# OYSTER ECOSYSTEM-BASED FISHERY MANAGEMENT PLAN (O-EBFM)
# FOR THE PENSACOLA BAY SYSTEM (PBS)

# PBS STAKEHOLDER WORKING GROUP

# MEETING XI—MEETING SUMMARY

**FEBRUARY 17, 2021**

**HOST: THE NATURE CONSERVANCY, FLORIDA**
**FACILITATOR: FACILITATED SOLUTIONS, LLC**
**ZOOM ONLINE MEETING**

*Convened by:*

The Nature Conservancy
Protecting nature. Preserving life.

*Facilitated and Summarized by:*

FACILITATED SOLUTIONS

# PBS STAKEHOLDER WORKING GROUP

## MEETING XI—MEETING SUMMARY

## February 17, 2021

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The Nature Conservancy

**OYSTER ECOSYSTEM-BASED FISHERY MANAGEMENT PLAN (O-EBFM) FOR THE PENSACOLA BAY SYSTEM (PBS)**

## PBS STAKEHOLDER WORKING GROUP
## MEETING XI EXECUTIVE SUMMARY
### February 17, 2021

Anne Birch, Florida Marine Program Manager, The Nature Conservancy, welcomed the Stakeholder Working Group members to the online Zoom meeting. Anne introduced the PBS facilitation team of Jeff Blair and Bob Jones with Facilitated Solutions LLC. The facilitator reviewed the meeting objectives and agenda and approved, without changes, the January 21, 2021 facilitator's Meeting #X Summary.

Whitney Scheffel, Pensacola & Perdido Bays Estuary Program (PPBEP) Senior Scientist, presented an inventory of 28 current oyster centric projects in the Pensacola Bay System *(see Appendix #5 for Project List)* She indicated the goal was to identify projects that had some benefit to oysters in the PBS and will help to align with the PPBEP Comprehensive Conservation and Management Plan (CCMP) priorities. The 28 projects cover the following themes: Water Quality improvements and monitoring; Sediment loading; Oyster restoration and monitoring; Living shorelines; Watershed Management Plans; Seagrass monitoring/restoration (or lack thereof); and Education/Outreach. The projects include: the oyster mapping efforts in Santa Rosa and Escambia counties; a Santa Rosa County living shoreline suitability model; and an unpaved roads initiative to deal with sediment problems; and many others. Whitney noted the PPBEP will be tracking project progress and they will continue to add to list. Working Group comments included: add "Project Oyster Pensacola" with the Bream Fishermen's Association; Pinpoint these projects on a map; and the FWC's GIS Assessment was completed by the FWC Aquatic Habitat team and covers specific Pensacola Bay priorities

Josh Neese presented on the new Gulf Coast Seafood Cluster based on a model from Iceland. Josh noted this was developed through the public/private partnership with UF/IFAS Escambia and Santa Rosa County Extension Offices (Chris Verlinde & Rick O'Connor), The Florida Oyster Trading Company, LLC., and SmartOysters Pty.,Ltd. in cooperation with the Florida Department of Agriculture and Consumer Services, Division of Aquaculture. The cluster approach will address industry issues in both aquaculture and wild harvest and create an industry led, actionable, and economically focused commercial organization that is committed to growing the local seafood production industry and blue economy through a science-based, economically focused strategy that incubates new ventures and tests new techniques. Their vision is "to develop a nationally recognized seafood hub that connects all levels of the industry through collaborative innovation." In response to Working Group comments, Josh noted the Cluster partners are focusing on the basics- "you have to crawl before you walk." Next, the Cluster partners will seek inclusion of "Ag tech" to build upon the basics.

In 2020, the Working Group agreed that the "vision of success" themes formed the basis for the Pensacola Bay System goal framework. The overarching approaches, four goals, outcomes,

objectives and strategies and actions and performance measures for each goal area were organized, developed and refined at the January 2020- February 2021 Working Group meetings. The fifth area included Working Group recommendations on strategies and actions to the Pensacola and Perdido Bays Estuary Program for evaluation.

The Working Group approved the draft revisions by consensus and a reaffirmation of the O-EBFM framework including: Approaches, Visions, Outcomes, Goals, Objectives, Strategies, Actions, and Performance Measures, and Implementation steps. The Working Group reviewed a few changes to the strategies and actions following the January 2021 meeting (*See, Appendix #6* which contains: the overarching approaches; the four Working Group goal areas, which include for each goal, a vision theme, goal, outcome and objectives, strategies and actions as finalized and approved at the February 17, 2021 meeting.

The Working Group reviewed a draft implementation table to discuss and identify which organizations and agencies would be willing to serve as leads and partners for each of the 25 strategies and what resources could be brought to bear to support the strategies and actions *(See, Appendix # 7)*. There are 25 strategies, including 19 Priority-1 Strategies, and 6 Priority-2 Strategies. There are five strategies that do not yet have Leads and Partners listed. There are 57 Actions for the 25 strategies. The Working Group suggested more clearly defining what is a lead and partner for the strategies. Most of the details for implementation of the actions would best be evaluated by the PPBEP working with an O-EBFM Advisory Committee.

Working Group members described partnerships underway and planned. The Working Group then participated in a word cloud exercise that identified and discussed an overarching set of messages to describe what the Plan is trying to achieve for the Pensacola Bay System and the communities and families that surround and rely on the bays, rivers and bayous. The facilitator suggested that key themes identified from the word cloud exercise included: clean, swimmable, and fishable waters, thriving, vibrant, sustainable, productive, cultural heritage, farm-to-table, and community pride as economic driver.

The facilitators invited members of the public to comment and there was no one who offered public comments. The facilitators then reviewed possible agenda items for Meeting XII the Working Group's final meeting, which will take place on March 17, 2021 in a Zoom virtual meeting format. The meeting concluded with a Zoom evaluation. *(See Appendix #3).*

*The meeting adjourned at 11:30 a.m. CT.*

**OYSTER ECOSYSTEM-BASED FISHERY MANAGEMENT PLAN (O-EBFM) FOR THE PENSACOLA BAY SYSTEM (PBS)**

# PBS STAKEHOLDER WORKING GROUP MEETING X DETAILED SUMMARY

**February 17, 2021**

*This section provides a detailed summary of the meeting with additional data from the presentations and verbatim comments from the Working Group members during review and discussion of the themes.*

## I. INTRODUCTIONS AND AGENDA REVIEW

Anne Birch, Florida Marine Program Manager, The Nature Conservancy, welcomed the Stakeholder Working Group members to the online Zoom meeting. The icebreaker for the meeting was what is your favorite vegetable dish. Anne introduced the PBS facilitation team of Jeff Blair and Bob Jones with Facilitated Solutions LLC. The facilitator reviewed the meeting objectives and agenda which members agreed to follow *(See Appendix #1).* Members also approved, without changes, the January 21, 2021 facilitator's Meeting #X Summary, which members had received in advance of the meeting. The facilitator reviewed guidelines for PBS virtual meetings.

## II. PRESENTATION AND DISCUSSION ON THE PENSACOLA BAY SYSTEM

### A. Overview of Oyster Centric Efforts in the Pensacola Bay System

Whitney Scheffel, Pensacola & Perdido Bays Estuary Program (PPBEP) Senior Scientist, presented an inventory of 28 current oyster centric projects in the Pensacola Bay System *(see Appendix #5 for Project List)* requested by the Working Group at the January 2021 meeting. She indicated the goal was to identify projects that had some benefit to oysters in the PBS. This inventory will serve to inform strategies and actions set forth in the Plan, contribute to existing, new or expanded partnerships, and align with the O-EBFM and PPBEP Comprehensive Conservation and Management Plan (CCMP) priorities. It will also help the implementation discussion later in the meeting that identifies potential leads on identified strategies.

The 28 projects cover the following themes: Water Quality improvements and monitoring; Sediment loading; Oyster restoration and monitoring; Living shorelines; Watershed Management Plans; Seagrass monitoring/restoration (or lack thereof); and Education/Outreach. The projects include: the oyster mapping efforts in Santa Rosa and Escambia counties; a Santa Rosa County living shoreline suitability model; and an unpaved roads initiative to deal with sediment problems; and many others.

Whitney noted the PPBEP will be tracking project progress and they will continue to add to list. She welcomed information on any additional projects that Working Group members might be able to identify. She suggested that awareness of current projects will be crucial for implementation of the Plan and development of the CCMP.

*PBS Working Group Comments/Questions*

- You may want to add "Project Oyster Pensacola" with Barbara Albrecht, Jane Caffrey, and the Bream Fishermen's Association.
- Can you pinpoint these projects on a map? *A: Yes, we can do that.*
- Katie Konchar, FWC noted the FWC's GIS Assessment was completed by the FWC Aquatic Habitat team and covers all estuarine and marine priority habitats in Florida with specific Pensacola Bay priorities highlighted. The published guidebook as well as a story map can be found at this link https://myfwc.com/wildlifehabitats/habitat/ahcr/priority-resources/. Kent Smith added that the assessment currently available was only for freshwater, but the full report will include all estuarine and marine priority habitats and will be available soon.

**B. The Gulf Coast Seafood Cluster**

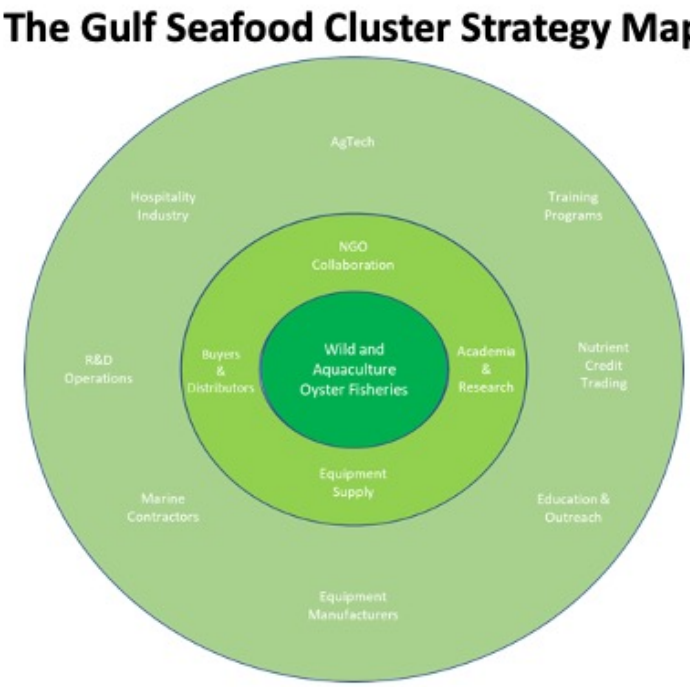
Josh Neese presented on the new Gulf Coast Seafood Cluster based on a model from Iceland. Josh noted this was developed through the public/private partnership with UF/IFAS Escambia and Santa Rosa County Extension Offices (Chris Verlinde and Rick O'Connor), The Florida Oyster Trading Company, LLC., and SmartOysters Pty., Ltd. in cooperation with the Florida Department of Agriculture and Consumer Services, Division of Aquaculture. The cluster approach will address industry issues in both aquaculture and wild harvest.

He noted the concept was to create an industry led, actionable, and economically focused commercial organization that provides the resources necessary to innovatively develop the oyster aquaculture industry while collaboratively assisting with the reestablishment of the commercial wild harvest. The organization is committed to growing the local seafood production industry and blue economy through a science based, economically focused strategy that incubates new ventures and tests new techniques. It will serve as a complementary organization to implement management plan-based, actionable projects to drive economic and industry growth. Their vision is "to develop a nationally recognized seafood hub that connects all levels of the industry through collaborative innovation."

At an industry townhall meeting convened by Gulf Coast Seafood Cluster partners, all agreed the need for starting with the basics and identified three industry pain points:

- Lack of consistent, quality seed available for oyster aquaculture farms to operate
- Lack of reliable and affordable labor available for oyster aquaculture farms
- Availability of permitted suitable hard bottom to experiment with wild population stock enhancement

Josh suggested where the Gulf Coast Seafood Cluster is in alignment with and will complement the strategies in the oyster plan.




