



**II. FISCAL IMPACT ANALYSIS**

**A. Five Year Summary of Fiscal Impact:**

Fiscal Years	2020	2021	2022	2023	2024
Capital Expenditures	_____	_____	_____	_____	_____
Operating Costs	<u>\$18,000</u>	_____	_____	_____	_____
External Revenues	<u>(\$18,000)</u>	_____	_____	_____	_____
Program Income (County)	_____	_____	_____	_____	_____
In-Kind Match (County)	_____	_____	_____	_____	_____
<b>NET FISCAL IMPACT</b>	<u>\$0</u>	_____	_____	_____	_____
# ADDITIONAL FTE POSITIONS (Cumulative)	_____	_____	_____	_____	_____

Is Item Included in Current Budget?      Yes \_\_\_\_\_      No X

Does this item include the use of federal funds?      Yes \_\_\_\_\_      No X

**Budget Account No.:**

Fund 1232 Department 380 Unit 3057 Object 3401 Program Lwlp/Monitoring Project

**B. Recommended Sources of Funds/Summary of Fiscal Impact:**

Manatee Protection Fund  
\$18,000 from FWC Purchase Order

**C. Department Fiscal Review:**

*S. Melny*

**III. REVIEW COMMENTS**

**A. OFMB Fiscal and /or Contract Dev. and Control Comments:**

*[Signature]* 10/30/19      *[Signature]* for *[Signature]*  
OFMB      Contract Development & Control  
10/28      10/30      11/1/19 TW

**B. Legal Sufficiency:**

*[Signature]* 11/4/19  
Assistant County Attorney

**C. Other Department Review:**

\_\_\_\_\_  
Department Director

ATTACHMENT 1

**AMENDMENT NO. 1 TO CONTRACT FOR  
CONSULTING/PROFESSIONAL SERVICES**

This is Amendment No.1 dated \_\_\_\_\_ to the Contract (R2019-0325) dated March 12, 2019, by and between Palm Beach County, a Political Subdivision of the State of Florida, by and through its Board of Commissioners, hereinafter referred to as the COUNTY, and Florida Fish & Wildlife Conservation Commission, Fish & Wildlife Research Institute, a State Agency authorized to do business in the State of Florida, hereinafter referred to as the CONSULTANT.

WITNESSETH

WHEREAS, the parties hereto desire to amend the Contract to extend it for an additional two (2) month period from December 30, 2020 to February 28, 2021, and increase the contract amount from \$72,000 to \$90,000.

NOW, THEREFORE, in consideration of the promises and of the mutual covenants hereinafter set forth and for such other good and valuable consideration, the receipt of which the parties hereto expressly acknowledge, the parties covenant and agree to the following terms and conditions:

1. Exhibit A to the Contract is hereby deleted in its entirety and replaced with Exhibit A, which is attached hereto and incorporated by reference.

2. Exhibit B to the Contract is hereby deleted in its entirety and replaced with Exhibit B, which is attached hereto and incorporated by reference.

3. ARTICLE 2 – SCHEDULE is hereby amended as follows:

The CONSULTANT shall commence services upon execution of this Contract and complete all services by December 30, 2020 February 28, 2021.

4. ARTICLE 3 - PAYMENTS TO CONSULTANT is hereby amended as follows:

A. The total amount to be paid by the COUNTY under this Contract for all services described in the Scope of Work Exhibit A shall not exceed a total contract amount of seventy two thousand dollars and 00/100 Dollars ~~(\$72,000.00)~~ ninety thousand dollars and 00/100 Dollars (\$90,000). The CONSULTANT will bill the COUNTY on a deliverable basis, at the amounts set forth in Exhibit B for services rendered toward the

IN WITNESS WHEREOF, the Board of County Commissioners of Palm Beach County, Florida has made and executed this Amendment on behalf of the COUNTY and CONSULTANT has hereunto set its hand the day and year above written.

**ATTEST:**  
**SHARON R. BOCK**  
**CLERK AND COMPTROLLER**

**PALM BEACH COUNTY**  
**BOARD OF COUNTY COMMISSIONERS:**

By: \_\_\_\_\_  
Deputy Clerk

By: \_\_\_\_\_  
Mayor

**WITNESS:**  
\_\_\_\_\_  
Signature

**CONSULTANT:**  
\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Name (type or print)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Typed Name

\_\_\_\_\_  
Title

**APPROVED AS TO FORM**  
**AND LEGAL SUFFICIENCY**

By \_\_\_\_\_  
Assistant County Attorney

**APPROVED AS TO TERMS**  
**AND CONDITIONS**

By Deborah Drum  
Deborah Drum, Director  
Department of Environmental Resources Management



## ATTACHMENT 2

### EXHIBIT A

#### SCOPE OF WORK Oyster Monitoring in Lake Worth Lagoon

##### 1.0 BACKGROUND

The eastern oyster, *Crassostrea virginica* (Gmelin, 1791), is abundant throughout much of the Atlantic and Gulf of Mexico coasts of the U.S. (Carriker and Gaffney 1996). This commercially valuable species prefers shallow, moderate salinity waters, and attaches to both hard and soft substrata (Shumway 1996). It has been the subject of farming and aquaculture since the 1800's and, more recently, the focus of restoration (Coen et al. 1999). Because of its wide distribution, historical context, and essential habitat value, the Eastern Oyster has been selected as a target species for monitoring (Parker et al. 2013). Changes in health and abundance will be monitored within the Lake Worth Lagoon (LWL).

From 2005 through 2014, the Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute (FWC-FWRI) was funded by the South Florida Water Management District (SFWMD) to conduct long-term monitoring of eastern oysters in three south Florida estuaries including three natural reef stations in LWL. When funding from the SFWMD ended in 2014, Palm Beach County funded an 18-month project to continue monitoring oysters at the three long-term natural reef stations, as well as three additional man-made reef stations in LWL: one near John's Island, one near Grassy Flats, and the other near Snook Island (Figure 1).

This is a 15-month contract that includes funding for 12 months of field sampling between the Palm Beach County and selected consultant (FWC-FWRI) for the collection, analysis and summary of oyster data from six sites within the LWL. No special activities license (SAL) is needed for oyster collections since work will be conducted by FWC-FWRI staff. Analysis of data generated from samples collected under this scope of work (SOW) will be used to guide management decisions affecting oyster restoration projects.

##### 2.0 OBJECTIVES

In order to fulfill the objectives required by this SOW, the Consultant shall:

- a) Assemble and manage staff ensuring capacity to complete all tasks in this SOW
- b) Provide all transportation required to access all monitoring stations in this SOW;
- c) Provide sampling equipment and supplies required to complete monitoring;
- d) Perform field collection and;
- e) Deliver verified data on the specified due dates.

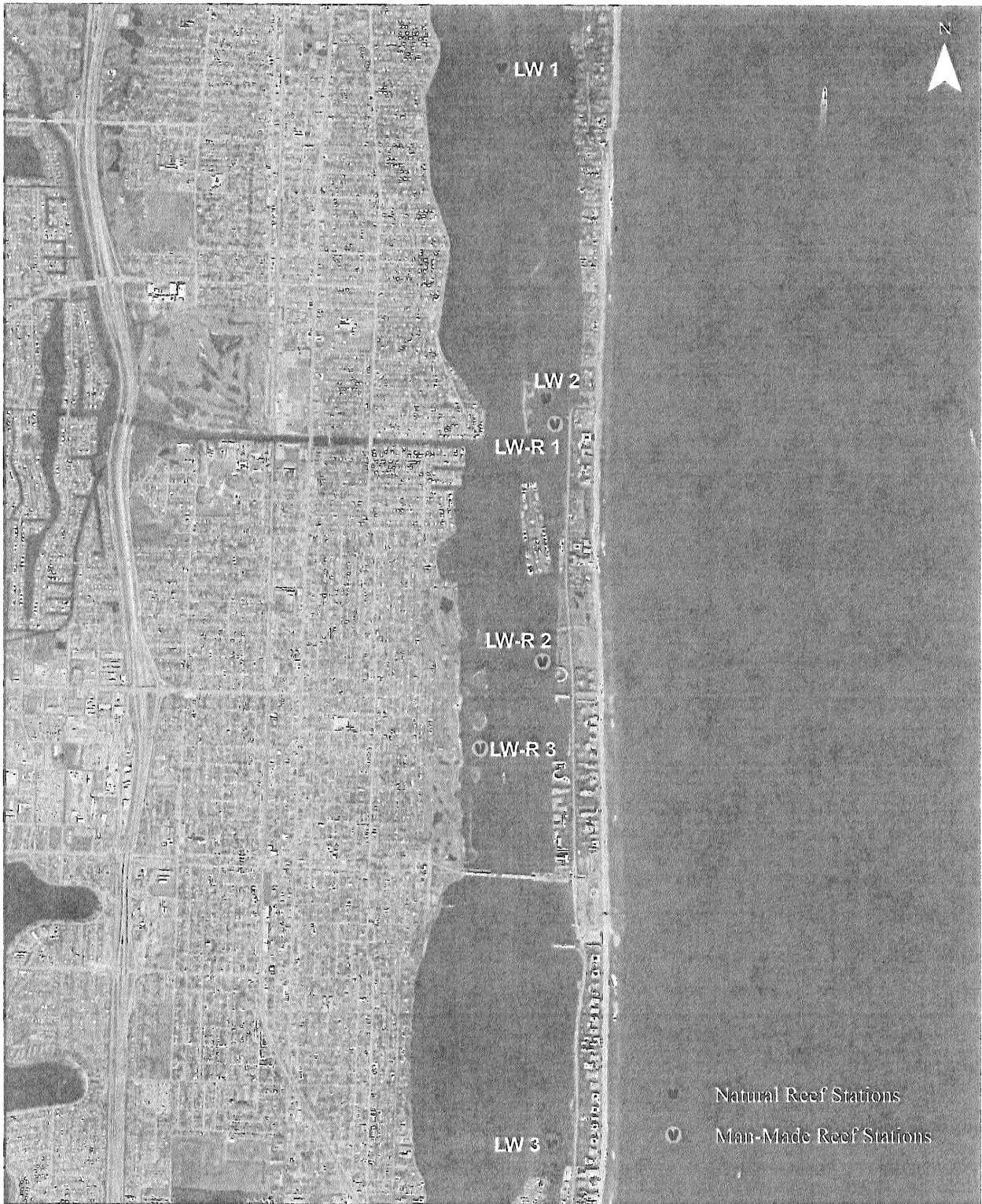


Figure 1. Natural reef (red) and man-made (green) oyster monitoring stations in Lake Worth Lagoon.

