

APALACHICOLA BAY SYSTEM INITIATIVE COMMUNITY ADVISORY BOARD

STRATEGY EVALUATION AND ACCEPTABILITY RATING WORKSHEET FOR DEVELOPMENT OF THE

APALACHICOLA BAY SYSTEM ECOSYSTEM-BASED ADAPTIVE MANAGEMENT AND RESTORATION PLAN

NOVEMBER 12, 2020—MEETING IX

THESE ARE PRELIMINARY DRAFT STRATEGIES FOR DISCUSSION AND
EVALUATION BY THE CAB AND ARE NOT RECOMMENDATIONS



FACILITATED BY JEFF BLAIR AND ROBERT JONES



**APALACHICOLA BAY SYSTEM INITIATIVE COMMUNITY ADVISORY BOARD
KEY TOPICAL ISSUES—STRATEGIES ACCEPTABILITY RATING WORKSHEET**

ACCEPTABILITY RATING EXERCISE OVERVIEW

During previous meetings Apalachicola Bay System Initiative (ABSI), Community Advisory Board (CAB) members were asked to propose an initial suite of strategies for achieving the objectives of the five Goal areas. During subsequent meetings the CAB will continue their review of existing proposed strategies, propose any additional strategies for CAB consideration, and ultimately rate the strategies for acceptability. Each strategy should be rated on its own merit, independently, rather than in relation to the other strategies. Initially, constraints such as funding and statutory authority should not be a limiting factor regarding whether a strategy has merit.

Following discussion and refinement of existing strategies, members may be asked to revisit proposed strategies if requested by either a CAB or project team member. Members should be prepared to offer specific refinements to address their reservations.

The strategies for Goals A - E are preliminary draft strategies for discussion and evaluation by the CAB, and are not recommendations at this stage of the process.

Once rated for acceptability, strategies with a 75% or greater number of 4s and 3s in proportion to 2s and 1s (\geq a 3.0 average rating) will be considered preliminary consensus recommendations for inclusion in the final package of recommendations for the **Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan (Plan)**. A lead entity and key implementation steps should be identified for each consensus level strategy.

At any point during the process, any strategy may be re-evaluated and rated at the request of any CAB or project team member. The status of a rated strategy will not be final until the final CAB meeting, when a vote will be taken on the entire package of consensus ranked recommendations for inclusion in the Plan. The following scale will be utilized for the rating exercises:

ACCEPTABILITY RATING SCALE	4= <i>Acceptable, I agree</i>	3= <i>Acceptable, I agree with minor reservations</i>	2= <i>Not Acceptable, I don't agree unless major reservations addressed</i>	1= <i>Not Acceptable</i>
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Please be prepared to state your minor and major reservations when asked, and to offer proposed refinements to the strategy to address your concerns. If you are not able to offer refinements to make the strategy acceptable (4) or acceptable with minor reservations (3) you should rate the strategy with a 1 (not acceptable).

CRITERIA TO CONSIDER FOR PROPOSING, EVALUATING, AND ACCEPTABILITY RATING STRATEGIES		
EFFECTIVE STRATEGIES ARE URGENT TO IMPLEMENT, HAVE SUPPORT, AND ARE SMART		
CRITERIA	EXPLANATION	
	URGENT	Is it essential to address the issue to achieve the goals and objectives? Will things move in the wrong direction if the issue is not addressed?
	SUPPORT	There is commitment and support from key stakeholders and regulators for implementation of the <i>Strategy</i> .
S	SPECIFIC	It is detailed enough so that anyone reviewing the <i>Strategy</i> will know what is intended to be accomplished.
M	MEASURABLE	The end result can be identified in terms of quantity, quality, acceptable standards, etc. You know you have a measurable <i>Strategy</i> when it states in objective terms the end result or product.
A	ATTAINABLE	The <i>Strategy</i> is likely to be implemented, and there are resources available, or likely to become available for implementing the <i>Strategy</i> .
R	RELEVANT	The <i>Strategy</i> is relevant, and if implemented it is likely to be successful in achieving the relevant goals and objectives of the ABSI.
T	TIME-FRAMED	There are milestones with a specific date attached for completion.

STRATEGIES WORKSHEET OVERVIEW

This Worksheet will be used to guide discussions at Apalachicola Bay System Initiative (ABSI) Community Advisory Board (CAB) meetings. **All strategies** that were proposed by CAB members at meetings were evaluated by the ABSI Project Team (scientists and facilitators) and put into the following **categories**:

SECTION I: CAB DRAFT ABSI STRATEGIES

Goal A: A Healthy and Productive Bay Ecosystem

Goal B: Sustainable Management of Oyster Resources

Goal C: Ecosystem-Based **Adaptive** Management and Restoration Plan Supported by Apalachicola Bay System Stakeholders

Goal D: An Engaged Stakeholder Community and Informed Public

SECTION II: STRATEGIES TO BE REFERRED TO OTHER PROGRAMS OR ENTITIES

Goal E: A Thriving Economy Connected to a Restored Apalachicola Bay System

SECTION III: STRATEGIES RATED AS NOT ACHIEVING CONSENSUS

SECTION IV: PERFORMANCE MEASURES

Performance measures are the decision-support tools forecast results that CAB members will use for weighing the potential outcomes of different strategies.