*PBS WG Comments/Questions*

- Great demonstration to see how the Cluster is aligned with the PBS O-EBFM and put into action through initiatives.
- Any gaps you have discovered? *A: We are focusing on the basics- you have to crawl before you walk. Next, we will seek inclusion of "Ag tech" to build upon the basics. We can identify and create opportunities for future innovations. The Australian initiative of Smart Oysters focuses on helping the aquaculture industry with farm management real time data to help leverage forecasting for anticipated harvest and revenue.*

## III. PENSACOLA BAY SYSTEM GOAL FRAMEWORK

### A. Overview of the Goal Framework

In 2020, the Working Group agreed on the "vision of success" themes that formed the basis for the PBS goal framework. The goals, outcomes, objectives and strategies and actions were organized, developed and refined at the January 2020- February 2021 Working Group meetings. The agreed upon framework is as follows:

**Section I: Working Group Goals, Objectives, and Draft Proposed Strategies**

*Overarching Approaches (4)*

Goal A: A Healthy and Productive Ecosystem - 9 Objectives, 9 Strategies, 14 Actions

Goal B: Management and Regulation of Wild Harvest and Aquaculture - 3 Objectives, 10 Strategies, 21 Actions

Goal C: Thriving Economy - 6 Objectives, 3 Strategies, 6 Actions
Goal D: Public Education Communication - 3 Objectives, 3 Strategies, 12 Actions

**SECTION II: STRATEGIES TO BE REFERRED TO OTHER PROGRAMS OR ENTITIES**
E. Pensacola and Perdido Bays Estuary Program: 8 Strategies and 9 Actions to be Referred for Evaluation

**SECTION III: PERFORMANCE MEASURES FOR EACH GOAL AREA**

**SECTION IV: TERMS AND DEFINITIONS**

**SECTION V: KEY TO COMMON ABBREVIATIONS**

### B. WORKING GROUP REVIEW AND APPROVAL OF PBS O-EBFM PLAN

The Working Group approved the revisions by consensus and an reaffirmation of the O-EBFM Framework including Approaches, Visions, Outcomes, Goals, Objectives, Strategies, Actions, and Performance Measures.

The Working Group reviewed a few changes to the strategies and actions following the January 2021 meeting. *Appendix #6* contains a "clean version" of the overarching approaches for the four Working Group goal areas, which include for each goal, a vision theme, goal, outcome and objectives, strategies and actions as finalized and approved at the February 17, 2021 meeting.

## V. FACILITATED DISCUSSION – COMMITMENT, PARTNERSHIPS AND OVERARCHING MESSAGE

### A. COMMITMENTS TO IMPLEMENTATION AND PARTNERSHIP COLLABORATION

The Working Group reviewed a draft implementation table *(Appendix # 7)* to discuss and identify which organizations and agencies would be willing to serve as leads and partners for each of the 25 strategies and what resources could be brought to bear to support the strategies and actions. There are 25 strategies, including 19 Priority-1 Strategies, and 6 Priority-2 Strategies. There are five strategies that do not yet have Leads and Partners listed. There are 57 Actions for the 25 strategies. The facilitator suggested working through the 25 strategies to discuss whether any strategy needed clarification and to identify leads, partners and resources.

The Working Group suggested more clearly defining what is a lead and partner for the strategies. It was suggested that a "lead" does not mean the organizations are responsible for securing resources. Leads instead will help facilitate the efforts and motivate people to take some ownership in advancing the strategy. Some of the clarification of the strategies included:

- Annually assessing the status of oysters in PBS and provide periodic updates vs. a stock assessment which will normally have management targets regarding harvest (Florida currently has no oyster stock assessments).
- Data gaps and analysis of data collected are two important functions that need attention.

- Need to clarify the shell budget modeling process. Shell budget modeling is a strategy being developed by FWC statewide for oyster fisheries.

Most of the details for implementation of the actions would best be evaluated by the PPBEP working with an O-EBFM Advisory Committee.

*PBS Working Groups Comments:*

- Visit Pensacola could host industry luncheons with speakers. Communicate with hospitality industry. Make presentations to the public, newsletters, by email. They could add messages on oysters through these communication platforms and on the public side through social media channels.
- PPBEP. We hope to use the TNC habitat suitability model to inform future restoration.
- PPBEP will be collaborating with UF autonomous underwater vehicles for surveying and mapping coordination with Sea Grant.
- PPBEP's business partnership hosting Oyster Appreciation Week in the Fall of 2021.
- Santa Rosa County budget request for Board of County Commission funding for oysters and the PPBEP. Also working with UF/Sea Grant on oyster leases and for wild harvest.
- Sea Grant helping with the Seafood Cluster concept development, local nonprofit, Ocean Strike Team for scuba assessments (reef/sharks/lionfish).
- Marine Science Academy working at Navy Point, getting schools and high school students involved; and the Auburn shellfish lab working with students.
- FDACS: UF oyster academic world virtual training for farmers (Triumph Inc. funded for in-person, but now virtual). Partner on Education and outreach opportunities; cost-share for oyster aquaculture gear (needs funding for start-up costs).
- USDA aquaculture efforts.

## B. Overarching Message

### 1. Word Cloud Vision

The Working Group identified and discussed an overarching set of messages to describe what the Plan is trying to achieve for the Pensacola Bay System and the communities and families that surround and rely on the bays, rivers and bayous, They engaged in an exercise using the "Mentimeter" platform and tool for offering responses to the following two questions:

- What word best describes your vision for the PBS in 20 years?
- Speaking to your family and friends how would you describe in 1-2 words the benefits of restoring oysters to the PBS?

The following "word clouds" are the responses of the Working Group members to the questions with the size of the words reflecting the words most often provided.

# What word best describes your vision for the bay in 20 years?

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# Speaking to your family and friends, how would you describe the benefits of restoring oysters to the bay? 1-2 words per answer


## 2. Overarching Message Working Group Ideas

The facilitator suggested that key themes identified from the word cloud exercise include clean, swimmable, and fishable waters, thriving, vibrant, sustainable, productive, cultural heritage, farm-to-table, and community pride as economic driver. The Working Group contributed the following thoughts on messaging:

*PBS Working Group Comments and Chat Messaging:*

- Restore the reefs, restore the Bay
- Restore the reefs protect a way of life
- A sustainable future has oysters in it
- Fuel your body, feed your soul, save and love the Bay
- Healthy oysters, healthy bay, healthy you
- Save the oysters sustain our communities



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- Eat where you live protect where you live
- Don’t be shellfish the Bay needs you, help us turn the tide
- Oysters as the heart of the Community
- Thriving Oysters, Thriving Bay
- Restore the Reefs, Restore the Bay
- Save the bay, eat an oyster
- Eat an oyster, save the bay
- Restore the reefs, protect a way of life
- A Sustainable Future has Oysters in it.
- Home grown Pensacola Oysters
- Healthy Oysters, Healthy Bay, Healthy Pensacola
- Save the local oysters, sustain our communities
- Stewardship is everyone's responsibility.
- Oysters for Life!
- Eat where you live, protect where you live
- Pensacola Bay Oyster Co. has done a fantastic job with their marketing!
- East Bay Oysters have a long historical reputation in the name recognition like Blue Point oysters

## VI. PUBLIC COMMENT AND NEXT STEPS

The facilitators invited members of the public to comment and there was no one who offered public comments. The facilitators then reviewed possible agenda items for Meeting XII the Working Group’s final meeting, which will take place on March 17, 2021 in a Zoom virtual meeting format.

The final meeting will review implementation strategies and adoption of the draft final plan outline and recommendations. The meeting concluded with a Zoom evaluation. *(See Appendix #3).*

*The meeting adjourned at 11:30 a.m. CT.*

## Appendix #1 - Meeting Agenda

**OYSTER ECOSYSTEM-BASED FISHERY MANAGEMENT PLAN**
**FOR THE PENSACOLA BAY SYSTEM (PBS)**
**PBS STAKEHOLDER WORKING GROUP**
**MEETING XI**
**FEBRUARY 17, 2021—8:30 AM – 12:00 PM CT**
**VIRTUAL MEETING VIA ZOOM**
**HOST: THE NATURE CONSERVANCY, FLORIDA**
**FACILITATOR: FACILITATED SOLUTIONS, LLC**

**MEETING XI OBJECTIVES**

- ✓ To Approve Regular Procedural Topics (Agenda, and Meeting X Summary Report)
- ✓ To Review Meeting Schedule and Updated Workplan
- ✓ To Receive Requested Presentations
- ✓ To Approve Revisions and Reaffirm Approval of Plan Framework (Goals, Objectives, Strategies, Actions, and Performance Measures)
- ✓ To Discuss Organizational Commitment, Collaboration, and Overarching Message
- ✓ To Review Draft Plan Outline
- ✓ To Identify Needed: Next Steps, Information, Presentations, and Agenda Items for Next Meeting

**PBS STAKEHOLDER WORKING GROUP MEETING XI AGENDA—FEBRUARY 17, 2021**

| | | |
|---|---|---|
| **1.** | **8:30** | **WELCOME, REVIEW OF VIRTUAL MEETING PARTICIPATION GUIDELINES, AND ROLL CALL**<br>**THANK YOU TO MICHAEL NORBERG AND WELCOME ALAN PEIRCE** |
| **2.** | | **REVIEW AND APPROVAL OF AGENDA** |
| **3.** | | **APPROVAL OF FACILITATORS' SUMMARY REPORT (JANUARY 21, 2021)** |
| **4.** | | **REVIEW OF PROJECT MEETING SCHEDULE AND WORKPLAN** |
| **5.** | **8:45** | **STAKEHOLDER REQUESTED PRESENTATIONS AND BRIEFINGS**<br>• Overview of Oyster Centric Efforts in the Pensacola Bay System– Whitney Scheffel, PPBEP<br>• The Gulf Coast Seafood Cluster - Josh Neese, Chris V. and Rick O'Connor |
| **6.** | | **APPROVAL OF REVISIONS AND REAFFIRMATION OF PLAN FRAMEWORK APPROVAL (GOALS, OBJECTIVES, STRATEGIES, ACTIONS, AND PERFORMANCE MEASURES)** |
| ***10:00 AM CT*** | | ***GROUP PHOTO AND BREAK (15 MINUTES)*** |
| **7.** | **10:10** | **FACILITATED DISCUSSION ON COMMITMENT, COLLABORATION, AND OVERARCHING MESSAGE**<br>• Word Cloud Exercise<br>• Working Group member reports on their organizations' specific commitments and resources available for implementing high priority strategies of the Plan.<br>• Working Group member reports on partnerships and stakeholder organizations for potential collaboration on implementing high priority strategies of the Plan.<br>• Working Group member reports on ideas for crafting an overarching message for fostering Community support and action for implementation of the Plan. |
| **8.** | **11:00 AM** | **REVIEW OF DRAFT PBS OYSTER ECOSYSTEM-BASED FISHERIES MANAGEMENT PLAN OUTLINE** |
| **9.** | **11:15 AM** | **PUBLIC COMMENT** |
| **10.** | **11:25** | **NEXT STEPS AND ASSIGNMENTS, INFORMATION NEEDS, PRESENTATIONS AND AGENDA ITEMS FOR THE NEXT MEETING (MARCH 17, 2021)**<br>• Review of action items and assignments<br>• Identify needed information and presentations for the next meeting<br>• Identify agenda items for the next meeting<br>• Meeting evaluation – Online Survey |
| ***11:30 PM CT*** | | ***ADJOURN*** |