### 3.0 POINT OF CONTACT

All communication associated with this work order shall be through Palm Beach County Environmental Resources Management Department (ERM) Contract Manager, Mayra Ashton, telephone: (561) 233-2451, Email: [MAshton@pbcgov.org](mailto:MAshton@pbcgov.org). In the event Mrs. Ashton is unavailable, Jennifer Baez (561-233-2424) will act as an alternate contact. Communication with FWC-FWRI shall be through Melanie Parker, Research Scientist, telephone: (727- 502-4919, email: [melanie.parker@myfwc.com](mailto:melanie.parker@myfwc.com).

All communication between ERM and the Consultant shall be done through the contract manager unless directed otherwise by the contract manager for project specific issues. The role of the contract manager is to ensure that communication between ERM and the Consultant is frequent, consistent, and documented. This includes gathering and disseminating documentation and deliverables, schedule review, and invoice review and approval.

### 4.0 SCOPE OF WORK

This SOW is for the collection, analysis and summary of oyster data from six sites within the LWL. All tasks associated with this SOW shall be conducted by the Consultant in accordance with established techniques outlined within this SOW.

The primary goal of this study is to determine settled oyster density, reproductive development, prevalence and intensity of the *Perkinsus marinus* parasite, and recruitment of established oysters at six locations in the LWL. Oyster vitality will also be related to incidence of the oyster disease *Perkinsus marinus* (dermo).

### 5.0 WORK BREAKDOWN STRUCTURE

#### *Task 1: Settled Oyster Abundance*

Density sampling will be conducted every six months, weather permitting, during the months of March and September, for a total of four sampling events. Oyster density sampling will follow methods described in Parker et al. (2013). On each sampled station, fifteen replicate 1/4-m<sup>2</sup> quadrats will be haphazardly deployed and all oysters within each quadrat will be collected for determination of the number of live and dead oysters with articulated shells. A maximum of 10 live oyster shell heights (SH = maximum linear distance from the umbo to the ventral shell margin) will also be measured from each quadrat.

#### *Task 2: Reproductive and Disease Monitoring*

Oysters will be collected for analysis of gonadal development state, and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) on a monthly basis whenever present. Each month, a sample of five oysters from the six stations (total N = five oysters \* six reefs = 30 per month) will be transported, live and chilled, to the FWRI laboratory for processing. If there are no live oysters available at a station, no oysters will be collected from that station. Each individual oyster will be processed for reproductive stage and disease status according to the

methods described below.

For *Perkinsus marinus* (dermo) disease analyses, prevalence and intensity will be diagnosed with Ray's fluid thioglycollate media (RFTM) method (Ray 1966). Small (1 cm<sup>2</sup>) pieces of gill and mantle tissue will be incubated in RFTM media with antibiotics and an antifungal for seven days in the dark at 25°C. Tissue pieces will then be placed onto glass microscope slides, macerated with razor blades, stained with Lugol's, and examined at 400x for the presence of hyphospores. Parasite density (infection intensity) will be ranked using the Mackin scale, which ranges from 0 to 5 (Table 1; Mackin 1962).

For reproductive analyses, the remaining tissues from the dermo analyses will be preserved in a modified Davidson's fixative solution (Shaw and Battle 1957), the main difference being no glycerin will be included. Following 20 hours of fixation, the oyster tissues will be thoroughly rinsed in tap water and preserved in 70% ethanol for subsequent histological preparation. Histological preparation will consist of dehydrating each oyster in 95% ethanol for a minimum of three hours, then embedding the tissue in paraffin. Depending upon the size of the individual oyster, a minimum of one to a maximum of six 3.5- $\mu$ m sections will be cut from each embedded sample using a microtome mounted with a glass knife, maintaining a minimum separation of 60  $\mu$ m (the approximate maximum diameter of an oocyte) between sections. The sections will be stained with hematoxylin and eosin, and then mounted onto pre-labeled glass slides for analysis. Resultant slides will be examined at  $\times$ 200-400 magnification with a compound microscope and each sample will be assigned one of four reproductive stages (Table 2) according to a classification scheme modified from the work of Fisher et al. (1996).

### ***Task 3: Spat Recruitment***

Juvenile oyster recruitment will be monitored at all six stations. Three replicate spat monitoring arrays will be deployed and retrieved at each station on a monthly schedule. Spat monitoring arrays will be constructed and processed following methods described in Parker et al. (2013). Each array will consist of 12 axenic adult oyster shells (5 -10 cm SH) strung onto two separate lengths of galvanized wire (6 shells per wire). The shells will be oriented with their inner surface facing downward when suspended off the bottom. After a month-long deployment, the shell strings will be recovered and spat recruitment estimated by discarding the top and bottom shells of each string and counting the number of settled spat on the underside of the remaining strung shells. Monthly water quality sampling will be conducted in conjunction with field sampling at all stations. Recorded parameters will include water depth, temperature, salinity, clarity, pH, and dissolved oxygen concentration. Water depth will be determined with a sounding line and clarity with a standard Secchi disk. We will follow DEP SOP requirements for initial and continuing calibration verification for salinity and pH.

**Table 1.** Mackin scale showing stages of *Perkinsus marinus* (dermo) infection intensity (Mackin 1962).

Stage	Category	Cell Number	Notes
0	Uninfected	No cells detected	
0.5	Very light	<10 cells in entire preparation	
1	Light	11-100 cells in entire preparation	Cells scattered or in localized clusters of 10-15 cells
2	Light-moderate		Cells distributed in local concentrations of 24-50 cells; or uniformly distributed so that 2-3 cells occur in each field at 100X
3	Moderate	3 cells in all fields at 100X	Masses of 50 cells may occur
4	Moderate heavy	Cells present in high numbers in all tissues	Less than half of tissue appears blue-black macroscopically
5	Heavy	Cells in enormous numbers	Most tissue appears blue-black macroscopically

**Table 2.** Qualitative reproductive staging criteria for oysters collected from Florida waters (modified from Fisher et al. 1996).

Value	Stage	Observations
1	Developing	Gametogenesis has begun immature gametes located on follicle walls mature gametes may be present
2	Ripe/Spawning	Follicles distended and full of ripe gametes ova compact/sperm with visible tails no immature gametes on follicle walls active spawning, but less than 2/3 depleted
3	Spent/Recycling	Most gametes evacuated from the follicles more than 2/3 depleted
4	Indifferent	Gonads devoid of gametes, cytolysis ongoing

## 6.0 DELIVERABLES

### *Task 1: Settled Oyster Abundance*

Descriptive statistics, figures and summaries of semi-annual oyster density and shell height will be generated for each applicable quarterly report. For the final report, oyster density and shell height will be statistically compared between stations and between sampling events. Statistical analysis of previously collected oyster data shows that most measured parameters, especially count data from density and recruitment estimates (Parker et al. 2013), do not meet normality assumptions. For that reason, the generalized linear mixed modeling procedure in SAS

Enterprise Guide v5.1 (SAS Institute Inc., Cary, NC) will be employed for all statistical comparisons.

### ***Task 2: Reproductive and Disease Monitoring***

Reproductive development will be classified according to the previously described scheme, presented in figures and summarized for each quarterly report. Descriptive statistics, figures and summaries of dermo prevalence and intensity will also be generated for each quarterly report. For the final report, dermo prevalence and intensity will be statistically compared between stations and among months. The generalized linear mixed modeling procedure in SAS Enterprise Guide v5.1 (SAS Institute Inc., Cary, NC) will be employed for all statistical comparisons.

### ***Task 3: Spat Recruitment***

Descriptive statistics, figures and summaries of spat recruitment rates will be generated for each applicable quarterly report. For the final report, spat recruitment rates will be statistically compared between stations and among months. The generalized linear mixed modeling procedure in SAS Enterprise Guide v5.1 (SAS Institute Inc., Cary, NC) will be employed for all statistical comparisons.

**Due Dates:** Quarterly summary reports of Tasks 1, 2, and 3 are due 30 days after each quarter. Assuming a start date of April 1, 2019, reports will be due on July 30, 2019, October 30, 2019 and January 30, 2020, April 30, 2020 and July 30, 2020. A completed draft report is due no later than 90 days after the final sampling month or on September 30, 2020 and a final report is due 30 days after PBC ERM comments or December 30, 2020.

