

**APALACHICOLA BAY SYSTEM INITIATIVE COMMUNITY ADVISORY BOARD
UNANIMOUS CONSENSUS RANKED GOALS, VISION THEMES, GOAL
STATEMENTS, OUTCOMES, OBJECTIVES, STRATEGIES, AND ACTIONS
FOR INCLUSION IN THE DRAFT PLAN* AUGUST 9, 2023**

** Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan*

**GOAL A
A HEALTHY AND PRODUCTIVE BAY ECOSYSTEM**

VISION THEME A: The Apalachicola Bay System, including its oyster reef resources, is sustainably managed. Water resources and affected habitats are afforded adequate protection to ensure that essential ecosystem functions are maintained, and a full suite of economic opportunities are realized.

GOAL A: The Apalachicola Bay System is a healthy and productive ecosystem that supports a vibrant and sustainable oyster fishery and other economically viable activities.

OUTCOME: By 2030, the Apalachicola Bay System is a healthy, productive and sustainably managed ecosystem that supports a viable oyster fishery while providing a broad suite of ecosystem services that, in turn, afford additional opportunities for sustainable economic development.

GOAL A OBJECTIVES

A1) To define measurable ecosystem health metrics (e.g. oyster population demographics, condition indices, reef associated community, water quality, nutrient levels, submerged aquatic vegetation, fish and wildlife populations) that can be used to determine the level and effects of change in ecosystem services (e.g., oyster fishery harvest, habitat for other fishery species, filtration capacity) and societal benefit derived from Apalachicola Bay System management and restoration efforts, with target and threshold levels identified.

A2) To help establish a comprehensive monitoring plan to evaluate the health of the oysters and the ABS ecosystem and its measurable ecological functions and ecosystem services with clearly defined performance measures and strong coordination among the various entities conducting research in the region.

A3) To use observations, monitoring, experiments and modeling to create decision support tools that can inform how a range of natural and human influenced factors will affect the ABS ecosystem.

A4) To use decision support tools to identify viable strategies for restoration and management of the ABS oyster communities and the function of the ABS ecosystem.

GOAL A — ECOSYSTEM RESTORATION PRIORITIZED STRATEGIES



- 1) **Establish Bay-wide metrics (e.g., targets, thresholds) to monitor the health and status of the ABS, including oysters, that can be used to sustainably restore and manage oysters and the ABS ecosystem.**
 - **Action 1-A)** Restore and create reef structures suitable in size, location, and substrate type that can support a healthy and sustainable oyster ecosystem.
 - **Action 1-B)** Obtain data at a Bay-wide scale to develop system-wide ecosystem-based metrics and models that will inform restoration and adaptive management decisions.
 - **Action 1-C)** Design and implement projects to achieve multiple ecological and ecosystem service targets (e.g., provision of habitat for reef-associated species, water filtration, shoreline protection).
 - **Action 1-D)** Implement oyster population enhancement studies to complement cultching for restoration.
 - **Action 1-E)** Establish performance measures and ecosystem service targets that can be used to guide restoration planning, implementation, and monitoring of restoration progress.
 - **Action 1-F)** Use habitat suitability analyses and results from oyster larval dispersal models to select optimal locations for restoring, enhancing, and/or developing new reef structures.
 - **Action 1-G)** Continue conducting restoration experiments to test efficacy of different reef structural designs (e.g., reef dimensions, orientation, shape and/or rugosity).
 - **Action 1-H)** Continue using knowledge gained from experiments to recommend best practices for broad scale restoration in the ABS.
- 2) **Incorporate stakeholder knowledge/experience to help identify suitable substrate(s) (e.g., limestone, granite, spat-on-shell, artificial structures) and the best locations for restoring, enhancing, and/or developing new reef structures.**
 - **Action 2-A)** Include oystermen in discussions to evaluate cultching techniques and materials for growing oysters (e.g., historical non-traditional, trees), adding spat on shell or other substrates.
 - **Action 2-B)** Include oystermen in discussions on spatial configuration of reefs (height, width, contours, etc.), locations (existing reefs and hard bottom), use of larger rock to protect restored reefs from siltation and sedimentation from prevailing currents and storms.
 - **Action 2-C)** Include oystermen on material deployment projects for reef restoration to ensure material is deployed properly and in proper locations.
- 3) **Determine area (acres or km²) of oyster reefs that currently support live oysters as well as the area needed to ensure sufficient spat production that will support development of sustainable oyster populations.**
 - **Action 3-A)** Continue to update maps of existing oyster habitat using multibeam sonar and backscatter, and ground-truth for accuracy, on a timeframe determined by speed of environmental change (e.g., *update mapping of the Bay every 5 years if data indicate detectable changes are occurring on this scale*).
 - **Action 3-B)** Continue to collect data to support estimates of oyster reef areas that support live oysters.