## Appendix #2 -Working Group Members, Project Team, Facilitators & Public Participating

*(**Bold** = members who attended the February 17, 2020 meeting. Italics for members who couldn't attend. When two people are listed on the same line the first person listed is the Working Group member and the second person listed is their Alternate)*

| MEMBER | AFFILIATION |
|---|---|
| **Building/Development** | |
| *Shelby Johnson* | *Johnson Construction of Pensacola, Inc.* |
| *Glenn Miley* | *biome Consulting Group* |
| **Business/Real Estate/Economic Development/Tourism** | |
| **1. Will Dunaway/Barbara Albrecht** | Environmental Lawyer |
| **2. Donnie McMahon** | Business and Aquaculture |
| **Environmental/Citizen** | |
| **3. Christian Wagley** | Healthy Gulf |
| **Local Government** | |
| **4. Shelley Alexander** | Santa Rosa County Environmental Programs |
| *Chips Kirschenfeld* | Escambia County Natural Resources Management |
| **5. Matt Posner/Whitney Scheffel/Donald Killorn** | Pensacola and Perdido Bays Estuary Program |
| **6. Mark Jackson** | Pensacola City Sustainability Coordinator |
| **7. Mike Norberg** | Okaloosa County |
| **Recreational Fishing** | |
| *Chris Phillips* | *Hot Spot Charters* |
| **Seafood Industry** | |
| *Pasco Gibson* | *Seafood Industry/Waterman* |
| *LD Henderson* | *Waterman* |
| **8. Josh Neese** | Aquaculture |
| *Pete Nichols* | *Seafood Industry/Waterman* |
| **9. Tommy Pugh** | Seafood Dealer |
| *Phil Rollo* | *Seafood Dealer* |
| *Calvin Sullivan* | *Oyster Harvester* |
| *William (Hub) Williamson* | *Oyster Harvester* |
| **State Government** | |
| **10. Beth Fugate** | FDEP/Aquatic Preserves |
| **11. Kent Smith/Katie Konchar** | FWC Division of Habitat and Species Conservation |
| **12. Alan Peirce** | FWC Division of Marine Fisheries Management |
| **13. Portia Sapp/Michelle Smith** | FDACS Division of Aquaculture |
| **14. Paul Thurman** | *NWFWMD* |
| **Tourism** | |
| **15. Shawn Brown** | Visit Pensacola |
| **University/Research** | |
| **16. Jane Caffrey** | UWF |
| **17. Rick O'Connor** | UF/IFAS Escambia County |
| **18. Chris Verlinde** | UF/IFAS/Sea Grant Santa Rosa County |

| PROJECT TEAM AND FACILITATORS | |
|---|---|
| **THE NATURE CONSERVANCY** | |
| **Anne Birch** | Marine Program Manager, Florida |
| **Bryan DeAngelis** | Marine Habitat Scientist, North America |
| **Laura Geselbracht** | Sr. Marine Scientist, Florida |
| **Andrea Graves** | Marine Projects Coordinator, Florida |
| **FACILITATED SOLUTIONS, LLC** | |
| **Jeff Blair** | Working Group Facilitator |
| **Robert Jones** | Working Group Facilitator |
| **PUBLIC** | |
| **Amanda Croteau** | UWF |
| **Haley Gancel** | UF |
| **Logan McDonald** | PPBEP |

**Appendix #3**
**Zoom Working Group Member Meeting Evaluation and Chat, February 17, 2021**

1. **The meeting objectives were clearly communicated at the beginning**

| *Average Rating* | *5.Strongly Agree* | *4.Agree* | *3.Not Sure* | *2.Disagree* | *1.Strongly Disagree* |
|---|---|---|---|---|---|
| **4.4 of 5** | **4** | **5** | **0** | **0** | **0** |

2. **The meeting objectives were met.**

| *Average Rating* | *5.Strongly Agree* | *4.Agree* | *3.Not Sure* | *2.Disagree* | *1.Strongly Disagree* |
|---|---|---|---|---|---|
| **4.4 of 5** | **4** | **5** | **0** | **0** | **0** |

3. **The facilitation of the meeting was effective for achieving the stated objectives**

| *Average Rating* | *5.Strongly Agree* | *4.Agree* | *3.Not Sure* | *2.Disagree* | *1.Strongly Disagree* |
|---|---|---|---|---|---|
| **4.4 of 5** | **4** | **5** | **0** | **0** | **0** |

4. **Follow-up actions were clearly summarized at the end of the meeting**

| *Average Rating* | *5.Strongly Agree* | *4.Agree* | *3.Not Sure* | *2.Disagree* | *1.Strongly Disagree* |
|---|---|---|---|---|---|
| **4.3 of 5** | **4** | **4** | **1** | **0** | **0** |

5. **The meeting was the appropriate length of time.**

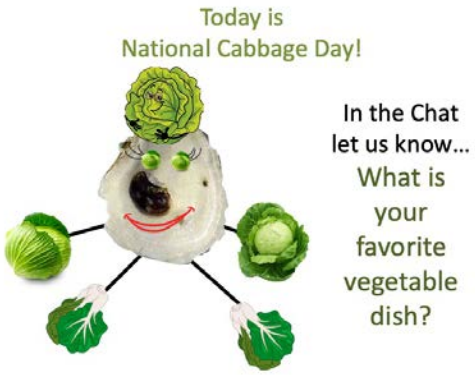
| *Average Rating* | *5.Strongly Agree* | *4.Agree* | *3.Not Sure* | *2.Disagree* | *1.Strongly Disagree* |
|---|---|---|---|---|---|
| **3.3 of 5** | **1** | **4** | **1** | **3** | **0** |

6. **Working Group Members had the opportunity to participate and be heard.**

| *Average Rating* | *5.Strongly Agree* | *4.Agree* | *3.Not Sure* | *2.Disagree* | *1.Strongly Disagree* |
|---|---|---|---|---|---|
| **4.7 of 5** | **6** | **3** | **0** | **0** | **0** |

**Zoom Chat Comments During the Meeting**

**Opening- Favorite Vegetable Dish?**




- Beth Fugate: zucchini
- Jane Caffrey: grilled cauliflower
- Michelle Smith: Asparagus
- Portia Sapp: Roasted broccoli
- Shawn Brown: baked brussels sprouts
- Donald Killorn: Roasted sweet potatoes and parsnips
- Jeff Blair: fresh seaweed
- Chris Verlinde: any roasted vegetables
- Mark Jackson: Zucchini
- Bob Jones: Grilled red peppers
- Haley Gancel: asparagus
- Mike Norberg: I'll take 1 of everyone's favorite so far!
- Laura Geselbracht: Thai stir fried basil and veggies
- Josh Neese: green beans
- Katie Konchar: Thai peanut broccoli
- Matt Posner: none ;), jk
- Anne Birch: roasted brussels sprouts
- Andrea Graves: scalloped potatoes
- Whitney ScheffeII: love caramelizing brussels sprouts with olive oil and red wine and spices
- Logan McDonald: Vegetable korma
- Shelley Alexander Santa Rosa: country club squash casserole
- Beth Fugate: I love a good casserole!
- Kent Smith, FWC: Roasted brussels sprouts with feta cheese and bacon bits

**Projects/ Presentations**

- Shelley Alexander Santa Rosa: Santa Rosa County has the Floridatown Living Shoreline Phase II- $125,000 FLDEP Coastal Resilience. Thanks Whitney!
- Laura Geselbracht: Is the GIS Assessment just for the PBS?

Katie Konchar: FWC's GIS Assessment was done by our Aquatic Habitat team (not just me) and covers all of FL with specific Pensacola Bay priorities highlighted. There is a link to the published guidebook there as well as a story map

- Kent Smith, FWC: Our Aquatic Habitat assessment on the link that Katie provided is only for freshwater at this time. We're waiting for the final report to be converted into an ADA accessible version to post it to our website, but this is imminent. I'll send out the full report with all estuarine and marine priority habitats identified in Florida for ease of everyone's access.
- Katie Konchar: Thanks for catching that, Kent!
- Laura Geselbracht: Fabulous! Thanks.
- Laura Geselbracht: Amazing work Josh!
- Whitney Scheffel, PPBEP: Thank you Josh for sharing this info! FYI as follow up....PPBEP staff has started a project mapping effort for both watersheds so we can see all current programs/projects in one place. Building a dashboard will take time, but we are working towards this goal. Thanks for the support!
- Josh Neese: Thanks guys. We can chat offline Whitney, just let me know a good time.

**Word Cloud Exercise**

- Anne Birch: Word Cloud results emailed to you as 2 PowerPoint slides

**Review Strategies and Lead/Partners/Resources**

- Shelley Alexander Santa Rosa: What about FDACS?
- Will Dunaway: I have always believed "lead" meant the entity with expertise. The entire report is going to be an unfunded "mandate" unless there is also some ideas for funding (taxes, fees, etc.) which may not be on us to solve.
- chrismv@ufl.edu: hey, we don't have the second option, we did on the
- Jane Caffrey: Thomas Soniat from Louisiana has the model
- Josh Neese: Absolutely
- Shelley Alexander Santa Rosa: What type of aquaculture data would be available? It has been portrayed as private information.
- Portia Sapp: We collect total planted and harvested.
- Chris Verlinde: UF does has expertise mostly focused on Apalachicola Bay
- Beth Fugate: did you ask about seagrass monitoring?
- Anne Birch: Yes, would FDEP be a lead or partner?
- Beth Fugate: on what strategy?
- Katie Konchar: Ryan Gandy's project is also likely relevant to Strategy A
- Anne Birch: great point on Master projects - this plan could spin off several potential projects for students
- Kent Smith, FWC: Yes. That works.
- Kent Smith, FWC: The revised combination of Strategies works well.
- Shelley Alexander Santa Rosa: How many oyster restoration projects is TNC involved with around the world?
- Anne Birch: many, I don't know the # but we're in several countries other than the U.S.

- Portia Sapp: Here is an open opportunity for schools. It is a freshwater system but could be expanded.
- Portia Sapp: https://urldefense.com/v3/__https://www.myflorida.com/apps/vbs/vbs_www.ad_r2.view_ad?advertisement_key_num=156596__;!!PhOWcWs!ieCD-UrJwnJyFFmlcLKLEVdI974AkJ52FQO1b5VODwqZX9Ue-Z5i4wLZpLVaT7M$
  Please share with anyone that may be interested.

**Messaging regarding Pensacola Bay Oysters**

- Logan McDonald: Thriving Oysters, Thriving Bay
- Logan McDonald: Restore the Reefs, Restore the Bay
- Matt Posner: Save the bay, eat an oyster
- Matt Posner: Eat an oyster, save the bay
- Chris Verlinde: Logan, what did you use for your marketing materials when you interviewed?
- Logan McDonald: Restore the reefs, protect a way of life
- Mark Jackson: A Sustainable Future has Oysters in it.
- Matt Posner: Home grown Pensacola Oysters
- Logan McDonald: Fuel your body, feed our soul, save/love the bay
- Matt Posner: Healthy Oysters, Healthy Bay, Healthy Pensacola
- Logan McDonald: Save the oysters, sustain our communities
- Christian Wagley: Yes--to Donald's point--LOCAL oysters
- Portia Sapp: Stewardship is everyone's responsibility.
- Kent Smith, FWC: Oysters for Life!
- Shelley Alexander Santa Rosa: East Bay Oysters have a long historical reputation in the Name Recognition like Blue Point oysters
- Logan McDonald: Chris, it was something about not being shellfish and turn the tide, I can't remember the detail right now
- Logan McDonald: Eat where you live, protect where you live
- Whitney Scheffel: I found it!! "Don't Be Shellfish, The Bay Needs You. Help Us Turn the Tide"
- Whitney Scheffel: The Oyster as the Heart of the Community
- Chris Verlinde: I Love that!
- Matt Posner: Pensacola Bay Oyster Co. has done a fantastic job with their marketing!

**Concluding thoughts**

- Kent Smith: Great meeting!  We've come a long way and bringing this plan in for a landing is quite an achievement.
- Matt Posner: Great work everyone!
- Chris Verlinde: Thanks!

