aimed at restoring bay scallop populations have been initiated throughout Southwest Florida.

  Currently all bay scallop monitoring and restoration efforts in Charlotte County waters have been conducted by the County's University of Florida/IFAS Sea Grant Extension program. This proposed project will build upon and enhance those efforts by allowing for intense restoration in areas that through previous monitoring and limited restoration have proven suitable for bay scallop populations to occur. Proposed activities will provide direct benefits to bay scallops in the estuary, and it will also enhance quality of life in the community. Charlotte County citizens will be involved in a science-based conservation effort and awareness of local natural resource restoration will be enhanced.

A summary of current bay scallop efforts in Charlotte County follows. It should be noted that these same types of monitoring and restoration efforts are occurring in Sarasota Bay to the north and Pine Island Sound to the south. Larger regional bay scallop restoration efforts have a history of preforming better over time because interconnected populations tend to be less vulnerable to episodic events such as red tide or heavy rainfall (Staugler 2009).

Bay Scallop Spat Recruitment Monitoring (Ongoing since 2008) – Key to monitoring the status and trends of recruiting bay scallops is ongoing recruitment (or spat) monitoring. Larval bay scallops are pelagic for 10-14 days after which time they settle to the bottom where they attach to seagrass blades (Geiger et al. 2010). Recruitment monitoring (Methods) measures the number of larvae settling out of the water column at select locations (Arnold et al. 1998). Spat recruitment monitoring is conducted from St. Andrew's Bay to Pine Island Sound using standardized methods. In Charlotte County recruitment is monitored monthly at five stations. Recruitment collectors are constructed from citrus bags stiffened with a sheet of Vexar (3.2 mm mesh) attached to a half cinder block that serves as an anchor. The citrus bag is held vertically in the water column by a small float and provides substrate for spat to settle on. A crab-trap buoy tied to the collector serves as a visual surface float.