- **Action 3-C)** Use ecological modeling that incorporates reproductive output, recruitment (includes reef carrying capacity), natural mortality rates and fishery harvest to assess oyster population dynamics.
 - **Action 3-D)** Study and incorporate the connectivity of shoreline (intertidal) oyster habitat with subtidal oyster reefs (e.g., larval transport modeling) when and where applicable.
- 4) Identify monitoring needs for assessing the health of oyster populations and detecting changes in environmental conditions and habitat quality (for oysters and other reef-associated species) over time.**
- **Action 4-A)** Monitor intertidal and sub-tidal reef/habitat using protocols and schedules FWC monitoring. Adjust and add to monitoring program as needed to sufficiently monitor and assess oyster habitat. After checking data accuracy, post updated monitoring data on a regular basis on an accessible public website.
 - **Action 4-B)** Conduct rapid ‘spot-checks’ (e.g. using tong surveys) at a sufficient number of different locations in the Bay to supplement the FWC site-level monitoring. Sufficient number of sites to be determined by statistical analysis of existing data. Document volume of material (rock/shell/oysters), abundance and size of live and box oysters (dead oyster with valves and hinge intact), abundance and type of predator and environmental data.
 - **Action 4-C)** Continue and expand sites for collecting long-term in situ environmental data (e.g., conductivity, pH, and temperature) and integrate ANERR environmental and nutrient data (e.g., TC, TN, and TP) as correlated with oyster metrics.
 - **Action 4-D)** Generate habitat condition indicators using monitoring data, and other ecological factors (e.g., oyster-associated communities and structural complexity).
 - **Action 4-E)** Evaluate the impacts of anthropogenic (human) nutrient loading and pollutants to oyster resources and the Bay ecosystem.
 - **Action 4-F)** Use data to evaluate status of oyster populations, oyster ecosystem health and quality of ecosystem services.
 - **Action 4-G)** Integrate ecosystem services metrics into a monitoring and adaptive management program to assess ecosystem recovery progress.
- 5) Use and update recently developed ecosystem models that forecast future environmental conditions and oyster population status for management and restoration strategies and decisions.**
- **Action 5-A)** Ensure data collected for use in ecosystem modeling are entered, receive data quality checks, and are made available to the public in an accessible online format.
 - **Action 5-B)** Incorporate existing data to forecast acceptable future environmental scenarios (or forecasts) and analyze potential effects on oyster populations and ecosystem-level services and habitat metrics (targets).
 - **Action 5-C)** Coordinate with appropriate state and federal agencies, out-of-state user groups, and other initiatives working on both geographically-constrained and basin-wide water-flow alterations and management strategies that affect the health of the ABS.



- **Action 5-D)** Use models to identify potential oyster restoration areas that could be used as protected spawning reefs to enhance recruitment and productivity of other reefs in the ABS.
- 6) **Conserve and/or restore watershed (landscape) habitat (i.e., Submerged aquatic vegetation (SAV) including seagrass, and wetland and riparian habitat) to work synergistically with oyster habitat restoration to enhance restoration of the ABS.**
- **Action 6-A)** Develop restoration projects in the Bay that work toward meeting the ecosystem-level metrics for the Bay.
 - **Action 6-B)** Monitor and model changes to foundational habitat (e.g., submerged aquatic vegetation, mangroves, salt marsh grasses) for identifying management and restoration priorities.
- 7) **Develop criteria for restoring specific reefs or reef systems that are resilient to adverse environmental conditions or natural disasters and incorporate adaptive management actions into the Restoration and Management Plan, as appropriate.**
- **Action 7-A)** Restore and manage oyster habitat and reefs that are resilient to adverse environmental conditions, episodic events, or natural disasters and incorporate adaptive management actions into the Restoration and Management Plan, as appropriate.
 - **Action 7-B)** Develop and incorporate metrics established elsewhere in this Plan for monitoring and evaluating the degree of damage and potential for recovery.
 - **Action 7-C)** Develop an approach for mitigating damage (e.g., physical repair, spat supplements, or some combination of both).
 - **Action 7-D)** Determine periodicity of hatchery-produced spat addition (e.g., annually or longer) with a specific timeline for continuing the approach. This approach is not intended to create a put-and-take fishery.
 - **Action 7-E)** Apply projected climate scenarios to larval dispersal and habitat suitability models to identify target areas for restoration that will persist under future conditions (i.e., increased temperature, extreme weather, sea level rise).

GOAL B

SUSTAINABLE MANAGEMENT OF OYSTER RESOURCES

VISION THEME B: A restored Apalachicola Bay System has resulted in a sustainably managed and adequately enforced wild harvest oyster fishery while also providing opportunities for other economically viable and complementary industries, including tourism and aquaculture. This is accomplished by working collaboratively with stakeholders to create, monitor and fund a plan that ensures that the protection of the habitat and the fishery it supports is based on science, stakeholder input, and industry experience, and is implemented in a manner that provides both fair and equitable access to and protection of the resource.

GOAL B: productive, sustainably, and adaptively managed Apalachicola Bay System supports sustainable oyster resources.



OUTCOME: By 2030, an engaged and collaborative group of stakeholders will have contributed to and helped spearhead a fully funded science-driven plan to sustainably manage oyster resources in the Apalachicola Bay System.

GOAL B OBJECTIVES

B1) To develop through a transparent and inclusive process a science-based ABS oyster recovery and adaptive management plan for both commercial and recreational industries that includes: broad stakeholder and community support; a long-term, comprehensive monitoring plan that will be carried out by state agencies and their contractors; a regulatory framework that allows for rapid modifications when needed to address changing environmental conditions; and enforceable regulations that contain penalties sufficient to deter violations and harm to the resource. This Plan must be constructed with the direct involvement of entities within the State of Florida (e.g., FWC, FDACS, State Legislature) in cooperation with other relevant agencies to enhance the likelihood of consideration for implementation.