### **Reporting**

All data shall be maintained in Microsoft Excel spreadsheets and reports shall be submitted in Microsoft Word. The Consultant shall submit quarterly reports consisting of the following:

- A summary of work performed on each site, including the dates of site visits, and water quality physical parameters;
- Descriptive statistics, figures and summaries of semi-annual settled oyster density and shell height monitoring for each station during applicable quarters;
- Descriptive statistics, figures and summaries of monthly reproductive development and disease monitoring for each station;
- Descriptive statistics, figures and summaries of monthly spat recruitment monitoring for each station;

The final report shall be cumulative and shall summarize all data collected for the 15-month period of the study. It will include statistical comparisons (using the methods described above) of appropriate parameters between stations and among months and will also relate measured biological parameters to flow associated with freshwater discharges and the physical data, especially salinity, collected during the study. The man-made reef stations will also be statistically compared to the long-term natural reef stations. The final report shall include a

discussion of all analytical results, an assessment of limiting factors for reef success, and comparisons to results from relevant previously published studies (e.g., Parker et al. 2013, Scarpa and Laramore 2010).

### Budget and Cost Schedule

#### Budget for 20-month Contract (15 months of sampling)

Category	Cost
OPS Salary (15 months)	\$62,500
Materials & Supplies	\$12,500
Travel	\$3,857
<b>TOTAL DIRECT COST (TDC)</b>	<b>\$78,857</b>
<b>TOTAL INDIRECT COST (5% of TDC)</b>	<b>\$3,943</b>
Total Direct + Indirect Costs	\$82,800
<b>LEGISLATIVE FEE (8% of TGC)</b>	<b>\$7,200</b>
<b>TOTAL GRANT COST (TGC)</b>	<b>\$90,000</b>

Product	Date Due	Invoice Amount
1 <sup>st</sup> Quarterly Report	July 30, 2019	\$18,000
2 <sup>nd</sup> Quarterly Report	Oct 30, 2019	\$18,000
3 <sup>rd</sup> Quarterly Report	Jan 30, 2020	\$18,000
4 <sup>th</sup> Quarterly Report	April 30, 2020	\$18,000
5 <sup>th</sup> Quarterly Report	July 30, 2020	\$10,000
Draft Report	Sep 30, 2020	\$4,000
Final Report	Dec 30, 2020	<u>\$4,000</u>
	<b>Project Total</b>	<b>\$90,000</b>

## References

- Carriker, M. R. and P. M. Gaffney. 1996. A catalogue of selected species of living oysters (Ostreacea) of the world. In: V. S. Kennedy, R. I. E. Newell & A. F. Eble, editors. The eastern oyster, *Crassostrea virginica*. College Park, MD: Maryland Sea Grant College, pp. 467-513.
- Coen, L. D., M. W. Luckenbach, and D. L. Breitburg. 1999. The role of oyster reefs as essential fish habitat: a review of current knowledge and some new perspectives. In: L.R. Benaka (Ed). Fish habitat: essential fish habitat and rehabilitation. American Fisheries Society, Symposium 22, Bethesda, MD. pp. 438-454.
- Fisher, W. S., J. T. Winstead, L. M. Oliver, H. L. Edmiston, and G. O. Bailey. 1996. Physiologic variability of eastern oysters from Apalachicola Bay, Florida. *Journal of Shellfish Research* 15: 543-553.
- Mackin, J. G. 1962. Oyster diseases caused by *Dermocystidium marinum* and other microorganisms in Louisiana. *Publication of the Institute of Marine Sciences, University of Texas* 7: 132-229.
- Parker, M. L., W. S. Arnold, S. P. Geiger, P. Gorman, and E. H. Leone. 2013. Impacts of freshwater management activities on eastern oyster (*Crassostrea virginica*) density and recruitment: recovery and long-term stability in seven Florida estuaries. *Journal of Shellfish Research* 32: 695-708.
- Ray, S. M. 1966. A review of the culture method for detecting *Dermocystidium marinum*, with suggested modifications and precautions. *Proceedings of the National Shellfisheries Association* 54: 55-69.
- Scarpa, J. and S. E. Laramore. 2010. Survey of select eastern oyster (*Crassostrea virginica*) populations in Lake Worth Lagoon, Palm Beach County, Florida: 2010 Annual Report. Palm Beach County, Department of Environmental Resources Management. Project #2008-0404. Harbor Branch Oceanographic Institute at Florida Atlantic University, Aquaculture and Stock Enhancement Program. Fort Pierce, FL. 58 pp.
- Shaw, B. L. and H. I. Battle. 1957. The gross and microscopic anatomy of the digestive tract of the oyster *Crassostrea virginica* (Gmelin). *Canadian Journal of Zoology* 35: 325-347.
- Shumway, S. E. 1996. Natural environmental factors. In: V. S. Kennedy, R. I. E. Newell & A. F. Eble, editors. The eastern oyster, *Crassostrea virginica*. College Park, MD: Maryland Sea Grant College. pp. 467-513.



ATTACHMENT 3

EXHIBIT B

SCHEDULE OF PAYMENTS

The Scope of Work to be completed by CONSULTANT as defined in Exhibit "A" consists of specific completion phases which shall be clearly identified on a phase-by-phase basis upon submission to the COUNTY of certain "deliverables"\* as expressly indicated below. Compensation for the work tasks stated herein shall be in accordance with the following Schedule of Payments:

**Deliverable 1**

Task(s) to be Completed: July 30, 2019

*Task 1: Settled Oyster Abundance* – no work planned for this period

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 1: \$ 18,000  
Deliverable(s) Required: Quarterly Report 1

**Deliverable 2**

Task(s) to be Completed: October 30, 2019

*Task 1: Settled Oyster Abundance* – fall sampling of oyster density and shell height at six stations

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 2: \$ 18,000  
Deliverable(s) Required: Quarterly Report 2

**Deliverable 3**

Task(s) to be Completed: January 30, 2020

*Task 1: Settled Oyster Abundance* – no work planned for this period

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 1: \$ 18,000  
Deliverable(s) Required: Quarterly Report 3

**Deliverable 4**

Task(s) to be Completed: April 30, 2020

*Task 1: Settled Oyster Abundance* – spring sampling of oyster density and shell height at six stations

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 1: \$ 18,000

Deliverable(s) Required: Quarterly Report 4

**Deliverable 5**

Task(s) to be Completed: July 30, 2020

*Task 1: Settled Oyster Abundance* – no work planned for this period

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 1: \$ 10,000

Deliverable(s) Required: Quarterly Report 5

**Deliverable 6**

Task(s) to be Completed: September 30, 2020

The draft report is due no later than 90 days after final sampling month or September 30, 2020. The report shall be cumulative and shall summarize all data collected for the 15 month period of the study. It will include statistical comparisons (using the methods described above) of appropriate parameters between stations and among months and will also relate measured biological parameters to flow associated with freshwater discharges and the physical data, especially salinity, collected during the study. The man-made reef stations will also be statistically compared to the long-term natural reef stations. The draft report shall include a discussion of all analytical results, an assessment of limiting factors for reef success, and comparisons to results from relevant previously published studies.

Completion Time: 2 months Compensation for Phase 1: \$ 4,000

Deliverable(s) Required: Final Report

**Deliverable 7**

Task(s) to be Completed: December 30, 2020

The final report is due 30 days after PBC ERM comments to the draft report or by December 30, 2020. The final report shall be cumulative and shall summarize all data collected for the 15 month period of the study. It will include statistical comparisons (using the methods described above) of appropriate parameters between stations and among months and will also relate measured biological parameters to flow associated with freshwater discharges and the physical data, especially salinity, collected during the study. The man-made reef stations will also be statistically compared to the long-term natural reef stations. The final report shall include a discussion of all analytical results, an assessment of limiting factors for reef success, and comparisons to results from relevant previously published studies.

Completion Time: 3 months Compensation for Phase 1: \$ 4,000

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Deliverable(s) Required: Final Report

\* "Deliverables" shall be defined as progress reports, prepared maps, bid documents, completed drawings, specific reports, work plans, documentation of meetings attended, assessment study reports, analysis reports, summary reports, recommendation reports and related draft reports and verifiable deliverables.

*Current Contract*

R2019 0325

**CONTRACT FOR CONSULTING/PROFESSIONAL SERVICES**

This Contract is made as of the \_\_\_\_\_ day of MAR 12 2019, 20\_\_\_\_, by and between Palm Beach County, a Political Subdivision of the State of Florida, by and through its Board of Commissioners, hereinafter referred to as the COUNTY, and Florida Fish & Wildlife Conservation Commission, Fish & Wildlife Research Institute, a State Agency authorized to do business in the State of Florida, hereinafter referred to as the CONSULTANT, whose Federal I.D. is 59-3105845.

In consideration of the mutual promises contained herein, the COUNTY and the CONSULTANT agree as follows:

**ARTICLE 1 - SERVICES**

The CONSULTANT'S responsibility under this Contract is to provide professional/consultation services in the area of oyster monitoring, as more specifically set forth in the Scope of Work detailed in Exhibit "A".

The COUNTY'S representative/liaison during the performance of this Contract shall be Deborah Drum, Director, Environmental Resources Management, telephone no. (561) 233-2400.

The CONSULTANT'S representative/liaison during the performance of this Contract shall be Ashley Ross, Grant Administrator, telephone no. (727) 502-4783.

**ARTICLE 2 - SCHEDULE**

The CONSULTANT shall commence services upon execution of this Contract and complete all services by December 30, 2020.

Reports and other items shall be delivered or completed in accordance with the detailed schedule set forth in Exhibit "A".

**ARTICLE 3 - PAYMENTS TO CONSULTANT**

- A. The total amount to be paid by the COUNTY under this Contract for all services described in the Scope of Work Exhibit A shall not exceed a total contract amount of seventy two thousand dollars and 00/100 Dollars (\$72,000.00). The CONSULTANT will bill the COUNTY on a deliverable basis, at the amounts set forth in Exhibit "B" for services rendered toward the completion of the Scope of Work. Where incremental billings for partially completed items are permitted, the total billings shall not exceed the estimated percentage of completion as of the billing date.
- B. Invoices received from the CONSULTANT pursuant to this Contract will be reviewed and approved by the COUNTY's representative, to verify that services have been rendered in conformity with the Contract. Approved invoices will then be sent to the Finance Department for payment. Invoices will normally be paid within thirty (30) days following the COUNTY representative's approval.