## Appendix #4 - Project Schedule & Workplan

| PBS STAKEHOLDER WORKING GROUP MEETING SCHEDULE AND WORKPLAN | | |
|---|---|---|
| **STANDING UP AND ORGANIZATION OF THE PBS STAKEHOLDER WORKING GROUP** | | |
| *TNC/Facilitated Solutions LLC Stakeholder Assessment and Report* | *May-Sept. 2019* | *TNC contracted Facilitated Solutions, LLC, based in Tallahassee, to conduct a series of stakeholder interviews and meetings in the community outline key issues and to recommend stakeholder representatives on a Working Group. Facilitated Solutions LLC subsequently designed and facilitated the Working Group meetings and process going forward.* |
| *Stakeholder Working Group Questionnaire* | *Sept. 2019* | *Working Group members completed a questionnaire in advance of the Organizational Meeting* |
| **Meeting I.**<br>**Studer Institute** | Oct. 9, 2019 | Scoping and organizational meeting, review of the assessment report and questionnaire, and review and refinement of overall project purpose, vision and goal framework. |
| **Meeting II.**<br>**UF/IFAS**<br>**SRC Extension** | Nov. 15, 2019 | Introduction to tools (e.g. oyster calculator, etc.) and member requested presentations on oyster ecology and restoration. Review and refinement of vision themes and goal framework. |
| **SCOPING OF PBS ISSUES, IDENTIFICATION OF PERFORMANCE MEASURES & OPTIONS** | | |
| **Meeting III.**<br>**Sanders Beach** | Jan. 15, 2020 | Presentations on regulatory management roles and framework for oysters, and strategic communications. Review and refinement of vision goals (4) framework continued. Introduction to potential performance measures to evaluate strategies. |
| **Meeting IV.**<br>**Virtual Meeting**<br>**Zoom Platform** | April 9, 2020 | Presentations on Oyster Habitat Restoration Suitability Model, Pensacola & Perdido Bays Estuary Program (PPBEP) and Gulf of Mexico Ecosystem Service Logic Models & Socio-Economic Indicators-GEMS Project. Review of draft vision theme and objectives, identification of strategies and related performance measures to evaluate strategies. |
| **Meeting V.**<br>**Virtual Meeting**<br>**Zoom Platform** | May 19, 2020 | Member requested presentations on FDEP Responsibilities in Oyster and Estuarine Management in Florida, An Economic Research Agenda for the PBS, and Shell Budget Briefing. Review testing acceptability and refinement of strategies in the 4 goal areas, review performance measures for evaluating strategies, and identify potential Plan implementation actions and steps. |
| **Watermen Workshop**<br>**Virtual Meeting**<br>**Zoom Platform** | June 4, 2020 | Workshop with Working Group watermen stakeholders to hear their comments and perspectives regarding draft Objectives and Strategies. |
| **BUILDING CONSENSUS ON PBS OYSTER ECOSYSTEM-BASED FISHERIES MANAGEMENT PLAN** | | |
| Update and Presentation to PPBEP | July 14, 2020 | Presentations by TNC to the Pensacola & Perdido Bays Estuary Program's Technical Advisory Committee on the Plan goals and framework. |
| **Meeting VI.**<br>**Virtual Meeting**<br>**Zoom Platform** | July 22, 2020 | Member requested presentations. Review of comments and suggestions from Watermen Workshop. Review testing acceptability and refinement of strategies in the 4 goal areas, review performance measures for evaluating strategies, and identify potential Plan implementation actions and steps. |
| **Meeting VII.**<br>**Virtual Meeting**<br>**Zoom Platform** | September 28, 2020 | Test acceptability and refinement of strategies and action steps for the Goals (A-D). Review and revise performance measures. |

| | | |
|---|---|---|
| Update and Presentation to PPBEP | October 7, 2020 | Presentation by TNC to the Pensacola & Perdido Bays Estuary Program's Policy Board on the Plan goals and framework. |
| **Meeting VIII.**<br>**Virtual Meeting**<br>**Zoom Platform** | October 21, 2020 | Test acceptability and refinement of strategies and action steps for each of the Goals in turn. |
| **FINALIZING CONSENSUS ON PBS OYSTER ECOSYSTEM-BASED FISHERIES MANAGEMENT PLAN** | | |
| **Meeting IX.**<br>**Virtual Meeting**<br>**Zoom Platform** | Nov. 18, 2020 | Test acceptability and refinement of strategies and action steps for each of the Goals in turn. Conduct strategies prioritization exercise. Evaluate habitat suitability spatial maps for identifying strategies. Approve the PBS Oyster Ecosystem-Based Fisheries Management Plan framework (Goals/Objectives/Strategies/Actions). |
| Watermen Workshop #2<br>**Virtual Meeting**<br>**Zoom Platform** | December 8, 2020<br>5:30 PM CT | Review strategies and actions with watermen, and solicit watermen feedback. |
| Update and Presentation to PPBEP | January 2021<br>Date TBD | Presentations by TNC to the Pensacola & Perdido Bays Estuary Program on the Plan's progress and the Estuary Program's role in implementing the Plan. |
| **Meeting X.**<br>**Virtual Meeting**<br>**Zoom Platform** | Jan. 21, 2021 | Refinement of actions steps for strategies incorporating watermen's feedback. Reaffirmation of Plan Framework. Approve the PBS Oyster Ecosystem-Based Fisheries Management Plan draft outline. |
| **Meeting XI.**<br>**Virtual Meeting**<br>**Zoom Platform** | Feb. 17, 2021 | Review and consensus testing of Draft Plan and implementation guidance, and agreement on Draft Plan. |
| **Meeting XII.**<br>**Virtual Meeting**<br>**Zoom Platform** | March 17, 2021 | Refinement as needed, and agreement on the PBS Oyster Ecosystem-Based Fisheries Management Plan. Plan will be presented to relevant agencies for evaluation and implementation. Working Group acknowledgement and celebration of completed Plan. |
| *Presentation of final PBS Oyster Ecosystem-Based Fisheries Management Plan to the PPBEP* | *April 2021* | *Presentation by TNC and Working Group members to the Pensacola & Perdido Bays Estuary Program on the Plan and the Estuary Program's role in implementing the Plan.* |

## Appendix #5 – Oyster Centric Projects in the Pensacola Bay System

(*from Whitney Scheffels' February 17, 2021 Presentation)*

| Agency | Funding Source | Project Title | Purpose | Funding Allocated |
|---|---|---|---|---|
| 1. PPBEP | FDEP State App. | National Coastal Condition Assessment | Water Quality, Sediment, Fish, Human Health | $65 K |
| 2. PPBEP | FDEP State App. | National Wetlands Condition Assessment | Habitat condition | $75 K |
| 3. PPBEP | FDEP State App. | Escambia County – Oyster Mapping (ESC/PNS Bays) | Oyster habitat extent; condition | $100 K |
| 4. TNC | NA | Santa Rosa County – Oyster Mapping (East/BW Bays) | Oyster habitat extent; condition | $150 K |
| 5. Escambia | NFWF | Navy Point Living Shoreline | Habitat restoration | $180 K |
| 6. Escambia | RESTORE (Pot 2) | Pensacola Bay Living Shoreline | Habitat restoration | $592 K |
| 7. Escambia | NFWF (Phase II) | Bayou Chico Water Quality Improvements | Water Quality | $11 M |
| 8. Escambia | RESTORE (Pot I) | Carpenter Creek/Bayou Texar WMP | Water Quality | $1.3 M |
| 9. TNC | NFWF GEBF | East Bay Oyster Habitat Restoration – Phase II | Habitat restoration | $15.1 M |
| 10. Escambia | RESTORE (Pots 2/3) | Bayou Chico Contaminated Sediment Remediation | Sediment Quality | $11 M |
| 11. FDEP | NFWF | Project Greenshores - Phase II | Habitat restoration | $19 K |
| 12. USA/DISL | FDEP (Mini Grant) | Fish Community Video Surveys | Fish community pre restoration | $18 K |
| 13. KPB/FDEP | NFWF | Residential Living Shorelines (Bayous Texar and Grande) | Shoreline protection; habitat | TBD |

| Agency | Funding Source | Project Title | Purpose | Funding Allocated |
|---|---|---|---|---|
| 14. ACF | RESTORE | Oyster Shell Recycling Program (Baldwin) | Habitat restoration; education/outreach | NA |
| 15. KPB | RESTORE | Oyster Shell Recycling Program (Escambia) | Habitat restoration; education/outreach | NA |
| 16. SeaGrant/SRC | RESTORE | Oyster Shell Recycling Program (Santa Rosa) | Habitat restoration; education/outreach | NA |
| 17. SRC | FDEP | Floridatown Living Shoreline Project | Shoreline protection; Habitat | $125 K |
| 18. FWC/FDACS | NRDA | FL Oyster Cultch Placement Project | Habitat Restoration; Fish & Wildlife | $5.3 M |
| 19. FWC | NRDA | FL Gulf Coast Habitat Suitability – Oyster Restoration | | $2.8 M |
| 20. DOI | NRDA | Seagrass Recovery Project @ GUIS – Naval Live Oaks | Seagrass restoration | $136 K |
| 21. SRC | RESTORE (Pot 3) | Navarre Beach Effluent Relocation Project & Monitoring | Water Quality | $12 M |
| 22. SRC/UWF | Same as above | Water Quality Monitoring SRS (pre/post) – 2 years | Water Quality | |
| 23. SRC | Various | New Wastewater Treatment Plant - Milton | Water Quality | $28 M |
| 24. FDEP | NRDA | Pensacola Bay Unpaved Roads Initiative | Water Quality; Sediment | |
| 25. FWRI | NRDA | Bay Scallop Restoration Project (Region 1 - SRS) | Fish & Wildlife | |
| **Agency** | **Funding Source** | **Project Title** | **Purpose** | **Funding Allocated** |

| | | | | |
|---|---|---|---|---|
| 26. FWC | MRTF | GIS Assessment: Framework for Restoration and Mgt. 2020 | Assessment; Management | |
| 27. SRC | RESTORE | Yellow River Marsh Preserve State Park Restoration | Habitat restoration | |
| 28. City of GB | Various | Deadman's Island Restoration in PBS | Habitat; Shoreline protection; Sediment | |

## Appendix #6- Clean List of the Overarching Approaches, Vision Themes, Goals, Outcomes & Objectives, Strategies and Actions

*The strategy statements listed under each theme reflect the changes made by the PBS Working Group during the January 21, 2021 Working Group meeting. These strategies will continue to be refined and added to and won't be adopted by the Working Group until the final meeting in March 2021.*

*The number in parenthesis is the Working Group's average ranking of that strategy conducted at the November 2020 meeting. The Strategies are listed from highest to lowest in rating values. Strategies that achieve an average rating of from 10 - 8 were classified as: Priority 1 Strategies = Important To Do Now. Strategies that achieve an average rating of from 7 - 5 were classified as: Priority 2 Strategies = Important, But Less Time Sensitive. Strategies that achieve an average ranking of from 4 - 1 were classified as: Priority 3 Strategies = As Time and Resources Allow.*

### SECTION I. WORKING GROUP GOALS, OBJECTIVES, AND DRAFT PROPOSED STRATEGIES AND ACTIONS

### WORKING GROUP OVERARCHING APPROACHES

1. Utilize the HSM as a means for identifying areas for oyster reef restoration and the siting of aquaculture facilities.
2. Evaluate non-traditional methods for implementing the plan's management and restoration actions (e.g., OysterCorps, etc.).
3. Utilize models and other relevant information on climate change impacts to influence adaptive, sustainable reef management.
4. Identify local partners to coordinate and collaborate with the lead entities on the implementation of strategies (stakeholders: e.g., watermen, citizen scientists, advocacy groups, NGOs, universities, counties and other local governments, PPBEP).
5. Include commercial fishermen in discussions of and to help work on management, restoration design, and implementation (locations, size, total coverage, clutching, etc.), establishment of permanent closed areas, shell recycling, shelling, oyster relaying, mentoring, and workforce entry development, etc.

### GOAL A: A HEALTHY AND PRODUCTIVE OYSTER REEF ECOSYSTEM

**VISION THEME A:** The oyster reef ecosystem is managed in a manner that supports ecosystem services by protecting and enhancing the habitat and resource in a sustainable and productive manner.
**GOAL:** The Pensacola Bay System sustains a healthy and productive oyster reef ecosystem.
**OUTCOME:** By 2030, the oyster reef ecosystem within the Pensacola Bay is managed in a sustainable manner providing measurable ecosystem services.

## OBJECTIVES

**Oyster Populations**

1. Measurements of oyster reef and population conditions (including larval availability, spat settlement, Spawning Stock Assessment, shell budgets) are defined and quantifiable, with target and threshold levels identified.
2. Oyster recruitment and survivorship occurs in the estuary on an annual basis at a level that sustains oyster harvest and ecosystem services from harvested and non-harvested oyster reefs.
3. Spawning stock biomass and parental standing stock has increased across the ecological gradients (e.g., salinity, dissolved oxygen) appropriate for oyster growth and survival
4. Shell-budget needs are attained on both harvested and non-harvested fished and non-fished oyster reefs to meet the management objectives of fishing, water filtration and fish production while oyster reef restoration is underway.

**Ecosystem Service**

5. Key ecosystem services and ecological health indicators are defined and measurable, with identified target and threshold levels.

**Substrate**

6. Policies and programs are established and implemented that provide the means to return a significant portion of the harvested oyster shell back to the PBS for substrate needed for larval recruitment to enhance population productivity on harvested and non-harvested oyster reefs.
7. Abundant oyster settlement substrate exists across the estuarine ecological gradients, where appropriate for oyster growth and survival.

**Future Conditions**

8. Climate-ready considerations are incorporated into restoration and management plans for the PBS to consider changes in management and future environmental conditions.
9. Impacts and activities from future climate scenarios affecting the health and restoration of the PBS ecosystem are considered and addressed to minimize negative effects to the PBS ecosystem.