SECTION V: TERMS AND DEFINITIONS AND PROJECT BOUNDARY

The categories above will be reviewed and discussed at subsequent ABSI CAB meetings where they will be refined and could be combined with other categories or split into new categories as appropriate. Revisions will be offered for discussion purposes by the ABSI Project Team (scientists and facilitators).

SECTION I COMMUNITY ADVISORY GROUP DRAFT ABSI STRATEGIES

OVERARCHING APPROACHES

- 1) Use the following ABSI-approved name for the developing management and restoration plan: the Apalachicola Bay System Ecosystem-Based Adaptive Management and Restoration Plan (Plan).
- 2) Incorporate scientifically-derived and coordinated long-term monitoring guidelines and metrics for assessing the overall health of the ABS system with a focus on oyster resources.
- 3) Use only the best available science (including information derived from **scientists**, agency personnel and stakeholders) for all components of ongoing research, modeling exercises, and development **of the Plan**, including relevant information on adaptation to climate change impacts. ~~associated with ABSI~~

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

Ensure there are strategies for all of the objectives of Goal A.

A1) To use observations, monitoring, experiments and modeling conducted through ABSI and related efforts to create decision support tools that can inform how a range of natural and human influenced factors will affect the ABS ecosystem.

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

A3) To use existing and new research, and decision support tools to identify viable strategies for restoration and management of the ABS oyster resources and the function of the ABS ecosystem.

A4) To define measurable ecosystem services that can be used to determine the level of change in ecological health (e.g. oyster fishery harvest, habitat for other fishery species, abundance and condition indices for oyster reef and population health) and societal benefit derived from Apalachicola Bay System management and restoration efforts, with target and threshold levels identified.

GOAL A PRELIMINARY DRAFT STRATEGIES

- 1) Use experimental evidence and habitat suitability analyses to determine the most suitable substrate (e.g., limestone, granite, spat-on-shell, artificial structures) for restoring, enhancing, and/or developing new reef structures that will increase productivity in the Apalachicola Bay oyster ecosystem. *[Clean version of proposed revision]*

~~Increase productivity of the Apalachicola Bay oyster ecosystem by restoring, enhancing, and/or developing new reef structures based on Use experimental evidence for the most suitable substrate (e.g., limestone, granite, spat on shell, artificial structures) and on habitat suitability analyses to determine the most suitable substrate (e.g., limestone, granite, spat-on-shell, artificial structures) for Increase productivity of the Apalachicola Bay oyster ecosystem by restoring, enhancing, and/or developing new reef structures that will increase productivity in the Apalachicola Bay oyster ecosystem. based on~~ *[Strategy 1 in strike-underline format]*

- *Action 1. A.):* Conduct restoration experiments to test efficacy of different materials, configurations, placement and seeding with hatchery spat.
- ~~*Action 2. A.):* Set aside some reef structures to be maintained as non-harvest protection areas.~~
[Action 2. A. is covered in Goal B]

- 2) Develop criteria for restoring specific reefs or reef systems damaged by environmental conditions or natural disasters.

- *Action 2. A.):* Evaluate degree of damage and potential for recovery.
- *Action 2. B.):* Develop an approach for mitigating damage (e.g., physical repair, spat supplements, or some combination of both).
- *Action 2. C.):* Determine periodicity of 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.

- 3) Determine area (acres or km²) of healthy oyster reefs that currently exists as well as the area needed to ensure sufficient spat production that will support sustainability of oyster reefs and sustainability of a limited entry fishery throughout the ABS.

- *Action 3. A.):* Map existing oyster reefs using multibeam sonar and backscatter, **and ground-truth for accuracy.**
- *Action 3. B.):* Apply model (Ed Camp, UF) that uses reproductive output, recruitment, natural mortality rates and fishery harvest to assess oyster population dynamics.