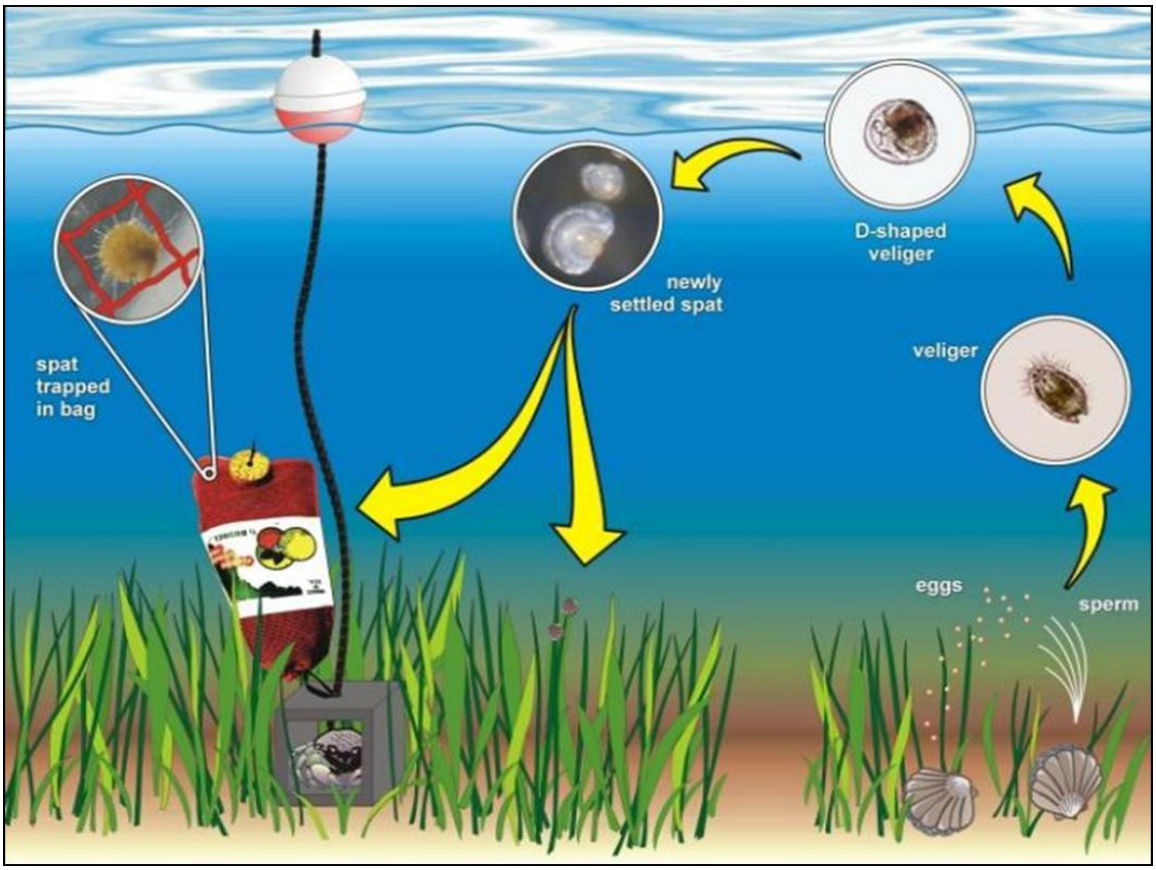

Figure 1. Image credit: Florida Fish and Wildlife Conservation Commission. Schematic of bay scallop spawning and recruitment collector design. Recruitment collectors will be deployed to collect data at targeted restoration sites in the proposed project as well as throughout Charlotte Harbor.

Volunteer Under Dock Cage Restoration (2010, 2011, 2012 & 2014) – Trained volunteers who live and have docks on Lemon Bay (in Charlotte County), Gasparilla Sound and Coral Creek hang wire cages containing bay scallops from their docks where the scallops grow and then spawn. The goals of this project are to increase the recruiting bay scallop population in local waters, and identify suitable areas for additional restoration by determining survival and growth rates of caged animals at different sites over time. Seven to ten volunteers participate annually. Volunteers receive scallops when they are about 10 mm in size. Bi-weekly, they pull the cages and clean the scallops and cages of fouling organisms. Monthly they record survival and shell height information (Methods).

Figure 2. Charlotte County residents collecting data for the Volunteer Under Dock Cage Restoration program. The proposed project will engage volunteers to produce a greater number of juvenile scallops for release into Charlotte Harbor.

Great Bay Scallop Search (Annual since 2009) – The Great Bay Scallop Search is a resource-monitoring program where volunteers snorkel, looking for scallops in select areas within Gasparilla Sound and lower Lemon Bay. The purpose of this program is to monitor and document the geographic distribution and trends over time of bay scallops in our local waters. Annually up to 40 boats and 150 snorkelers are recruited. Trained volunteers monitor bay wide

conditions using standardized transect monitoring procedures that allow for year to year comparisons. These methods represent a slightly modified version of those completed by the FWC on statewide basis.

Figure 3. In addition to contributing to an important monitoring effort, Great Bay Scallop Search volunteers are educated about the biology of Charlotte Harbor and the importance of conservation.

Larval and Juvenile Releases (2013 & early 2014) – Approximately 12 million commercial hatchery spawned bay scallop larvae have been released at five locations in Charlotte County (two in Lemon Bay and three in Gasparilla Sound) and approximately 30,000 hatchery spawned juvenile bay scallops that were locally raised to various sizes (~2 mm – 30 mm) were released into local waters at 15 sites.

Monitoring of the larval releases mentioned above was done via recruitment collectors deployed at four locations surrounding each release site. A six month post release targeted dive survey was conducted at all larvae and juvenile release sites. Early results were positive with recruitment found at three of five larval release sites and the post release dive survey found 12% greater bay scallop abundance at the restoration sites than background conditions. Background conditions were considered to be the results of the Great Bay Scallop Search which was designed as a random sampling effort and not to target restoration sites.

RESTORE Funding Scope of Work – We propose to capitalize on our existing efforts and volunteer network to conduct two years of higher intensity larval and juvenile bay scallop

restoration. We will contract for up to eight hatchery spawns with the State's authorized commercial hatchery Bay Shellfish Co. and conduct restoration using three approaches.

Approach (1): The majority of all hatchery spawned animals will be released as larvae 10 days post spawn. At 10 days, larvae are ready to settle out of the water column (Greenwalt-Boswell, et al. 2007; Lu and Blake 1997). The free floating larval stage is a time of high natural mortality, so by culturing animals through this stage we increase their chance of survival to settlement in targeted locations. Ideally, these locations foster patches of increased density which would allow those animals that survive to sexual maturity to spawn with greater success and thereby contribute to future generations (Leverone et al. 2010). Larvae released into construction booms in a 2003 Pine Island Sound restoration resulted in a considerable increase in bay wide bay scallop abundance two years later (Leverone et al. 2010). Preliminary results of larvae free released into Charlotte County waters in 2013 were also favorable and follow up monitoring is planned (Staugler unpublished).