- C. **Final Invoice:** In order for both parties herein to close their books and records, the CONSULTANT will clearly state "final invoice" on the CONSULTANT'S final/last billing to the COUNTY. This shall constitute CONSULTANT'S certification that all services have been properly performed and all charges and costs have been invoiced to Palm Beach County. Any other charges not properly included on this final invoice are waived by the CONSULTANT.

#### ARTICLE 4 - TRUTH-IN-NEGOTIATION CERTIFICATE

Signature of this Contract by the CONSULTANT shall also act as the execution of a truth-in-negotiation certificate certifying that the wage rates, over-head charges, and other costs used to determine the compensation provided for in this Contract are accurate, complete and current as of the date of the Contract and no higher than those charged the CONSULTANT'S most favored customer for the same or substantially similar service.

The said rates and costs shall be adjusted to exclude any significant sums should the COUNTY determine that the rates and costs were increased due to inaccurate, incomplete or noncurrent wage rates or due to inaccurate representations of fees paid to outside consultants. The COUNTY shall exercise its rights under this Article 4 within three (3) years following final payment.

#### ARTICLE 5 - TERMINATION

This Contract may be terminated by the CONSULTANT upon sixty (60) days' prior written notice to the COUNTY in the event of substantial failure by the COUNTY to perform in accordance with the terms of this Contract through no fault of the CONSULTANT. It may also be terminated, in whole or in part, by the COUNTY, with cause upon five (5) business days written notice to the CONSULTANT or without cause upon ten (10) business days written notice to the CONSULTANT. Unless the CONSULTANT is in breach of this Contract, the CONSULTANT shall be paid for services rendered to the COUNTY'S satisfaction through the date of termination. After receipt of a Termination Notice, except as otherwise directed by the COUNTY, in writing, the CONSULTANT shall:

- A. Stop work on the date and to the extent specified.
- B. Terminate and settle all orders and subcontracts relating to the performance of the terminated work.
- C. Transfer all work in process, completed work, and other materials related to the terminated work to the COUNTY.
- D. Continue and complete all parts of the work that have not been terminated.

#### ARTICLE 6 - PERSONNEL

The CONSULTANT represents that it has, or will secure at its own expense, all necessary

personnel required to perform the services under this Contract. Such personnel shall not be employees of or have any contractual relationship with the COUNTY.

All of the services required hereinunder shall be performed by the CONSULTANT or under its supervision, and all personnel engaged in performing the services shall be fully qualified and, if required, authorized or permitted under state and local law to perform such services.

Any changes or substitutions in the CONSULTANT'S key personnel, as may be listed in Exhibit "A", must be made known to the COUNTY'S representative and written approval must be granted by the COUNTY's representative before said change or substitution can become effective.

The CONSULTANT warrants that all services shall be performed by skilled and competent personnel to the highest professional standards in the field.

All of the CONSULTANT'S personnel (and all Subcontractors), while on County premises, will comply with all COUNTY requirements governing conduct, safety and security.

#### ARTICLE 7 - SUBCONTRACTING

The CONSULTANT agrees that it shall not subcontract any of the services to be provided under this Contract.

#### ARTICLE 8 - FEDERAL AND STATE TAX

The COUNTY is exempt from payment of Florida State Sales and Use Taxes. The COUNTY will sign an exemption certificate submitted by the CONSULTANT. The CONSULTANT shall not be exempted from paying sales tax to its suppliers for materials used to fulfill contractual obligations with the COUNTY, nor is the CONSULTANT authorized to use the COUNTY'S Tax Exemption Number in securing such materials.

The CONSULTANT shall be responsible for payment of its own and its share of its employees' payroll, payroll taxes, and benefits with respect to this contract.

#### ARTICLE 9 - AVAILABILITY OF FUNDS

The COUNTY'S performance and obligation to pay under this contract for subsequent fiscal years are contingent upon annual appropriations for its purpose by the Board of County Commissioners.

#### ARTICLE 10 - INSURANCE

Without waiving the right to sovereign immunity as provided by section 768.28, Florida Statutes, (Statute), CONSULTANT represents that it is self-insured subject to the limitations of the Statute, as may be amended.

CONSULTANT agrees to maintain or to be self-insured for Workers' Compensation insurance in accordance with Chapter 440, Florida Statutes.

Should CONSULTANT contract with a third-party (Contractor) to perform any service related to the AGREEMENT, CONSULTANT shall require the Contractor to provide the following minimum insurance:

- Commercial General Liability insurance with minimum limits of \$1,000,000 combined single limit for property damage and bodily injury per occurrence and \$2,000,000 per aggregate. Such policy shall be endorsed to include CONSULTANT and COUNTY as Additional Insureds. CONSULTANT shall also require that the Contractor include a Waiver of Subrogation against COUNTY
- Business Automobile Liability insurance with minimum limits of \$1,000,000 combined single limits for property damage and bodily injury per occurrence.
- Workers' Compensation insurance in compliance with Chapter 440, Florida Statutes, and which shall include coverage for Employer's Liability with minimum limits of \$1,000,000 each accident.
- Professional Liability insurance with minimum limits of \$1,000,000 per claim and in the aggregate.

When requested, CONSULTANT shall provide an affidavit or Certificate of Insurance evidencing insurance or self-insurance.

Compliance with the foregoing requirement shall not relieve the CONSULTANT of its liability and obligations under this Agreement.

#### ARTICLE 11 - INDEMNIFICATION

Each party shall be liable for its own actions and negligence. The foregoing indemnification shall not constitute a waiver of sovereign immunity beyond the limits set forth in Section 768.28, Florida Statutes, nor shall the same be construed to constitute agreement by either party to indemnify the other party for such other party's negligent, willful or intentional acts or omissions.

#### ARTICLE 12 - SUCCESSORS AND ASSIGNS

The COUNTY and the CONSULTANT each binds itself and its partners, successors, executors, administrators and assigns to the other party and to the partners, successors, executors, administrators and assigns of such other party, in respect to all covenants of this Contract. Except as above, neither the COUNTY nor the CONSULTANT shall assign, sublet, convey or transfer its interest in this Contract without the prior written consent of the other.

#### ARTICLE 13 - REMEDIES

This Contract shall be governed by the laws of the State of Florida. Any legal action necessary to enforce the Contract will be held in a court of competent jurisdiction located in Palm Beach

County, Florida. No remedy herein conferred upon any party is intended to be exclusive of any other remedy, and each and every such remedy shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity, by statute or otherwise. No single or partial exercise by any party of any right, power, or remedy hereunder shall preclude any other or further exercise thereof.

No provision of this Contract is intended to, or shall be construed to, create any third party beneficiary or to provide any rights to any person or entity not a party to this Contract, including but not limited to any citizen or employees of the COUNTY and/or CONSULTANT.

#### ARTICLE 14 - CONFLICT OF INTEREST

The CONSULTANT represents that it presently has no interest and shall acquire no interest, either direct or indirect, which would conflict in any manner with the performance of services required hereunder, as provided for in Chapter 112, Part III, Florida Statutes, and the Palm Beach County Code of Ethics. The CONSULTANT further represents that no person having any such conflict of interest shall be employed for said performance of services.

The CONSULTANT shall promptly notify the COUNTY's representative, in writing, by certified mail, of all potential conflicts of interest of any prospective business association, interest or other circumstance which may influence or appear to influence the CONSULTANT'S judgement or quality of services being provided hereunder. Such written notification shall identify the prospective business association, interest or circumstance, the nature of work that the CONSULTANT may undertake and request an opinion of the COUNTY as to whether the association, interest or circumstance would, in the opinion of the COUNTY, constitute a conflict of interest if entered into by the CONSULTANT. The COUNTY agrees to notify the CONSULTANT of its opinion by certified mail within thirty (30) days of receipt of notification by the CONSULTANT. If, in the opinion of the COUNTY, the prospective business association, interest or circumstance would not constitute a conflict of interest by the CONSULTANT, the COUNTY shall so state in the notification and the CONSULTANT shall, at its option, enter into said association, interest or circumstance and it shall be deemed not in conflict of interest with respect to services provided to the COUNTY by the CONSULTANT under the terms of this Contract.

#### ARTICLE 15 - EXCUSABLE DELAYS

The CONSULTANT shall not be considered in default by reason of any failure in performance if such failure arises out of causes reasonably beyond the control of the CONSULTANT or its subcontractors and without their fault or negligence. Such causes include, but are not limited to, acts of God, force majeure, natural or public health emergencies, labor disputes, freight embargoes, and abnormally severe and unusual weather conditions.

Upon the CONSULTANT'S request, the COUNTY shall consider the facts and extent of any failure to perform the work and, if the CONSULTANT'S failure to perform was without it or its subcontractors fault or negligence, the Contract Schedule and/or any other affected provision of this Contract shall be revised accordingly, subject to the COUNTY'S rights to change, terminate,



or stop any or all of the work at any time.

**ARTICLE 16 - ARREARS**

The CONSULTANT shall not pledge the COUNTY'S credit or make it a guarantor of payment or surety for any contract, debt, obligation, judgement, lien, or any form of indebtedness. The CONSULTANT further warrants and represents that it has no obligation or indebtedness that would impair its ability to fulfill the terms of this Contract.