- 4) Identify monitoring needs for assessing the health* of oyster populations (including disease), and detecting changes in environmental conditions and habitat quality (for oysters and other reef-associated species) over time. *[Health is covered in Action 4.E.]*

- *Action 4. A.):* Continue to monitor intertidal and sub-tidal reefs monthly and bi-annually using same protocols as FWC sub-tidal monitoring. Adjust to add metrics as needed. Data will be shared between FWC and ABSI.
- *Action 4. B.):* Continue to monitor spat settlement around intertidal and sub-tidal habitats using same protocols as FWC. Data will be shared between FWC and ABSI.
- *Action 4. C.):* Conduct ‘spot-checks’ at a large number (TBD) of different locations in the Bay to supplement the more intensive monitoring data. Document volume of rock/shell/oysters, number of spat, medium and market sized live oysters and boxes ~~live vs. dead and presence of juveniles~~ together with environmental data.
- *Action 4. D.):* Collect long term in situ environmental data using ABSI instruments and integrate ANERR environmental and nutrient data as correlates with oyster metrics.
- *Action 4. E.):* Generate health indicators for ABSI using monitoring data, and other ecological factors (e.g. oyster-associated communities and structural complexity).

***Ecosystem Health:** Ecosystem health is a complex interaction of human and ecological factors, which has yet to be defined for ABSI.

- 5) Develop ecosystem models that forecast future environmental conditions and oyster population status. ~~These should include the effects of climate change, such as increasing sea level and ocean acidification, salinity gradients, water temperatures, storm intensity and rainfall events, and the availability of freshwater.~~ *[This is covered in Overarching Approach #3.]*
 - *Action 5. A.):* Collect data needed by the models, and follow up with testing the models to refine accuracy of output.
 - *Action 5. B.):* Coordinate with appropriate state and federal agencies, pertinent out of state user groups, and other initiatives working on both geographically-constrained and basin-wide water-flow alterations and management strategies that contribute positively to the health of the ABS.
- 6) Assess existing ecosystem services metrics used for other oyster studies, and develop a list of ABSI specific metrics to assess change over time.
 - *Action 6. A.):* Conduct literature review and work with Florida Oyster Recovery Science (FORS) working group to identify measurable indicators of changes in ecosystem services
 - *Action 6. B.):* Integrate ecosystem services metrics into monitoring program.

Lead:	Partners:
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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 protection of the habitat and the fishery it supports is supported by science, stakeholder input, and industry experience, and is implemented in a manner that provides both fair and equitable access to and protection for 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

Ensure there are strategies for all of the objectives of Goal B.

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. It is imperative that this Plan 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 its implementation.

B2) To make recommendations to FDACS for oyster aquaculture best management practices that allow for the unimpeded recovery of oysters reefs, the oyster fishery, and the ecological and societal health of the ABS ecosystem while providing economic opportunities to the aquaculture industry.

GOAL B RECOMMENDATION

Closing the Apalachicola Bay to Wild Oyster Harvest. At the March 11, 2020 ABSI CAB meeting the FWC requested that the CAB recommend whether to close Apalachicola Bay to all wild harvest of oysters (commercial and recreational). The CAB discussed the issue and unanimously recommended to FWC that they immediately close Apalachicola Bay to all wild harvest of oysters (commercial and recreational). This recommendation was reviewed and accepted by FWC and the Final Rule will be addressed at the October 2020 Commission meeting. The closure to recreational and commercial harvest went into effect on August 1, 2020. The oyster fishery closed area has well-

defined boundaries (set by FWC in consultation with FDACS and contained within the Apalachicola Bay System as defined in FWC's Rule 68B-27, F.A.C.¹

The CAB agreed that in subsequent meetings, it would make science-based recommendations for the criteria and performance metrics that should be met before reopening the Bay to wild oyster harvest. Under consideration are the following strategies related to closing the wild oyster fishery.

GOAL B PRELIMINARY DRAFT STRATEGIES

1. Recommend specific criteria and/or conditions, ~~identified~~ with related performance measures for the reopening of Apalachicola Bay to limited wild oyster harvesting.
 - **Action 1. A.):** Use ABSI health metrics to develop criteria for opening wild oyster harvest. *[This is covered in Goal A, Strategy 6]*
 - **Action 1. B.):** Work with FWC & FDACS to ensure that definitions of oyster population health are not only based on harvest metrics.
2. Use decision-support tools to develop a system of closed areas 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 2 A):* Engage local stakeholders in determining total coverage (how much to protect), placement (where to protect), and size (how large) of all proposed types of closed areas using gridded maps as well as distributions of selected fishery and ecologically important species.
3. **Recommend in the Plan, management policies that require shell retention and recycling and habitat replenishment in the ABS as part of FWC's regulatory framework.**
 - **Action 3. A.):** 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; Florida statute Chapter 157 (McClellan 1881).
4. Define performance criteria (~~e.g. shell budget that will maintain sufficient habitat~~) for an oyster population that can sustain a pre-determined level of wild oyster harvest, with a stipulated number of harvesters (limited entry), and protocols to ensure sustainability.
 - **Action 4. A.):** Use ecosystem modeling outputs to identify the oyster population abundance that can support sustainable harvest.
 - **Action 4. B.):** Use ecosystem modeling outputs to identify percentage of productive reef area required to support sustainable harvest.
 - **Action 4. C.):** Use ecosystem modeling outputs to identify annual; recruitment required to support sustainable harvest.