B2) To evaluate oyster aquaculture best-management practices that allow for the unimpeded recovery of oyster's reefs, the oyster fishery, and the ecological and societal health of the ABS ecosystem while providing economic opportunities to the aquaculture industry.

GOAL B — MANAGEMENT PRIORITIZED STRATEGIES

- 1. Evaluate a suite of management approaches that in combination achieve the goal of maintaining a sustainable wild oyster fishery as measured in relation to relevant performance metrics for determining success.**
 - **Action 1-A)** Evaluate the potential for limited-entry fishery that would be managed adaptively with the number of entrants in the fishery based on an adopted sustainable harvest level. Evaluate the potential for establishing a limited-entry oyster fishery program and various management strategies through a transparent representative stakeholder driven consensus-building process that includes vetting the plan with local oystermen and FWC law enforcement.
 - **Action 1-B)** Consider implementation of a Bay-wide summer (June – August) wild-harvest fishery closure.
 - **Action 1-C)** Consider daily harvest limits in conjunction with a Monday – Friday five-day harvest week.
 - **Action 1-D)** Consider a recreational wild oyster harvest limit (e.g., one 5-gallon bucket of oysters), and allow recreational hand-harvesting during the same season the fishery is open to commercial harvest.
 - **Action 1-E):** Evaluate managing harvest areas to prevent the concentration of effort in locations by allowing all of the legal and approved (by FDACS) harvest areas of the Bay to be open during the harvest season and harvesting hours (Action 1-B and 1-C above).
 - **Action 1-F):** Evaluate existing allowable and minimally destructive alternative gear type options and harvest methods, including the use of experimental gear for wild oyster harvesting.
- 2. Develop specific criteria and/or conditions, with related performance measures for the reopening and closing of Apalachicola Bay to limited wild oyster harvesting.**



- **Action 2-A.)** Use the best available science and decision-support tools to develop criteria for opening and closing wild oyster harvest and for determining sustainable harvest before the harvest season and during the harvest season in conjunction with the annual stock assessments and frequent monitoring.
 - **Action 2-B)** Select a reasonable but conservative starting target for reopening the fishery and adjust (through adaptive management) the allowable harvest based on monitoring and oyster population analysis (e.g., stock assessments).
 - **Action 2-C)** Ensure that definitions of oyster population health are based on metrics/criteria specific to the resource in addition to the fishery.
 - **Action 2-D)** Evaluate harvest-level or oyster population-based metrics used to manage oyster reef harvest at sustainable target levels and above threshold levels. Consider graduated metrics that serve as targets, or indicators when harvest should be limited or closed. This should be applied by area or reef data allows.
 - **Action 2-E)** Consider temporary wild harvest closures based on the results of oyster population monitoring relative to the established metrics.
 - **Action 2-F)** Add a spatial component to the ecological and fishery modeling to approximate historical and existing reefs and reassess management strategies based on the evaluation of modeling scenarios.
- 3. Conduct an oyster stock assessment for the Apalachicola Bay System with periodic updates.**
- **Action 3-A)** Conduct annual or biannual stock assessments using fisheries dependent and independent data, with data collection methods and site selection done in collaboration with oystermen, for determining a sustainable level of wild oyster harvest for each season.
 - **Action 3-B)** Conduct monitoring (i.e., spot-checks) of oyster abundance during the fishing season to facilitate adaptive management of harvest limits.
- 4. FWC Law Enforcement should develop enforcement strategies and appropriate penalties sufficient to deter harvest or sale of undersized oysters as well as violations that harm wild or leased oyster reefs and other natural resources, and that will support restoration efforts in the ABS.**
- **Action 4-A)** FWC should develop strategies to increase enforcement presence and number of checkpoints to provide a deterrent to illegal activities.
 - **Action 4-B)** Ensure law enforcement presence during peak harvesting periods, and on the water during harvest season hours.
 - **Action 4-C)** FWC should develop strategies to ensure consistent practices are used for enforcement of regulations regarding the harvestable and marketable size of oysters. (See Actions 5-F and 5-G)
 - **Action 4-D)** Statutes and/or rules should be revised as needed to require FWC to check harvested oysters for size-limit enforcement* before they are washed and processed. Once processed, enforcement of oyster size-limits should be limited to oysters under 2.75” because processing changes shell height.
- * Sampling and other data collection activities shall not be impacted by this recommendation.*