**ARTICLE 17 - DISCLOSURE AND OWNERSHIP OF DOCUMENTS**

The CONSULTANT shall deliver to the COUNTY's representative for approval and acceptance, and before being eligible for final payment of any amounts due, all documents and materials prepared by and for the COUNTY under this Contract.

To the extent allowed by Chapter 119, Florida Statutes, all written and oral information not in the public domain or not previously known, and all information and data obtained, developed, or supplied by the COUNTY or at its expense will be kept confidential by the CONSULTANT and will not be disclosed to any other party, directly or indirectly, without the COUNTY'S prior written consent unless required by a lawful court order. All drawings, maps, sketches, programs, data base, reports and other data developed, or purchased, under this Contract for or at the COUNTY'S expense shall be and remain the COUNTY'S property and may be reproduced and reused at the discretion of the COUNTY.

All covenants, agreements, representations and warranties made herein, or otherwise made in writing by any party pursuant hereto, including but not limited to any representations made herein relating to disclosure or ownership of documents, shall survive the execution and delivery of this Contract and the consummation of the transactions contemplated hereby.

Notwithstanding any other provision in this Contract, all documents, records, reports and any other materials produced hereunder shall be subject to disclosure, inspection and audit, pursuant to the Palm Beach County Office of the Inspector General, Palm Beach County Code, Sections 2-421 - 2-440, as amended.

**ARTICLE 18 - INDEPENDENT CONTRACTOR RELATIONSHIP**

The CONSULTANT is, and shall be, in the performance of all work services and activities under this Contract, an Independent Contractor, and not an employee, agent, or servant of the COUNTY. All persons engaged in any of the work or services performed pursuant to this Contract shall at all times, and in all places, be subject to the CONSULTANT'S sole direction, supervision, and control. The CONSULTANT shall exercise control over the means and manner in which it and its employees perform the work, and in all respects the CONSULTANT'S relationship and the relationship of its employees to the COUNTY shall be that of an Independent Contractor and not as employees or agents of the COUNTY.

The CONSULTANT does not have the power or authority to bind the COUNTY in any promise, agreement or representation.

#### ARTICLE 19 - CONTINGENT FEES

The CONSULTANT warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the CONSULTANT to solicit or secure this Contract and that it has not paid or agreed to pay any person, company, corporation, individual, or firm, other than a bona fide employee working solely for the CONSULTANT, any fee, commission, percentage, gift, or any other consideration contingent upon or resulting from the award or making of this Contract.

#### ARTICLE 20 - ACCESS AND AUDITS

The CONSULTANT shall maintain adequate records to justify all charges, expenses, and costs incurred in estimating and performing the work for at least three (3) years after completion or termination of this Contract. The COUNTY shall have access to such books, records, and documents as required in this section for the purpose of inspection or audit during normal business hours, at the CONSULTANT'S place of business.

Palm Beach County has established the Office of the Inspector General in Palm Beach County Code, Section 2-421 - 2-440, as may be amended. The Inspector General's authority includes but is not limited to the power to review past, present and proposed County contracts, transactions, accounts and records, to require the production of records, and to audit, investigate, monitor, and inspect the activities of the CONSULTANT, its officers, agents, employees, and lobbyists in order to ensure compliance with contract requirements and detect corruption and fraud.

Failure to cooperate with the Inspector General or interfering with or impeding any investigation shall be in violation of Palm Beach County Code, Section 2-421 - 2-440, and punished pursuant to Section 125.69, Florida Statutes, in the same manner as a second degree misdemeanor.

#### ARTICLE 21 - NONDISCRIMINATION

The COUNTY is committed to assuring equal opportunity in the award of contracts and complies with all laws prohibiting discrimination. Pursuant to Palm Beach County Resolution R2017-1770, as may be amended, the CONSULTANT warrants and represents that throughout the term of the Contract, including any renewals thereof, if applicable, all of its employees are treated equally during employment without regard to race, color, religion, disability, sex, age, national origin, ancestry, marital status, familial status, sexual orientation, gender identity or expression, or genetic information. Failure to meet this requirement shall be considered default of the Contract.

#### ARTICLE 22 - AUTHORITY TO PRACTICE

The CONSULTANT hereby represents and warrants that it has and will continue to maintain all licenses and approvals required to conduct its business, and that it will at all times conduct its business activities in a reputable manner. Proof of such licenses and approvals shall be submitted

to the COUNTY's representative upon request.

**ARTICLE 23 - SEVERABILITY**

If any term or provision of this Contract, or the application thereof to any person or circumstances shall, to any extent, be held invalid or unenforceable, the remainder of this Contract, or the application of such terms or provision, to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected, and every other term and provision of this Contract shall be deemed valid and enforceable to the extent permitted by law.

**ARTICLE 24- PUBLIC ENTITY CRIMES**

As provided in F.S. 287.132-133, by entering into this contract or performing any work in furtherance hereof, the CONSULTANT certifies that it, its affiliates, suppliers, subcontractors and consultants who will perform hereunder, have not been placed on the convicted vendor list maintained by the State of Florida Department of Management Services within the 36 months immediately preceding the date hereof. This notice is required by F.S. 287.133(3)(a).

**ARTICLE 25 - MODIFICATIONS OF WORK**

The COUNTY reserves the right to make changes in Scope of Work, including alterations, reductions therein or additions thereto. Upon receipt by the CONSULTANT of the COUNTY'S notification of a contemplated change, the CONSULTANT shall, in writing: (1) provide a detailed estimate for the increase or decrease in cost due to the contemplated change, (2) notify the COUNTY of any estimated change in the completion date, and (3) advise the COUNTY if the contemplated change shall affect the CONSULTANT'S ability to meet the completion dates or schedules of this Contract.

If the COUNTY so instructs in writing, the CONSULTANT shall suspend work on that portion of the Scope of Work affected by a contemplated change, pending the COUNTY'S decision to proceed with the change.

If the COUNTY elects to make the change, the COUNTY shall initiate a Contract Amendment and the CONSULTANT shall not commence work on any such change until such written amendment is signed by the CONSULTANT and approved and executed on behalf of Palm Beach County.

**ARTICLE 26 - NOTICE**

All notices required in this Contract shall be sent by certified mail, return receipt requested, hand delivery or other delivery service requiring signed acceptance. If sent to the COUNTY, notices shall be addressed to:

Deborah Drum, Director  
Department of Environmental Resources Management  
2300 North Jog Road, 4<sup>th</sup> Floor

West Palm Beach, FL 33411-2743

With copy to:

Palm Beach County Attorney's Office  
301 North Olive Ave.  
West Palm Beach, Florida 33401

If sent to the CONSULTANT, notices shall be addressed to:

Ashley Ross, Grant Administrator  
Fish & Wildlife Research Institute  
100 8th Avenue S.E.  
St. Petersburg, Florida 33701

#### ARTICLE 27 - ENTIRETY OF CONTRACTUAL AGREEMENT

The COUNTY and the CONSULTANT agree that this Contract sets forth the entire agreement between the parties, and that there are no promises or understandings other than those stated herein. None of the provisions, terms and conditions contained in this Contract may be added to, modified, superseded or otherwise altered, except by written instrument executed by the parties hereto in accordance with Article 25- Modifications of Work.

#### ARTICLE 28 - CRIMINAL HISTORY RECORDS CHECK

The CONSULTANT, CONSULTANT'S employees, subcontractors of CONSULTANT and employees of subcontractors shall comply with Palm Beach County Code, Section 2-371 - 2-377, the Palm Beach County Criminal History Records Check Ordinance ("Ordinance"), for unescorted access to critical facilities ("Critical Facilities") or criminal justice information facilities ("CJI Facilities") as identified in Resolution R-2003-1274, as amended. The CONSULTANT is solely responsible for the financial, schedule, and/or staffing implications of this Ordinance. Further, the CONSULTANT acknowledges that its Contract price includes any and all direct or indirect costs associated with compliance with this Ordinance, except for the applicable FDLE/FBI fees that shall be paid by the COUNTY.

This Contract may include sites and/or buildings which have been designated as either "critical facilities" or "criminal justice information facilities" pursuant to the Ordinance and Resolution R2003-1274, as amended. COUNTY staff representing the COUNTY department will contact the CONSULTANT(S) and provide specific instructions for meeting the requirements of this Ordinance. Individuals passing the background check will be issued a badge. The CONSULTANT shall make every effort to collect the badges of its employees and its subcontractors' employees upon conclusion of the contract and return them to the COUNTY. If the CONSULTANT or its subcontractor(s) terminates an employee who has been issued a badge, the CONSULTANT must notify the COUNTY within two (2) hours. At the time of termination, the CONSULTANT shall retrieve the badge and shall return it to the COUNTY in a timely manner.

The COUNTY reserves the right to suspend the CONSULTANT if the CONSULTANT 1) does not comply with the requirements of County Code Section 2-371 - 2-377, as amended; 2) does not contact the COUNTY regarding a terminated CONSULTANT employee or subcontractor employee within the stated time; or 3) fails to make a good faith effort in attempting to comply with the badge retrieval policy.

#### ARTICLE 29 - REGULATIONS; LICENSING REQUIREMENTS

The CONSULTANT shall comply with all laws, ordinances and regulations applicable to the services contemplated herein, to include those applicable to conflict of interest and collusion. CONSULTANT is presumed to be familiar with all federal, state and local laws, ordinances, codes and regulations that may in any way affect the services offered.