¹ FWC's Rule 68B-27.013, F.A.C. (as modified in the proposed draft rule language presented at the July 22, 2020, commission hearing): "Apalachicola Bay" or "Bay" means all waters within St. George Sound, East Bay in Franklin County, Apalachicola Bay, St. Vincent Sound in Franklin County, and Indian Lagoon in Gulf County, including canals, channels, rivers and creeks.

- **Action 4. D.):** Use ecosystem modeling outputs to determine amount and frequency of habitat replacement to maintain productive oyster reefs.
5. Work with FDACS 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 a wild harvest **fisheries fishery** and the important cultural role of a working waterfront and seafood industry.
- **Action 5. A.):** Develop maps using FDACS data showing all aquaculture activities in the ABS, superimposed on existing maps of essential fish habitat and fishing activities to identify potential conflicts.
 - **Action 5. B.):** Utilize habitat and activity maps from *Action 5. A.* to identify potential new oyster restoration areas.
6. **Work with FWC Law Enforcement to develop** ~~Propose to FWC and FDACS~~ 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 6. A.):** Develop strategies to increase FWC enforcement presence and number of checkpoints.
 - **Action 6. B.):** Develop strategies to ensure uniformity in the harvestable and marketable size of oysters.
 - **Action 6. C.):** Develop strategies to Limit oyster harvest to periods outside of peak spawning season.
 - **Action 6. D.):** Develop standards for a limited entry fishery.
 - **Action 7. D.):** Propose strategies to FWC and FDACS for implementation.

Lead:	Partners:
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GOAL C
A FULLY FUNDED AND ~~SCIENCE-INFORMED~~ ECOSYSTEM-BASED **ADAPTIVE MANAGEMENT AND RESTORATION PLAN SUPPORTED BY APALACHICOLA BAY SYSTEM STAKEHOLDERS**

VISION THEME C: The Apalachicola Bay System Ecosystem-Based **Adaptive** Management and Restoration Plan is science-based and 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

Ensure there are strategies for all of the objectives of Goal C.

C1) To establish a fully funded permanent, representative stakeholder process to monitor the long-term implementation of the Plan.

C2) To support efforts to identify funding sources and define mechanisms for full implementation of the Plan.

GOAL C PRELIMINARY DRAFT STRATEGIES

CAB Proposed Strategies During the ABSI Process

- 1) The ABSI Team and the CAB will continue to have an open and transparent process for the development of the Plan with many opportunities for stakeholder engagement and input in a variety of forums (e.g., workshops, online, public/ government meetings) for generating awareness and support while incorporating any changes the CAB deems appropriate and necessary to fulfill the goals and objectives.
 - Action 1. A.): Continue CAB meetings and public workshops as outlined in the FCRC proposal for 2021.
- 2) Prior to completion of the Plan, the ABSI Team will form a sub-committee within the CAB to evaluate the efficacy of forming a CAB successor group. The intent of a successor group would be to ensure continuity between the CAB members and the agencies responsible for oyster management.
 - Action 2. A.): The subcommittee will define a plausible scope of work for the successor group, including evaluating regulatory processes and engaging with and being accountable to decision-makers and the public for the actions laid out in the Plan and the implementation thereof.
 - Action 2. B.): The subcommittee will evaluate the best organizational structure for ensuring longevity of the successor group, including working under the auspices of a state agency, an estuary program, or private/public partnerships.

~~After the Plan is completed, the CAB should evaluate transitioning to a successor group (with stakeholder composition similar to the ABSI CAB) in collaboration with the state as a partner in overseeing the Plan. The successor group will define its scope of work including evaluating regulatory processes and engaging with and being accountable to decision-makers and the public for the actions laid out in the Plan and the implementation thereof. The successor group will also evaluate the best organizational structure for ensuring longevity including working under the auspices of a state agency, an estuary program, private/public partnerships, etc.~~

[The above strategy is now covered in Strategy 2 and occurs during the CAB process]

- 3) **A successor group to the CAB is developed by the time the Plan is completed.**
- **Action 5. A.):** The successor group actively engages with state programs to encourage their adoption of ABSI's 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 ecosystem.
 - **Action 5. B.):** The successor group encourages agencies to prioritize the Plan's recommendations for investing more funding in the management and restoration of oyster resources.

[The above 2 actions were previously strategies and are now under a single strategy #3]

Lead:	Partners:
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<p>GOAL D</p> <p>AN ENGAGED STAKEHOLDER COMMUNITY AND INFORMED PUBLIC</p>

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-based 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 as well as 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

Ensure there are strategies for all of the objectives of Goal D.

