APALACHICOLA BAY SYSTEM INITIATIVE COMMUNITY ADVISORY BOARD

STRATEGY EVALUATION AND ACCEPTABILITY RATING WORKSHEET OCTOBER 15, 2020—MEETING VIII

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

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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 (≥ 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 Management and Restoration 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= Acceptable, I agree*	*3= Acceptable, I agree with **minor reservations***	*2= Not Acceptable, I don't agree unless **major reservations** addressed*	*1= Not Acceptable*

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 SMARTS		
CRITERIA		EXPLANATION
S	SPECIFIC	It is detailed enough so that anyone reviewing the *Strategy* 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 *Strategy* when it states in objective terms the end result or product.
A	ATTAINABLE	The *Strategy* is likely to be implemented, and there are resources available, or likely to become available for implementing the *Strategy*.
R	RELEVANT	The *Strategy* 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.
S	SUPPORT	There is commitment and support from key stakeholders and regulators for implementation of the *Strategy*.

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: Science-Informed Ecosystem-Based Management and Restoration Plan Supported by Apalachicola Bay System Stakeholders
Goal D ~~E~~: An Engaged Stakeholder Community and Informed Public

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

Goal E ~~D~~: A Thriving Economy Connected to a Restored Apalachicola Bay System
~~Goal E: An Engaged Stakeholder Community and Informed Public~~

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. The underlined strategies are being offered for discussion purposes by the ABSI Project Team (scientists and facilitators).

SECTION I
COMMUNITY ADVISORY GROUP DRAFT ABSI STRATEGIES

OVERARCHING APPROACHES

1) 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. ~~water quality, oyster abundance, and demographics that will be implemented by FWC and regularly reviewed by the CAB or successor group to maintain healthy and sustainable oyster and other resources.~~
[Moved from Goal B and revised]

2) Use only the best available science (including information derived from agency personnel and stakeholders) for all components of ongoing research and modeling exercises associated with ABSI.
[Removed from specific strategies as an overarching approach]

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 anthropogenic factors ~~disease, predation, human activities and future climate scenarios~~ 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 ~~Bay~~.

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

~~A5) To enhance stakeholder and public interest in and understanding of the science conducted to support restoration efforts designed to improve the health of oyster resources and the overall health of the Bay ecosystem; and to encourage their participation in the development of the management and restoration plans for the Bay.~~
[Moved to Goal D]

GOAL A PRELIMINARY DRAFT STRATEGIES

1) Increase productivity of the Apalachicola Bay oyster ecosystem by restoring, enhancing, and/or developing new reef structures (~~some of which would be maintained as non-harvest protection areas~~) based on experimental evidence for the most suitable substrate (e.g., limestone, granite, spat-on-shell, artificial structures) and on habitat suitability analyses ~~using the best available scientific information coupled with the knowledge and experience of managers and stakeholders~~
   - *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.

   [Actions proposed by Project Team]

2) Develop criteria for restoring ~~sustaining~~ specific reefs or reef systems damaged by environmental conditions or natural disasters. ~~that includes~~
   - *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. ~~(e.g., 3 years or longer)~~ This approach is not intended to create a put-and-take fishery.

   [Strategy was revised and Actions extracted from the original strategy]

3) Determine area (acres or km^2) 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.
   - *Action #. B.):* Apply model (Ed Camp, UF) that uses reproductive output, recruitment, natural mortality rates and fishery harvest to assess oyster population dynamics.

   [Actions proposed by Project Team]

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. ~~to understand the root causes of oyster decline~~

- *Action 4. A.):* Continue to monitor intertidal 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 habitats using same protocols as FWC. Data will be shared between FWC and ABSI.
- *Action 4. B.):* Conduct 'spot-checks' at a large number (TBD) of different locations in the Bay to supplement the more intensive monitoring data. Document volume of shell/oysters, live vs. dead and presence of juveniles, together with environmental data.
- *Action 4. C.):* Collect long term in situ environmental data using ABSI instruments and integrate ANERR environmental and nutrient data as correlates with oyster metrics.