#### ARTICLE 30 - SCRUTINIZED COMPANIES (when contract value is greater than \$1 million)

- A. As provided in F.S. 287.135, by entering into this Contract or performing any work in furtherance hereof, the CONSULTANT certifies that it, its affiliates, suppliers, subcontractors and consultants who will perform hereunder, have not been placed on the Scrutinized Companies that boycott Israel List, or is engaged in a boycott of Israel, pursuant to F.S. 215.4725.
- B. When contract value is greater than \$1 million: As provided in F.S. 287.135, by entering into this Contract or performing any work in furtherance hereof, the CONSULTANT certifies that it, its affiliates, suppliers, subcontractors and consultants who will perform hereunder, have not been placed on the Scrutinized Companies With Activities in Sudan List or Scrutinized Companies With Activities in The Iran Petroleum Energy Sector List created pursuant to F.S. 215.473 or is engaged in business operations in Cuba or Syria.

If the COUNTY determines, using credible information available to the public, that a false certification has been submitted by CONSULTANT, this Contract may be terminated and a civil penalty equal to the greater of \$2 million or twice the amount of this Contract shall be imposed, pursuant to F.S. 287.135. Said certification must also be submitted at the time of Contract renewal, if applicable.

#### ARTICLE 31 - PUBLIC RECORDS

Notwithstanding anything contained herein, as provided under Section 119.0701, F.S., if the CONSULTANT: (i) provides a service; and (ii) acts on behalf of the COUNTY as provided under Section 119.011(2) F.S., the CONSULTANT shall comply with the requirements of Section 119.0701, Florida Statutes, as it may be amended from time to time. The CONSULTANT is specifically required to:

- A. Keep and maintain public records required by the COUNTY to perform services as provided under this Contract.
- B. Upon request from the COUNTY's Custodian of Public Records, provide the COUNTY with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119 or as otherwise provided by law. The CONSULTANT further agrees that all fees, charges and expenses shall be determined in accordance with Palm Beach County PPM CW-F-002, Fees Associated with Public Records Requests, as it may be amended or replaced from time to time.
- C. Ensure that public records that are exempt, or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the Contract, if the Consultant does not transfer the records to the public agency.
- D. Upon completion of the Contract the CONSULTANT shall transfer, at no cost to the COUNTY, all public records in possession of the CONSULTANT unless notified by COUNTY's representative/liaison, on behalf of the COUNTY's Custodian of Public Records, to keep and maintain public records required by the COUNTY to perform the service. If the CONSULTANT transfers all public records to the COUNTY upon completion of the Contract, the CONSULTANT shall destroy any duplicate public records that are exempt, or confidential and exempt from public records disclosure requirements. If the CONSULTANT keeps and maintains public records upon completion of the Contract, the CONSULTANT shall meet all applicable requirements for retaining public records. All records stored electronically by the CONSULTANT must be provided to COUNTY, upon request of the COUNTY's Custodian of Public Records, in a format that is compatible with the information technology systems of COUNTY, at no cost to COUNTY.

Failure of the CONSULTANT to comply with the requirements of this article shall be a material breach of this Contract. COUNTY shall have the right to exercise any and all remedies available to it, including but not limited to, the right to terminate for cause. CONSULTANT acknowledges that it has familiarized itself with the requirements of Chapter 119, F.S., and other requirements of state law applicable to public records not specifically set forth herein.

**IF THE CONSULTANT HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, PLEASE CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT RECORDS REQUEST, PALM BEACH COUNTY PUBLIC AFFAIRS DEPARTMENT, 301 N. OLIVE AVENUE, WEST PALM BEACH, FL 33401, BY E-MAIL AT RECORDSREQUEST@PBCGOV.ORG OR BY TELEPHONE AT 561-355-6680.**

**Attachments:**

**Exhibit A: Scope of Work**

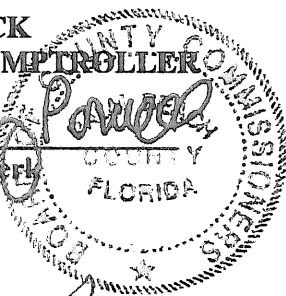
**Exhibit B: Schedule of Payments**

*Remainder of page intentionally left blank.*

IN WITNESS WHEREOF, the Board of County Commissioners of Palm Beach County, Florida has made and executed this Contract on behalf of the COUNTY and CONSULTANT has hereunto set its hand the day and year above written.

R2019 0325

ATTEST:  
SHARON R. BOCK  
CLERK AND COMPTROLLER  
By: *Sharon Bock*  
Deputy Clerk



PALM BEACH COUNTY MAR 12 2019  
BOARD OF COUNTY COMMISSIONERS:

By: *Mack Bernard*  
Mack Bernard, Mayor

WITNESS:  
*Ashley C Ross*  
Signature  
Ashley C Ross  
Name (type or print)

CONSULTANT:  
Fish & Wildlife Research Institute  
Company Name  
*[Signature]*  
Signature  
Gil McRae  
Typed Name  
1/7/19  
Title

APPROVED AS TO FORM  
AND LEGAL SUFFICIENCY  
By: *[Signature]*  
Assistant County Attorney

APPROVED AS TO TERMS  
AND CONDITIONS  
By: *Deborah Drum*  
Deborah Drum, Director  
Department of Environmental Resources Management



## EXHIBIT "A"

### SCOPE OF WORK Oyster Monitoring in Lake Worth Lagoon

#### 1.0 BACKGROUND

The eastern oyster, *Crassostrea virginica* (Gmelin, 1791), is abundant throughout much of the Atlantic and Gulf of Mexico coasts of the U.S. (Carriker and Gaffney 1996). This commercially valuable species prefers shallow, moderate salinity waters, and attaches to both hard and soft substrata (Shumway 1996). It has been the subject of farming and aquaculture since the 1800's and, more recently, the focus of restoration (Coen et al. 1999). Because of its wide distribution, historical context, and essential habitat value, the Eastern Oyster has been selected as a target species for monitoring (Parker et al. 2013). Changes in health and abundance will be monitored within the Lake Worth Lagoon (LWL).

From 2005 through 2014, the Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute (FWC-FWRI) was funded by the South Florida Water Management District (SFWMD) to conduct long-term monitoring of eastern oysters in three south Florida estuaries including three natural reef stations in LWL. When funding from the SFWMD ended in 2014, Palm Beach County funded an 18-month project to continue monitoring oysters at the three long-term natural reef stations, as well as three additional man-made reef stations in LWL: one near John's Island, one near Grassy Flats, and the other near Snook Island (Figure 1).

This is a 15-month contract that includes funding for 12 months of field sampling between Palm Beach County and selected consultant (FWC-FWRI) for the collection, analysis and summary of oyster data from six sites within the LWL. No special activities license (SAL) is needed for oyster collections since work will be conducted by FWC-FWRI staff. Analysis of data generated from samples collected under this scope of work (SOW) will be used to guide management decisions affecting oyster restoration projects.

#### 2.0 OBJECTIVES

In order to fulfill the objectives required by this SOW, the Consultant shall:

- a) Assemble and manage staff ensuring capacity to complete all tasks in this SOW
- b) Provide all transportation required to access all monitoring stations in this SOW;
- c) Provide sampling equipment and supplies required to complete monitoring;
- d) Perform field collection and;
- e) Deliver verified data on the specified due dates.

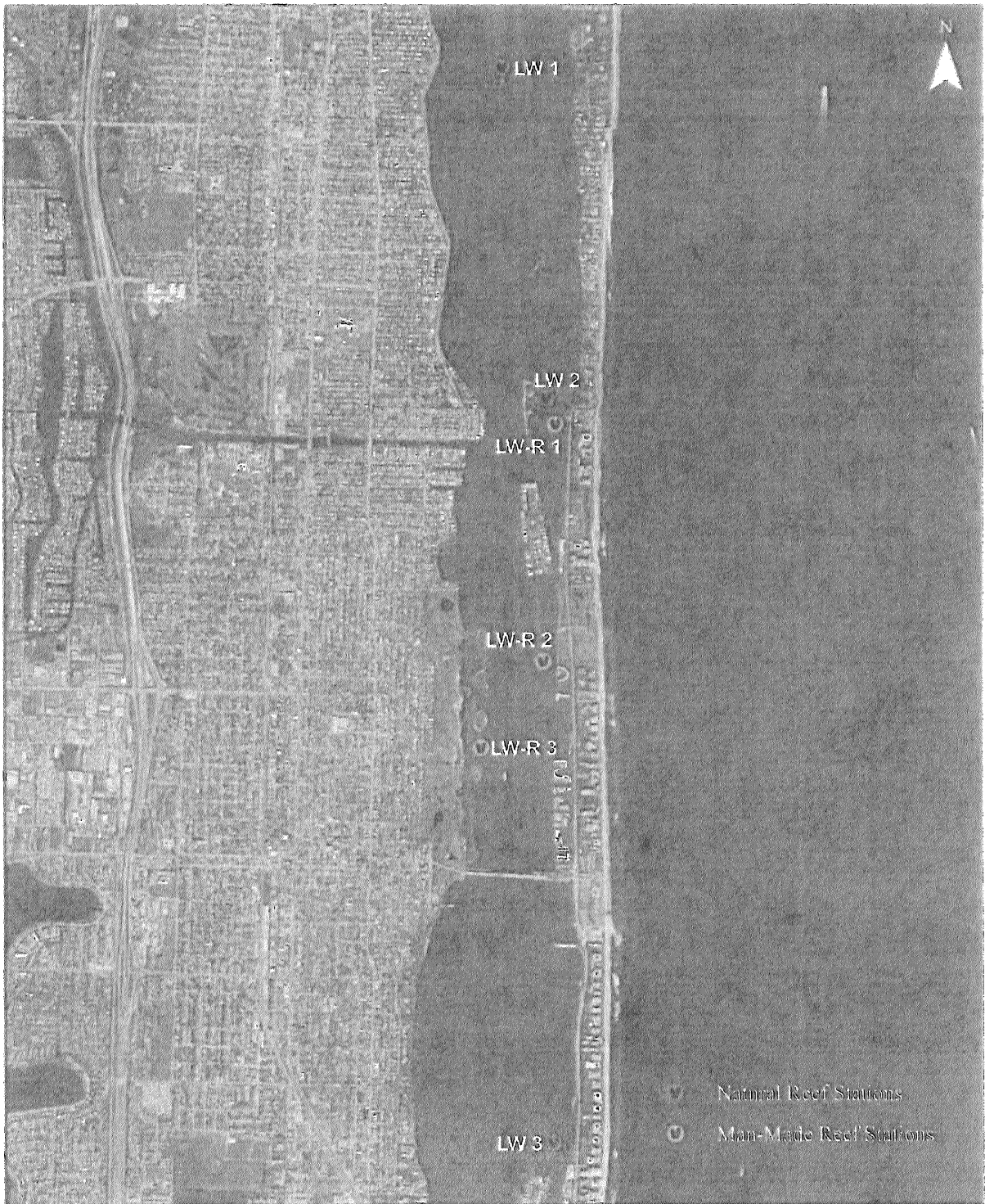


Figure 1. Natural reef (red) and man-made (green) oyster monitoring stations in Lake Worth Lagoon.