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, 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 PRELIMINARY DRAFT STRATEGIES

- 1) Develop a Community Advisory Board (CAB) for the ABS Initiative that provides critical information and perspective to the ABSI leadership and whose members recognize the importance of their role as ambassadors for the initiative. [Status: initiated]
- 2) Build, with the help of the CAB, community support and stewardship by educating stakeholders on the importance of maintaining healthy oyster reefs and by engaging them in the Bay restoration through a variety of hands-on programs.

Action 2. A.): Form a sub-committee within the CAB that can spearhead an outreach and community engagement effort **and develop a community outreach strategy** intended to inform and educate stakeholders and the public about the research, the Plan developing through ABSI, and focusing on a healthy ABS ecosystem. The intended audience includes local city, county, and state government officials, businesses and organizations, citizens of every age, and other interested stakeholder groups.

Action 2. B.): Define what makes a successful shell recycling program, and work with local groups, businesses and other stakeholders to help initiate its development.

Action 2. C.): Develop a “Bay Stewards” program to honor, reward, and provide incentives for businesses and individuals that demonstrate their stewardship of the resource.

- 3) Support and participate in providing educational opportunities for students at all levels (primary & secondary school through college) ~~in fisheries ecology and management~~ to understand the value of their coastal ecosystems, importance of stewardship and ~~with particular emphasis on~~ the role oysters play in ecosystem health and fisheries.

Action 3. A.): Work with existing entities (e.g., [WeatherStem](#), [Scientist in Ever Florida School \(Florida Museum\)](#)) to expose more K-12 students to the research being conducted by ABSI.

Action: 3. B.): Provide training and financial support for new workforce entrants in the Franklin County Community through an aquaculture internship program.

Action 3. C.): Provide research opportunities for undergraduate and graduate students in science that supports the ABSI mission.

Lead:	Partners:
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SECTION II

STRATEGIES OUTSIDE THE SPECIFIC SCOPE OF ABSI AND TO BE REFERRED TO OTHER PROGRAMS OR ENTITIES

The strategies that are not a part of the Ecological (Goal A), Sustainable Management of Oyster Resources (Goal B), and The Management and Restoration Plan (Goal C) components of the Apalachicola Bay System Ecosystem-Based Management and Restoration Plan including: training, marketing, education, communication, economic development, funding, and the formation of a Task Force are being moved to this category. They will be included as recommendations in an appendix, and the CAB should identify a responsible entity to refer the recommendations to for their development, implementation, monitoring, and maintenance.

GOAL E

A THRIVING ECONOMY CONNECTED TO A RESTORED APALACHICOLA BAY SYSTEM

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

Ensure there are strategies for all of the objectives of Goal E.

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 PRELIMINARY DRAFT STRATEGIES

- 1) Work with existing partners (e.g., the Chamber of Commerce, Apalachee Regional Planning Council, and city and county staff) to monitor and report on the economic benefits of a restored ABS, including key economic indicators relevant to the commercial oyster fishery and associated industries in the region. This can be displayed as a dashboard that includes key economic indicators over time based on restoration efforts in the Apalachicola Bay System (ABS).
- 2) Recommend monitoring² and enforcement programs continue with appropriate metrics to measure output from and impact of harvest on oyster reefs.
- 3) Support planning tied to economic indicators that consider future conditions (climate, SLR, reduced river flow) and their effects on the ABS.
- 4) Work with oystermen and other community stakeholders to promote post-recovery Apalachicola oysters.
- 5) 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.
- 6) Develop new markets for selling oysters to areas within and outside of Florida in part by investing in location (Apalachicola Bay) branding.
- 7) 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.
- 8) 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.
- 9) Engage commercial fishermen in the restoration of the bay and encourage future participation in restoration such as shell recycling, shelling, and relaying.

Lead:	Partners:
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² 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. (We remain unable to get FWRI data)

**ADDITIONAL STRATEGIES OUTSIDE OF ABSI SCOPE
TO BE REFERRED TO OTHER PROGRAMS OR ENTITIES**

- 1) 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.
- 2) Engage the general 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.
- 3) Build Gulf-wide mechanism for communities interested in the restoration and revitalization of fisheries to exchange best practices and lessons learned. [Status: this is developed through FWC]
- 4) Provide training and financial support for new workforce entrants (particularly young entrants) interested in being employed in existing industries as well as and developing industries in new fisheries, aquaculture, and restoration science.

~~Action 4. A.): develop an aquaculture internship program through ABSI that provides job training for young adults (18-25) in the Franklin County Community.~~

[Action 4. A. was moved to Goal D]

- 5) 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 5. A.): Identify source of shell, **or other restoration material.**

Lead:	Partners:
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**SECTION III
STRATEGIES RATED AS NOT ACHIEVING CONSENSUS AND ARCHIVED**

None to date.

