

**OYSTER ECOSYSTEM-BASED FISHERY MANAGEMENT PLAN (O-EBFM)
FOR THE GREATER PENSACOLA BAY SYSTEM (GPBS)
GPBS STAKEHOLDER WORKING GROUP
MEETING IV—MEETING SUMMARY
APRIL 9, 2020**

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

Convened by:

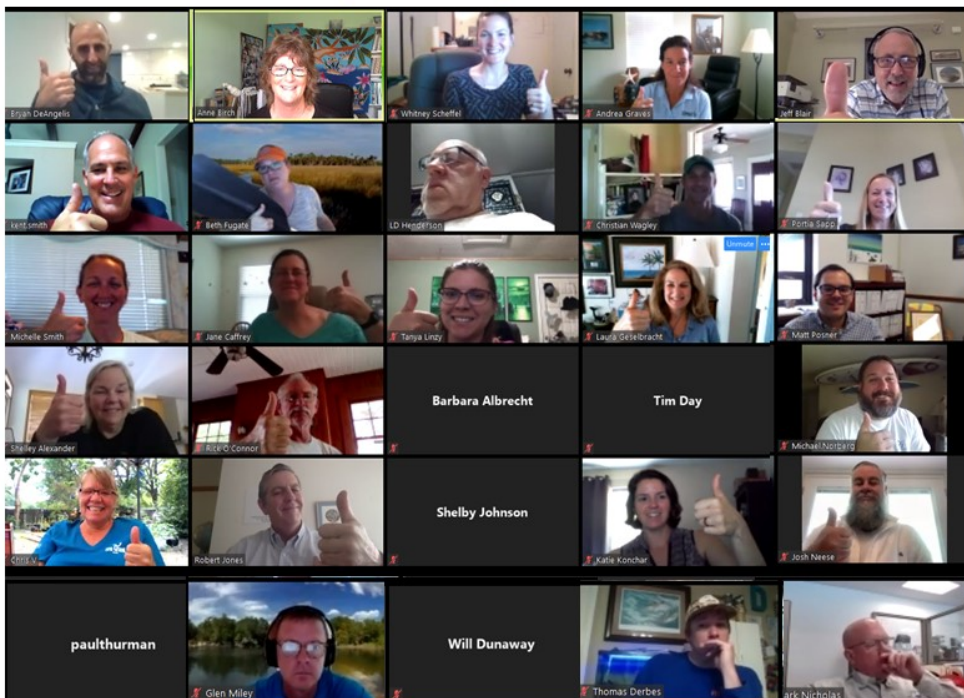


Facilitated and Summarized by:



Thumbs Up for the 1st Zoom Call of the
Greater Pensacola Bay System Oyster EBFM Working Group on April 9, 2020

THANK YOU!



GPBS STAKEHOLDER WORKING GROUP

MEETING IV—MEETING SUMMARY

April 9, 2020

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**OYSTER ECOSYSTEM-BASED FISHERY MANAGEMENT PLAN (O-EBFM)
FOR THE GREATER PENSACOLA BAY SYSTEM (GPBS)
GPBS STAKEHOLDER WORKING GROUP**

MEETING IV EXECUTIVE SUMMARY- April 9, 2020

Anne Birch, Florida Marine Program Manager, the Nature Conservancy, welcomed the Stakeholder Working Group members to the online Zoom 4th meeting that was rescheduled after postponing the face-to-face meeting March 18, 2020 at the Santa Rosa Extension Offices due to COVID-19. Anne introduced the Zoom technology, including inviting members to use the Chat function to share what they are doing differently as they shelter in place. Anne introduced the GPBS facilitation team of Jeff Blair and Bob Jones with Facilitated Solutions LLC. Members introduced themselves and the facilitator reviewed the meeting objectives and agenda which members agreed to follow. Members also approved, without changes, the January 15, 2020 facilitator's meeting summary (*pp 8-14 infra*).

The following are brief overviews of the three presentations. More in-depth notes of each are provided the full summary.

Oyster Suitability Model. Laura Geselbracht, Florida Senior Marine Scientist for The Nature Conservancy, provided an overview of an updated habitat suitability model. The model uses seven factors including dissolved oxygen, contemporary reefs, historical reefs, seagrass, sediments, salinity, and oyster recruitment. The model points to areas that may be more suitable for oyster reef restoration than other areas. Laura also presented maps of shell-planting areas that FDACS provided and potential oyster management plan boundaries (HUC 4, 6, 8 boundaries). The Working Group comments covered the following topics: suitability analysis; dissolved oxygen levels; oyster drills; oyster gardening; the importance of oystermen observations; and tracking conservation projects.

Pensacola & Perdido Bays Estuary Program (PPBEP). Matt Posner, GPBS Working Group member and PPBEP Interim Director, presented on the Estuary Program offering a brief history of its establishment and an overview of its structure. In 2017 EPA issued a Request For Proposals to fund one Estuary Program in Northwest Florida with Deepwater Horizon RESTORE funding. Proposals were submitted from three watersheds -Pensacola & Perdido Bays, Choctawhatchee Bay, and St. Andrew & St. Joe Bays. In 2018 a \$2 million grant was awarded for establishment of the Pensacola and Perdido Bays Estuary Program. The PPBEP represents a coalition of local, state, federal stakeholders from 2 states (AL and FL), 4 counties, 9 municipalities and is a stakeholder driven, non-regulatory program involving community stakeholders in the decision-making process. The program will establish measurable goals for water quality, habitat, living resource restoration as part of the Comprehensive Conservation and Management Plan (CCMP). The CCMP is a long-term strategic plan that will identify local prioritized action items using a science-based approach.

GEMS Project (Gulf of Mexico Ecosystem Service Logic Models & Socio-Economic Indicators).

Dr. Lydia Olander, Nicholas Institute and NESP, Duke University, presented on the GEMS Project. The GEMS project team is seeking to link project impacts to economic, health, and wellbeing benefits for people in the Gulf. Billions of dollars are and will be spent on restoration of Gulf ecosystems, but there is no shared platform to guide assessment and reporting of restoration progress and effectiveness for the broad set of social and economic goals shared by the many institutions working in the Gulf. The GEMS Project sought to lay the groundwork for such a shared platform for restoration funders and program managers in the Gulf – e.g., the RESTORE Council, NRDA, state resource agencies, and NFWF. Funding for this work has been provided by the National Academy of Sciences Gulf Research Program. Lydia reviewed the actions in GEMS Phase I, including convening a series of workshops across the Gulf of Mexico where oysters were an important issue, additional outreach to experts, practitioners, and stakeholders and a literature review to: identify the major socioeconomic outcomes of oyster reef restoration in the Gulf of Mexico; and develop a set of metrics to measure those outcomes at project and regional scales. Restoration Approaches for Phase 2 of the GEMS project include: habitat restoration; hydrologic connectivity; recreation enhancement; and water quality enhancement. In terms of application to Pensacola Bay, Lydia invited the oyster EBFM planning effort to adapt the logic models to identify and consider the potential social and economic outcomes of the different aspects of the oyster EBFM plan

Vision of Success Themes and Goal Framework. The Working Group agreed on the “vision of success” themes that were drawn from the questionnaire responses, reviewed and rated at the October 9 and November 15 Working Group meetings and adopted as the GPBS goal framework at the January 15 meeting. The GPBS Stakeholder Working Group Goal Framework includes: A Healthy and Productive Oyster Reef Ecosystem; The Management and Regulation of the Oyster Fishery and Aquaculture Industry; A Thriving Economy Connected to the Greater Pensacola Bay System; and An Engaged and Informed Public.

GPBS STAKEHOLDER WORKING GROUP GOAL FRAMEWORK

| | |
|---|---|
| A. A HEALTHY AND PRODUCTIVE OYSTER REEF ECOSYSTEM | B. THE MANAGEMENT AND REGULATION OF THE OYSTER FISHERY AND AQUACULTURE INDUSTRY |
| C. THRIVING ECONOMY CONNECTED TO THE GREATER PENSACOLA BAY SYSTEM | D. AN ENGAGED AND INFORMED PUBLIC |

A. A HEALTHY AND PRODUCTIVE OYSTER REEF ECOSYSTEM

Draft Objectives. Based on the input and discussion of issues and potential objectives at the January 2020 meeting, the TNC team developed and sent the Working Group a draft set of nine objectives (a-i) for this vision theme and goal for review in advance of this meeting. The Working Group reviewed and discussed and found the suite of draft objectives consistent with the January discussion and acceptable. The Working Group comments covered the following topics: Oyster reef benefits vs access; Oyster population and productivity; Larval production vs. juvenile recruitment; Parental standing stock; Sea level rise and intertidal reefs; Cultch materials; Shell budgets and shell recycling; Awareness of other related projects.

GPBS Stakeholder Working Group April 9, 2020 Meeting IV Summary

Initial Ecosystem Strategies. The Working Group brainstormed and discussed the following potential strategies: Manage silt and create a sedimentation budget; Moving oysters to more suitable habitat; Shells and Recycling; Use science for substrate placement; Oyster gardening; and Spatial plans for enhancing oyster population.