- **Action 4-E)** FWC should evaluate and enhance, as needed, the regulations and enforcement practices to ensure dealers accurately identify the source of oysters after processing and packaging.
 - **Action 4-F)** FWC should evaluate and revise, as needed, the statutory and/or regulatory requirements to ensure that FWC has authority to enforce oyster regulations at the dealers' location.
 - **Action 4-G)** FWC should work with oystermen to evaluate current rules and regulations to ensure they are enforced consistently, fairly, and practically with an understanding of real-world on-the-water harvesting practices and constraints.
 - **Action 4-H)** FWC should evaluate and seek authority to implement a tiered system of penalties for willful violators (increased fines and license suspensions ranging from increased length of suspension to the permanent loss of license) to keep willful violators out of the industry.
 - **Action 4-I)** FWC should encourage community and industry support for consistent judicial imposition of penalties within the existing penalties framework for oyster harvest violations, including imposing stricter penalties for habitual and willful violators.
 - **Action 4-J)** Prior to the opening of each harvest season FWC should conduct a joint workshop between FWC law enforcement and the oystermen to review the current rules and regulations, identify any changes, discuss enforcement approaches relative to harvest practices and constraints on the water, and to provide mutual two-way education, and enhance communication and collaboration between FWC and oystermen.
 - **Action 4-K)** FWC should work together and with other stakeholders to seek funds to support the recommended increased law enforcement presence in the Bay.
 - **Action 4-L)** FWC should establish the 5% allowable undersize oyster limit for both harvesters and dealers.
 - **Action 4-M)** FWC should clarify that it is an allowable practice for oystermen to weigh oyster bags while on the water to ensure the bags meet the weight limit regulations.
5. **Establish co-management advisory committees to provide advice and oversight to state managing agencies on oyster habitat and wild harvest. Evaluate the development of a policy that would require setting sustainable harvest goals and placing limitations on or a complete closure to harvesting in certain areas (e.g., important spawning reefs) based on the results of data (e.g., stock assessment, larvae transport modeling) collected and evaluated under a comprehensive monitoring program designed to sustainably manage the resource.**
- **Action 5-A)** Convene a co-management advisory committee comprised of state and federal agencies, and other appropriate experts, to assess and make recommendations on oyster habitat needs in conjunction with harvest management strategies.
 - **Action 5-B)** Convene an Oyster Fishery Advisory Board within FWC to review and make recommendations on management and enforcement of the oyster fishery in Apalachicola Bay.
6. **Recommend policies and actions that retain and recycle shell or other suitable material for habitat replenishment in the Apalachicola Bay System.**
- **Action 6-A)** Develop agency rules and policies that require shell retention and/or obtain shell or other suitable material for habitat replenishment (through a fee or incentive program).



- **Action 6-B)** Obtain legislative support for statutes that support or require shell recycling and oyster habitat replenishment. (e.g., Texas House Bill 51 (2017); North Carolina General Statute §130A-309.10 (2010); Maryland House Bill 184; Chapter 157, F.S. (McClellan 1881).
 - **Action 6-C)** Establish and/or expand partnerships with local organizations, stakeholder groups, industry, and universities in shell recycling programs.
7. **Use decision-support tools to evaluate and develop a system of potential closed areas (e.g., spawning reefs) that are well defined in terms of size, location, and longevity and include rotational and seasonal harvest areas, as well as long-term closed areas in strategic locations to provide habitat for year-round protection for brood stock and enhanced spawning opportunities.**
- **Action 7-A)** Engage local stakeholders in determining total coverage (how much to protect), placement (where to protect), and size (how large) of all types of potential closed areas using gridded maps as well as distributions of selected fishery and ecologically important species.
 - **Action 7-B)** Use ecological quantitative modeling outputs to identify: the oyster population abundance that can support sustainable harvest; percentage of the total reef area that is sufficiently productive to support sustainable harvest; annual recruitment required to support sustainable harvest; and to determine the amount and frequency of habitat replacement to maintain productive oyster reefs.
8. **Work with FDACS and oyster aquaculture industry stakeholders to ensure that oyster aquaculture practices and locations in the Bay are compatible with the goals and strategies for restoration and management of the ecosystem and are compatible with wild fisheries and the important cultural role of a working waterfront and seafood industry.**
- **Action 8-A)** Develop maps using FDACS data showing all proposed and existing aquaculture activities in the ABS, superimposed on existing maps of essential fish habitat, fishing activities, seagrass beds, and natural existing hard bottom (reefs/bars) to identify potential conflicts.
 - **Action 8-B)** Evaluate and consider programs and policies that use farmed oysters for restoration on wild oyster reefs and to retain oysters and/or shells from aquaculture industry to be recycled on wild reefs.
9. **Assess the effectiveness of an oyster replenishment program for maintaining a sustainable wild oyster harvest in Apalachicola Bay. Specific areas would receive regular cultch and/or deployment of hatchery spat-on-shell and would be subject to the same fishery management regulations as non-supplemented areas.**
- **Action 9-A)** Conduct field studies of survival of planted spat-on-shell to harvestable size and time required to attain market size.
 - **Action 9-B)** Use fishery models to estimate the amount and frequency of cultch and/or spat-on-shell required to maintain the minimum threshold for sustainable harvest (i.e., 400 bags/acre).
 - **Action 9-C)** Conduct cost-benefit analysis of deploying cultch and/or spat-on-shell in support of wild oyster harvest in Apalachicola Bay. This includes cost of cultch and spat-on-shell production, cost of deployment, survival of hatchery spat, and value of harvest and associated industry.



- **Action 9-D)** Monitor the stability of oyster populations using the oyster replenishment program approach to wild fishery harvest, to determine whether deploying cultch or spat-on-shell helps reduce natural fluctuations in oyster populations.

GOAL C

A FULLY FUNDED ECOSYSTEM-BASED ADAPTIVE MANAGEMENT AND RESTORATION PLAN SUPPORTED BY APALACHICOLA BAY SYSTEM STAKEHOLDERS

STRATEGIES TO ENSURE THE IMPLEMENTATION, MONITORING, AND ADAPTABILITY OF THE PLAN

VISION THEME C: The Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan is science-based, developed with engagement and support from the Apalachicola Bay System stakeholders, and is fully funded.