PRIORITY OF STRATEGIES BY GOAL AREA

PRIORITY 1 STRATEGIES = IMPORTANT TO DO NOW

GOAL A	GOAL B	GOAL C	GOAL D
<p>Identify monitoring needs for assessing the health of oyster populations (including disease), and detecting changes in environmental conditions and habitat quality (for oysters and other reef-associated species) over time</p>	<p>Define performance criteria for an oyster population that can sustain a pre-determined level of wild oyster harvest, with a stipulated number of harvesters (limited entry), and protocols to ensure sustainability.</p>	<p>The ABSI Team and the CAB will continue to have an open and transparent process for the development of the Plan with many opportunities for stakeholder engagement and input in a variety of forums (e.g., workshops, online, public/government meetings) for generating awareness and support while incorporating any changes the CAB deems appropriate and necessary to fulfill the goals and objectives.</p>	<p>Develop a Community Advisory Board (CAB) for the ABS Initiative that provides critical information and perspective to the ABSI leadership and whose members recognize the importance of their role as ambassadors for the initiative. [Status: initiated]</p>
<p>Determine area (acres or km²) of healthy oyster reefs that currently exists as well as the area needed to ensure sufficient spat production that will support sustainability of oyster reefs and sustainability of a limited entry fishery throughout the ABS.</p>	<p>Work with FDACS 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 a wild fishery and the important cultural role of a working waterfront and seafood industry.</p>		<p>Build, with the help of the CAB, community support and stewardship by educating stakeholders on the importance of maintaining healthy oyster reefs and by engaging them in the Bay restoration through a variety of hands-on programs.</p>
<p>Develop ecosystem models that forecast future environmental conditions and oyster population status.</p>			

PRIORITY 2 STRATEGIES = IMPORTANT BUT LESS TIME SENSITIVE

GOAL A	GOAL B	GOAL C	GOAL D
Develop criteria for restoring specific reefs or reef systems damaged by environmental conditions or natural disasters.	Work with FWC Law Enforcement to 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.	Prior to completion of the Plan, the ABSI Team will form a sub-committee within the CAB to evaluate the efficacy of forming a CAB successor group. The intent of a successor group would be to ensure continuity between the CAB members and the agencies responsible for oyster management.	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.
Use experimental evidence and habitat suitability analyses to determine the most suitable substrate (e.g., limestone, granite, spat-on-shell, artificial structures) for restoring, enhancing, and/or developing new reef structures that will increase productivity in the Apalachicola Bay oyster ecosystem.	Recommend specific criteria and/or conditions identified with related performance measures for the reopening of Apalachicola Bay to limited wild oyster harvesting.		
Assess existing ecosystem services metrics used for other oyster studies, and develop a list of ABSI specific metrics to assess change over time.	Use decision-support tools to develop a system of closed areas 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.		
	Recommend in the Plan, management policies that require shell retention and recycling and habitat replenishment in the ABS as part of FWC's regulatory framework.		
PRIORITY 3 STRATEGIES = AS TIME AND RESOURCES ALLOW			
GOAL A	GOAL B	GOAL C	GOAL D
		A successor group to the CAB is developed by the time the Plan is completed.	

PRIORITY OF STRATEGIES REFERRED TO OTHER PROGRAMS OR ENTITIES	
PRIORITY 1 STRATEGIES = IMPORTANT TO DO NOW	
GOAL E	REFERRED TO OTHER PROGRAMS OR ENTITIES
Recommend monitoring and enforcement programs continue with appropriate metrics to measure output from and impact of harvest on oyster reefs.	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.
Work with oystermen and other community stakeholders to promote post-recovery Apalachicola oysters	Build Gulf-wide mechanism for communities interested in the restoration and revitalization of fisheries to exchange best practices and lessons learned.
Engage commercial fishermen in the restoration of the bay and encourage future participation in restoration such as shell recycling, shelling, and relaying.	Provide training and financial support for new workforce entrants (particularly young entrants)-interested in being employed in existing industries as well as and developing industries in new fisheries, aquaculture, and restoration science.
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.	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.
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.	
PRIORITY 2 STRATEGIES = IMPORTANT BUT LESS TIME SENSITIVE	
GOAL E	REFERRED TO OTHER PROGRAMS OR ENTITIES
Develop complementary industries in wild oyster harvest and oyster aquaculture that provide new economic opportunities by building a	Engage the general public (students, residents and tourists) in learning about the history and the ecological and economic

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.	importance of the Apalachicola Bay region, including the natural resources, and lumber, cotton shipping, and fishing industries.
Support planning tied to economic indicators that consider future conditions (climate, SLR, reduced river flow) and their effects on the ABS.	
PRIORITY 3 STRATEGIES = AS TIME AND RESOURCES ALLOW	
GOAL E	REFERRED TO OTHER PROGRAMS OR ENTITIES
Work with existing partners (e.g., the Chamber of Commerce, Apalachee Regional Planning Council, and city and county staff) to monitor and report on the economic benefits of a restored ABS, including key economic indicators relevant to the commercial oyster fishery and associated industries in the region. This can be displayed as a dashboard that includes key economic indicators over time based on restoration efforts in the Apalachicola Bay System (ABS).	
Develop new markets for selling oysters to areas within and outside of Florida in part by investing in location (Apalachicola Bay) branding.	