Performance Measures to Evaluate Strategies. The Working Group reviewed the performance measures developed at the January 2020 meeting and offered refinements and comments on the TNC team's revised performance measures. The Working Group discussion of performance measures covered the following topics: spat settlement or larval abundance; reference reef models; combining strategies; and water clarity as a measure.

B. THE MANAGEMENT AND REGULATION OF THE OYSTER FISHERY AND AQUACULTURE INDUSTRY

Draft Objectives. Based on the input and discussion of issues and potential objectives at the January 2020 meeting, the TNC team developed and sent the Working Group a draft set of four objectives (a-d) for this vision theme and goal for review in advance of this meeting. The Working Group reviewed and discussed and found the suite of draft objectives consistent with the January discussion and acceptable. The Working Group comments covered the following topics: Additional Objective; "Sustainability;" and Co-production.

Initial Management and Regulation Strategies: The Working Group brainstormed and discussed the following potential strategies: Build consumer interest; Involving oystermen; Recreational oyster harvest; Commercial and aquaculture harvest; Limited shell collection; Market for locally caught oysters; Where are local PB oysters ending up.

Related Performance Measures to Evaluate Strategies. The Working Group reviewed the performance measures developed at the January 2020 meeting and offered refinements and comments on the TNC team's revised performance measures. The Working Group discussion of performance measures covered the following topics: enforcement; ability to utilize a performance measure; condition index; monitoring; enhancements to current management regime (DEP FWC FDACS and feds); oystermen and collection of oyster biology metrics; and technologies for stock assessment.

C. A THRIVING ECONOMY CONNECTED TO THE GREATER PENSACOLA BAY SYSTEM

Draft Objectives. Based on the input and discussion of issues and potential objectives at the January 2020 meeting, the TNC team developed and sent the Working Group a draft set of six objectives (a-f) for this vision theme and goal for review in advance of this meeting. The Working Group reviewed and discussed and found the suite of draft objectives consistent with the January discussion and acceptable. The Working Group comments covered the following topics: address land use impact on water quality; look beyond the aquatic environments to the watershed boundaries; link vibrant fisheries with a healthy oyster reef system.

Initial Economic Strategies. The Working Group brainstormed and discussed the following potential strategies: Monitor economic indicators; Develop a marketing strategy with partners; Engage with ecotourism industry; Growth management-work with local government to align policies with oyster

restoration; SeaGrant opportunities; and Aquaculture-branding PB as clean water and local connection.

Related Performance Measures to Evaluate Strategies. The Working Group reviewed the performance measures developed at the January 2020 meeting and offered refinements and comments on the TNC team's revised performance measures. The Working Group discussion of performance measures covered the following topics: measuring non-oyster recreational fishing benefits from oystering; reference model; and ongoing area projects.

D. AN ENGAGED AND INFORMED PUBLIC AND DECISION-MAKERS

DRAFT OBJECTIVES. Based on the input and discussion of issues and potential objectives at the January 2020 meeting, the TNC team developed and sent the Working Group a draft set of six objectives (a-f) for this goal for review in advance of this meeting. The Working Group reviewed and discussed and found the suite of draft objectives consistent with the January discussion and acceptable. The Working Group comments covered the following topics: public support for implementation of plan; extension programs help with surveying; partnerships e.g. the Studer Institute and CiviCon.

Initial Public Engagement Strategies. The Working Group brainstormed and discussed the following potential strategies: Oysters enhance other fisheries; Develop volunteer programs The Working Group comments covered the following topics; Advocacy; Loss of oyster habitat negatively impacting fisheries; Citizen science; Shell recycling; Living shoreline education; and valuing ecosystem services.

Performance Measures to Evaluate Public Engagement Strategies. The Working Group reviewed the performance measures developed at the January 2020 meeting and offered refinements and comments on the TNC team's revised performance measures. The Working Group discussion of performance measures covered the following topics: measured recreational fishing economic and social benefits; social issues get to values and how people think about the resource.

The facilitators invited members of the public to comment and there was no one who offered public comments. They then reviewed possible agenda items for Meeting V, which will take place May 19, 2020 in a Zoom virtual meeting format. The Working Group members suggested consideration of the following presentations and discussions: Draft strategies based on this meeting discussion along with performance measures; Greater Pensacola Bay economic research agenda presentation; presentation on FDEP's management role and responsibilities (similar to the January presentations by FWC and FDACS); List of related projects in play in the study area; Presentation on shell budget and shell programs; Oyster fishery management regimes in the five Gulf of Mexico states and techniques, technologies and regulations; Perspective on fishery resources from recreational fishing industry.

The meeting adjourned at 1:10 pm. CST

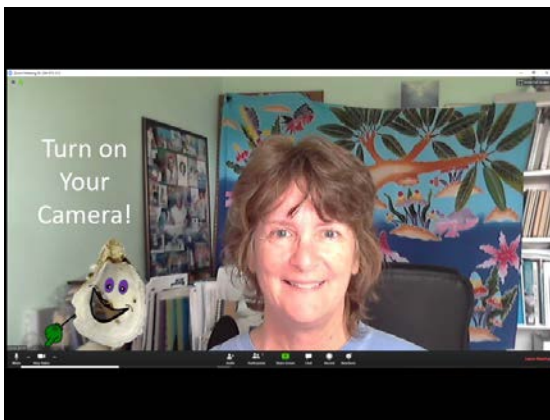
**OYSTER ECOSYSTEM-BASED FISHERY MANAGEMENT PLAN (O-EBFM) FOR THE GREATER
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MEETING IV DETAILED SUMMARY- April 9, 2020**

This section provides a more 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. INTRODUCTION

A. WELCOME

Anne Birch, Florida Marine Program Manager, the Nature Conservancy, welcomed the Stakeholder Working Group members to the online Zoom 4th meeting that was rescheduled after postponing the face-to-face meeting March 18, 2020 at the Santa Rosa Extension Offices due to COVID-19. Anne introduced the Zoom technology, including inviting members to use the Chat function to share what they are doing differently as they shelter in place.



B. AGENDA, CONSENSUS PROCEDURES AND GUIDING PRINCIPLES REVIEW

Anne introduced the GPBS facilitation team of Jeff Blair and Bob Jones with Facilitated Solutions LLC. Members introduced themselves and the facilitator reviewed the meeting objectives and agenda which members agreed to follow. Members also approved, without changes, the January 15, 2020 facilitator's meeting summary. Jeff then reviewed the guidelines for GPBS virtual meetings (*See Appendix #3*).

II. PRESENTATIONS ON THE GREATER PENSACOLA BAY SYSTEM

A. GPBS REVIEW OF OYSTER HABITAT SUITABILITY MAP, RECENT SHELL-PLANTING AREAS AND OPTIONS FOR OYSTER MANAGEMENT PLAN BOUNDARY

Laura Geselbracht, Florida Senior Marine Scientist for The Nature Conservancy, provided an overview of an updated habitat suitability model. The model uses seven factors including dissolved oxygen, contemporary reefs, historical reefs, seagrass, sediments, salinity, and oyster recruitment. The dissolved oxygen (DO) information was based on an EPA study that utilized average DO levels based from 1995 to 2000 data. The revised version of the Suitability Model updated the DO component with data from 2015 to 2019 and used minimum DO values which are a better indicator of the least suitable areas of oysters. Laura also should DO minimum values over four-decade timeframes: 1980s (n=51), 1990s (n=75), 2000s (n=589) to 2010 (n=102), where n represents the number of sampling points. Minimum DO areas increased substantially by decade, possibly due to increased development in the watershed(s) emptying into the GPBS. The model doesn't provide absolute designations, rather it only points to areas that may be more suitable for oyster reef restoration than other areas. Laura reviewed a map, of recent shell-planting areas and highlighted historic oyster reefs and plant sites created by FDACS. She also presented a map which highlighted potential oyster management plan boundaries (HUC 4, 6, 8 boundaries).



Workgroup Questions and Comments

- **Suitability analysis.** The suitability analysis Laura presented can inform site selection in addition to observations from locals
- **Suitability analysis.** The suitability analysis Laura presented can inform site selection in addition to observations from locals

- Portal data. Off Magnolia Point – lower Pensacola Bay in the shallows on the west side has Low Dissolved Oxygen. EPA has data in that region, but it was never written up. It may be possible to obtain this extensive dataset. Analysis of it could provide a more detailed view of frequently low DO areas in the GPBS.
- **Dissolved oxygen level.** What is driving dissolved oxygen levels? It appears to be hammering the Mid Bay section. Is it nutrient content? Can a correlation of low DO and excess nutrient level be made?
A: We have the nutrient data. It may be nonpoint source runoff. Can a correlation of low DO and excess nutrient level be made?
- Jane Caffrey noted two research papers address dissolved oxygen: Hagy III, James D., and Michael C. Murrell. "Susceptibility of a northern Gulf of Mexico estuary to hypoxia: An analysis using box models." *Estuarine, Coastal and Shelf Science* 74.1-2 (2007): 239-253. Murrell, Michael C., et al. "Phytoplankton production and nutrient distributions in a subtropical estuary: importance of freshwater flow." *Estuaries and Coasts* 30.3 (2007): 390-402.
- There is stratification in low Dissolved Oxygen (DO) in which the bottom water separated from the surface water. They also show that one month after big river flows there is low DO and phytoplankton present.
- **Oyster drills.** Is there any way to mitigate oyster drills?
A: You can trap/catch oyster drills and eat them. Just like escargot.
- **Oyster gardening** that is done at the surface may avoid the low DO conditions.
A: Keep in mind that any oyster gardening or activities of the sort need permitting, which hasn't necessarily been happening
- **Waterman observations.** LD's oysterman observations have unleashed a world of issues that need to be addressed to achieve successful oyster management and provision of ecological function in this system. Great to have this crucial input!
- **Tracking Conservation Projects.** One resource in use is the Florida Conservation Actions Tracker: <https://flcpa.databasin.org/surveys/cat> All stakeholders will be able to track conservation efforts with this Tracker.