[Actions proposed by Project Team]

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.
   - *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 ~~ABSI should and communicate~~ 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. ~~based on the best available science and data~~

[Actions proposed by Project Team]

~~6) Form a sub-committee within the CAB that can spearhead an outreach and community engagement effort intended to inform and educate stakeholders and the public about the research, restoration plan, and management 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.~~

[Moved to Goal D]

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 investigate the feasibility of developing oyster shell recycling programs that can return a significant portion of harvested oyster shell to the ABS to restore substrate for recruitment of spat and to enhance oyster population growth.~~
[Captured in Goal D]

B2) ~~B3)~~ 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 evaluate whether to close Apalachicola Bay to all wild harvest of oysters (commercial and recreational). The CAB evaluated the issue and unanimously recommended to FWC ~~the CAB voted~~ 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.

2. Use ~~the best available scientific data and~~ 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.

   ~~Supplement shelling of oyster reefs, through a recycling program combined with State legislation that provides staff, funding strategies, and incentives for involving local watermen, seafood dealers, restaurants, aquaculture operations, and private citizens in an effort to increase the viability of the oyster resource.~~
   [This is captured in Goal C and Goal E]

3. 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.

4. 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 fishery and the important cultural role of a working waterfront and seafood industry.

[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.

5. 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.

GOAL C
A FULLY FUNDED AND SCIENCE-INFORMED ECOSYSTEM-BASED MANAGEMENT AND RESTORATION PLAN SUPPORTED BY APALACHICOLA BAY SYSTEM STAKEHOLDERS

VISION THEME C: The Apalachicola Bay System Ecosystem-Based Management and Restoration Plan is science-based and developed with engagement and support from the Apalachicola Bay System stakeholders, and is fully funded. ~~and informed by the best available science and other relevant socio-economic information~~

GOAL C: The Apalachicola Bay System Ecosystem-Based Management and Restoration Plan is ~~informed by the best available science,~~ 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 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 ABS restoration and management plans. ~~Management and Restoration Plan~~

C2) To support efforts to identify funding sources and define mechanisms for full implementation of the ABS restoration and management plans. ~~Management and Restoration 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 ABS restoration and management plans ~~Management and Restoration 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.

CAB Proposed Strategies Subsequent to the ABSI Process:

2) 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 Bay Management 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 management 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. *[Clean version of proposed revised Strategy #2]*

   After the Plan is completed, the CAB should evaluate transitioning ~~transition~~ to a successor group ~~nonprofit 501c3 Task Force~~ (with stakeholder ~~membership~~ composition similar to the ABSI CAB) in collaboration with the state ~~that is recognized by~~ as a partner in overseeing the Bay Management Plan. The successor group ~~Task Force~~ will define its scope of work including evaluating ~~explore~~ regulatory processes and ~~will~~ engaging with and being accountable to decision-makers and the public for the actions laid out in the management plan and the implementation thereof. The successor group will evaluate the best organizational structure for ensuring longevity including working under the auspices of a state agency, an estuary program, private/public partnerships, etc. ~~It also can seek the necessary funding from whatever sources it needs (e.g., private, state, federal, estuary program) to build the capacity of the organization to ensure its longevity and potentially to hire a Director.~~

3) The successor group ~~Task Force~~ should encourage state programs as appropriate ~~FWC and other~~ to adopt ABSI's scientifically-derived coordinated 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 with input from the successor group ~~Task Force~~ (e.g., private, public, NGO, partnerships, etc.).

4) The successor group ~~Task Force~~ should encourage agencies to prioritize CAB recommendations for investing more funding in the management and restoration of oyster resources.

GOAL D ~~E~~
AN ENGAGED STAKEHOLDER COMMUNITY AND INFORMED PUBLIC

[The Project Team revised this Goal to be consistent with the ABSI scope, moved from Section II to Section I, and re-lettered accordingly]

VISION THEME D: Stakeholders of the Apalachicola Bay System are committed to working together ~~beyond the Apalachicola Bay System Initiative t~~o 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 ~~expand~~ coordinate community engagement ~~outreach and education~~ efforts ~~originally initiated through ABSI~~ 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 ~~E~~ PRELIMINARY DRAFT STRATEGIES

~~**CAB Proposed 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. Done

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. ~~such as shell recycling, shelling, and relaying initiatives~~
   - *Action 2. A.):* Form a sub-committee within the CAB that can spearhead an outreach and community engagement effort intended to inform and educate stakeholders and the public about the research, restoration plan, and management 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 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.