GOAL C: The Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan is supported by the Apalachicola Bay System stakeholders and is fully funded.

OUTCOME: By 2030, the Apalachicola Bay System is a productive and sustainably managed ecosystem. A fully funded and well-executed science-based Ecosystem-Based Adaptive Management and Restoration Plan that incorporates the monitoring necessary for evaluation and adaptation is broadly supported by Apalachicola Bay System stakeholders with guidance from a permanent stakeholder advisory board.

GOAL C OBJECTIVES

- C1)** To establish a fully funded permanent, representative stakeholder process to monitor the long-term implementation of the Plan.
- C2)** To identify funding sources and define mechanisms for full implementation of the Plan.

GOAL C PRIORITIZED STRATEGIES

- 1) The CAB “Successor Group” will have an open and transparent process for the implementation of the Plan with many opportunities for stakeholder engagement and input in a variety of forms (e.g., workshops, online, public/ government meetings) for generating awareness and support while incorporating any changes the “Successor Group” deems appropriate and necessary to fulfill the goals and objectives.
 - **Action 1-A)** The successor group actively engages with state programs to encourage their adoption of long-term monitoring guidelines and metrics for assessing water quality, oyster abundance, and demographics and to regularly review and update these guidelines and metrics to maintain a healthy and sustainable oyster harvest and Bay ecosystem.
 - **Action 1-B)** The successor group will monitor the Plan’s implementation and make recommendations for revisions required to adaptively respond to changing conditions.
 - **Action 1-C)** The successor group will encourage agencies to prioritize the Plan’s recommendations for investing more funding in the management and restoration of oyster resources.



- **Action 1-D)** The successor group facilitates bidirectional information flow between agencies implementing the restoration and management plans and the public, other government entities and NGOs.
 - **Action 2-E)** The successor group facilitates bidirectional information flow between agencies implementing the restoration and management plans and the public, other government entities and NGOs. The successor group should evaluate whether to initiate the development of an Apalachicola Bay Estuary Program (ABEP) to coordinate and lead in the implementation and monitoring of the Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan. The successor group should explore whether it's a better model to be a part of the Environment Protection Agency's (EPA) National Estuary Program or to model the ABEP after the EPA program with funding provided from other entities as was done with the St. Andrew and St. Joseph Bays Estuary Program.
- 2) **Create a comprehensive funding approach for the Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan implementation including a comprehensive analysis for future grant funding for strategies that support sustainable monitoring deriving from the Plan.** *[Status: Initiated and Ongoing]*
- **Action 2-A)** Evaluate and seek funding sources for implementation of management and restoration strategies included in the Plan (e.g., state agencies, region-wide Gulf trustee implementation group for NRDA funding, federal agencies)
 - **Action 2-B)** Evaluate and seek grant opportunities from recommendations included in the Plan.
 - **Action 2-C)** Evaluate and seek funding for the engineering design, permitting and implementation of habitat restoration efforts based on oyster habitat suitability mapping and modeling and restoration and management targets in consultation with stakeholders.
 - **Action 2-D)** Evaluate and seek funding sources to generate awareness, education, and support for a healthy oyster and ABS ecosystem.
 - **Action 2-E)** Evaluate 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 2-F)** Develop and seek a funding source to provide cultch for habitat restoration on an ongoing basis.
 - **Action 2-G)** Work across estuary programs to fund and leverage large scale monitoring for the Panhandle Region – Perdido to Suwanee.
 - **Action 2-H)** The successor group should evaluate whether to initiate the development of an Apalachicola Bay Estuary Program (ABEP) to coordinate and lead in the implementation and monitoring of the Plan. The successor group should explore whether it's a better model to be a part of Environmental Protection Agency's National Estuary Program or to model an ABEP after the EPA program with funding provided from other entities as was done with the St. Andrew and St. Joseph Bays Estuary Program.

GOAL D

AN ENGAGED STAKEHOLDER COMMUNITY AND INFORMED PUBLIC



STRATEGIES TO SUPPORT EDUCATION, OUTREACH, AND COMMUNITY SUPPORT FOR THE PLAN

VISION THEME D: Stakeholders of the Apalachicola Bay System are committed to working together to disseminate relevant information and advocate for a sustainably managed oyster habitat and a healthy Bay ecosystem. In so doing, the group will facilitate innovative research, development and implementation of best management practices and serve as a hub for information exchange that supports new innovation, education and communication opportunities.

GOAL D: A productive and well-managed Apalachicola Bay System is supported by an actively engaged and informed stakeholder community and public.

OUTCOME: By 2030, stakeholders, private and nonprofit civic leaders, and the public are informed of the importance of sustaining the health of the Apalachicola Bay System, and are engaged and working actively together along with elected and appointed leaders and managers to invest in and implement the Plan.

GOAL D OBJECTIVES

D1) To coordinate community engagement efforts to increase public awareness of and support for a healthy and well-managed ABS ecosystem; and to ensure that businesses, industries, non-profits, community groups, individuals, and local governments are supportive and included in these efforts.

D2) To measure public and stakeholder understanding of the issues important to the health and restoration of the Bay and socio-economic indicators.