B. PENSACOLA AND PERDIDO BAYS ESTUARY PROGRAM

Matt Posner, GPBS Working Group member and PPBEP Interim Director, presented on the Estuary Program offering a brief history noting the reliance on the fishery from the early days and since the 1950s when noticeable degradation appeared in the Pensacola and Perdido Bays and bayous. In response, in 1987 the Bay Area Resource Council (BARC) was founded which sought to improve the area's quality of life by restoring and preserving the Pensacola and Perdido Bay systems through community participation and coordination with local governments, citizens, academia, and the private sector. BARC members included Escambia County, Santa Rosa County, City of Gulf Breeze, City of Milton and City of Pensacola.

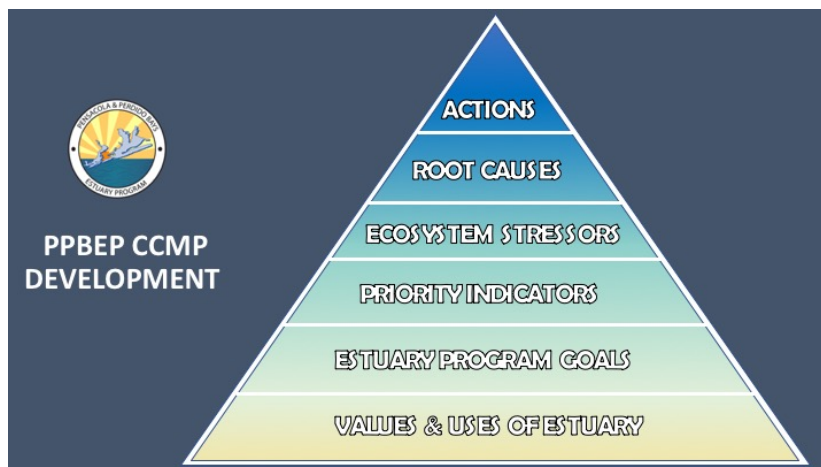
The Estuary Program represents a coalition of local, state, federal stakeholders from 2 states (AL, FL), 4 counties, 9 municipalities and is a stakeholder driven, non-regulatory program involving community stakeholders in the decision-making process. The program will establish measurable goals for water quality, habitat, and living resource restoration as part of the

Comprehensive Conservation and Management Plan (CCMP). This long-term strategic plan will identify local prioritized action items using a science-based approach to develop and implement the CCMP.

In 2017, EPA issued a Request For Proposals to fund one Estuary Program in Northwest Florida through the Deepwater Horizon RESTORE Council. Proposals were submitted to establish the Pensacola & Perdido Bays Estuary Program, Choctawhatchee Bay Estuary Program, and St. Andrew & St. Joe Bays Estuary Program. In 2018 a \$2 million grant was awarded to the Pensacola and Perdido Bays program.



The PPBEP structure includes a Policy Board and staff, supporting agencies and three fact finding committees: a Business Partnership Committee; a Technical Committee; and an Education Committee. The Policy Board adopted the following mission for the Estuary Program: "To protect and restore water quality and natural resources in Pensacola and Perdido Bays and watersheds through partnerships, using a scientifically-sound, community-based approach to enhance resilience."



Expected Program Outcomes include: Water quality improvement; Restoration and conservation of habitat; Provide healthy ecosystems in order to support: Wildlife (endangered & threatened species, migratory birds, resident species); Fish and shellfish (commercial & recreational); and other estuarine resources. GPBS Stakeholder Working Group April 9, 2020 Meeting IV Summary

recreational); Improve surface and groundwater quality and quantity in addition to flood control; Enhance community resilience; Revitalize the coastal economy; and Enhance quality of place and quality of life.

The Program is hiring program staff including a Senior Scientist (Whitney Scheffel, March 2020), an Executive Director and a Community Outreach Coordinator. In the spring, the Program will begin a technical characterization including a literature review, data gap analysis and identification of priority values, indicators, stressors, and root causes in each system. It will engage stakeholders in defining estuary values and uses. The program received a Florida legislative appropriation and will work with a funded UF/UWF Centers of Excellence Project, an EPA National Coastal Conditions Assessment and an EPA Trash Free Waters Grant. The Oyster Ecosystem-Based Fisheries Management Plan will be incorporated into the PPBEP CCMP.

Workgroup Questions and Comments

- Since oysters are an indicator species, the oyster EBFM Plan should tie into the Estuary Program.
A: Yes we are supporting the effort.

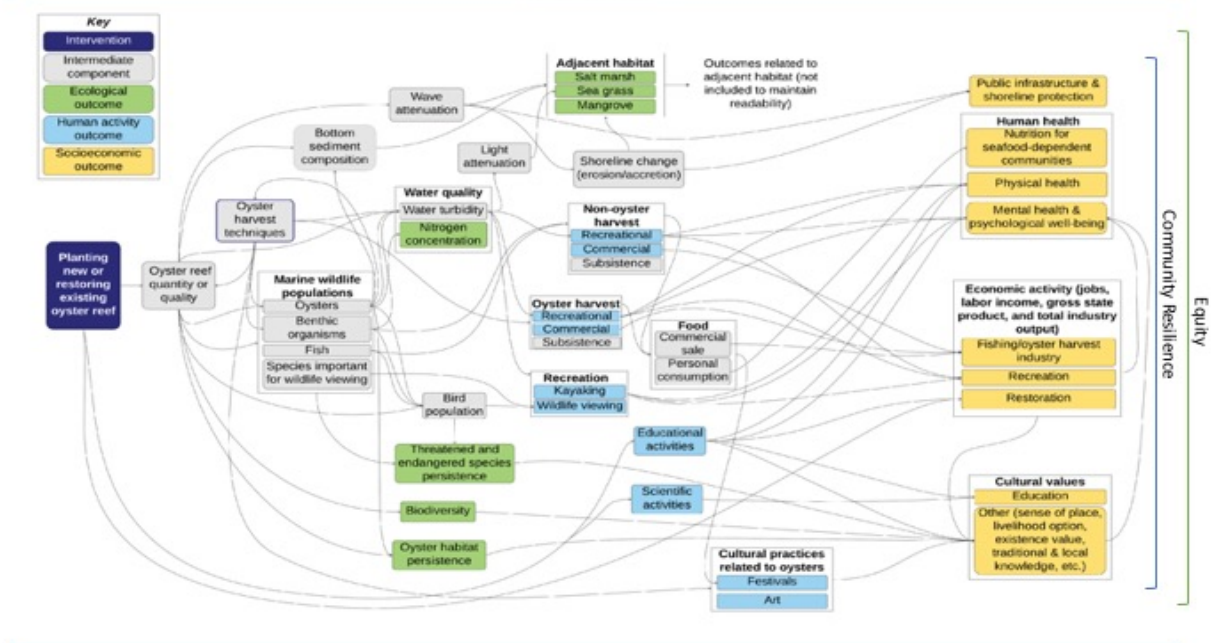
C. SOCIAL AND ECONOMIC OUTCOMES FROM OYSTER REEF RESTORATION IN THE GULF OF MEXICO: APPLYING THE GEMS MODEL TO THE GREATER PENSACOLA BAY SYSTEM.

Dr. Lydia Olander, Nicholas Institute and NESP, Duke University, presented on the GEMS Project (Gulf of Mexico Ecosystem Service Logic Models & Socio-Economic Indicators). They are seeking to link project impacts to economic, health, and wellbeing benefits for people in the Gulf. Billions of dollars are and will be spent on restoration of Gulf ecosystems, but there is no shared platform to guide assessment and reporting of restoration progress and effectiveness for the broad set of social and economic goals shared by the many institutions working in the Gulf. The GEMS Project sought to lay the groundwork for such a shared platform for restoration funders and program managers in the Gulf – e.g., the RESTORE Council, NRDA, state resource agencies, and NFWF. Funding for this work has been provided by the NAS Gulf Research Program.

To facilitate effective project planning, evaluation, and comparison, GEMS is developing a set of evidence-based logic models that follow through to social and economic outcomes, and a tractable set of socio-economic metrics that are relevant across projects, programs, and locations. This will allow: comparison of restoration approaches across a broader suite of shared goals; identification of uncertainties and gaps in knowledge about social and economic outcomes; and tracking performance toward the social and economic goals.