   [Strategies revised to be actions proposed by Project Team]

3) Support and participate in providing educational opportunities for students at all levels (primary & secondary school through college) in fisheries ecology and management, with particular emphasis on the role oysters play in ecosystem health and fisheries. ~~resources and ecology for aquaculture and commercial fishing, education programs for primary & secondary school students along with help from community college~~

[Revised by the Project Team]

~~The Task Force~~ ~~ABSI~~ ~~should coordinate and communicate with appropriate agencies (e.g., USACE, USFWS, NOAA, NWFWMD, FWC, FDACS), 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 based on the best available science and data.~~

[Moved to Goal A]

[The following are captured in other Goal areas or are already taking place]

~~**The CAB should also evaluate the following for inclusion in existing strategies as appropriate:**~~

A. ~~**Collaboration.** Establish and communicate a long-term shared vision of success for oyster resources among stakeholders that can be sustained, implemented and strengthened into the future.~~

B. ~~**Existing Programs**. Collaborate with existing programs.~~

C. ~~**Education.** Support education in fisheries science and management.~~

D. ~~**Community Advisory Board Process.** The ABSI CAB itself represents an educational initiative and a forum for communication among stakeholders.~~

E. ~~**Develop Programs.** Identify and implement education programs that would be beneficial to the industry, especially young entrants.~~

F. ~~**Lessons Learned.** Look at lessons learned from other areas and fisheries in terms of how they addressed and solve issues around oyster resource management and education, such as Puget Sound, Virginia, Delaware, Maryland, Apalachicola, Gulf States, scallop and clam fisheries etc. Review best practices and outcomes and adapt successful techniques from other places/regions.~~

G. ~~**School Education.** Support and participate in educational opportunities for students at all levels (primary & secondary school through college) in fisheries ecology and management, with particular emphasis on the role of oysters play in ecosystem health and fisheries. resources and ecology for aquaculture and commercial fishing, education programs for primary & secondary school students along with help from community college.~~

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 be 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 ~~D~~
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. ~~over the course of the ABSI project by *year x*~~.

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 ~~D~~ PRELIMINARY DRAFT STRATEGIES

CAB Proposed 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 monitoring[2] 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.

[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. (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.

5) ~~Develop shell recycling program combined~~ Work with State legislators ~~ion that provides staff~~ to develop funding strategies, and incentives for involving local watermen, seafood dealers, restaurants, aquaculture operations, and private citizens in oyster reef restoration ~~an~~ efforts ~~to~~ that will increase the viability of ~~the~~ oyster resources.
   - *Action 5. A.):* Identify source of shell.

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**
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.	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.	The ABSI Team and the CAB will continue to have an open and transparent process for the development of the ABS Management and Restoration 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.	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.
Determine area (acres or km^2) 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.	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 fishery and the important cultural role of a working waterfront and seafood industry.		
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.			
Priority 2 Strategies = Important But Less Time Sensitive			
GOAL A	**GOAL B**	**GOAL C**	**GOAL D**
Increase productivity of the Apalachicola Bay oyster ecosystem by restoring, enhancing, and/or developing new reef structures (some of which would be maintained as non-harvest protection areas) based on experimental evidence for the most suitable substrate (e.g., limestone, granite, spat-on-shell, artificial structures) and on habitat suitability analyses using the best available scientific information coupled with the knowledge and experience of managers and stakeholders.	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.		Support and participate in providing educational opportunities for students at all levels (primary & secondary school through college) in fisheries ecology and management, with particular emphasis on the role ~~of~~ oysters play in ecosystem health and fisheries.
	Recommend specific criteria and/or conditions identified with related performance measures for the reopening of Apalachicola		

	Bay to limited wild oyster harvesting.		
	Use data and 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.		
Priority 3 Strategies = As Time and Resources Allow			
GOAL A	**GOAL B**	**GOAL C**	**GOAL D**
Develop criteria for sustaining specific reefs or reef systems damaged by environmental conditions or natural disasters that includes (1) degree of damage and potential for recovery; (2) approach for mitigating damage (e.g., physical repair, spat supplements, or some combination of both); (3) periodicity of spat addition (e.g., annually or longer); (4) specific timeline for continuing the approach (e.g., 3 years or longer). This approach is not intended to create a put-and-take fishery.		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 Bay Management 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 management 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.	