## ECOLOGICAL STRATEGIES AND ACTIONS

A. Use data collection, monitoring, status assessment data to inform management of oyster populations. (Priority 1- 9.1 rating)
   *Action A-1.):* Develop and implement a monitoring plan that references methodologies used.
   *Action A-2.):* Develop shell budget model scenarios.
   *Action A-3.):* Implement a spat collection program throughout the bay to inform restoration of the habitat and fishery.
B. Enhance the monitoring and accuracy of harvested and non-harvested reefs and aquaculture stock data collection and reporting methods for inclusion in recovery targets (restoration and management). (Priority 1- 8.2 rating)
   *Action B-1.):* Design and implement a program(s) to supplement state monitoring activities (e.g., Oyster Corps).
C. Establish restoration and management targets for functional harvested and non-harvested oyster reefs using 1-3 ecological health indicators (e.g., amount of water filtered by oysters, amount of

juvenile fish enhancement by reefs; seagrass habitat and other adjacent ecosystems established or restored). (Priority 1- 8.2 rating)

*Action C-1.):* Create and manage a prioritized list with spatially explicit maps of restoration projects for the bay system based on the Habitat Suitability Model and restoration and management targets.

*Action C-2.):* Establish ecosystem service targets to manage the Bay System (e.g., water filtration, rec. fishing, and denitrification).

D. Develop and seek a long-term funding source for the development of a dashboard with key metrics and indicators for monitoring ecosystem health that is used across programs and projects. (Priority 2- 7.8 rating)
E. Evaluate the development of a policy that would require setting sustainable harvest goals and placing limitations on partial and/or a complete closure to harvesting based on the results of data (e.g., stock assessment) collected and evaluated under a comprehensive monitoring program designed to sustainably manage the resource. (Priority 2- 5.8 rating)

*Action E-1.)*: Co-management advisory committee assess and make a recommendation to the state.

F. Implement policies and programs for the return of sufficient oyster shell back to the PBS to support sustainable oyster populations and demographic targets and thresholds. (Priority 1- 8.1 rating)

*Action F-1.):* Examine existing laws and create novel policies and programs to support return of shell back to the system (e.g., TX law requires return of material to the water).

*Action F-2.):* Examine if policies should also apply to the State's fossil shell sources.

*Action F-3.):* Demonstrate the benefits of shell recycling programs to return shell back into the System.

*Action F-4.):* Identify the current location, quantity, and fate of shell material as a by-product of shucking.

G. Manage and remediate sources of sedimentation to the estuary and sediment sinks in the estuary impacting the oyster reef ecosystem. (Priority 1- 9.2 rating)

*Action G-1.):* Identify sources of sediment into estuary.

*Action G-2.):* Identify how sediment sinks in the bay system affects oysters.

H. Restore and create reef structures suitable for sustained oyster settlement that enhance ecosystem services in designated restoration areas. (Priority 1- 8.9 rating)

*Action H-1.):* Design and implement projects to achieve multiple ecosystem service targets (e.g., recreational fishing, shoreline protection).

*Action H-2.):* Implement restoration projects simultaneously rather than sequentially.

I. Evaluate the effects of land use changes in the watershed on the health of oysters (e.g., floodplain forests, marshes, open spaces). (Priority 1- 8.6 rating)

*Action I-1.):* Track land use changes over time (retrospectively and prospectively) to determine if future changes could adversely affect oyster viability in the system.

*Action I-2.):* Proactively address potential adverse impacts.

## GOAL B: THE MANAGEMENT AND REGULATION OF THE OYSTER FISHERY AND AQUACULTURE INDUSTRY

**VISION THEME B:** The management, regulation, restoration and enhancement of the oyster fishery and aquaculture industry is conducted by working collaboratively with stakeholders to create a plan that ensures that protection of the fishery and habitat is monitored and implemented in a manner that is supported by science, data, and field and industry experience and observation, and provides fair and equitable access to the oyster resource.

**GOAL:** A productive, and sustainably managed and regulated oyster reef fishery ~~and ecosystem~~ and aquaculture industry in the Pensacola Bay System.

**OUTCOME:** By 2030, oyster reefs in the Pensacola Bay System support a sustainably managed and productive fishery and aquaculture industry supported by stakeholders, using the best available science and monitoring to manage and regulate fishery and aquaculture activities in a fair and equitable manner.

### OBJECTIVES

1. Establish sustainable biological and production thresholds and targets for wild harvest.
2. For wild harvest and aquaculture, ensure management is adaptable and re-assessed on a periodic basis to account for changes in climate and other future environmental conditions.
3. Growth and expansion of the oyster aquaculture industry in the GPSBS uses best management practices that have broad support of the industry and community, and enables economic opportunities, while maximizing beneficial services of aquaculture, and preventing negative effects to the PBS and its users.

### WILD HARVEST AND AQUACULTURE STRATEGIES AND ACTIONS

A. Annually assess the status of oysters in the PBS and provide regular updates. (Priority 1- 9.4 rating)
B. Develop oyster population and demographic targets and biological thresholds (at the smallest scale that makes sense to inform harvest targets). (Priority 1- 8.4 rating)
   *Action B-1.):* Apply routine monitoring data and shell budget models.
   *Action B-2.):* Define the scale used for the specific boundaries.
C. Manage the commercial oyster industry and recreational oyster fishing to provide for sustainable spat production and spawning and the recovery of oyster populations. (Priority 2- 7.6 rating)
   *Action C-1.):* Evaluate management scenarios (e.g., closures, rotational harvest, non-harvested spawning reefs, Territorial Use Rights of Fishing, limited entry, regulations, transferable license program).
   *Action C-2.):* Evaluate existing allowable and minimally destructive alternative gear type options and harvest methods, including the use of experimental gear for wild oyster harvesting.
D. Enhance the monitoring and accuracy of commercial and recreational oyster harvest and aquaculture stock data collection and reporting methods for inclusion in fisheries management targets. (Priority 2- 7.2 rating)
   *Action D-1.):* Develop and implement a monitoring plan that references methodologies used.
   *Action D-2.):* Develop shell budget model scenarios. (*Lead Entity and Key Partners:* FWC)
   *Action D-3.):* Collect annual estimate of aquaculture harvest (implement via FDACS).
   *ActionD-4.):* Evaluate whether recreational data should be monitored, how it would be implemented, and in relation to a cost/benefit analysis for collecting the data.

E. Promote opportunities for agencies, law enforcement and watermen to work together on enforcement of oyster resource regulations. (Priority 2- 7.7 rating)
*Action E-1.):* Evaluate strategies for increasing the capacity of enforcement agencies.
*Action E-2.):* Track law enforcement capacity over time.
*Action E-3.):* Evaluate, and if needed, improve the process for watermen to communicate with law enforcement.
*Action E-4.):* Develop a process for managers and watermen to work with state attorneys and judges on enhancing enforcement and evaluating appropriate penalties.

F. Restore and create reef structures suitable for sustained oyster settlement and production for harvesting. (Priority 1- 8.1 rating)
*Action F-1.):* Work with watermen to evaluate cultching techniques for growing oysters (e.g., historical non-traditional, trees).
*Action F-2.):* Design and implement projects to achieve oyster fishery production targets.
*Action F-3.):* Design projects that include both fished and non-fished reefs.
*Lead: FWC Partners: universities, NOAA for funding*

G. Investigate oyster shell and oyster relay programs to move both cultch and live oysters to more favorable habitat. (Priority 2- 6.5 rating)
*Action G-1.):* Use the HSM, information on larval source areas and environmental conditions to inform the potential programs.
*Action G-2.):* Research similar relay programs in other areas as potential models and cautionary tales.

H. Create public/seafood industry stakeholder programs to cooperatively manage harvested reefs. (Priority 2- 6.4 rating)
*Action H-1.):* Evaluate relaying oysters and/or distributing seed programs.

I. Support and prepare for the expected growth of aquaculture in the PBS. (Priority 2- 6.7 rating)
*Action I-1.):* Develop an aquaculture growth plan that outlines and defines optimal expansion of the aquaculture industry
*Action I-2.):* Develop Spatial Area Management Plan that maps ideal areas for current and future growth using abiotic (DO, salinity, temperature, etc.) and social variables (proximity to docks, exclusion zones, etc.).
*Action I-3.):* Establish Aquaculture Use Zones (AUZ).

J. Characterize and quantify current biological (e.g., red tide) and chemical hotspots (e.g., pesticides, heavy metals) and inputs into the PBS and their effect on oysters. (Priority 1- 8.9 rating)
*Action J-1.):* Commission studies to collect and analyze data.

## GOAL C: A THRIVING ECONOMY CONNECTED TO THE PENSACOLA BAY SYSTEM

**VISION THEME C:** The Pensacola Bay System oyster fishery, aquaculture, and oyster reef ecosystem serve as key components of the region's cultural heritage and economic viability and serve to sustain an economically viable and thriving fishery, recreation and tourism industry.
**GOAL:** A healthy Bay System contributes measurably to a thriving economy for the Pensacola Bay region.
**OUTCOME:** By 2030, recovery of the Pensacola Bay ecosystem spurred by restoration of oyster reef ecosystems and a sustainable oyster fishery and development of aquaculture has led to a thriving economy that provides opportunities for sustainable and responsible industry, development, business, recreation and tourism.

### OBJECTIVES

1. Oyster habitat, oyster harvesting, and oyster aquaculture are recognized and valued as key components of the local economy and cultural heritage by the PBS community and the state.
2. Economic indicators of the commercial oyster fishery, aquaculture industry and associated industries in the PBS demonstrate increasing viability and growth over 10 years.
3. Investments in water quality management are being made with the goal of protecting and supporting the oyster habitat and oyster aquaculture industry (including land use impacts).
4. The oyster fishery and oyster aquaculture industries provide economic and career growth opportunities.
5. Industries, and businesses within the PBS are supportive of and compatible with a healthy, well-managed, and resilient PBS ecosystem.
6. Government policies, plans and regulations affecting oysters are increasingly compatible with a healthy and well-managed ecosystem while maintaining a thriving economy and supporting cultural heritage.

### THRIVING ECONOMY STRATEGIES AND ACTIONS

A. Monitor key economic indicators for changes over time based on restoration efforts in the PBS. (Priority 2- 7.9 rating)
   *Action A-1.):* Characterize the connection between enhanced recreational fishing and tourism opportunities and oyster reef habitat quality and quantity.
   *Action A-2.):* Identify which economic indicators will be most valuable to monitor.
   *Action A-3.):* Include indicators that characterize and track the following: key ecosystem services of oyster habitat (e.g., water quality and sport fisheries enhancement), oyster fishery and oyster aquaculture industries.
B. Promote sustainable wild harvest and cultured oysters and the value of ecosystem services provided by restored oyster populations in the PBS. (Priority 1- 8.1 rating)
   *Action B-1.):* Develop and implement a marketing and communication plan, which celebrates oysters as an important feature of the area's cultural heritage.
   *Action B-2.):* Promote and market certification programs and engage with certification agencies and organizations to certify Pensacola Bay oysters.

C. Align local and state government policies and practices that support oyster restoration, fisheries and aquaculture. (Priority 1- 8.2 rating)
*Action C-1.):* Evaluate existing policies and practices and recommend adjustments.

## GOAL D: AN ENGAGED AND INFORMED PUBLIC AND DECISION-MAKERS

**VISION THEME D:** Stakeholders of the Pensacola Bay System are committed to working together collaboratively to serve as a hub for best practices and research, and provide education and communication on the importance of maintaining the health and productivity of the oyster reef ecosystem, fishery, and aquaculture, and the role they play in ensuring a thriving community.
**GOAL:** The oyster reef ecosystem of the Pensacola Bay System is supported and protected by an engaged and informed public, and decision-makers.
**OUTCOME:** By 2030, the Pensacola Bay System stakeholders are informed of the importance of sustaining the health of the Bay System, and work actively to invest in and implement the Plan.

### OBJECTIVES

1. Establish a coordinated outreach and education plan to increase public and stakeholder awareness and support for a healthy and well-managed oyster and PBS ecosystem.
2. The Pensacola and Perdido Bays Estuary Program incorporates and promotes the recommendations of the PBS oyster plan.