Ecosystem Service Logic Model (ESLM) for Oyster Reef Restoration

<http://bit.ly/GEMSort>



Lydia reviewed the actions in GEMS Phase I, including convening a series of workshops across the Gulf of Mexico where oysters were an important issue, additional outreach to experts, practitioners, and stakeholders and a literature review to: identify the major socioeconomic outcomes of oyster reef restoration in the Gulf of Mexico; and develop a set of metrics to measure those outcomes at project and regional scales.

She reviewed the various Oyster Reef Restoration techniques including:

1. Cultch planting to create a structurally simple, subtidal, intensively harvested reef
2. Placement of large, durable structures to create a structurally complex, subtidal, intensely harvested reef
3. Placement of large, durable structures to create a structurally complex, subtidal, not intensively harvested reef
4. Placement of large, durable structures to create a structurally complex, intertidal, not intensively harvested reef
5. Protection or enhancement of existing reef
6. Oyster aquaculture

She listed a set of key resources and reports that set a foundation for their metrics review. GEMS created a matrix that highlighted the project or program scale and was organized in four areas: Economic activity (jobs, expenditures, labor income, etc.); Public infrastructure protection; Cultural values; and Human health (health, community resilience; and equity). For

each area there were two tiers: Tier 1 – important to measure and feasible; required; and Tier 2 – Nice to have, but harder to measure; not required.

Metrics matrix

| | Tier 1 – important to measure and feasible; required | Tier 2 – Nice to have, but harder to measure; not required |
|---------------|--|--|
| Project scale | easy | More difficult |
| Program Scale | | |

Socio-economic metrics

- Economic Activity (jobs, expenditures, labor income...)
- Public Infrastructure Protection
- Cultural Values
- Human Health

Community Resilience

Equity

Below are Restoration Approaches for Phase 2 of the GEMS project:

Restoration Approaches for Phase 2

| | |
|--|---|
| Habitat restoration (significant overlap with ORR) | <ul style="list-style-type: none"> • Beach restoration • Mangrove restoration • Salt marsh restoration • Seagrass restoration • Living shoreline creation |
| Hydrologic connectivity (overlap with habitat restoration) | <ul style="list-style-type: none"> • Reconnecting hydrologic flows to restore salinity and promote habitat recovery |
| Recreation enhancement | <ul style="list-style-type: none"> • Boat ramps (building and restoring) • Fishing pier installation • Trails and boardwalks (building and restoring) |
| Water quality enhancement | <ul style="list-style-type: none"> • Storm water management infrastructure installation <ul style="list-style-type: none"> ◦ Gray and green • Septic to sewer conversion • Wastewater treatment plant upgrades |

In terms of application to Pensacola Bay, Lydia invited the oyster EBFM planning effort to identify and consider the potential social and economic outcomes of the different aspects of the plan. She suggested the consideration of different alternatives in a systematic and transparent way and to identify and consider critical beneficiaries/stakeholders that will be affected and think about equity. In terms of metrics she suggested selecting program scale

metrics that if monitored could be used to evaluate the impacts of the project on social and economic outcomes for the community. She also recommended identifying cultural values that are important to the community and how you might monitor them.

III. GREATER PENSACOLA BAY SYSTEM GOAL FRAMEWORK

The Working Group agreed on the “vision of success” themes that were drawn from the questionnaire responses, reviewed and rated at the October 9 and November 15 Working Group meetings and formed the basis for the goal framework. The vision themes represent key topical issue areas that together characterize the desirable future for the oyster reef ecosystem and the Greater Pensacola Bay System.

GPBS STAKEHOLDER WORKING GROUP GOAL FRAMEWORK

| | |
|---|---|
| E. A HEALTHY AND PRODUCTIVE OYSTER REEF ECOSYSTEM | F. THE MANAGEMENT AND REGULATION OF THE OYSTER FISHERY AND AQUACULTURE INDUSTRY |
| G. THRIVING ECONOMY CONNECTED TO THE GREATER PENSACOLA BAY SYSTEM | H. AN ENGAGED AND INFORMED PUBLIC |

A. A HEALTHY AND PRODUCTIVE OYSTER REEF ECOSYSTEM

1. Vision, Goal, Outcomes and Issues

The Working Group at its previous meetings has agreed on the following statements:

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 Greater Pensacola Bay System sustains a healthy and productive oyster reef ecosystem.

Outcome: By 2030, the oyster reef ecosystem within the Greater Pensacola Bay is managed in a sustainable manner providing measurable ecosystem services.

Key Topical Issues: Identifiable and achievable targets; Growth; Public understanding and support; Best practices as a framework for recommendations; Link the Plan to the Estuary Program; Integrate and build on existing management plans; Identify existing and planned projects; Model successes from other estuaries and scale up faster; Geospatial mapping; Leverage and support funding for advanced wastewater treatment facilities; Resiliency and adaptive management as guiding principles; and, Clarify and mitigate potential impacts to sustainably managing the PBS.

2. Draft Objectives for a Healthy Productive Oyster Reef Ecosystem

Based on the input and discussion of issues and potential objectives at the January 15, 2020 Working Group meeting, the TNC team developed and sent the Working Group a draft set of nine objectives (a-i) for this vision theme and goal for review in advance of this meeting. The Working Group reviewed and discussed and found the suite of draft objectives consistent with the January discussion and acceptable. The additions in Blue reflect the comments received from the Working Group during the April meeting.

- a. Measurements of oyster reef and population conditions (including larval production, spawning stock assessment, shell budgets) are defined and quantifiable, with target and threshold levels identified.
- b. Ecosystem services and ecological health indicators are defined and measurable, with identified target and threshold levels.
- c. Policies and programs are established and implemented that provide the means to return a significant portion of the harvested oyster shell back to the GPBS for substrate needed for larval recruitment to enhance population productivity.
- d. Restoration and management plans for the GPBS consider changes in management and future environmental conditions, such as freshwater flow (quantity, timing, hydrodynamics), water quality (e.g., salinity and temperature), sea level, and habitat change.
- e. Impacts and activities from future climate scenarios affecting the health and restoration of the GPBS ecosystem are considered and addressed to minimize negative effects to the GPBS ecosystem.
- f. Reliable oyster larval production occurs in the estuary on an annual basis
- g. Abundant oyster settlement substrate exists across the estuarine salinity gradient, where appropriate for oyster growth and survival.
- h. Spawning stock biomass and **parental standing stock** has increased across the salinity gradient appropriate for oyster growth and survival
- i. A positive shell-budget on both fished and non-fished reefs **is sustained while oyster reef restoration is underway**

Working Group Comments on Objectives and Identification of Initial Strategies

- **Oyster reef benefits vs access.** Currently oyster reefs in watershed (some put in recently) are not placed there for harvest but for other benefits, e.g. we are blocking access at Navy Point.
A: Some projects put in for oyster harvest- others for erosion control combo of projects in the system
- “b.” above focuses on Harvest. Is “a.” above measuring linear feet of the system?
- **Oyster population and productivity.** Measurements of population conditions are clues to productivity
- Makes sense as we are trying to Increase the production of oysters in the Bay system

- **Larval production vs. juvenile recruitment.** Is “larval production” the right measure? Is juvenile recruitment a better measure?
A: Yes- measuring settlement and recruitment
- **Parental standing stock.** Are we managing for parent stock in the system? Add that component to the objective. Objective h. Spawning stock biomass and parental standing stock has increased across the salinity gradient appropriate for oyster growth and survival
- Parental standing stock, add others? Maybe add more specificity at the strategy and actions level.
- Define spawning stock.
A: Biomass of spawning adult oysters in the system
- **Management.** Not maximizing harvest from management and fishery perspective. How does this fit in? Maybe better under Goal B
- **Sea level rise and intertidal reefs.** Adapting to sea level rise on intertidal reefs would be important to get bigger.
- **Cultch materials added to reef.** It is better to use cultch vs. limestone if oyster shell is being removed.
- Consider limestone’s impact on water quality?
- **Shell budgets** are a good item on the list (includes box, or dead oysters)
- Define shell budget? Add to GPBS definitions?
A: The TNC team will propose a definition at the May meeting.
- How to monitor the shell budget- loss and augmentation.
- Increase oyster resource- until we get to restored functional reef. Set a target goal, and until we achieve the goal, we may need to have a positive shell budget.
- Suggest the following refinement to objective i. A positive shell-budget on both fished and non-fished reefs is sustained while oyster reef restoration is underway.
- Pensacola has an oyster shell recycling program. How do they decide where these shells are used? Are they contributing to restoration efforts?
A: The shell recycling program is managed by the County, DEP, and Keep Pensacola Beautiful in Escambia and used for living shoreline projects and restoration projects. DEP used to do shell recycling, and now Escambia County is collecting. We have used shell for our projects, and still use for some of the materials, but you'll find that if using in intertidal reefs, they don't hold up well. Material would be very suitable for subtidal beds.
- Santa Rosa County has just started a recycling program within the last three months. Once mapping has been completed of the natural beds they will be placed on those reefs to enhance the reefs and also be used for living shoreline projects throughout the bay.
- Who does manage when a shell barge load is deployed over an established reef? Seems LD was saying too much was deployed at one time and smothered the top of the reef.
A: FDACS has placed shell barge loads on established, but degraded commercially harvested reefs in the past.
- **Awareness of other related projects.** Aware of Apalachicola Bay System Initiative? Parallel programs. Intersection of thoughts and ideas. UF involvement in both projects. Do we want to share presentations on other initiatives in West Florida?