Approach (2): A subset of each spawn will be raised by the hatchery to a size of .5-1mm, after which time they will be transported to trained volunteers who will raise them in various size mesh bags inside wire cages from their docks. Volunteers will clean scallop bags at least twice weekly and sort scallops into larger mesh bags every two weeks. Once the scallops reach sizes of 10 mm to 30 mm they will be released into the estuary at targeted sites. This is a slightly modified version of the juvenile releases that took place in Charlotte County in 2013 and in Sarasota Bay by Mote Marine Laboratory also during 2013. The proposed project will increase cost effectiveness by capitalizing on our network of volunteers to grow scallops at their docks rather than relying on commercial hatchery rearing or establishing a local grow out nursery, both of which are considerably more expensive undertakings.

Approach (3): At a single restoration site bay scallops from Approach 2 will be planted in cages anchored in the seagrass and maintained and monitored over time. This method was employed for three consecutive years in the late 1990s in large-scale using thousands of caged animals to form spawning aggregations in Crystal River/Homosassa, Anclote Estuary, and Tampa Bay (Wilbur et al. 2005). Although resource-intensive, this restoration strategy successfully increased larval supply to the larger population (Geiger 2015, Arnold et al. 2005). Because this method is very labor intensive and not nearly as cost effective as the other methods we propose only the one site.

GPS location of all restoration activities will be captured for follow-up monitoring. Our restoration efforts will be focused at a few discrete locations with multiple releases occurring over the course of the project in order to establish dense patches of spawning stock. Bay scallops possess both male and female sexual organs. Eggs and sperm are released sequentially to avoid self-fertilization and once released may be viable for only minutes to hours. Because of this bay scallop spawning success is dependent upon the density of the spawning stock (Arnold et al. 2005).

Larval release site monitoring will be carried out via recruitment collectors deployed at four locations surrounding each release site. A six month post release targeted dive survey will be conducted at all larvae and juvenile restoration sites (Approaches 1 and 2) and compared to background conditions (Great Bay Scallop Search) to quantify changes in scallop abundance. Bay scallops are an annual crop (Geiger et al. 2010) whose larval stages disperse based on currents. Due to these life history characteristics, post-six months restoration monitoring will focus on estuary wide abundance. To accomplish this we will supplement the volunteer search data with additional dive surveys to get an enhanced picture of bay scallop status in the estuaries.

Concurrent with this project we also hope to secure funding to conduct perennial DNA sequencing. This addition to our project would allow us to determine conclusively if our restoration animals are contributing to the wild stock population.

Project eligibility

- This project meets three RESTORE act criteria: restore resources, education, and promote tourism. Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region is the primary activity this project addresses. This project seeks to directly increase the number of bay scallops in Charlotte Harbor and Southwest Florida estuaries. By educating and involving citizen scientists, this project also indirectly addresses the protection aspect of this criterion. According to the Environmental Protection Agency, volunteer monitors build community awareness of pollution problems, help identify and restore problem sites, become advocates for their estuary and provide data to scientists. This project also addresses promotion of tourism in the Gulf Coast Region including recreational fishing, workforce development and job creation. Large-scale restoration efforts initiated in the 1990s contributed to the reopening of a recreational scallop harvest in the Crystal River area in 2002. This reopening provided an estimated economic impact of over $1.6 million to Citrus County in 2003 and a total of 35 jobs were estimated to have been created by the additional revenues from scallopers visiting Citrus County (Stevens et al, UF/IFAS EDIS #FE493).