### DRAFT PUBLIC EDUCATION COMMUNICATION STRATEGIES AND ACTIONS

A. Build a broad constituency to support outreach efforts that generate and increase public awareness and support for a healthy and well-managed oyster habitat and fisheries and the ecosystem services they provide. (Priority 1- 8.8 rating)
*Action A-1.):* Engage businesses, industries, non-profits, and local governments to gain their support and include them in outreach and education efforts.
*Action A-2.):* Address both positive and negative consequences of depleted/lost oyster reef habitat respectively.
*Action A-3.):* Seek public buy-in for supporting restoration efforts by highlighting the benefits to and enlisting the support of recreational fishing, ecotourism, and water sports interests.
*Action A-4.):* Establish an oral history project to document the history, present day circumstances, and future visions for oysters by the community in the Pensacola Bay System.
B. Expand existing or create new mentoring and education programs focused on restoration and monitoring of oyster habitat and fisheries and training for aquaculture farming that involves all sectors of the community. (Priority 1- 8.1 rating)
*Action B-1.):* Develop and support new and existing volunteer citizen-science programs for monitoring, data collection, and restoration efforts for oyster restoration projects at all levels (e.g., youth, adult, K-12, and colleges and universities).
*Action B-2.):* Demonstrate the benefits of shell recycling programs to return shell back into the System.
*Action B-3.):* Develop metrics for public engagement and education programs.

*Action B-4.):* Develop and support education programs that focus on oysters as drivers of restoration and management of the PBS.

*Action B-5.):* Develop education and mentoring programs to create a new oyster workforce for restoration and monitoring, wild harvest, and aquaculture industries.

*Action B-6.):* Design and implement local community initiatives for growing oysters for their ecosystem services (i.e., Mobile Bay oyster gardening), ensuring that science-based best practices are utilized.

*Action B-7.)*: Develop a "future farmers" program that helps locals in the area learn about aquaculture and the potential for making a living by growing oysters in the PBS. (e.g., Partner with existing programs such as Sea Grant MS/AL programs).

C. Demonstrate the economic and social benefits derived from the ecosystem services provided by oyster fisheries and restored/natural reef habitat. (Priority 1- 8.2 rating)

*Action C-1.):* Compile information on the economic and social benefits accruing from restored reefs (fished and non-fished).

*Action C-2.):* Seek out partnerships with researchers that have been doing this work.

## SECTION II STRATEGIES REFERRED TO OTHER ENTITIES

### STRATEGIES AND ACTIONS TO BE REFERRED FOR EVALUATION TO THE PENSACOLA AND PERDIDO BAYS ESTUARY PROGRAM

A. **Leveraging Resources.** Evaluate and ensure that the PBS Plan works synergistically with and leverages the benefits of the other strategies, plans, and initiatives that are ongoing or planned for the PBS. (Priority 1- 8.6 rating)

*Action A-1.):* Enlist and work with advocacy groups to help improve conditions in the PBS.

B. **Advisory Committee.** Establish a co-management advisory committee under the auspices of the Estuary Program to periodically evaluate and adapt the plan, as needed, and review effectiveness of management decisions. Composition: state management agencies (FWC, FDACS, FDEP), watermen, and other key stakeholders. (Priority 2- 6.6 rating)

*Action F-1.):* Annually assess and report on the progress of completing the Plan's Actions.

C. **Funding.** Create a comprehensive funding approach for Plan implementation including a comprehensive analysis for future grant funding for strategies, including support for sustainable monitoring deriving from the Plan. (Priority 1- 8.2 rating)

*Action C-1.):* Evaluate funding sources for implementation of management and restoration strategies included in the PBS Ecosystem-Based Oyster Fisheries Management Plan (e.g., region-wide Gulf trustee implementation group for NRDA funding.)

*Action C-2.):* Evaluate grant opportunities from recommendations included in the PBS Ecosystem-Based Oyster Fisheries Management Plan.

*Action C-3.):* Allocate sufficient funding for habitat restoration based on the oyster HSM and restoration and management targets (e.g., Develop funding source for cultch used in oyster reef restoration.)

*Action C-4.):* Allocate sufficient funding for restoration of harvested reefs and aquaculture farms based on the oyster Habitat Suitability Model (HSM).

*Action C-5.):* Evaluate funding sources to generate awareness, education, and support for a healthy oyster and PBS ecosystem.

*Action C-6.):* Develop and seek long-term funding for a comprehensive monitoring program that is used across programs and projects with a dashboard on metrics and indicators to leverage resources, standardize the metrics and indicators measured, and to share data.

*Action C-7.):* Work across estuary programs to fund and leverage large scale monitoring for the Panhandle Region – Perdido to Suwanee.

*Action C-8.*): Develop and seek a funding source to provide cultch for habitat restoration.

D. **Long-Term Environmental Impacts.** Consider the impacts including but not limited to ocean acidification and climate change/sea level rise, and population growth on the oyster resource. (Priority 2- 6.6 rating)
E. **Water Quality Standards.** Develop a set of water quality strategies as common ground that can address pollution and sediment impacts on the oyster resource. (Priority 1- 8.5 rating)
F. **Nutrient Credit Trading.** Consider nutrient credit trading impacts on oyster fishery/resource.
*Lead: PPBEP Partners: agencies, local governments, stakeholders as appropriate*
G. **Research Needs.** Conduct research needed to continue to address and find solutions for oyster disease, predation and oyster spat. (Priority 2- 7.7 rating)
H. **Other Habitat Restoration.** Seagrass and other SAV, and wetland and riparian habitat should be restored concurrently to work synergistically with oyster habitat restoration to enhance restoration of the PBS. (Priority 2- 7.8 rating

**Appendix #7 Implementing Priority Strategies – Lead, Partners and Resources**

*The text of strategies highlighted in yellow were reviewed and added to during the February 17, 2021 Working Group discussions.*

| **GOAL A: ECOLOGICAL**<br>**PRIORITY 1 STRATEGIES/ACTIONS** | **LEAD/PARTNERS** | **RESOURCES** |
|---|---|---|
| **Strategy A.** Use data collection, monitoring, annual stock assessment data and comprehensive shell budget models to inform management of oyster populations.<br>(clarify shell budget model process) | **Lead**: FWC/FWRI<br>**Partners**: PPBEP, NWFWMD, DEP/Aquatic Preserves, universities, local data collectors/citizen scientists, watermen | Student help from universities (UWF/UF), |
| *Action A-1.):* Develop and implement a monitoring plan that references methodologies used. | **Lead**: FWC/FWRI<br>**Partners**: | (In Apalachicola, expand) |
| *Action A-2.):* Develop shell budget model scenarios. | **Lead**: FWC/FWRI<br>**Partners**: | Available models (LA) |
| *Action A-3.):* Implement a spat collection program throughout the bay to inform restoration of the habitat and fishery | **Lead**: BFA<br>**Partners**: UF/IFAS/Sea Grant | Project Oyster Pensacola (spat collection on docks) |
| **Strategy B.** Enhance the monitoring and accuracy of harvested and non-harvested reefs and aquaculture stock data collection and reporting methods for inclusion in recovery targets (restoration and management). | **Lead**: FWC/FDACS/PPBEP<br>**Partners**: Local Gov'ts, aquaculture/harvesting industry (Cluster), universities | Watermen, GC Seafood Cluster, Student help from universities (UWF/UF) |
| *Action B-1.):* Design and implement a program(s) to supplement state monitoring activities (e.g., Oyster Corps). | **Lead**:<br>**Partners**: | |
| **Strategy C.** Establish restoration and management targets for functional harvested and non-harvested oyster reefs using 1-3 ecological health indicators (e.g., amount of water filtered by oysters, amount of juvenile fish enhancement by reefs; seagrass habitat and other adjacent ecosystems established or restored). | **Lead**: FWC<br>**Partners**: FDEP/Aquatic Preserve | Ryan Gandy/Alan Pierce project; citizen science program UWF |

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| *Action C-1.):* Create and manage a prioritized list with spatially explicit maps of restoration projects for the bay system based on the Habitat Suitability Model and restoration and management targets. | **Lead**: FWC<br>**Partners**: FDEP/Aquatic Preserve | |
| *Action C-2.):* Establish ecosystem service targets to manage the Bay System (e.g., water filtration, rec. fishing, and denitrification). | **Lead**: FWC<br>**Partners**: FDEP/Aquatic Preserve | |

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| **Strategy F.** Implement policies and programs for the return of sufficient oyster shell back to the PBS to support sustainable oyster populations and demographic targets and thresholds. | **Lead**: PPBEP and local gov.<br>**Partners**: FWC/FDACS aquaculture industry, watermen | Use of FDACS' USACE permit |
| *Action F-1.):* Examine existing laws and create novel policies and programs to support return of shell back to the system (e.g., TX law requires return of material to the water). | **Lead**: FWC/FDACS<br>**Partners**: UF Levin College of Law, Sea Grant/PPBEP | |
| *Action F-2.):* Examine if policies should also apply to the State's fossil shell sources. | **Lead**:<br>**Partners**: | |
| *Action F-3.):* Demonstrate the benefits of shell recycling programs to return shell back into the System. | **Lead**:<br>**Partners**: | |
| *Action F-4.):* Identify the current location, quantity, and fate of shell material as a by-product of shucking. | **Lead**: Local Gov'ts<br>**Partners**: UF, DOH | |
| **Strategy G.** Manage and remediate sources of sedimentation to the estuary and sediment sinks in the estuary impacting the oyster reef ecosystem. | **Lead**: NWFWMD<br>**Partners**: U.S. Geological Survey, local governments, FDOT, FDEP, EPA, NRCS | |
| *Action G-1.):* Identify sources of sediment into estuary. | **Lead**:<br>**Partners**: | Citizen scientists, sport fishers, county monitoring |
| *Action G-2.):* Identify how sediment sinks in the bay system affects oysters | **Lead**:<br>**Partners**: | University student projects, Citizen scientists |
| **Strategy H**. Restore and create reef structures suitable for sustained oyster settlement that enhance | **Lead**: FWC and UF<br>**Partners**: PPBEP, universities, local governments, FDOT, | Watermen, private industry/business, engineering/environmental firms, habitat structure makers, oyster |

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| ecosystem services in designated restoration areas. | NGOs, coastal property owners, DEP, TNC, UF/IFAS/Sea Grant, universities | shell recycling programs, Student projects |
| *Action H-1.):* Design and implement projects to achieve multiple ecosystem service targets (e.g., recreational fishing, shoreline protection). | **Lead**:<br>**Partners**: | |
| *Action H-2.):* Implement restoration projects simultaneously rather than sequentially. | **Lead**:<br>**Partners**: | |
| **Strategy I.** Evaluate the effects of land use changes in the watershed on the health of oysters (e.g., floodplain forests, marshes, open spaces). | **Lead**: Local Governments<br>**Partners**: NWFMD, FDOT, RPC, universities, development community, private sector | Student projects |
| *Action I-1.):* Track land use changes over time (retrospectively and prospectively) to determine if future changes could adversely affect oyster viability in the system. | **Lead**:<br>**Partners**: | |
| *Action I-2.):* Proactively address potential adverse impacts. | **Lead**:<br>**Partners**: | |
| **GOAL B: WILD HARVEST AND AQUCULTURE**<br>**PRIORITY 1 STRATEGIES/ACTIONS** | **QUESTION B**<br>**LEAD/PARTNERS** | **QUESTION A**<br>**RESOURCES** |
| **Strategy A.** ~~Conduct an oyster stock assessment for the PBS with periodic updates.~~<br>Annually assess the status of oysters in the PBS and provide regular updates. | **Lead**: FWC<br>**Partners**: FDACS, universities, NGOs, citizen scientists | FDACS water quality data |
| Shell budget model<br>*No Actions Yet Identified* | **Lead**:<br>**Partners**: | |
| **Strategy B.** Develop oyster population and demographic targets and biological thresholds (at the smallest scale that makes sense to inform harvest targets). | **Lead**: FWC<br>**Partners**: universities | |
| *Action B-1.):* Apply routine monitoring data and shell budget models. | **Lead**:<br>**Partners**: | |

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| *Action B-2.):* Define the scale used for the specific boundaries. | **Lead**:<br>**Partners**: | |
| **Strategy C.** Manage the commercial oyster industry and recreational oyster fishing to provide for sustainable spat production and spawning and the recovery of oyster populations. | **Lead**: FWC<br>**Partners**: PPBEP, universities, Sea Grant, watermen | |
| *Action C-1.):* Evaluate management scenarios (e.g., closures, rotational harvest, non-harvested spawning reefs, Territorial Use Rights of Fishing, limited entry, regulations, transferable license program). | **Lead**:<br>**Partners**: | |
| *Action C-2.):* Evaluate existing allowable and minimally destructive alternative gear type options and harvest methods, including the use of experimental gear for wild oyster harvesting. | **Lead**:<br>**Partners**: | |
| **Strategy D.** Enhance the monitoring and accuracy of commercial and recreational oyster harvest and aquaculture stock data collection and reporting methods for inclusion in fisheries management targets. | **Lead**: FWC<br>**Partners**: universities, Sea Grant, IFAS | |
| *Action D-1.):* Develop and implement a monitoring plan that references methodologies used. | **Lead**:<br>**Partners**: | |
| *Action D-2.):* Develop shell budget model scenarios. (*Lead Entity and Key Partners:* FWC) | **Lead**: FWC<br>**Partners**: | |
| *Action D-3.):* Collect annual estimate of aquaculture harvest (implement via FDACS). | **Lead**: FDACS<br>**Partners**: | |
| *Action D-4.):* Evaluate whether recreational data should be monitored, how it would be implemented, and in relation to a cost/benefit analysis for collecting the data. | **Lead**:<br>**Partners**: | |
| **Strategy F.** Restore and create reef structures suitable for sustained oyster settlement and production for harvesting. | **Lead**: state agencies, NGOs, oyster industry<br>**Partners**: | Students/universities; DWH funding |