A: Yes, we are aware and TNC has been communicating with the project leads, Felicia Coleman and Sandra Brooke, since the outset of both projects. We will continue to coordinate and look for opportunities to share information and lessons being learned.

3. Initial Ecosystem Strategies

The Working Group brainstormed and discussed the following potential ideas and strategies:

- Can't compare Apalachicola- we have a more confined water flow in Pensacola Bay
- Politics in Apalachicola exercise control of oyster harvest
- Not much commercial oysterman left in Pensacola Bay unlike Apalachicola
- Account for various harvest amounts on different reefs
- Preserve Ecosystem services for oysters.
- Oysters off the JP Getty oil rig in east bay?
A. Yes. Old bed off White Point still there. Oyster hulls, some in the half shell conditions as big as your hand.
- **Manage silt and sedimentation.** Limestone is only good for 1 year. Silt gathers and larvae will not settle. Consider Fixing a device to blow the silt off the limestone to get more oyster production
- Mix shell with limestone to manage silt and sedimentation?
- What is the origin of silt? It is the sediment- you have confined channels – e.g. Blackwater River into East Bay scattered on the channel wall area. As you move away from river channel the silt grows weaker.
- Establish a sediment budget. Control sources of sediments- a sediment budget for the system
- Control runoff to manage Dissolved Oxygen.
- Identify projects contributing to the problem of sedimentation
- **Moving oyster to more suitable habitat.** Would be useful to move oyster hulls (box oysters and disarticulated shells) to more suitable habitat. You see the hulls where oyster drills have moved in and eaten the meats.
- Strategy of taking material into Bayou Chico and then transplant to other places
- Moving oysters from one place to another? Salinity the same?
A: Bayou Chico move to across the bay and it is the relatively same salinity. Moving from Blackwater Bay to East Bay
- Careful not to take out of a poorly functioning system and make it worse.
- **Shells and Recycling.** Limited shell out of harvest industry. Sources are widespread recycling program with restaurants
- Shell recycling programs- shell markets in FL? Wholesale distribution.
- Half shell markets limit substrate options
- 2 semi loads of oysters a day- out of the system many years ago
- **Use science for substrate placement.** Substrate materials- spat stick on the productive beds. Shell for substrate for healthy reefs.
- Important to have correct scientific placement
- Don't spend good \$\$ after a bad idea. E.g. stabilizing riverbanks and sediment control

- **Oyster gardening.** Mobile Bay oyster gardening strategy. Local initiatives for growing oysters in cages- local model for community engagement. Can kick start restoration
- **Spatial plans** for enhancing oyster population

B. Related Performance Measures to Evaluate Strategies

The Working Group reviewed the performance measures at the January 15, 2020 meeting and offered refinements and comments on the TNC team's revised performance measures at the April meeting.

- a. Shell budget model indicators
- b. Area of settlement substrate in the estuary (possibly with goals defined for each 'management objective' – fishing, water filtration, fish production)
- c. Larval abundance in the water column or on standardized settlement substrates
- d. Density of live oysters (number per m²) and density of dead oysters
- e. Total oyster biomass (by reef and/or by reefs with different management objectives)
- f. Biomass of spawning stock (> 3 inches or 75 mm) and biomass of very-large spawning stock (> 5 inches or 127 mm)
- g. Reef-enhanced species (or selected species) are increasing in abundance
- h. Number of reef-enhanced species (Oyster Calculator, and FWC's fishery-independent monitoring program)
- i. Seagrass area is expanding within the estuary

Working Group Questions and Comments on Performance Measures

- **Spat settlement or larval abundance.** Agree with larval abundance vs. standardized settlement measure
- Oyster Fisheries Independent Monitoring program- spat settlement vs oyster spat abundance.
- Density of live and dead oysters.
- E.g. West Bay in Panama City- there have been good and bad years for oyster recruitment.
- **Reference reef models.** I have a locational bias and think we should include reference reef models. Do we need to include such reference models?
- Identify natural reef for reference?
- Reference reefs- intertidal. May not good to set your targets based on that and under shoot
- Nothing natural about the majority of reefs as they are now
- Not much harvest in Pensacola Bay system. Reefs good starting points going forward.
- Some of it makes sense, others not? E.g. increase blue crabs may suggest increase reef capacity, etc.
- **Combine strategies.** We should be seeking to combine strategies over time in the oyster plan.
- **Water clarity** as a measure- total suspended solids is an easy measure.
- Water clarity measure? Filtration of oysters. Correlate seagrass goal with water clarity
- Good papers and documents are available to serve as foundational documents.
- **Link metrics with objectives.** Go back and note what metrics will be used for what objectives
- Habitat suitability- see overall acreage for oysters.

B. THE MANAGEMENT AND REGULATION OF THE OYSTER FISHERY AND AQUACULTURE INDUSTRY

1. Vision, Goal, Outcomes and Key Issues

The Working Group at its previous meetings has agreed on the following statements:

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 Greater Pensacola Bay System.

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

Key Topical Issues: Ongoing funding for management; Ecological restoration principles; Fish and oyster production objectives; Adapt for future changes and circumstances; Incorporate state vetted plans; Address enforcement of regulation; Manage wild harvest differently than aquaculture; Regulation of aquaculture; Define fair and equitable; and, Consider providing access to the fishery through changes in licensing requirements, building in a preference for locals or specific user types.

2. Draft Objectives for The Management and Regulation of the Oyster Fishery and Aquaculture Industry

Based on the input and discussion of issues and potential objectives at the January 15, 2020 meeting, the TNC team developed and sent the Working Group a draft set of four objectives (a-d) for this vision theme and goal for review in advance of this meeting. The Working Group reviewed and discussed and found the suite of draft objectives consistent with the January discussion and acceptable.

- a. Sustainable production target(s) established for wild (and aquaculture oysters?)
- b. Management plans have estuary-specific catch data for commercial and recreational oyster fishing
- c. Aquaculture spatial area management plans are developed with broad support of the industry and community to facilitate the 'smart' growth and expansion of the aquaculture industry in the GPBS
- d. The oyster aquaculture industry is regulated using best management practices that enable economic opportunities, while maximizing beneficial services of aquaculture, and preventing negative effects to the GPBS and its users.

April 9, 2020 Working Group Comments on Objectives

- **Additional Objective?** Develop a science-based map of suitable area for production highly informed by the oyster industry stakeholders and monitored on a continuous basis

- Oyster productivity overall and oyster reefs need to be effectively monitored.
- There needs to be a funded program in place measuring and monitoring
- **“Sustainability.”** Is it the numbers or the size of oysters for harvest?
- Estuary specific- hurdle of size- high abundance of 3 inch. Size vs. abundance.
- Size issue- larger oysters are important
- This Bay needs own unique thinking
- **Co-production.** In the TNC work with controversial fisheries in the U.S. and elsewhere, exploring fishery co-management opportunities has been helpful. We have brought oyster stakeholders into management process.
- FWC believes it is important to have a collaborative effort for the oyster fishery. FWC has led in co-management and engagement with industry stakeholders

3. Initial Management and Regulation Strategies

The Working Group brainstormed and discussed the following potential ideas and strategies:

- **Involving oystermen.** Challenge in getting oysterman together during the day. Try a Zoom format after hours? Bring the oystermen together and conduct a survey?
- Rollo’s is the place in the East where bags are tagged so it is easy to monitor
- **Recreational oyster harvest** is trivial? Should we monitor recreational oyster harvest?
- **Commercial and aquaculture harvest.** Is there a difference between commercial harvest vs aquaculture leases. How much is each harvesting?
A: Reporting requirements distinguish between wild and aquaculture harvest
- FDACS can’t report on actual sites/areas = reports statewide data. [Data at the processor level](#) is confidential
- FWC Tags for wild oysters and separate for reporting landings. Reported by county but only landed not necessarily from the area.
- **Limited shell collection-** take them to Milton and won’t drive to Panama City or Alabama. There’s no time to travel the 75 miles. Go to closest area. Rollo will offer harvesters a “good deal” (i.e., price) for the shells.
- **Market for locally caught oysters?** East Bay and Escambia Bay- better tasting, larger oysters than Apalachicola oysters. Half shell market is hot right now.
- **Build consumer interest** in locally raised oysters.
- **Where are local Pensacola Bay oysters ending up?** Implication for shell recycling in the bay system.
- 10 years since substantial harvesting. Down so long commercial oysterman is a thing of a past.
- Chris Verlinde has been very helpful and oystermen appreciate her work.