GOAL D PRIORITIZED STRATEGIES

- 1) **Build, with the help of the Successor Group, community support and stewardship by educating stakeholders on the importance of maintaining a healthy ABS ecosystem and oyster reefs and by engaging them in the Bay restoration through a variety of hands-on programs.**
 - **Action 1-A)** The successor group shall support development of a community outreach strategy intended to inform and educate stakeholders and the public about the research, the Plan, and focusing on a healthy ABS ecosystem. The audience will include local city, county, and state government officials, businesses and organizations, citizens of every age, and other interested stakeholder groups.
 - **Action 1-B)** Work with local groups, agencies, businesses and other stakeholders to develop a successful shell-recycling program.
 - **Action 1-C)** Develop a “Bay Stewards” program to honor, reward, and provide incentives for businesses and individuals that demonstrate their stewardship of the resource.
- 2) **Support and participate in providing educational opportunities for students at all levels (primary & secondary school through college) to understand the value of their coastal ecosystems, importance of stewardship and the role oysters play in ecosystem health and fisheries.**



- **Action 2-A)** Work with existing entities (e.g., WeatherStem, Scientist in Every Florida School program of the Florida Museum) to expose more K-12 students to the research being conducted to support ABS restoration and management.
- **Action: 2-B)** Provide training and financial support for new workforce entrants in the Franklin County Community through an aquaculture internship program.
- **Action 2-C)** Provide research opportunities for undergraduate and graduate students in science that supports the Plan’s goals.

GOAL E
A THRIVING ECONOMY CONNECTED TO A
RESTORED APALACHICOLA BAY SYSTEM
STRATEGIES TO MONITOR, ASSESS, AND REPORT ON THE ECONOMIC VIABILITY OF
THE PLAN

VISION THEME E: A restored Apalachicola Bay System sustains a vibrant commercial oyster fishery, a thriving aquaculture industry and recreational and tourism-related activities and development opportunities that underpin a strong local economy and resilient coastal community.

GOAL E: The broader Apalachicola Bay Region is thriving economically as a result of a fully-restored Apalachicola Bay System.

OUTCOME: By 2030, the broader Apalachicola Bay Region is thriving economically as a result of a restored Apalachicola Bay System that reflects a unique coastal cultural heritage, based on a vibrant oyster fishery, while simultaneously providing new opportunities for sustainable and responsible development, business, recreation and tourism.

GOAL E OBJECTIVES

- E1)** To ensure that economic indicators of the commercial oyster fishery and associated industries in the ABS demonstrate increasing viability and growth.
- E2)** To ensure that industries and businesses within the ABS are compatible with a healthy and well-managed ABS ecosystem.
- E3)** To develop growth management policies, plans and regulations affecting the ABS that are compatible with a healthy and well-managed ABS ecosystem while maintaining a thriving economy and supporting cultural heritage.
- E4)** To develop an oyster aquaculture industry that provides economic opportunities and is complementary to the wild harvest fishery.

GOAL E — ECONOMIC STRATEGIES OUTSIDE ABSI SCOPE PRIORITIZED STRATEGIES

- 1) Engage all stakeholders to support the regional economy linked to a restored and functionally robust ABS.**



- **Action 1-A)** Engage commercial fishermen in the restoration of the Bay and encourage future participation in restoration such as monitoring, cultching, and shell recycling.
- **Action 1-B)** Coordinate with the local business community and governing bodies (i.e., city and county commissions) to ensure that growth management plans, land use and development regulations meet strong standards that are compatible with and minimize the environmental impact of industry and business activities within the ABS and are conducive to a healthy ecosystem.
- **Action 1-C)** Coordinate with and encourage recreational businesses and activities that recognize the importance of and support a sustainable commercial oyster fishery and the importance of the seafood industry to the Region's cultural heritage.
- **Action 1-D)** Work with existing partners (e.g., the Chamber of Commerce, Apalachee Regional Planning Council, and city and county staff) and initiatives such as the Regional Recreation Economy Alliance to leverage resources to support the local economy and monitor and report on the economic benefits of a restored Apalachicola Bay System (ABS). Include key economic indicators relevant to the commercial oyster fishery and associated industries in the region. Develop a dashboard that includes key economic indicators over time based on restoration efforts in the ABS.

2) Develop economic information and tools necessary to support efforts connecting ABS restoration and management with local and regional economies.

- **Action 2-A) Recommend monitoring* and enforcement programs continue with appropriate metrics to measure output from and impact of harvest on oyster reefs.**
**Ongoing fisheries-dependent and fisheries-independent monitoring by FWRI, coupled with ABSI complementary data based on request of watermen. Both entities are sharing data with one another which is critical for ABSI model development.*
- **Action 2-B)** Support development of planning strategies tied to economic indicators that consider future conditions (climate, SLR, altered river flow) and their effects on the ABS.
- **Action 2-C)** Review land development regulations to provide flexibility while supporting and enhancing efforts to maintain and revitalize working waterfronts in Apalachicola and Eastpoint to ensure preservation of Franklin County's cultural heritage and a viable seafood industry.
- **Action 2-D)** Work with oystermen and other community stakeholders to promote markets for post-recovery Apalachicola oysters products.
- **Action 2-E)** Develop complementary industries in wild oyster harvest and oyster aquaculture that provide new economic opportunities by building a network of experts that can help Franklin County citizens build successful programs through business training, identifying sources of funding for equipment, and developing products that will enhance and diversify local industries.
- **Action 2-F)** Develop new markets for selling oysters to areas within and outside of Florida in part by investing in location (Apalachicola Bay) branding.