SECTION IV PERFORMANCE MEASURES

Performance measures are the decision-support tools forecast results that CAB members will use for weighing the potential outcomes of different strategies. They are the regular measurement of outcomes and results, which generates reliable data on the effectiveness, efficiency, and sustainability of programs and plans.

A.) A HEALTHY AND PRODUCTIVE OYSTER REEF ECOSYSTEM **Related Draft Performance Measures to Evaluate Strategies**

Basic Monitoring

Note that everything in this subsection applies to monitoring existing, restored, and newly-placed reefs.

Persistence of Reef Habitat Before and After Restoration Project

- Updated maps of intertidal and subtidal reefs
- Reef areal dimensions (m²)
- Reef area (total actual area of patches of living and nonliving oyster shell or substrate with and without live oysters) (m²)
- Reef height of existing reefs (m)
- Models that address oyster population and reef area required to meet ecological and fishery targets
- Project footprint (max. areal extent of the footprint of the reef (m²))
- Project reef height determined to support sustainable reefs and oyster production (m)

Oyster Recruitment, Abundance, Survivorship

- Spat, and recruitment assessment throughout the system
- Density of live oysters (juveniles/spat (less than 25 mm) & mature adults (#/m²))
- Oyster size-frequency distribution (using shell height) (mm)
- Reproductive status
- Conditions index
- Pest and predator prevalence
- Disease prevalence

Environmental Variables

- Water temperature (°C)
- Salinity (ppt, psu)
- Dissolved oxygen (mg/L)
- Turbidity
- pH
- Nutrients

Ecosystem-Based Goals of Restoration

- Enhanced oyster populations & habitat:
 - Enhanced brood stock, larval supply, and oyster populations on both restored and nearby non-restored reefs (#/m²).
 - Enhanced diversity, abundance of ecologically- and economically-important resident & transient species on and off reef (e.g., soft sediments) and demonstrate positive species interactions that enhance recruitment, survival, and growth (e.g., refuge for fish that eat shell-crushing crabs) or reduce physiological or biological stress (e.g., vertical shell orientation compared to horizontal creates microclimate) (#/m² for selected spp; biodiversity indices).
 - Enhancement/protection of adjacent shoreline habitat (Change in shoreline extent, elevation, marsh cover).
 - **Maintain sufficient live oysters and dead shell to sustain a healthy ecosystem.**
- Ecosystem Modeling
 - Development of a forecasting model for salinity, temperature, nutrients (including nitrogen) and organic carbon dynamics under different climate and management scenarios (relates to water entering the Bay from the river and water exchange between the Bay and the Gulf (Light penetration, seston/chlorophyll a concentration)).

B.) SUSTAINABLE MANAGEMENT OF OYSTER RESOURCES

Measures to Reopen the Oyster Fishery

- FWC rule currently stipulates that the fishery will reopen once '300 bags/acre can be found on a significant number of oyster reefs'. This metric will be used as a performance measure unless/until model data indicates otherwise.

Closed Areas

- Map and apportion some percentage of existing reef areas as Management Areas based on types of closed areas and identify allowable gear by area:
 - X% of the most important larval source areas are assigned as permanent closures to oyster harvest.
 - X% all reefs closed seasonally during peak spawning seasons and during either local- or large-scale environmental disturbances that negatively affect water quality and/or the oyster populations.
 - X% Reefs put on rotational closure cycle based on scientific data on population dynamics
 - Reefs are closed to harvest when oyster populations fall below critical sustainable levels (defined in 1) above).

Stock Assessment & Shell Budget Models

- Sustainable allowable catch in total biomass (kg), including harvest rate (allowable daily catch) and shell budgets.
- **Account for commercial & recreational (data needed) harvest in stock assessment model.**
- Model different management regimes (e.g., adaptive management with IFQs, ITQs TURFS, others), to promote stability and long-range planning and investment by harvesters and dealers, and minimize gear & area conflicts.

Aquaculture Effects on Restoration

- FDACS, FWC or other entity supports studies to identify aquaculture practices that both positively and negatively affect oyster restoration and fisheries, and other habitats within the ecosystem.

Enforcement Measures

- FWC increases enforcement presence on the water during open oyster harvest periods.
 - FWC develops appropriate penalties for regulation violations.
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C.) THE ECOSYSTEM-BASED ADAPTIVE MANAGEMENT AND RESTORATION PLAN

This is covered by the Objectives for Goal C and the performance measures in Goals A and B that collectively make up the Apalachicola Bay System Management and Restoration Plan.