Project benefits

- Project success will be directly measured by aquatic natural resources specialists and citizens of Charlotte County as well as some out-of-county visitors. Results will be quantified in terms of observed increases in scallop recruitment following larval release, and abundance of adult scallops found at restoration sites six months post-release. Beyond expected increases in scallops counted at restoration sites during the project, we hope to observe longer-term increases in overall levels of bay scallops in Charlotte Harbor as established by the annual Great Bay Scallop Search. Such increases would be attributable on some scale to higher-intensity restoration efforts funded through the proposed project. Bay scallops disperse via advection during a two-week larval phase. Thus, by aiming to increase numbers of reproductive adult bay

scallops in Charlotte Harbor over two consecutive years, this project has the potential to bolster scallop populations in a broader area of Southwest Florida. The direct scale of this project is limited to Charlotte Harbor; however combined effects with bay scallop restoration and monitoring work previously described in neighboring estuaries increases chances for improved outcomes region-wide. Positive impacts to natural resources will be disseminated to Charlotte County citizens in an understandable and scientifically sound manner. In addition to educating the general public about an important restoration effort for Charlotte County, this project will build upon years of citizen science and volunteerism. Taking part in activities such as the Great Bay Scallop Search and Under Dock Cage Restoration – both of which will be important to this project – increase the number of citizens who take pride in ownership and feel a sense of responsibility for the health of Charlotte County's natural environment. These sentiments diffuse into other aspects of a person's actions and words which are difficult to quantify but undoubtedly make a real and positive impact on Charlotte County.

2. PROJECT FEASIBILITY

Personnel

- Key project personnel include Betty Staugler M.S., Florida Sea Grant Agent with UF/IFAS Extension, Charlotte County and Josh Patterson Ph.D., Assistant Professor and Restoration Aquaculture Specialist with UF/IFAS Fisheries and Aquatic Sciences. As Sea Grant Agent, Ms. Staugler has developed and overseen all previous and ongoing bay scallop activities in Charlotte County. Dr. Patterson's experience in aquaculture and past work with estuarine species will ensure the technical rigor of project activities and dissemination of results within the broader scientific community.

Project Timeline

Start Date	Completion Date	Milestone
Upon Receipt of Award	Within 2 months	Purchase and assemble field gear; coordinate spawning with hatchery
First September following award	Through the following March	Restoration of bay scallops 1st year
At first larval release	August – Great Bay Scallop Search	Collection of restoration data 1st year
Second September following award	Through the following March	Restoration of bay scallops 2nd year

At first larval release	August – Great Bay Scallop Search	Collection of restoration data 2nd year
Upon Receipt of Award	Throughout project	Dissemination of information
	Two years after start	Final Report

Progress to date

- This project is well poised as a result of our having seven years of monitoring data to build upon. Key personnel have thoroughly scrutinized and discussed all aspects of the proposed project. In order to release bay scallop animals into local waters, a Special Activity License (SAL) must be obtained from the Florida Fish and Wildlife Conservation Commission (FWC). The SAL must be renewed annually. The applicant has maintained an active SAL since 2011 (Current SAL–14-1390-SCR) and will continue to update as needed and renew annually. This project is consistent with the Charlotte Harbor National Estuary CCMP, specifically FW-F Restore and protect a balance of native plant and animal communities, and FW-P Support public involvement programs in habitat and wildlife issues. This project also aligns with Charlotte Board of County Commissioners Strategic Plan 2015/16 – 2016/17, specifically Water Resources: Ensure quality of natural water resources and provide a safe and reliable water supply, long range goal: Strengthen public appreciation of the local natural environment and its importance to our local economy, and Quality of Life: Enhance community life by clean air and water, conservation of wildlife and natural resources, and provide community amenities, long range goal: Increase access to and awareness of local natural resources.

Cost-effectiveness

- This project is cost effective because it relies heavily on the talents of trained volunteers. Proposed restoration strategies are informed by Best Available Science pertaining to past bay scallop restoration efforts on the Florida Gulf Coast. The mix of restoration techniques chosen for this project is designed to maximize cost-effectiveness in previously tested strategies while further developing a novel technique with the potential to be highly efficient for future restoration efforts. Further detail is included in Section 3 below.

Project sustainability

- If this project is successful at re-establishing bay scallop populations no additional restoration would be needed upon completion. The monitoring efforts already in place (monthly recruitment and annual volunteer search) will continue and be sufficient to evaluate bay scallop populations into the future.

Compliance with local, state, and federal regulations

- The activity proposed is regulated by the FWC through the Special Activity License (SAL). The SAL specifies authorized personnel, approved release methods and locations, notification of field activities protocol, and follow-up reporting requirements.

Achievable permitting

- As stated above, this project is regulated by FWC through the Special Activity License (SAL). The applicant currently holds approved SAL–14-1390-SCR, however all SALs must be renewed annually.