4. Related Performance Measures to Evaluate Strategies

The Working Group reviewed the performance measures at the January 15, 2020 meeting and offered refinements and comments on the TNC team’s revised performance measures at the April 9, 2020 meeting:

- a. Total harvest in bushels
- b. Harvest by size category
- c. Harvest by location
- d. Harvest by fishery type (recreational/commercial)
- e. Timing of harvest during the fishing season
- f. Harvest per licensed harvester
- g. Effort expended harvesting
- h. Catch per unit effort (catch per trip)
- i. Amount of illegal harvest
- j. Number of full-time harvesters that the fishery can support
- k. % live oysters harvested
- l. Biomass of oysters (> 3 inches?) on fishable reefs
- m. Number and size of aquaculture leases

Working Group Questions and Comments on Performance Measures

- In Louisiana, dragging for production is permitted but it is not allowed in Florida.
- Need a sediment removal strategy to give more opportunity of spat survive.
- **Enforcement.** Apalachicola more water but same # of enforcement officers. Enforcement in Pensacola Bay is good
- **Ability to use a performance measure?** Some don't collect data to use in dependent monitoring
- **"Condition index"**- parasites, reproductive stages etc.
- Ask Mike Norberg to go through list to determine how/if to measure in terms of difficulty in securing data. Little to no independent data collected in Pensacola Bay.
- **Monitoring** is underfunded in most fisheries.
- **Enhancements to current management regime** (DEP FWC FDACS and feds)
- **Oystermen and collection of oyster biology metrics.** What type oyster biology metrics can you use watermen to collect? Build trust in stock assessment data and increase data.
- **Technologies for stock assessment.** Expensive stock assessments. Use technologies to aid (e.g. drones etc).

C. A THRIVING ECONOMY CONNECTED TO THE GREATER PENSACOLA BAY SYSTEM

1. Vision, Goal, Outcomes and Key Issues

Vision Theme C: The Greater 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 Greater Pensacola Bay region.

Outcome: By 2030, recovery of the Greater 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.

Key Topical Issues: Growth and conflicts among users; Aquaculture regulation and user conflicts; Aquaculture Use Zones; Economic activities that rely on a healthy bay; Social science; Controlling runoff; Public pushback for living shoreline projects; Revenue generation and the plan; Local government involvement; Access opportunities to the water; Maintaining working waterfronts; and, Promotion and branding of aquaculture and oysters and the health of the Bay.

2. Draft Objectives for A Thriving Economy

Based on the input and discussion of issues and potential objectives at the January 15, 2020 meeting, the TNC team developed and sent the Working Group a draft set of six objectives (a-e) for this vision theme and goal for review in advance of this meeting. The Working Group reviewed and discussed and found the suite of draft objectives consistent with the January discussion and acceptable.

- a. Economic indicators of the commercial oyster fishery, aquaculture industry and other associated industries in the GPBS demonstrate increasing viability and growth over X years.
- b. Key water quality management investments are being made with the goal of protecting and enabling the oyster fishery and oyster aquaculture industry.
- c. The oyster aquaculture industry provides economic opportunities and is complementary to the wild harvest fishery
- d. Industries, and businesses within the GPBS are supportive and compatible with a healthy and well-managed Greater Pensacola Bay ecosystem.
- e. Growth management policies, plans and regulations affecting the GPBS are compatible with a healthy and well-managed ecosystem while maintaining a thriving economy and supporting cultural heritage.
- f. Oyster reefs, oyster fishing and oyster aquaculture are recognized as an important (key?) component of the local (Panhandle?) economy

April 9, 2020 Working Group Comments

- For objective b. Water quality Investments- e.g. address land use impacts from Eglin AFB. Look outside the aquatic environment to the watershed boundaries.
- For objective f. Thriving oysters create and support more vibrant fisheries.

3. Initial Economic Strategies

The Working Group brainstormed and discussed the following potential strategies and comments:

- **Monitor economic indicators** for changes over time
- **Develop a marketing strategy with partners?** Promote these things. Local chambers?

- Ecotourism- tourism board- address marketing comment
- **Growth management**-work with local government to align policies with oyster restoration
- **Sea Grant opportunities?** Work with shellfish specialist based in Cedar Key
- “Seafood at your fingertips” Sea Grant program restarting
- **Aquaculture-branding Pensacola Bay** as clean water and local connection

4. Related Economic Performance Measures to Evaluate Strategies

The Working Group reviewed the performance measures at the January 15, 2020 meeting and offered refinements and comments on the TNC team’s revised performance measures.

- Value of harvest that meets an economic minimum for sustainability for waterman
- Cost/value per bags
- Number of fishermen participating in the fishery
- Number of aquaculturists
- Total aquaculture production and revenue
- Revenue per harvester (and perhaps its distribution)
- Travel time costs, and distance travelled
- Cost of management measures (e.g., restoration efforts)
- % local oysters in the market
- Revenue per harvester (and perhaps its distribution)
- Revenue raised in fees/bushel taxes
- Restoration costs avoided
- Social benefits (value of ecosystem benefits)
- Performance metric for economic sustainability of the community
- Cost-Benefit Analysis (total economic investment versus outcome to economy)
- Area of prohibited (or open) waters
- Number of days of emergency closures
- WQ data
- Economic measures (number of fishers, aquaculturists, days fishing)
- Commercial and recreational catch, as well as aquaculture production (bags per day, total annual catch)
- Estimated filtration at estuarine scale (Oyster Calculator)
- Percentage of “residence time filtration” (Oyster Calculator)
- Estimated enhancement of reef-enhanced species (Oyster Calculator, along with FWC’s fishery-independent monitoring program?)
- Turbidity/Water clarity (reduction in suspended matter)
- Nitrogen reduction (sequestration, burial and/or denitrification)
- Value of nitrogen reduction (\$)
- aa. % Removal of Nitrogen
- bb. Filtration of estuary volume by oysters (wild and aquaculture stock) occurs within estuary residence time (27 days)

Working Group Questions and Comments on Performance Measures

- Reference model- reference ecosystem
- Ongoing area projects- list of what is being done that would impact this project
- Estuary program has discussed this. PERT Steering Committee- Katie Konchar leading this effort
- DWH restoration projects is a good list. Hard to find a consolidated list for the area.
- A restoration project in the Shoal River- Yellow River WMA- 100% of the PB surface water passes thru the site. Gin Hole Mitigation Bank-all documents are publicly available on RIBITS: <https://ribits.usace.army.mil/>
- One resource in use is the Florida Conservation Actions Tracker: <https://flcpa.databasin.org/surveys/cat>
- Measuring non oyster recreational fishing- businesses, participants, birders etc.
- Benthic assessment- pollutant load impact on oysters on the bottom?
- Identify fishery benefits of oysters (e.g. # of redfish, which are oyster dependent, landed and other benefits.

D. AN ENGAGED AND INFORMED PUBLIC AND DECISION-MAKERS

1. Vision, Goal, Outcomes and Key Issues

Vision Theme D: Stakeholders of the Greater 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 Greater Pensacola Bay System is supported and protected by an engaged and informed public, and decision-makers.

Outcome: By 2030, the Greater Pensacola Bay System, stakeholders, private and nonprofit civic leaders, the public, and decision-makers are informed of the importance of sustaining the health of the Bay System and work actively together along with elected and appointed leaders and managers to invest in and implement the Plan.

Key Topical Issues: A communication strategy to bring the PBS back to health; Marine habitats- out of sight out of mind; Plan should fit into the Estuary Program's Comprehensive Conservation Management Plan CCMP; Local government support; Unique community/state partnership; Distrust of science; and, Lack of information and measures on benefits to the community for a restored system.

2. DRAFT OBJECTIVES FOR AN ENGAGED, INFORMED PUBLIC

Based on the input and discussion of issues and potential objectives at the January 15, 2020 meeting, the TNC team developed and sent the Working Group a draft set of six objectives (a-f) for this vision theme and goal for review in advance of this meeting. The Working Group reviewed and discussed and found the suite of draft objectives consistent with the January discussion and acceptable.

- a. City, county and state-level budgets are influenced by the Oyster EBFM Plan
- b. City and county officials are incorporating Oyster EBFM Plan recommendations into relevant growth management plans and decisions
- c. A coordinated outreach and education plan is established and implemented to increase public awareness and support for a healthy and well-managed GPBS ecosystem.
- d. Businesses, industries, non-profits, and local governments are supportive and included in outreach and education efforts to generate and increase public awareness and support for a healthy and well-managed GPBS ecosystem.
- e. Funding resources are identified and utilized to generate awareness, education, and support for a healthy oyster and GPBS ecosystem.
- f. The new estuary program incorporates and promotes the recommendations of the new oyster plan.