D.) AN ENGAGED STAKEHOLDER COMMUNITY AND INFORMED PUBLIC

Education & Public Awareness

- Number of people with improved understanding of the ecosystem services provided by oysters important to health and restoration of the ABS.
- 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.
- Number of undergraduate and graduate student research projects conducted related to ABSI.

E.) A THRIVING ECONOMY CONNECTED TO A RESTORED APALACHICOLA BAY SYSTEM

Outreach

- Number of times Plan is referenced in growth management plans.

Implementation

- Number of Land Development Code policy changes implemented to enhance and protect the ABS.
- The extent to which FWC & FDACS implement recommendations in the Plan.
- Percent of funds secured in relation to funds needed to implement the Plan.
- Amount of private, state, federal (and RESTORE) funds allocated for management and restoration actions in the ABS.

SECTION V TERMS AND DEFINITIONS AND PROJECT BOUNDARY

GUIDING PRINCIPLES: The Community Advisory Board’s Guiding Principles reflect the broad values and philosophy that guides the operation of the Community Advisory Board and the behavior of its members throughout its process and in all circumstances regardless of changes in its goals, strategies or membership.

VISION: An idealized view of where or what the stakeholders would like the oyster resource and ecosystem to be in the future.

VISION THEMES: The related key topical issue area strategies that characterize the desirable future for the oyster resource and ecosystem. The Vision Themes establish a framework for goals and objectives. They are not ordered by priority.

GOAL: A goal is a statement of the project’s purpose to move towards the vision expressed in fairly broad language.

OUTCOME: Outcomes describe the expected result at the end of the project period – what is hoped to be achieved when the goal is accomplished. *(E.g., an ecologically, and economically viable, healthy and sustainable Apalachicola Bay System oyster fishery and ecosystem)*

Objective: Objectives describe in concrete terms how to accomplish the goal to achieve the vision within a specific timeframe and with available resources. *(E.g., by 2023, the State of Florida will have approved a stakeholder developed Ecosystem-Based Management and Restoration Plan for the Apalachicola Bay System.)*

STRATEGY: A method, action, plan of action, or policy that can be tested to determine whether it solves a problem and helps to achieve objectives and goals in the context of bringing about a desired future for the Apalachicola Bay System.

RESTORATION: The process of establishing or re-establishing a habitat that in time can come to closely resemble a natural condition in terms of structure and function.

PERFORMANCE MEASURES: The regular measurement of outcomes and results, which generates reliable data on the effectiveness, efficiency, and sustainability of programs and plans.

STAKEHOLDERS: All interest groups whether public, private or non-governmental organizations who have an interest or concern in the success of a project, and can affect or be affected by the outcome of any decision or activity of the project. For purposes of the Apalachicola Bay System Initiative, stakeholders include but are not limited to: agriculture, silviculture, business, real estate, economic development, tourism, environmental, citizen groups, recreational fishing, commercial seafood industry, regional groups (i.e., ACF Stakeholders, and Riparian Counties), local government, state government, federal government, universities, and research interests.

ECOSYSTEM SERVICES: The direct and indirect contributions of ecosystems to human wellbeing. These services include **provisioning services** (food, raw materials, fresh water, medicinal resources), **regulating services** (climate, air quality, carbon sequestration & storage, moderation of extreme events, waste water treatment, erosion prevention & maintenance of soil fertility), **habitat or supporting services** (habitat for all species, maintenance of genetic diversity), and **cultural services** (recreation for mental & physical health; tourism; aesthetic appreciation and inspiration for culture, art & design; spiritual experience & sense of place).

APALACHICOLA BAY SYSTEM: Consists of six bays: Apalachicola Bay, East Bay, St Vincent Sound, East and West St George Sound, and Alligator Harbor comprising a total of 155,374 acres (62,879 Ha). Confined to Franklin County and ending to the north at river mile **zero (0)**. Important considerations include riverine and offshore inputs to the ABS as well as the reciprocal influences of outputs from the ABS to the Gulf of Mexico.

HEALTHY APALACHICOLA BAY SYSTEM:

A healthy ecosystem is one in which material and energy flows are balanced through interacting biological, physical, and chemical processes (involving microorganisms, plants, animals, sunlight, air, water) that conserve diversity, support fully functional evolutionary and ecological processes, and sustain a range of ecological and ecosystem services.

OYSTER RESOURCES: Sources of oysters that provide natural and cultural benefits to humans. These sources can come from the wild or from aquaculture (see ecosystem services). The responsible management of oyster resources for present-day needs and future generations requires integrated approaches that are place-based, embrace systems thinking, and incorporate the social, economic, and environmental considerations of sustainability.

APALACHICOLA BAY SYSTEM INITIATIVE PROJECT BOUNDARY