**ADDITIONAL PRIORITIZED STRATEGIES OUTSIDE ABSI SCOPE
FOR REFERRAL TO OTHER ENTITIES**

- 1) Work with State legislators and state agencies to develop funding strategies, and incentives for involving local watermen, seafood dealers, restaurants, aquaculture operations, and**



private citizens in oyster reef restoration efforts that will increase the viability of oyster resources.

- *Action 1-A)* Identify source of shell, or other restoration material.
- 2) Provide training and seek financial support for new workforce entrants (particularly young entrants) interested in being employed in existing industries as well as developing industries in new fisheries, aquaculture, and restoration science.
 - 3) Develop surveys or other tools that can be used to measure and track changes in stakeholder and public understanding of the issues important to the health and restoration of the Bay.
 - 4) Support existing entities in building Gulf-wide mechanisms for communities interested in the restoration and revitalization of oyster fisheries to exchange best practices and lessons learned.
 - 5) Engage the public (students, residents and tourists) in learning about the history and the ecological and economic importance of the Apalachicola Bay region, including the natural resources, and lumber, cotton shipping, and fishing industries.



CONSENSUS APPROVED PERFORMANCE MEASURES

APPROVED NOVEMBER 16, 2021

PERFORMANCE MEASURES: The regular measurement of outcomes and results, which generates reliable data on the effectiveness, efficiency, and sustainability of programs and plans. The decision support tools will be used when available to forecast results that will help weigh the potential outcomes of different strategies.

PERFORMANCE MEASURES	
GOAL A—A HEALTHY AND PRODUCTIVE BAY ECOSYSTEM	
OBJECTIVES	RECOMMENDED METRICS
<p>A1) To define measurable ecosystem health metrics (e.g. oyster population demographics, condition indices, reef associated community, water quality, nutrient levels, submerged aquatic vegetation, fish and wildlife populations) that can be used to determine the level and effects of change in ecosystem services (e.g., oyster fishery harvest, habitat for other fishery species, filtration capacity) and societal benefit derived from Apalachicola Bay System management and restoration efforts, with target and threshold levels identified.</p> <p>Goal for Objective A1: User-friendly informative decision support tools available to ABS resource managers.</p>	<ul style="list-style-type: none"> • Oyster population dynamics (recruitment, growth, mortality, shell budgets). • River flows under climate and management scenarios (River flow model). • Current speed and direction and particle trajectories (proxy for larval dispersal), under different river flow, tidal and wind-forced scenarios (hydrodynamic model). • Temperature, salinity, oxygen, pH, nutrients and organic carbon dynamics under different climate and management scenarios (combined river flow and hydrodynamic models). • Reef area and height (total area of patches of living and nonliving oyster shell or substrate with and without live oysters). • Area and distribution of suitable oyster habitat (from predictive habitat models) for current and future conditions.
<p>A2) To help establish a comprehensive monitoring plan to evaluate the health of the oysters and the ABS ecosystem and its measurable ecological functions and ecosystem services with clearly defined performance measures and strong coordination among the various entities conducting research in the region.</p> <p>Goal for Objective A2: A monitoring plan approved by stakeholders and resource management.</p>	<ul style="list-style-type: none"> • Regularly updated maps of intertidal and subtidal reefs • Oyster recruitment rates • Density (#/m²) of live and dead oyster juveniles (<25mm), sub-adults (26-75 mm) and market size (> 76 mm) adults. • Oyster size-frequency distribution (using shell height) (mm) • Reproductive status • Condition index • Pest and predator prevalence • Disease prevalence



	<ul style="list-style-type: none"> • Environmental variables (temperature, salinity, oxygen, turbidity, pH, nutrients)
<p>A3) To use observations, monitoring, experiments and modeling to create decision support tools that can inform how a range of natural and human influenced factors will affect the ABS ecosystem.</p> <p>Goal for Objective A3: Management and restoration plan that increases ecological function of oyster reefs in the ABS.</p>	<ul style="list-style-type: none"> • Understanding of optimal restored reef, placement, dimensions and materials. • Identification of optimal locations for broodstock reefs (areas closed to harvest). • Increase density of legal oyster populations on both restored and non-restored reefs (#/m²).to at least 100 m³ (levels observed in 2000). • Statistically significant increase (over current conditions) in diversity and abundance of ecologically- and economically-important species (resident and transient). • Maintenance of sufficient live oysters and dead shell to sustain a healthy oyster reef ecosystem.
<p>A4) To use decision support tools to identify viable strategies for restoration and management of the ABS oyster communities and the function of the ABS ecosystem.</p> <p>Goal for Objective A4: Improved oyster reef ecosystem services for the ABS.</p>	<ul style="list-style-type: none"> • Change in the amount of shoreline habitat that is protected (Goal: increase in shoreline extent, elevation, marsh cover). • Change in the amount of sustainable wild oyster harvest that is supported by restored oyster populations. • Improved recreational and commercial fisheries of oyster-reef related species (stone crab, sheepshead, drum). • Improved water clarity in the vicinity of restored oyster reefs.
GOAL B—SUSTAINABLE MANAGEMENT OF OYSTER RESOURCES	
<p>B1) To develop through a transparent and inclusive process a science-based ABS oyster recovery and adaptive management plan for both commercial and recreational industries that includes: broad stakeholder and community support; a long-term, comprehensive monitoring plan that will be carried out by state agencies and their contractors; a regulatory framework that allows for rapid modifications when needed to address changing environmental conditions; and enforceable regulations that contain penalties sufficient to deter violations and harm to the resource. This Plan must be constructed with the direct involvement of entities within the State of Florida (e.g., FWC, FDACS, State Legislature) in cooperation with other relevant agencies to enhance the likelihood of consideration for implementation.</p> <p>Goal for Objective B1: A stakeholder supported adaptive management plan for the ABS.</p>	<ul style="list-style-type: none"> • Establish sustainable allowable catch in total biomass (kg), including harvest rate and shell budgets. • Incorporate commercial and recreational harvest in oyster stock assessment model for ABS. • Model different adaptive management approaches, to promote sustainability of the fishery, and long-term planning and investment by harvesters and dealers. • Assign some existing reefs as broodstock reefs that are closed to harvest • FWC law enforcement increases presence during oyster open season, and develops appropriate penalties for regulation violations • FWC establishes a long-term state-wide oyster monitoring program