Working Group Comments on Informed, Engaged Public Objectives

- Want the public abiding and supporting the recommendations and regulations that flow from the Plan
- Extension programs may be able to help with getting questions in their ongoing surveys? They typically follow up 6 months after their surveys.
- Consider partnering with the Studer Institute and the CivicCon program to assist the Estuary programs with economic metrics and public engagement.
- The GEMS program may help with surveys

3. Initial Strategies for Public Engagement

The Working Group brainstormed and discussed the following potential strategies:

- **Oysters enhance other fisheries.** Demonstrate oyster reef provides for other fish- e.g. food for other species of fish
- **Develop volunteer programs** for oyster reef restoration projects
- **Advocacy.** Advocacy group to help improve conditions in Bay
- **Loss of oyster habitat negatively impacting fisheries.** Things you enjoy such as fishing will be adversely impacted. Use the fishery oyster calculator.
- Need to address both positive and negative consequences. Address depletion of resources. And the need for shell recycling
- Habitat replacing with oyster reefs. History has many examples over the years.
- **Citizen science.** Public- citizen science- use this approach. May not easily fit oysters (“spooked”).
- Build the projects and monitor. Address the difficulty getting to the sites.
- Enlist harvesters in citizen science efforts
- **Shell recycling.** Show negative side of throwing and dumping the trash. Recycle shells
- Fish and crabs and oysters are enhanced by sea grass habitats. Inform citizens what would happen if we lost this habitat.
- Shells- collection from restaurants and community public drop off sites

- **Living shoreline education**- make the connection- opportunity
- **Valuing ecosystem services.** EPA intern- ecosystem service valuation for the Estuary Program

4. Related Performance Measures to Evaluate Public Engagement Strategies

The Working Group reviewed the performance measures at the January 15, 2020 meeting and offered refinements and comments on the TNC team's revised performance measures.

- Secure the funding needed for plan implementation.
- # of times plan is referenced in local and regional growth management plans.
- # of people with improved understanding of the issues important to health and restoration of Pensacola Bay.
- # of businesses, industries, non-profits, and local governments participating in outreach efforts
- % funding of available versus needed to implement the plan
- Amount of local, state, federal (and RESTORE?) funds allocated for management and restoration actions in Pensacola Bay
- The extent to which the new estuary program implements recommendations in the new oyster plan
- Number of volunteers participating in oyster restoration efforts.

Working Group Questions and Comments on Performance Measures

- Measured rec fishing benefits= Texas example. Econ and Social metrics tied
- System wide basis- estuary program, target goals.
- Social issues get to values and how people think about the resource. Connection with economic and social
- "Fad" e.g. fish attracting device negative connotation. Hopefully oyster reefs won't be a fad
- Charlotte Harbor- generated food for fish

IV. PUBLIC COMMENT & NEXT STEPS

The facilitators invited members of the public to comment and there was no one who offered public comments. Possible agenda items for Meeting V, which will take place May 19, 2020 in a zoom virtual meeting format, were reviewed. The Working Group members suggested consideration of the following presentations and discussions:

- Draft strategies based on this meeting discussion along with performance measures.
- Greater Pensacola Bay economic research agenda presentation
- A listing of related projects in play in the study area.
- Presentation on shell budget and shell programs- think about the market. What happens on the back end of the market?
- Watermen slot? Encourage and provide an opportunity for watermen perspectives
- Low DO as nutrients

- Learn about Management regimes in the five Gulf of Mexico states and techniques, technologies and regulations, e.g. how they manage their leases. Scraping of the bottom in LA and TX. Not dragging and dredging. E.g. LA- oysters private leased not many wild open areas. Beth Walton might be a good one to ask based on her previous work.
- Perspective on fishery resources from recreational fishing industry- species targeted, targeting oyster reefs, etc.
- Presentation on FDEP role and responsibilities for estuary management, similar in scope to the presentations provided by FWC and FDACS at the January 15th meeting.

The meeting adjourned at 1:10 pm. CST

Appendix #1 Meeting Agenda

OYSTER ECOSYSTEM-BASED FISHERY MANAGEMENT PLAN FOR THE GREATER PENSACOLA BAY SYSTEM

GPBS STAKEHOLDER WORKING GROUP

MEETING IV—APRIL 9, 2020—8:30 AM CST

VIRTUAL MEETING VIA ZOOM

HOST: THE NATURE CONSERVANCY, FLORIDA, FACILITATOR: FACILITATED SOLUTIONS, LLC

MEETING IV OBJECTIVES

- ✓ To Approve Regular Procedural Topics (Agenda and Meeting III Summary Report)
- ✓ To Receive Requested Presentations
- ✓ To Review and Refine Objectives and Strategies for Goals
- ✓ To Review and Refine Draft Performance Measures
- ✓ To Identify Needed Next Steps and Information, and Agenda Items for Next Meeting

GPBS STAKEHOLDER WORKING GROUP MEETING IV AGENDA—APRIL 9, 2020

All Agenda Times are Central Time Zone

All Times Are Approximate and Subject to Change (including Public Comment and Adjournment)

| 8:30 AM CST | | CALL TO ORDER |
|--------------|-------|---|
| 1. | 8:30 | WELCOME AND INTRODUCTIONS |
| 2. | 8:40 | REVIEW AND APPROVAL of Agenda |
| 3. | 8:45 | APPROVAL OF FACILITATORS' SUMMARY REPORT (JANUARY 15, 2020 MEETING) |
| 4. | 8:50 | STAKEHOLDER REQUESTED PRESENTATIONS AND BRIEFINGS (15 MINUTES/PRESENTATION) <ul style="list-style-type: none"> • Review of Habitat Suitability Map, Recent Shell-Planting Areas, and Options for Oyster Management Plan Boundary (HUC 4, 6, 8 boundaries). Laura Geselbracht, The Nature Conservancy • Pensacola and Perdido Bays Estuary Program Overview. Matt Posner, Interim Director, Pensacola and Perdido Bays Estuary Program • Social and Economic Outcomes from Oyster Reef Restoration in the Gulf of Mexico: Applying the GEMS Model to the Greater Pensacola Bay System. Dr. Lydia Olander, Dir. Ecosystem Services Program, Duke Nicholas Institute for Environmental Policy Solutions • An Economic Research Agenda for the GPBS. (Postponed to May Mtg.) |
| 10:00 AM CST | | BREAK |
| 5. | 10:15 | A.) A HEALTHY AND PRODUCTIVE OYSTER REEF ECOSYSTEM <ul style="list-style-type: none"> • Review and Refine Draft Objectives, Identify and Clarify Strategies, and Review and Refine Relevant Performance Measures to Assess Strategies |
| 6. | 11:15 | B.) THE MANAGEMENT AND REGULATION OF THE OYSTER FISHERY AND AQUACULTURE <ul style="list-style-type: none"> • Review and Refine Draft Objectives, Identify and Clarify Strategies, and Review and Refine Relevant Performance Measures to Assess Strategies |
| 12:00 PM CST | | BREAK |
| 7. | 12:15 | C.) A Thriving Economy Connected to the Greater Pensacola Bay System <ul style="list-style-type: none"> • Review and Refine Draft Objectives, Identify and Clarify Strategies, and Review and Refine Relevant Performance Measures to Assess Strategies |
| 8. | 12:45 | D.) An Engaged and Informed Public <ul style="list-style-type: none"> • Review and Refine Draft Objectives, Identify and Clarify Strategies, and Review and Refine Relevant Performance Measures to Assess Strategies |
| 9. | 1:00 | PUBLIC COMMENT |
| 10. | 1:15 | NEXT STEPS AND AGENDA ITEMS FOR THE NEXT MEETING |
| ~1:30 PM CST | | ADJOURN |

Appendix #2 Working Group Members, Project Team & Facilitators

(**Bold** = members who attended the April 9, 2020 meeting. 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)

| GPBS STAKEHOLDER WORKING GROUP MEMBERS AND PUBLIC ATTENDANCE | |
|--|--|
| MEMBER | AFFILIATION |
| Building/Development | |
| 1. Shelby Johnson | Johnson Construction of Pensacola, Inc. |
| 2. Glen Miley | biome Consulting Group |
| Business/Real Estate/Economic Development/Tourism | |
| 3. Will Dunaway/ Barbara Albrecht | Environmental Lawyer |
| 4. Donnie McMahon/ Thomas Derbes | Business and Aquaculture |
| Environmental/Citizen | |
| 5. Christian Wagley | Healthy Gulf |
| Local Government | |
| 6. Shelley Alexander | Santa Rosa County Environmental Programs |
| 7. Chips Kirschenfeld/ Mark Nicholas/Tim Day | Escambia County Natural Resources Management |
| 8. Matt Posner/ Whitney Scheffel | Pensacola and Perdido Bays Estuary Program |
| 9. Keith Wilkins | Pensacola City Administrator |
| Recreational Fishing | |
| 10. Chris Phillips | Hot Spot Charters |
| Seafood Industry | |
| 11. Pasco Gibson | Seafood Industry/Waterman |
| 12. Josh Neese | Aquaculture |
| 13. Pete Nichols | Seafood Industry/Waterman |
| 14. Tommy Pugh | Seafood Dealer |
| 15. Phil Rollo | Seafood Dealer |
| 16. Calvin Sullivan | Oyster Harvester |
| 17. William (Hub) Williamson | Oyster Harvester |
| State Government | |
| 18. Beth Fugate | FDEP/Aquatic Preserves |
| 19. Kent Smith/Katie Konchar | FWC Division of Habitat and Species Conservation |
| 20. Mike Norberg | FWC Division of Marine Fisheries Management |
| 21. Portia Sapp/Michelle Smith | FDACS Division of Aquaculture |
| 22. Paul Thurman | NFWFMD |
| Tourism | |
| 23. Jack Brown | Visit Pensacola |
| University/Research | |
| 24. Jane Caffrey | UWF |
| 25. Rick O'Connor | UF/IFAS Escambia County |
| 26. 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 | |
| L D Henderson, | Oysterman |
| Tanya Linzy | Santa Rosa County |
| Lydia Olander - Presenter | Duke University |

Appendix #3 What are You Doing Differently As You Shelter in Place?