3. BEST AVAILABLE SCIENCE

Status of the resource

- Data on Florida's bay scallop populations are made publicly available by FWC's Fish and Wildlife Research Institute (FWRI) in the form of annual reports. Most recently, the 2013 annual report was released on 31 March 2014 and can be accessed at the following URL: http://myfwc.com/media/2144988/2013_annual_report_ada.pdf
  Adult bay scallop abundance was surveyed by counting scallops within a 2 meter width along a 300 meter transect line. During May through July 2013, twenty transect lines were sampled at each of ten study sites from St. Andrew Bay to Pine Island Sound, with the exception of Sarasota Bay which had ten sample transects. Charlotte Harbor was not included as a study site, however data from the Great Bay Scallop Search are made publicly available by Charlotte County University of Florida/IFAS Sea Grant Extension. In areas open to recreational scallop harvest, the same transect lines were sampled again in September and October 2013 following fishery closure. In addition to adult abundance, juvenile scallop recruitment was monitored using "spat collectors" similar to those previously described and proposed for this study. Juvenile recruitment was monitored at eight study sites from St. Andrew Bay to Pine Island Sound.

  Summer 2013 sampling returned the lowest overall mean abundance of bay scallops in Florida since 2006. Overall the stock status was classified as Vulnerable with only the Homosassa study site having a Stable bay scallop population. Bay scallop populations in study sites from Tampa Bay southward were all classified as Collapsed, with very low numbers of animals present. Results of the Great Bay Scallop Search in Charlotte Harbor corroborate these findings. Annual juvenile recruitment rate for Florida bay scallops in 2013 was the lowest measured since 2005. Recruitment declined from 2012 levels in all eight study sites with Collapsed adult populations cited as a major factor.

Proposed Methodology

- *We propose three strategies: larval release, volunteer cages, staff-managed cages*. Proposed approaches 1 and 3 have both been utilized with success in the past. As previously mentioned,

two bay scallop restoration success stories in Florida are supported by Best Available Science. Tracking released settlement competent bay scallop larvae through their life cycle has generated evidence that this restoration technique can contribute to significant increases in the subsequent year-class (Arnold 2008). Larval releases similar in scale and methodology to those proposed for this project were attributed to measured levels of population recovery in both Pine Island Sound and Boca Ciega Bay (Leverone et al 2010). Aggregating adult scallops in cages anchored within seagrass beds as proposed in approach 3 increases the potential for fertilization of released gametes. Large-scale restoration efforts conducted by the state of Florida in 1998, 1999, and 2000 employed this methodology to deploy thousands of restoration stock scallops in caged spawning aggregations in Crystal River/Homosassa, Anclote Estuary, and Tampa Bay (Wilbur et al. 2005). Although resource-intensive, this restoration strategy successfully increased larval supply to the larger population (Arnold et al. 2005). Partially as a result of active restoration programs, the recreational bay scallop fishery was reopened between the Suwannee and Weeki Wachee Rivers in 2002, bringing an estimated economic impact of over $1.6 million to Citrus County in 2003 (Stevens et al. UF/IFAS EDIS # FE493). Scallop populations in this zone still support recreational harvest at present (~ 2.1 million in 2014 dollars, even without considering the rapid growth in the scalloping industry there (Geiger 2015)). Approach 2 is a restoration strategy which could serve as a less resource intensive surrogate for anchored cages. In addition to demonstrated dedication to the project, volunteers currently participating in the scallop cage program in Charlotte Harbor have been selected for a location subject to good water quality with suitable seagrass habitat in close proximity. Logistics of dock-suspended cage culture provide a method for aggregating adult scallops while reducing costly and time consuming permitting, maintenance, and monitoring requirements.

Long Term Uncertainties

- Long term uncertainties for bay scallop restoration center on the fact that success is dependent upon suitable environmental conditions for scallop larvae to settle, mature, and spawn. Because bay scallop restoration efforts and especially releases of competent larvae are punctuated events, short-term environmental perturbations such as red tides and freshwater inflows can negatively affect restoration. Due to the widespread Collapsed status of bay scallop populations and low observed recruitment in southwest Florida, restoration efforts designed to increase numbers of settlement competent larvae over suitable seagrass habitat offer improved chances for population recovery despite uncertainties related to environmental conditions.