### 3.0 POINT OF CONTACT

All communication associated with this work order shall be through Palm Beach County Environmental Resources Management Department (ERM) Contract Manager, Eric Anderson, telephone: (561) 233-2514 , Email: EAnderson1@pbcgov.org. In the event Mr. Anderson is unavailable, Jennifer Báez (561-233-2424) will act as an alternate contact. Communication with FWC-FWRI shall be through Melanie Parker, Research Scientist, telephone: (727) 502-4919, email: [melanie.parker@myfwc.com](mailto:melanie.parker@myfwc.com)

All communication between ERM and the Consultant shall be done through the contract manager unless directed otherwise by the contract manager for project specific issues. The role of the contract manager is to ensure that communication between ERM and the Consultant is frequent, consistent, and documented. This includes gathering and disseminating documentation and deliverables, schedule review, and invoice review and approval.

### 4.0 SCOPE OF WORK

This SOW is for the collection, analysis and summary of oyster data from six sites within the LWL. All tasks associated with this SOW shall be conducted by the Consultant in accordance with established techniques outlined within this SOW.

The primary goal of this study is to determine settled oyster density, reproductive development, prevalence and intensity of the *Perkinsus marinus* parasite, and recruitment of established oysters at six locations in the LWL. Oyster vitality will also be related to incidence of the oyster disease *Perkinsus marinus* (dermo).

### 5.0 WORK BREAKDOWN STRUCTURE

#### *Task 1: Settled Oyster Abundance*

Density sampling will be conducted every six months, weather permitting, during the months of March and September, for a total of four sampling events. Oyster density sampling will follow methods described in Parker et al. (2013). On each sampled station, fifteen replicate 1/4-m<sup>2</sup> quadrats will be haphazardly deployed and all oysters within each quadrat will be collected for determination of the number of live and dead oysters with articulated shells. A maximum of 10 live oyster shell heights (SH = maximum linear distance from the umbo to the ventral shell margin) will also be measured from each quadrat.

#### *Task 2: Reproductive and Disease Monitoring*

Oysters will be collected for analysis of gonadal development state, and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) on a monthly basis whenever present. Each month, a sample of five oysters from the six stations (total N = five oysters \* six reefs = 30 per month) will be transported, live and chilled, to the FWRI laboratory for processing. If there are no live oysters available at a station, no oysters will be collected from that station. Each individual oyster will be processed for reproductive stage and disease status according to the

methods described below.

For *Perkinsus marinus* (dermo) disease analyses, prevalence and intensity will be diagnosed with Ray's fluid thioglycollate media (RFTM) method (Ray 1966). Small (1 cm<sup>2</sup>) pieces of gill and mantle tissue will be incubated in RFTM media with antibiotics and an antifungal for seven days in the dark at 25°C. Tissue pieces will then be placed onto glass microscope slides, macerated with razor blades, stained with Lugol's, and examined at 400x for the presence of hyphospores. Parasite density (infection intensity) will be ranked using the Mackin scale, which ranges from 0 to 5 (Table 1; Mackin 1962).

For reproductive analyses, the remaining tissues from the dermo analyses will be preserved in a modified Davidson's fixative solution (Shaw and Battle 1957), the main difference being no glycerin will be included. Following 20 hours of fixation, the oyster tissues will be thoroughly rinsed in tap water and preserved in 70% ethanol for subsequent histological preparation. Histological preparation will consist of dehydrating each oyster in 95% ethanol for a minimum of three hours, then embedding the tissue in paraffin. Depending upon the size of the individual oyster, a minimum of one to a maximum of six 3.5- $\mu$ m sections will be cut from each embedded sample using a microtome mounted with a glass knife, maintaining a minimum separation of 60  $\mu$ m (the approximate maximum diameter of an oocyte) between sections. The sections will be stained with hematoxylin and eosin, and then mounted onto pre-labeled glass slides for analysis. Resultant slides will be examined at  $\times$ 200-400 magnification with a compound microscope and each sample will be assigned one of four reproductive stages (Table 2) according to a classification scheme modified from the work of Fisher et al. (1996).

### *Task 3: Spat Recruitment*

Juvenile oyster recruitment will be monitored at all six stations. Three replicate spat monitoring arrays will be deployed and retrieved at each station on a monthly schedule. Spat monitoring arrays will be constructed and processed following methods described in Parker et al. (2013). Each array will consist of 12 axenic adult oyster shells (5 -10 cm SH) strung onto two separate lengths of galvanized wire (6 shells per wire). The shells will be oriented with their inner surface facing downward when suspended off the bottom. After a month-long deployment, the shell strings will be recovered and spat recruitment estimated by discarding the top and bottom shells of each string and counting the number of settled spat on the underside of the remaining strung shells. Monthly water quality sampling will be conducted in conjunction with field sampling at all stations. Recorded parameters will include water depth, temperature, salinity, clarity, pH, and dissolved oxygen concentration. Water depth will be determined with a sounding line and clarity with a standard Secchi disk. We will follow DEP SOP requirements for initial and continuing calibration verification for salinity and pH.

Table 1. Mackin scale showing stages of *Perkinsus marinus* (dermo) infection intensity (Mackin 1962).

Stage	Category	Cell Number	Notes
0	Uninfected	No cells detected	
0.5	Very light	<10 cells in entire preparation	
1	Light	11-100 cells in entire preparation	Cells scattered or in localized clusters of 10-15 cells
2	Light-moderate		Cells distributed in local concentrations of 24-50 cells; or uniformly distributed so that 2-3 cells occur in each field at 100X
3	Moderate	3 cells in all fields at 100X	Masses of 50 cells may occur
4	Moderate heavy	Cells present in high numbers in all tissues	Less than half of tissue appears blue-black macroscopically
5	Heavy	Cells in enormous numbers	Most tissue appears blue-black macroscopically

Table 2. Qualitative reproductive staging criteria for oysters collected from Florida waters (modified from Fisher et al. 1996).

Value	Stage	Observations
1	Developing	Gametogenesis has begun immature gametes located on follicle walls mature gametes may be present
2	Ripe/Spawning	Follicles distended and full of ripe gametes ova compact/sperm with visible tails no immature gametes on follicle walls active spawning, but less than 2/3 depleted
3	Spent/Recycling	Most gametes evacuated from the follicles more than 2/3 depleted
4	Indifferent	Gonads devoid of gametes, cytolysis ongoing

## 6.0 DELIVERABLES

### *Task 1: Settled Oyster Abundance*

Descriptive statistics, figures and summaries of semi-annual oyster density and shell height will be generated for each applicable quarterly report. For the final report, oyster density and shell height will be statistically compared between stations and between sampling events. Statistical analysis of previously collected oyster data shows that most measured parameters, especially count data from density and recruitment estimates (Parker et al. 2013), do not meet normality assumptions. For that reason, the generalized linear mixed modeling procedure in SAS

Enterprise Guide v5.1 (SAS Institute Inc., Cary, NC) will be employed for all statistical comparisons.

*Task 2: Reproductive and Disease Monitoring*

Reproductive development will be classified according to the previously described scheme, presented in figures and summarized for each quarterly report. Descriptive statistics, figures and summaries of dermo prevalence and intensity will also be generated for each quarterly report. For the final report, dermo prevalence and intensity will be statistically compared between stations and among months. The generalized linear mixed modeling procedure in SAS Enterprise Guide v5.1 (SAS Institute Inc., Cary, NC) will be employed for all statistical comparisons.

*Task 3: Spat Recruitment*

Descriptive statistics, figures and summaries of spat recruitment rates will be generated for each applicable quarterly report. For the final report, spat recruitment rates will be statistically compared between stations and among months. The generalized linear mixed modeling procedure in SAS Enterprise Guide v5.1 (SAS Institute Inc., Cary, NC) will be employed for all statistical comparisons.

**Due Dates:** Quarterly summary reports of Tasks 1, 2, and 3 are due 30 days after each quarter. Assuming a start date of April 1, 2019, reports will be due on July 30, 2019, October 30, 2019, January 30, 2020, and April 30, 2020. A completed draft report is due no later than 90 days after the final sampling month or on June 30, 2020 and final report is due 30 days after PBC ERM comments or October 30, 2020.