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| *Action F-1.):* Work with watermen to evaluate cultching techniques for growing oysters (e.g., historical non-traditional, trees). | **Lead**: FWC<br>**Partners**: universities, Sea Grant, watermen and aquaculture organizations, local county programs | |
| *Action F-2.):* Design and implement projects to achieve oyster fishery production targets. | **Lead**: FWC<br>**Partners**: TNC, universities, NOAA for funding | |
| *Action F-3.):* Design projects that include both fished and non-fished reefs. | **Lead**: FWC<br>**Partners**: TNC, universities, NOAA for funding | |
| **Strategy I.** Support and prepare for the expected growth of aquaculture in the PBS. | **Lead**: FDACS/FWC<br>**Partners**: counties, Sea Grant, NRCS, stakeholders (watermen), GC Seafood Cluster | UWF economic group (HAAS Center) |
| *Action I-1.):* Develop an aquaculture growth plan that outlines and defines optimal expansion of the aquaculture industry. | **Lead**:<br>**Partners**: | |
| *Action I-2.):* Develop Spatial Area Management Plan that maps ideal areas for current and future growth using abiotic (DO, salinity, temperature, etc.) and social variables (proximity to docks, exclusion zones, etc.). | **Lead**: PPBEP<br>**Partners**: | |
| *Action I-3.):* Establish Aquaculture Use Zones (AUZ). | **Lead**:<br>**Partners**: | |
| **Strategy J.** Characterize and quantify current biological (e.g., red tide) and chemical hotspots (e.g., pesticides, heavy metals) and inputs into the PBS and their effect on oysters. | **Lead**: FDEP<br>**Partners**: FWC/FDACS, universities, EPA | Citizen scientists |
| *Action J-1.):* Commission studies to collect and analyze data. | **Lead**:<br>**Partners**: | |
| **GOAL C: THRIVING ECONOMY**<br>**PRIORITY 1 STRATEGIES/ACTIONS** | **QUESTION B**<br>**LEAD/PARTNERS** | **QUESTION A**<br>**RESOURCES** |
| **STRATEGY B.** Demonstrate the economic and social benefits derived from the ecosystem services provided | **Lead**: PPBEP<br>**Partners**: universities, Sea Grant, Visit | TNC in quantifying the ecosystem services; Gulf Breeze EPA Lab, |

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| by oyster fisheries and restored/natural reef habitat. | Pensacola, Chamber of Commerce (for the private sector | Office of Research and Development |
| *Action B-1.):* Compile information on the economic and social benefits accruing from restored reefs (fished and non-fished). | **Lead**:<br>**Partners**: | |
| *Action B-2.):* Seek out partnerships with researchers that have been doing this work. | **Lead**:<br>**Partners**: | |
| **STRATEGY C.** Align local and state government policies and practices that support oyster restoration, fisheries and aquaculture. | **Lead**: PPBEP<br>**Partners**: FWC, counties, stakeholders, local governments; development community; NGOs | Chamber could bring economic development and private resources to the table; FL West and economic arms of local governments. |
| *Action C-1.):* Evaluate existing policies and practices and recommend adjustments. | **Lead**:<br>**Partners**: | |
| **GOAL D: PUBLIC EDUCATION COMMUNICATION**<br>**PRIORITY 1 STRATEGIES/ACTIONS** | **QUESTION B**<br>**LEAD/PARTNERS** | **QUESTION A**<br>**RESOURCES** |
| **STRATEGY A.** Build a broad constituency to support outreach efforts that generate and increase public awareness and support for a healthy and well-managed oyster habitat and fisheries and the ecosystem services they provide. | **Lead**: PPBEP<br>**Partners**: Local gov't's, local partners, Sea Grant, Visit Pensacola, Escambia Co School district/Santa Rosa; private industry (restaurants), DEP | Students, farmers, harvesters, watermen; B-WET Grants |
| *Action A-1.):* Engage businesses, industries, non-profits, and local governments to gain their support and include them in outreach and education efforts. | **Lead**:<br>**Partners**: | |
| *Action A-2.):* Address both positive and negative consequences of depleted/lost oyster reef habitat respectively. | **Lead**:<br>**Partners**: | |
| *Action A-3.):* Seek public buy-in for supporting restoration efforts by highlighting the benefits to and enlisting the support of recreational fishing, ecotourism, and water sports interests. | **Lead**:<br>**Partners**: | |

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| *Action A-4.):* Establish an oral history project to document the history, present day circumstances, and future visions for oysters by the community in the Pensacola Bay System. | **Lead**:<br>**Partners**: | |
| **STRATEGY B.** Expand existing or create new mentoring and education programs focused on restoration and monitoring of oyster habitat and fisheries and training for aquaculture farming that involves all sectors of the community. | **Lead**: Sea Grant<br>**Partners**: FWC, FDACS, universities, K-12, watermen, local governments/counties, career source, Oyster Corps | 4H Ag programs, FFA; FAITC; Gulf Coast Seafood Cluster |
| *Action B-1.):* Develop and support new and existing volunteer citizen-science programs for monitoring, data collection, and restoration efforts for oyster restoration projects at all levels (e.g., youth, adult, K-12, and colleges and universities). | **Lead**:<br>**Partners**: | |
| *Action B-2.):* Demonstrate the benefits of shell recycling programs to return shell back into the System. | **Lead**:<br>**Partners**: | |
| *Action B-3.):* Develop and support education programs that focus on oysters as drivers of restoration and management of the PBS. | **Lead**:<br>**Partners**: | |
| *Action B-4.):* Develop education and mentoring programs to create a new oyster workforce for restoration and monitoring, wild harvest, and aquaculture industries. | **Lead**:<br>**Partners**: | |
| *Action B-5.):* Design and implement local community initiatives for growing oysters for their ecosystem services (i.e., Mobile Bay oyster gardening), ensuring that science-based best practices are utilized | **Lead**:<br>**Partners**: | |
| *Action B-6.)*: Develop a "future farmers" program that helps locals in the area learn about aquaculture and the potential for making a living by growing oysters in the PBS. (e.g., Partner with existing programs such as Sea Grant MS/AL programs). | **Lead**:<br>**Partners**: | |
| **STRATEGY C.** Promote sustainable wild harvest and cultured oysters and the | **Lead**: PPBEP | |

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| value of ecosystem services provided by restored oyster populations in the PBS. | **Partners**: FDACS, universities (UWF), Sea Grant, EPA Lab, Gulf Coast Seafood Cluster, watermen and other stakeholders | |
| *Action C-1.):* Develop and implement a marketing and communication plan, which celebrates oysters as an important feature of the area's cultural heritage. | **Lead**:<br>**Partners**: | |
| *Action C-2.):* Promote and market certification programs and engage with certification agencies and organizations to certify Pensacola Bay oysters. | **Lead**:<br>**Partners**: | |
| **GOAL A: ECOLOGICAL**<br>**PRIORITY 2 STRATEGIES/ACTIONS** | **QUESTION B**<br>**LEAD/PARTNERS** | **QUESTION A**<br>**RESOURCES** |
| **Strategy D.** Develop and seek a long-term funding source for the development of a dashboard with key metrics and indicators for monitoring ecosystem health that is used across programs and projects. | **Lead**: PPBEP<br>**Partners**: FWC, universities, local governments, citizen scientists | |
| *No Actions Yet Identified* | **Lead**:<br>**Partners**: | |
| **Strategy E.** Evaluate the development of a policy that would require setting sustainable harvest goals and placing limitations on or a complete closure to harvesting based on the results of data (e.g., stock assessment) collected and evaluated under a comprehensive monitoring program designed to sustainably manage the resource. | **Lead**:<br>**Partners**: | |
| *Action E-1.)*: Co-management advisory committee assess and make a recommendation to the state. | **Lead**: FWC<br>**Partners**: FDACS, PPBEB, universities, local governments | |
| **GOAL B: WILD HARVEST AND AQUACULTURE**<br>**PRIORITY 2 STRATEGIES/ACTIONS** | **QUESTION B**<br>**LEAD/PARTNERS** | **QUESTION A**<br>**RESOURCES** |
| **Strategy E.** Promote opportunities for agencies, law enforcement and watermen to work together on | **Lead**: FWC<br>**Partners**: universities, watermen, and aquaculture organizations | |

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| enforcement of oyster resource regulations. | | |
| *Action E-1.):* Evaluate strategies for increasing the capacity of enforcement agencies. | **Lead**:<br>**Partners**: | |
| *Action E-2.):* Track law enforcement capacity over time. | **Lead**:<br>**Partners**: | |
| *Action E-3.):* Evaluate, and if needed, improve the process for watermen to communicate with law enforcement. | **Lead**:<br>**Partners**: | |
| *Action E-4.):* Develop a process for managers and watermen to work with state attorneys and judges on enhancing enforcement and evaluating appropriate penalties. | **Lead**:<br>**Partners**: | |
| **Strategy G.** Investigate oyster shell and oyster relay programs to move both cultch and live oysters to more favorable habitat. | **Lead**: FDACS/FWC<br>**Partners**: universities, Sea Grant, FDEP, FDOH, stakeholders (watermen) | |
| *Action G-1.):* Use the HSM, information on larval source areas and environmental conditions to inform the potential programs. | **Lead**:<br>**Partners**: | |
| *Action G-2.):* Research similar relay programs in other areas as potential models and cautionary tales. | **Lead**:<br>**Partners**: | |
| **Strategy H.** Create public/seafood industry stakeholder programs to cooperatively manage harvested reefs. | **Lead**:<br>**Partners**: | |
| *Action H-1.):* Evaluate relaying oysters and/or distributing seed programs. | **Lead**:<br>**Partners**: | |
| **GOAL C: THRIVING ECONOMY**<br>**PRIORITY 2 STRATEGIES/ACTIONS** | **QUESTION B**<br>**LEAD/PARTNERS** | **QUESTION A**<br>**RESOURCES** |
| **Strategy A.** Monitor key economic indicators for changes over time based on restoration efforts in the PBS. | **Lead**: PPBEP<br>**Partners**: universities (UWF), Sea Grant, EPA Lab, stakeholders | |
| *Action A-1.):* Characterize the connection between enhanced recreational fishing and tourism opportunities and oyster reef habitat quality and quantity. | **Lead**:<br>**Partners**: | |

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| *Action A-2.):* Identify which economic indicators will be most valuable to monitor. | **Lead**:<br>**Partners**: | |
| *Action A-3.):* Include indicators that characterize and track the following: key ecosystem services of oyster habitat (e.g., water quality and sport fisheries enhancement), oyster fishery and oyster aquaculture industries. | **Lead**:<br>**Partners**: | |