<p>B2) To evaluate oyster aquaculture best-management practices that allow for the unimpeded recovery of oyster’s reefs, the oyster fishery, and the ecological and societal health of the ABS ecosystem while providing economic opportunities to the aquaculture industry.</p> <p>Goal for Objective B1: Identify positive and negative interactions between oyster aquaculture and wild oyster restoration and fisheries.</p>	<ul style="list-style-type: none"> • FDACS, FWC or other entity supports studies to identify aquaculture practices that affect oyster restoration and fisheries, and other habitats within the ecosystem.
GOAL C—A FULLY FUNDED AND SUPPORTED MANAGEMENT & RESTORATION PLAN	
<p>C1) To establish a fully funded permanent, representative stakeholder process to monitor the long-term implementation of the Plan.</p> <p>Goal for Objective C1: Establish a stakeholder group to ensure community support for the management and restoration plans.</p>	<ul style="list-style-type: none"> • Creation of an ABSI CAB successor group to continue stakeholder engagement in the management and restoration process
<p>C2) To identify funding sources and define mechanisms for full implementation of the Plan.</p> <p>Goal for Objective C2: Obtain sufficient funding to implement restoration and management plans.</p>	<ul style="list-style-type: none"> • Form a small stakeholder group that will identify and obtain funding for large scale continued restoration of the ABS oyster reefs.
GOAL D—AN ENGAGED STAKEHOLDER COMMUNITY AND INFORMED PUBLIC	
<p>D1) To coordinate community engagement efforts to increase public awareness of and support for a healthy and well-managed ABS ecosystem; and to ensure that businesses, industries, non-profits, community groups, individuals, and local governments are supportive and included in these efforts.</p> <p>Goal for Objective D1: An engaged and informed community, including K-12 and adults in the local area and beyond.</p>	<ul style="list-style-type: none"> • Number of people with improved understanding of the ecosystem services provided by oysters • Number of businesses, schools, industries, non-profits, and local governments participating in outreach efforts. • Number of volunteers participating in oyster reef restoration efforts. • Number of internship program “graduates” that enter the oyster aquaculture workforce in the ABS or other estuary in Florida. • Number of K-12 students reached by ABSI.
<p>D2) To measure public and stakeholder understanding of the issues important to the health and restoration of the Bay and socio-economic indicators.</p> <p>Goal for Objective D2: Understand stakeholder commitment to a healthy ABS ecosystem.</p>	<ul style="list-style-type: none"> • Survey of stakeholders to assess level of understanding of the ecosystem services provided by oysters, and commitment to adopting measures that improve ABS health.
GOAL E—A THRIVING ECONOMY CONNECTED TO A RESTORED ABS	



<p>E1) To ensure that economic indicators of the commercial oyster fishery and associated industries in the ABS demonstrate increasing viability and growth.</p> <p>Goal for Objective E1: Increased viability and growth of oyster fishery and associated industries.</p>	<ul style="list-style-type: none"> • Monitor economic indicators of a successful wild oyster industry, and assess causes of positive and negative trends.
<p>E2) To ensure that industries and businesses within the ABS are compatible with a healthy and well-managed ABS ecosystem.</p> <p>Goal for Objective E2: Create a decision support tool to assess the effect of ABS industries on ecosystem health.</p>	<ul style="list-style-type: none"> • Monitor metrics associated with Goal A and with objective E1 (above) to determine whether they have positive, neutral or negative interactions
<p>E3) To develop growth management policies, plans and regulations affecting the ABS that are compatible with a healthy and well-managed ABS ecosystem while maintaining a thriving economy and supporting cultural heritage.</p> <p>Goal for Objective E3: A healthy, well-managed ABS and thriving working waterfront industries.</p>	<ul style="list-style-type: none"> • Assess effect of growth management plans on ABS ecosystem health and economic growth
<p>E4) To develop an oyster aquaculture industry that provides economic opportunities and is complementary to the wild harvest fishery.</p> <p>Goal for Objective E4: Establish complementary oyster aquaculture and wild oyster harvest industries.</p>	<ul style="list-style-type: none"> • Assess economic indicators associated with aquaculture and wild oyster harvest • Assess social and economic compatibility between the two industries using stakeholder survey tools.

Draft Plan for Report