**Reporting**

All data shall be maintained in Microsoft Excel spreadsheets and reports shall be submitted in Microsoft Word. The Consultant shall submit quarterly reports consisting of the following:

- A summary of work performed on each site, including the dates of site visits, and water quality physical parameters;
- Descriptive statistics, figures and summaries of semi-annual settled oyster density and shell height monitoring for each station during applicable quarters;
- Descriptive statistics, figures and summaries of monthly reproductive development and disease monitoring for each station;
- Descriptive statistics, figures and summaries of monthly spat recruitment monitoring for each station;

The final report shall be cumulative and shall summarize all data collected for the 12-month period of the study. It will include statistical comparisons (using the methods described above) of appropriate parameters between stations and among months and will also relate measured biological parameters to flow associated with freshwater discharges and the physical data, especially salinity, collected during the study. The man-made reef stations will also be statistically compared to the long-term natural reef stations. The final report shall include a

discussion of all analytical results, an assessment of limiting factors for reef success, and comparisons to results from relevant previously published studies (e.g., Parker et al. 2013, Scarpa and Laramore 2010).

**Budget and Cost Schedule**

**Budget for 16-month Contract (12 months of sampling)**

Category	Cost
OPS Salary (12 months)	\$50,000
Materials & Supplies	\$10,000
Travel	\$3,086
<b>TOTAL DIRECT COST (TDC)</b>	<b>\$63,086</b>
<b>TOTAL INDIRECT COST (5% of TDC)</b>	<b>\$3,154</b>
Total Direct + Indirect Costs	\$66,240
<b>LEGISLATIVE FEE (8% of TGC)</b>	<b>\$5,760</b>
<b>TOTAL GRANT COST (TGC)</b>	<b>\$72,000</b>

Product	Date Due	Invoice Amount
1 <sup>st</sup> Quarterly Report	July 30, 2019	\$18,000
2 <sup>nd</sup> Quarterly Report	Oct 30, 2019	\$18,000
3 <sup>rd</sup> Quarterly Report	Jan 30, 2020	\$18,000
4 <sup>th</sup> Quarterly Report	April 30, 2020	\$10,000
Draft Report	June 30, 2020	\$ 4,000
Final Report	Oct 30, 2020	\$ 4,000
	<b>Project Total</b>	<b>\$72,000</b>

## References

- Carriker, M. R. and P. M. Gaffney. 1996. A catalogue of selected species of living oysters (Ostreacea) of the world. In: V. S. Kennedy, R. I. E. Newell & A. F. Eble, editors. The eastern oyster, *Crassostrea virginica*. College Park, MD: Maryland Sea Grant College, pp. 467-513.
- Coen, L. D., M. W. Luckenbach, and D. L. Breitburg. 1999. The role of oyster reefs as essential fish habitat: a review of current knowledge and some new perspectives. In: L.R. Benaka (Ed). Fish habitat: essential fish habitat and rehabilitation. American Fisheries Society, Symposium 22, Bethesda, MD. pp. 438-454.
- Fisher, W. S., J. T. Winstead, L. M. Oliver, H. L. Edmiston, and G. O. Bailey. 1996. Physiologic variability of eastern oysters from Apalachicola Bay, Florida. *Journal of Shellfish Research* 15: 543-553.
- Mackin, J. G. 1962. Oyster diseases caused by *Dermocystidium marinum* and other microorganisms in Louisiana. *Publication of the Institute of Marine Sciences, University of Texas* 7: 132-229.
- Parker, M. L., W. S. Arnold, S. P. Geiger, P. Gorman, and E. H. Leone. 2013. Impacts of freshwater management activities on eastern oyster (*Crassostrea virginica*) density and recruitment: recovery and long-term stability in seven Florida estuaries. *Journal of Shellfish Research* 32: 695-708.
- Ray, S. M. 1966. A review of the culture method for detecting *Dermocystidium marinum*, with suggested modifications and precautions. *Proceedings of the National Shellfisheries Association* 54: 55-69.
- Scarpa, J. and S. E. Laramore. 2010. Survey of select eastern oyster (*Crassostrea virginica*) populations in Lake Worth Lagoon, Palm Beach County, Florida: 2010 Annual Report. Palm Beach County, Department of Environmental Resources Management. Project #2008-0404. Harbor Branch Oceanographic Institute at Florida Atlantic University, Aquaculture and Stock Enhancement Program. Fort Pierce, FL. 58 pp.
- Shaw, B. L. and H. I. Battle. 1957. The gross and microscopic anatomy of the digestive tract of the oyster *Crassostrea virginica* (Gmelin). *Canadian Journal of Zoology* 35: 325-347.
- Shumway, S. E. 1996. Natural environmental factors. In: V. S. Kennedy, R. I. E. Newell & A. F. Eble, editors. The eastern oyster, *Crassostrea virginica*. College Park, MD: Maryland Sea Grant College. pp. 467-513.



EXHIBIT "B"

SCHEDULE OF PAYMENTS

The Scope of Work to be completed by CONSULTANT as defined in Exhibit "A" consists of specific completion phases which shall be clearly identified on a phase-by-phase basis upon submission to the COUNTY of certain "deliverables"\* as expressly indicated below. Compensation for the work tasks stated herein shall be in accordance with the following Schedule of Payments:

Deliverable 1

Task(s) to be Completed: July 30, 2019

*Task 1: Settled Oyster Abundance* – spring sampling of oyster density and shell height at six stations

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 1: \$ 18,000  
Deliverable(s) Required: Quarterly Report 1

Deliverable 2

Task(s) to be Completed: October 30, 2019

*Task 1: Settled Oyster Abundance* – no work planned for this period

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 2: \$ 18,000  
Deliverable(s) Required: Quarterly Report 2

Deliverable 3

Task(s) to be Completed: January 30, 2020

*Task 1: Settled Oyster Abundance* – fall sampling of oyster density and shell height at six stations

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 1: \$ 18,000  
Deliverable(s) Required: Quarterly Report 3

**Deliverable 4**

Task(s) to be Completed: April 30, 2020

*Task 1: Settled Oyster Abundance* – no work planned for this period

*Task 2: Reproductive and Disease Monitoring* – monthly sampling of oysters for analysis of gonadal development state and for the prevalence and intensity of the oyster disease *Perkinsus marinus* (dermo) at six stations

*Task 3: Spat Recruitment* – monthly sampling of juvenile oyster recruitment at six stations

A quarterly report including descriptive statistics, figures and summaries of all parameters measured in Tasks 1, 2 and 3 will be written and submitted.

Completion Time: 3 months Compensation for Phase 1: \$ 10,000  
Deliverable(s) Required: Quarterly Report 4

**Deliverable 5**

Task(s) to be Completed: June 30, 2020

The draft report is due no later than 90 days after final sampling month or June 30, 2020. The report shall be cumulative and shall summarize all data collected for the 12 month period of the study. It will include statistical comparisons (using the methods described above) of appropriate parameters between stations and among months and will also relate measured biological parameters to flow associated with freshwater discharges and the physical data, especially salinity, collected during the study. The man-made reef stations will also be statistically compared to the long-term natural reef stations. The draft report shall include a discussion of all analytical results, an assessment of limiting factors for reef success, and comparisons to results from relevant previously published studies.

Completion Time: 2 months Compensation for Phase 1: \$ 4,000  
Deliverable(s) Required: Final Report

**Deliverable 6**

Task(s) to be Completed: October 30, 2020

The final report is due 30 days after PBC ERM comments to the draft report or by October 30, 2020. The final report shall be cumulative and shall summarize all data collected for the 12 month period of the study. It will include statistical comparisons (using the methods described above) of appropriate parameters between stations and among months and will also relate measured biological parameters to flow associated with freshwater discharges and the physical data, especially salinity, collected during the study. The man-made reef stations will also be statistically compared to the long-term natural reef stations. The final report shall include a discussion of all analytical results, an assessment of limiting factors for reef success, and comparisons to results from relevant previously published studies.

Completion Time: 4 months Compensation for Phase 1: \$ 4,000  
Deliverable(s) Required: Final Report

\* "Deliverables" shall be defined as progress reports, prepared maps, bid documents, completed drawings, specific reports, work plans, documentation of meetings attended, assessment study reports, analysis reports, summary reports, recommendation reports and related draft reports and verifiable deliverables.

BOARD OF COUNTY COMMISSIONERS  
PALM BEACH COUNTY, FLORIDA  
BUDGET AMENDMENT

Fund 1232: Manatee Protection

ACCT.NUMBER	ACCOUNT NAME	ORIGINAL BUDGET	CURRENT BUDGET	INCREASE	DECREASE	ADJUSTED BUDGET	EXPENDED/ ENCUMBERED As of 09/30/2019	REMAINING BALANCE
<b>REVENUES</b>								
380-3057 LWLP/Monitoring Project	3439 State Grnt Other Phys Envir	0	0	18,000	0	18,000		
<b>Total Receipts and Balances</b>		<b>5,164,906</b>	<b>5,164,906</b>	<b>18,000</b>	<b>0</b>	<b>5,182,906</b>		
<b>EXPENDITURES</b>								
380-3057 LWLP/Monitoring Project	3401 Other Contractual Services	191,006	191,006	18,000	0	209,006	0	209,006
<b>Total Appropriations &amp; Expenditures</b>		<b>5,164,906</b>	<b>5,164,906</b>	<b>18,000</b>	<b>0</b>	<b>5,182,906</b>		

ATTACHMENT 5

Environmental Resources Management  
INITIATING DEPARTMENT/DIVISION

Administration/Budget Department Approval  
OFMB Department - Posted

Signatures & Dates

*Deborah Jamm* 10-18-19

By Board of County Commissioners  
At Meeting of  
November 19, 2019

Deputy Clerk to the  
Board of County Commissioners