## Appendix #8- Objectives, Goals and Performance Measures

*Recommended Metrics Associated with Goal Areas & Objectives (to be measured annually)*

| **Goal A: A HEALTHY AND PRODUCTIVE OYSTER REEF ECOSYSTEM** | |
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| **Objectives** | **Recommended Metrics** |
| **Oyster Populations**<br>1. Measurements of oyster reef and population conditions (including larval availability, spat settlement, Spawning Stock Assessment, shell budgets) are defined and quantifiable, with target and threshold levels identified.<br>Goal: Reef area is expanding, and population variables are improving.<br>2. Oyster recruitment and survivorship occurs in the estuary on an annual basis at a level that sustains oyster harvest and ecosystem services from harvested and non-harvested oyster reefs.<br>Goal: Oyster recruitment and survivorship increases throughout the PBS.<br>3. Spawning stock biomass and parental standing stock has increased across the ecological gradients (e.g., salinity, dissolved oxygen) appropriate for oyster growth and survival.<br>Goal: Oyster standing stock and biomass are increasing across appropriate ecological gradients in the PBS.<br>4. Shell-budget needs are attained on both harvested and non-harvested fished and non-fished oyster reefs to meet the management objectives of fishing, water filtration and fish production while oyster reef restoration is underway.<br>Goal: Net shell budgets are positive and increasing on all reef types. | • Stock assessment and shell budget data on all reefs (harvested and non-harvested):<br>• Location, extent/height and amount of oysters and reef structures ($m^2$ and $m^3$; harvestable and non-harvestable).<br>• Density of live oysters, recent boxes and dead shell (number per $m^2$) on defined reef areas.<br>• Total oyster biomass (by reef and/or by reefs with similar management objectives).<br>• Amount (e.g., weight and volume) of cultch and type (see https://oystersentinel.cs.uno.edu/shell-budget type characterization) for shell budget. (Only cultch above the anoxic sediment layer)<br>• Area and relief (spatial configuration and interstitial space) of settlement substrate in the estuary.<br>• Spatial extent and quantity of larvae in the water column and spat settled throughout the PBS (on standardized substrate) by season and year<br>• Funding allocated for restoration |
| **Ecosystem Services**<br>5. Key ecosystem services (fishing and fish production) and ecological health indicators (water filtration/water quality) are defined and measurable, with identified target and threshold levels.<br>Goal: Ecosystem service and health indicator metrics are increasing/improving. | • Established ecosystem service targets are quantified.<br>• Quality and spatial extent of fine sediments present in the bay and their propensity for resuspension and redistribution of pollutants potentially harmful to oysters and people. |
| **Substrate**<br>6. Policies and programs are established and implemented that provide the means to return a significant portion of the harvested oyster shell back to the PBS for substrate needed for larval recruitment to enhance population | • Amount ($m^3$) of shell returned to the system as result of policies and programs implemented.<br>• Oyster shell returned to the system by ecological gradients appropriate for oyster growth and survival. |

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| productivity on harvested and non-harvested oyster reefs.<br><br>Goal: Oyster shell returned to the system is increasing.<br><br>7. Abundant oyster settlement substrate exists across the estuarine ecological gradients, where appropriate for oyster growth and survival.<br><br>Goal: Oyster shell returned to the system is increasing across ecological gradients as appropriate. | |
| **Future Conditions**<br>8. Climate-ready considerations are incorporated into restoration and management plans for the PBS to consider changes in management and future environmental conditions.<br><br>Goal: Water regime (quantity, timing, hydrodynamics) and water quality inputs into the PBS as well as changes in PBS water and habitat quality are improving in terms of their impact on oyster resources.<br><br>9. Impacts and activities from future climate scenarios affecting the health and restoration of the PBS ecosystem are considered and addressed to minimize negative effects to the PBS ecosystem.<br><br>Goal: PBS O-EBFM Plan is adaptable to climate change and other management considerations. | • Quantity, timing and quality of water flowing into the PBS<br>• Spatially explicit characterization of PBS water quality over time.<br>• Volume and quality of sediments entering the bay. |
| **Goal B: The Management and Regulation of the Oyster Fishery and Aquaculture Industry** | |
| **Objectives** | **Recommended Metrics** |
| 1. Establish sustainable biological and production thresholds and targets for wild harvest.<br><br>Goal: Oyster stocks and harvest levels are improving to meet the established targets for oyster fishery enhancements. | • Stock assessment, shell budget, and harvest data to inform management – refer to Performance Measure #1 in Goal A above, with the addition of the following metrics:<br>• Total harvest in bags or pounds<br>• Harvest by fishery type (commercial and recreationa<br>• Time of harvest during the open fishing season.<br>• Harvest per licensed harvester<br>• Effort expended harvesting/Catch per trip<br>• Amount of illegal harvest.<br>• Number of full-time harvesters that the fishery support.<br>• Percent of live oysters harvested.<br>• Number of acres restored to meet fisheries restoration objectives |
| 2. For wild harvest and aquaculture, ensure management is adaptable and re-assessed on a periodic basis to account for changes in climate and other future environmental conditions. | • Changes in climate and other future environmental conditions are studied and analyzed (e.g., modeled, etc.) to anticipate how these conditions might impact oyster resources |

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| Goal: Oyster managers are knowledgeable about how changes in climate and other future environmental conditions are changing and could impact oyster resources. | |
| 3. Growth and expansion of the oyster aquaculture industry in the GPSBS uses best management practices that have broad support of the industry and community, and enables economic opportunities, while maximizing beneficial services of aquaculture, and preventing negative effects to the PBS and its users.<br><br>Goal: Industry and community support for growth and expansion of the oyster aquaculture industry in the PBS is high | • Annual aquaculture production by bay region<br>• Aquaculture's contribution to ecological services based on biomass measurements<br>• Industry and community support for growth and pace of expansion of the oyster aquaculture industry |

| **Goal C: A Thriving Economy Connected to the Pensacola Bay System** | |
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| **Objectives** | **Recommended Metrics** |
| 1. Oyster habitat, oyster harvesting, and oyster aquaculture are recognized and valued as key components of the local economy and cultural heritage by the PBS community and the state.<br><br>Goal: Recognition and value of oyster habitat, oyster harvesting, and oyster aquaculture as key components of the local economy and cultural heritage is high or increasing in the PBS community and state. | • Public attitudes about oyster habitat, oyster harvesting, and oyster aquaculture as key components of the local economy and cultural heritage in the PBS community and state.<br>• Number of fishermen participating in the fishery/Number of aquaculture leases/Number of workers participating in the aquaculture industry,<br>• Landed value per pound<br>• Number of oyster harvester and aquaculture-related jobs created (deckhands, fish house employees, etc.)<br>this is very similar to the first bullet and I think this one is a better metric<br>• Number of jobs created for habitat and fishery restoration<br>• Cost of management measures (e.g., restoration efforts).<br>• Percent of local wild harvest and local aquaculture oysters in the market.<br>• Commercial and recreational total annual catch (bags/day)/total annual aquaculture production<br>• Amount of local, state, federal (and RESTORE) funds allocated for management and restoration actions in the PBS.<br>• Estimated production of reef-enhanced finfish and crab species<br>• Spatially explicit characterization of water quality parameters (e.g., Turbidity/Water clarity-reduction in suspended matter and chlorophyll, and extent of seagrass cover.<br>• Percent removal of nitrogen and value of nitrogen reduction (in dollars). |
| 2. Economic indicators of the commercial oyster fishery, aquaculture industry and associated industries in the PBS demonstrate increasing viability and growth over 10 years<br><br>Goal: The commercial oyster fishery, aquaculture industry and associated industries in the PBS are viable and growing. | |
| 3. Investments in water quality management are being made with the goal of protecting and supporting the oyster habitat and oyster aquaculture industry (including land use impacts).<br><br>Goal: Water quality parameters of importance to oysters in the PBS are sufficient for supporting vibrant fished and farmed oyster industries. | |
| 4. The oyster fishery and oyster aquaculture industries provide economic and career growth opportunities.<br>Goal: Participation in the oyster fishery and oyster aquaculture industries are growing and creating sustainable careers. | |
| 5. Industries, and businesses within the PBS are supportive of and compatible with a healthy, well-managed, and resilient PBS ecosystem. | |

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| Goal: Level of support by industries and businesses within the PBS for a healthy, well-managed, and resilient PBS ecosystem is expanding. | • Social benefits (value of ecosystem services). (i.e., quality of life, increase of sportfishing in the system, swimmable days) **This will need to be further defined…by the E.P.?**<br>• Level of investment in improving PBS water quality for oyster resources.<br>• Level of support by industries and businesses within the PBS for a healthy, well-managed, and resilient PBS ecosystem.<br>• Number of restaurants selling locally produced oysters<br>• Number of locally owned businesses that have contributed to restoration and recovery efforts<br>• Workforce development initiatives designed to ensure the industry remains economically viable and sustainable.<br>• Number of "future oyster farmers" programs implemented including the number of participants.<br>• Number of mentor program "graduates" that enter the oyster restoration and/or fishery workforce in the PBS or other estuary in Florida.<br>• Number of education and mentoring programs created to build a new oyster workforce for restoration and monitoring, wild harvest, and aquaculture industries (number of engagements/participants).<br>• Number of government policies, plans and regulations passed that are compatible with a healthy and well-managed ecosystem while maintaining a thriving economy and supporting cultural heritage.<br>• Number of land development code policy changes implemented to enhance and protect the PBS. |
| 6. Government policies, plans and regulations affecting oysters are increasingly compatible with a healthy and well-managed ecosystem while maintaining a thriving economy and supporting cultural heritage.<br><br>Goal: (Incorporated into objective) | |
| **Goal D: An Engaged and Informed Public and Decision-Makers** | |
| **Objectives** | **Recommended Metrics** |
| 1. Establish a coordinated outreach and education plan to increase public and stakeholder awareness and support for a healthy and well-managed oyster and PBS ecosystem.<br><br>Goal: The implemented outreach and education plans increase public and stakeholder awareness and support for a healthy and well-managed oyster resources and PBS ecosystem. | • Number of times Plan is referenced in county and city growth management plans.<br>• Number of people with improved understanding of the ecosystem services provided by oysters important to health and restoration of the PBS (to be identified through a survey).<br>• Number of businesses, schools, industries, non-profits, and local governments participating in outreach efforts (include number of people participating in each event as well).<br>• Number of volunteers participating in oyster reef restoration efforts.<br>• Number of citizen science programs initiated and number of participants/participant hours. |
| 2. The Pensacola and Perdido Bays Estuary Program incorporates and promotes the recommendations of the PBS oyster plan.<br><br>Goal: The PPBEP increasingly incorporates and promotes recommendations of the PBS oyster plan. | |

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| | • Number of outreach events held (and number of attendees) on the benefits of shell recycling programs.<br>• Number of public engagement and education programs held (and number of participants) that focus on oysters as drivers of restoration and management of the PBS.<br>• Number of community initiatives for growing oysters for their ecosystem services implemented as well as their number of participants.<br>• Quantify the ecosystem and social benefits of provided by oyster reefs and oyster fisheries.<br>• Percent of funds secured in relation to funds needed to implement the Plan.<br>• Extent to which the Estuary Program implements recommendations in the Plan.<br>• Extent to which implemented outreach and education plans increase public and stakeholder awareness and support for a healthy and well-managed oyster resources and PBS ecosystem. |

## Appendix #9 - Project Summary and Statement of Purpose

**PROJECT SUMMARY.** The Nature Conservancy (TNC) in Florida is convening stakeholders to develop an oyster ecosystem-based fisheries management plan for the Greater Pensacola Bay System (GPBS). For the purpose of this initiative the system is defined as Escambia, Pensacola, East and Blackwater Bays in Escambia and Santa Rosa Counties. TNC has been supporting and implementing projects in the GPBS for the past several years in collaboration with partners. Oysters and the once vibrant fishery are disappearing from the System. Significant funding as a result of the Deepwater Horizon oil spill is being dedicated to restoration of oysters throughout the Gulf of Mexico. This is a once-in-a-lifetime opportunity to reverse the trend and create a robust future for oysters and the fishery in Florida and the Gulf.

**STATEMENT OF PURPOSE.** The goal of the initiative is that by 2022 an oyster ecosystem-based fisheries management plan (Plan) for the GPBS is approved by the stakeholders. The Plan will be offered as a model for management of oyster resources throughout Florida's estuarine systems, the Gulf of Mexico and other regions. The intent is for the Plan to be developed, owned and implemented by the community and the State, not a "TNC plan".

The Working Group and the resulting Plan will seek to address and determine the priority of multiple objectives including wild harvest, oyster aquaculture, ecosystem service outcomes (i.e., clear water, more crabs and fish, nitrogen removal), and social benefits (e.g., recreational angling opportunities, and opportunity to participate in defining credible management processes) for the GPBS.

The Plan resulting from this initiative will help to define long-term estuary-scale goals for restoring and sustaining oysters in the estuary. It will work in the broader context of the Pensacola and Perdido Bays Estuary Program that received EPA funding in 2018 as part of the Deepwater Horizon oil spill settlement. The program hired an executive director in 2019 and is organizing to develop a Comprehensive Conservation and Management Plan (CCMP) for the Pensacola and Perdido Estuary System.

**PROJECT WEBPAGE (URL):** https://www.ppbep.org/the-plan/oyster-plan

**PROJECT FACILITATION:** Meetings are facilitated, and meeting reports drafted by Jeff Blair and Robert Jones from Facilitated Solutions, LLC. Information at: http://facilitatedsolutions.org.