Literature Cited

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Stevens, T, C Adams, A Hodges, and D Mulkey. Economic impact on the re-opened scalloping area for Citrus County, Florida – 2003. UF/IFAS EDIS # FE493.

Wilbur, AE, S Seyoum, TM Bert, and WS Arnold. 2005. A genetic assessment of bay scallop *Argopecten irradians* restoration efforts in Florida's Gulf of Mexico coastal waters (USA), Conservation Genetics 6, 111-122.

4. SUPPORTING TECHNICAL INFORMATION – N/A

Budget Match Expanded

Secure Match – See documentation from Martin Main **$1,500.00**

In-kind Match –

Volunteers - Calculation of economic value of trained volunteers' contribution to extension programs: According to 2013 Florida data from the Independent Sector (http://independentsector.org/volunteer_time.html) the estimated dollar value of a volunteer hour is $21.24. In Extension, trained volunteers are contributing to Extension program by dedicating their time, skills, talents and expertise under supervision or guidance by faculty.

Scallop Search Volunteers	150 volunteers x	1 event	$3,186.00
Scallop Cage Volunteers	10 volunteers x	5hr/mo/vol	12,744.00
Scallop Restoration Vols.	50 volunteers x	8hrs	8,496.00
Volunteer Boat use	40 boat x	$200/day	8,000.00
Total Volunteer In-Kind Annually			***$32,426.00***
Total Volunteer In-Kind over Project (2 years)			***$64,852.00***

UF Faculty – See Letter from UF, Co-PI Patterson two year salary match (+27.8% fringe) - $8608 (+$2393.02) – For extension effort related to working with volunteers on the project.

Total UF Faculty In-Kind Annually	***$5,500.51***
Total UF Faculty In-Kind over Project (2 years)	***$11,001.02***

UF Indirect - UF F&A (off campus MTDC) 25% ***$2,750.26***

Permit – FWC-SAL $25.00 annually ***$50.00***

Total In-Kind Over Project **$78,653.28**

Anticipated Cash Match - $10,000 over two years Florida Sea Grant - Program Development Grant to conduct DNA parental analysis for validation of restoration success. **$10,000.00**

Total Match **$90,153.28**

From: Main,Martin B
Sent: Thursday, April 16, 2015 4:27 PM
To: Staugler,Elizabeth A
Cc: Main,Martin B
Subject: RE: Letter of Secure Match Documentation

Betty,

I am going to provide the $1,500 requested for purchasing supplies for the "Great Bay Scallop Search". Jaime Arnold will assist with the purchase order.

Good luck with the survey.

Best,
Marty

UF IFAS Extension UNIVERSITY of FLORIDA Sea Grant Florida

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April 17, 2015

Dr. Betty Staugler
Extension Agent
25550 Harbor View Road, Unit 3
Port Charlotte, FL 33980

Dear Dr. Staugler

On behalf of the University of Florida, we are presenting for your review a proposal submission:

UF Principal Investigation:	Dr. Joshua Patterson
Department:	Forest Resources & Conservation
Proposal Title:	Restoring Bay Scallops in Charlotte Harbor
Support Requested: **Support Matched:**	$30,920.00 $44,672
Period of Support:	10/01/2015 – 09/30/2017

This proposal has been reviewed by the University of Florida and is authorized for submission.

Best Regards,

Adrienne J. Fagan
Research Coordinator IV
Authorized Organizational Representative
Division of Sponsored Programs

Budget narrative (UF items only) –

Figures in orange on the spreadsheet are those that would be coming to or from UF.

OPS salary (+3.9% fringe) - $21,840.00 (+$851.76) – To pay a part time OPS worker $14/hour to work 15 hours/week for the two year duration of the project.

Co-PI Patterson two year salary match (+27.8% fringe) - $8608 (+$2393.02) – For extension effort related to working with volunteers on the project.

UF boat - $1440.00 – A total of 16 motor hours at $90/hour over the two year project to operate a 24' University of Florida Carolina Skiff in Charlotte Harbor performing activities related to bay scallop restoration and monitoring.

Vehicle mileage - $604.80 – A total of 1080 miles at $0.54/mile over the two year project for six round trips from Apollo Beach to Port Charlotte with boat in tow.

Indirect cost - $8934.40 – Charged to University of Florida budget items at the 25% off campus MTDC rate for federal flow-through funds.