In opening the Zoom meeting, Anne Birch invited the participants to share on the Chat function what they were doing differently as they shelter in place.

- My wonderful husband built me a puzzle board so I could start making puzzles again but not seize control of the dining room table for X? months. 1,000 piece puzzle, what was I thinking?
- Chatting with other dog walking neighbors from afar in the evenings
- Volleyball in the back yard with our daughter
- Taking walks with the kids around the neighborhood every night
- Fixing our irrigation system
- Building furniture, I have been wanting to do for a long time
- Lots of time on my vegetable garden
- I'm drinking tea, not coffee
- Building custom fishing rods
- Biking, walking and running also facilitating many virtual meetings
- I go out as much as possible
- Getting outside and enjoying our new sun umbrella on the patio and watching all the birds in the yard.
- Puzzling, gardening and recently trying to teach myself to play the keyboard, much to my pets' dismay
- Lots of walks and growing a vegetable garden
- Open air jeep rides, driving by the beach
- Built a new computer during this, forgot to add camera and microphone so I will be having to communicate through chat
- Walking around my neighborhood in full zombie makeup to terrify my neighbors
- More zoom meetings.

Appendix #4 Virtual Meeting Process Guidelines

GREATER PENSACOLA BAY SYSTEM STAKEHOLDER WORKING GROUP VIRTUAL MEETING VIA WEBINAR-TELECONFERENCE PARTICIPATION PROCESS

GENERAL

- Please be aware that background noise from participants is picked-up and amplified on the webinar system, especially when using a speakerphone or your computer without a headset.
- Greater Pensacola Bay System Stakeholder Working Group (Working Group) members, and any other meeting participants should offer their names each time they speak to ensure all participants know who is speaking.
- Members should offer their names when making and seconding motions.
- Working Group members should announce if they have to sign-off before the virtual meeting is complete.
- Ranking exercise results and votes will be tallied by recording members' votes by name in turn.

ATTENDANCE

- Facilitator will conduct roll call of Working Group members and Project Team.
- Once attendance is complete, the agenda will be reviewed and approved by the Working Group.

PARTICIPANT ETIQUETTE

- Please keep your phones on mute if calling in and mute the microphone icon in the Virtual Meeting Control Panel if you are connected by webinar. The default mode for your microphone is mute and is reflected by a red microphone icon next to your name, to unmute click the red microphone icon and it will turn green when you are unmuted.
- It works best if everyone mutes themselves except when speaking.
- Please don't put your phones on hold.
- Please wait until invited by the Facilitator to speak to avoid confusion.
- Names will be stacked by the Facilitator to ensure order.
- Participants will have ample time to speak on substantive agenda items.

DISCUSSION PROCESS

- Facilitator will introduce discussion item or presenter.
- Presenter will provide overview of issue and recommendation(s) for Working Group action.
- Hold questions until presentation is complete.
- Once presentation is complete, Facilitator will ask if Working Group members have clarifying questions on the issue, create a speaker's list, and call on members in-turn for clarification.
- Facilitator will ask if any Working Group member wishes to discuss the issue or propose alternative options, create a speaker's list, and call on members in-turn for discussion.
- Once clarification and discussion are complete, Facilitator will conduct a rating exercise or test for consensus on the issue as appropriate.

GUIDELINES FOR VIRTUAL MEETING PARTICIPATION

COME PREPARED. Review the agenda, presentations and background documents ahead of time. Schedule at least 15 minutes to prepare for the meeting/webinar – if you don't need it you can have the time back. Do the pre-work. Make notes and be ready with questions.

TEST THE TECHNOLOGY AHEAD OF TIME. Log in the day before to ensure full access to whatever online technology is being used. Check your headset and/or telephone system.

PARTICIPATION—VIDEO AND AUDIO: If you participate using your computer for audio (using a headset to listen and/or speak) do not use the teleconference call in number (it creates interference). You can listen and/or speak using your headset through the VOIP function of your computer. If you use your computer only for the video/visual function (to view presentations) you will need to call in on the teleconference line to listen and/or speak. Participants who wish to view the presentations will need to use their computers to log-in using the meeting URL provided on the meeting agenda whether they participate with VOIP or the teleconference participation option for audio and video functions.

TURN UP EARLY. Put the web address and teleconference details in your calendar and bookmark the web URL. Set the reminder 15 minutes ahead of the call.

REMOVE DISTRACTIONS. Schedule a quiet place to participate from. Clear your desk and computer desktop. Turn off email & instant messaging. Put your cell phone aside. Put a note on your office door. Create an environment that allows you to fully participate without distractions.

TAKE RESPONSIBILITY FOR YOUR OWN PARTICIPATION. Don't plan to do any "catch up" activities during the call. If you catch yourself multi-tasking, close your eyes and listen. Avoid side conversations whether in the room with colleagues or in an online chat space. Keep your phone on "Mute" unless speaking. Never place your phone on "Hold". Be aware that when your phone is on speaker mode it transmits background noise and can interfere with the meeting.

BE AWARE OF AIR TIME. Fully participate while allowing others to do the same. Speak your name before making a comment.

FOLLOW WORKING GROUP'S MEETING PARTICIPATION GUIDELINES. Do not speak without acknowledgement from the facilitator. Speaking out of turn is very disruptive to a virtual meeting.

SUPPORT THE FACILITATOR. Acknowledge questions and pay attention. Use the raise hand function to speak and wait for the facilitator to invite questions and/or comments. The facilitator will create a speakers list at all appropriate times during the meeting. Keep your phone on "Mute" (not "Hold") whenever possible.

Appendix #5 Project Schedule & Workplan

Meetings Dates are Subject to Change

| PROJECT WORKPLAN | | |
|---|--|--|
| GPBS STAKEHOLDER WORKING GROUP MEETING SCHEDULE AND WORKPLAN | | |
| STANDING UP AND ORGANIZATION OF THE GPBS STAKEHOLDER WORKING GROUP | | |
| Meeting I. Studer Institute, Pensacola | Oct. 9, 2019 | Scoping and organizational meeting, review and refinement of overall project purpose, vision and goal framework. |
| Meeting II. UF/IFAS SRC Extension, Milton | Nov. 15, 2019 | Review and refinement of goal framework, draft management plan outline, review of science and data gaps. Introduction to decision-support tools and requested presentations. |
| SCOPING OF GPBS ISSUES, IDENTIFICATION OF PERFORMANCE MEASURES & OPTIONS | | |
| Meeting III. Sanders Beach, Pensacola | Jan. 15, 2020 | Review of oyster management plans, issues and options. Identification of draft performance measures, draft outline of Oyster Ecosystem-Based Fisheries Management Plan. |
| Meeting IV. Zoom | March 18, 2020 <i>Rescheduled to April 9, 2020</i> | Identification of decision-support tools options, review of objectives, strategies and performance measures |
| Meeting V. Zoom | May 19, 2020 | Review of decision-support tools scenarios and consensus rating of options and policy issues. Review and agreement on draft outline for a Oyster Ecosystem-Based Fisheries Management Plan. Public Workshop Draft. |
| Public Workshop #1 | June 2020 | Review of Vision, Goal Framework, Plan outline, issues & options. |
| BUILDING CONSENSUS ON GPBS OYSTER ECOSYSTEM-BASED FISHERIES MANAGEMENT PLAN | | |
| Meeting VI. Zoom | July 22, 2020 | Review of public comments on Draft Plan, review of decision-support tools scenario results and consensus rating of options, draft performance measures, and identification of policy issues. |
| Meeting VII. Studer Institute, Pensacola | Sept. 16, 2020 | Review of Draft Plan, recommendations on policy issues, decision-support tools scenario results, and consensus rating of options. |
| FINALIZING CONSENSUS ON GPBS OYSTER ECOSYSTEM-BASED FISHERIES MGT. PLAN | | |
| Meeting VIII. UF/IFAS SRC Extension, Milton | Nov. 18, 2020 | Review and consensus testing of Draft Plan and recommendations on policy issues. |
| Meeting IX. Sanders Beach, Pensacola | Jan. 27, 2021 | Review and consensus testing of Draft Plan and implementation guidance and agreement on Workshop Draft Plan. |
| Public Workshop #2 | February 2021 | Review of GPBS Oyster Ecosystem-Based Fisheries Management Plan and implementation guidance. |
| Meeting X. UF/IFAS SRC Extension, Milton | March 17, 2021 | Review of public comment, refinement and consensus on the GPBS Oyster Ecosystem-Based Fisheries Management Plan and implementation guidance. |

GPBS 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://myescambia.com/oyster-ebfm-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>.