TOTAL UF REQUEST - $30,920

TOTAL UF PROJECT - $44,672

Budget Detailed					
Categories	Year 1	Year 2	Match year 1	Match Year 2	TOTAL PROJECT
Salaries and Wages					
OPS Salary	$10,920.00	$10,920.00			$21,840.00
OPS Fringe (3.9%)	$425.88	$425.88			$851.76
Co-PI Patterson			$4,304.00	$4,304.00	$8,608.00
Co-PI Patterson fringe (27.8%)			$1,196.51	$1,196.51	$2,393.02
Volunteers			$32,426.00	$32,426.00	$64,852.00
TOTAL SALARIES & WAGES	$11,345.88	$11,345.88	$37,926.51	$37,926.51	$98,544.78
Travel					
UF boat (8 hours @ $90/hr)	$720.00	$720.00			$1,440.00
Vehicle mileage (540 mi @ $0.56/mi)	$302.40	$302.40			$604.80
Materials and Supplies					
Cage culture and monitoring supplies	$9,000.00	$2,200.00			$11,200.00
Monitoring supplies			$750.00	$750.00	$1,500.00
Permits					
FWC - SAL			$25.00	$25.00	$50.00
Contracts					
Scallop spawns (4 @ $8500/spawn)	$34,000.00	$34,000.00			$68,000.00
Pending Funding					
Genetic validation of scallop parentage			$5,000.00	$5,000.00	$10,000.00
TOTAL OTHER COSTS	$44,022.40	$37,222.40	$5,775.00	$5,775.00	$92,794.80
TOTAL DIRECT COSTS	**$55,368.28**	**$48,568.28**	**$43,701.51**	**$43,701.51**	$191,339.58
UF F&A (off campus MTDC) **25%**					
TOTAL INDIRECT COSTS	$3,092.07	$3,092.07	$1,375.13	$1,375.13	$8,934.40
TOTAL COSTS	**$58,460.35**	**$51,660.35**	**$45,076.64**	**$45,076.64**	**$200,273.98**

Kelly Shoemaker

Staff Liaison
Charlotte County
Deputy County Administrator

Florida Fish and Wildlife Conservation Commission

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Richard A. Corbett
Chairman
Tampa

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Fish and Wildlife Research Institute
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(727) 896-8626
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Managing fish and wildlife resources for their long-term well-being and the benefit of people.

Fish and Wildlife Research Institute
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St. Petersburg, Florida 33701-5020
Voice: (727) 896-8626
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Hearing/speech-impaired:
(800) 955-8771 (T)
(800) 955-8770 (V)
MyFWC.com/Research

Dear Ms. Shoemaker,

I am sending this letter as a means of support or the proposal "**Restoring bay scallops in Charlotte Harbor"** being put forth by Betty Staugler and Josh Patterson.

FWRI has been monitoring bay scallop in SW Florida since 1992, and has worked with a host of local organizations since 2003 to stabilize and enhance the depleted scallop population in this region. This population represents the fringe of the functional population of the species in the state, the status of the population in its historic range through Florida Bay, the Keys, and SE FL coast probably bordering on extirpation, if that has not already happened. We feel through some combination of natural and man-made causes that the population was severely depleted, jeopardizing more stable populations to the north of Tampa Bay. Bay scallops are species whose population will natural fluctuate and are stabilized in the long run through multiple, smaller subpopulations.

We have worked with Betty for many years as one of the critical partners in the effort to restore the connectivity between Big Bend/Springs Coast sub-populations and SW FL subpopulations. The decline took decades and will likely require an extended and consistent effort to restore. Fortunately, the regional average has increased from collapsed to vulnerable. We anticipate several more years will be required to return the area to a stable classification, wherein it will hopefully maintain itself without further assistance – but merely careful management.

Betty's efforts have been instrumental in raising awareness of the issue amongst her constituents, and have probably already contributed to the modest gains we have observed, but increased and steady funding will allow a greater chance for success at the true goal of restoring this indicator species to a semblance of its former distribution and abundance, and also importantly, help to stabilize the statewide population against future declines.

Thank you for considering this request.

Steve

Stephen P. Geiger, PhD
Research Scientist - Molluscan Fisheries
Marine Fisheries Research
Fish & Wildlife Research Institute
FL Fish and Wildlife Conservation Commission
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