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 (m^2)
- Reef area (total actual area of patches of living and nonliving oyster shell or substrate with and without live oysters) (m^2)
- 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 (m^2)
- Project reef height determined to support sustainable reefs and oyster production (m)

Oyster Recruitment, Abundance, Survivorship

- Spat recruitment assessment throughout the system
- Density of live oysters (juveniles* & mature adults (#/m^2)
- 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 (#/m^2).
  - 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) (#/m^2 for selected spp; biodiversity indices).
  - Enhancement/protection of adjacent shoreline habitat (Change in shoreline extent, elevation, marsh cover).

- 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).

[The following are either captured above, outside the scope of ABSI, or not useful performance measures for the ABSI project]

~~A. Development of a forecasting model for salinity, temperature, nutrients (including nitrogen) and organic carbon dynamics under different climate and management scenarios.~~
~~B. Reef height (feet or meters), where "reef" means live and dead shell, as well as other restoration material.~~
~~C. Reef habitat measured in terms of height (feet or meters) and area (acres or km^2), where "reef" is defined as structural material suitable for oyster recruitment (e.g., live shell, dead shell, and/or restoration materials).~~
~~D. Reef area, reef defined as above (acres or km^2).~~
~~E. Density of live oysters, new boxes and dead shell (#/m^2).~~
~~F. Density of live oysters, including density of recruits and spawning adults (#/m^2).~~
~~G. Oyster population demographics (size/frequency).~~
~~H. Biomass of live oysters (calculated from demographic data)~~
~~I. Amount of brood stock (abundance and biomass of mature adults)~~
~~J. Spat settlement patterns (spatial and temporal)~~
~~K. Oyster recruitment patterns, where recruitment is defined as survival beyond a density-dependent mortality stage (~1.4"/35mm).~~
L. ~~Incidence of oyster diseases, parasites and predators~~
~~M. Assess and manage for sustainable natural mortality rates (e.g., due to predation, parasites, disease).~~
~~N. Diversity and abundance/biomass of reef-associated species~~
~~O. Community diversity and population abundance/biomass of reef-associated taxa, including (commercially or recreationally) fished populations like blue crabs, stone crabs, mullet, redfish, etc.~~
~~P. Soft sediment community structure and associated fisheries species.~~

Q. ~~Levels of pollutants (PCB, Heavy metals etc.) in water, sediment and animal tissue.~~ (Outside ABSI Scope)
R. ~~Sedimentation rates~~ (Outside ABSI Scope)
S. ~~Salinity regimes across the ABSI region under different climate and management scenarios.~~
T. ~~Organic carbon dynamics (food availability) under different climate and management scenarios.~~
U. ~~Water filtration rates (volume/day) and days to filter estuary volume~~
V. ~~Water clarity (visibility) – changes over time~~
W. ~~Area of seagrass in the ABS region~~
X. ~~Nutrient dynamics of the ABS region~~
Y. ~~Relative proportion of nitrogen removed compared to nitrogen input~~
Z. ~~Assess changes in coastal vulnerability indices (e.g., indices of shoreline erosion, which are related to changes in saltmarsh, mangrove, seagrass habitat, but also vulnerability to storms).~~ (Outside ABSI Scope)
AA. ~~Assess changes in shoreline erosion protection~~ (Outside ABSI Scope)
BB. ~~Assess changes in salt marsh, mangrove, and/or seagrass indices.~~ (Outside ABSI Scope)
CC. ~~Number of sloughs connected to the Apalachicola River (depending on flow levels~~). (Outside ABSI Scope)
DD. ~~Timing and extent of floodplain inundation~~. (Outside ABSI Scope)

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.
- Proportional allocation to commercial & recreational fisheries.
- 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.

[The following are captured elsewhere]

~~A. Total harvest in bags the oyster population can support~~
~~B. Sustainable allowable catch in annual total biomass (kg) removed, under different management regimes.~~
~~C. How close to a complete fishery (fraction harvested of allowable catch)~~
~~D. Harvest (annual total biomass) by fishery type (recreational/commercial)~~
E. ~~Develop models for predicting sustainable allowable catch in annual total biomass (kg) removed (allocated to recreational and commercial fisheries and by type of managed area), under different management regimes. This would include calculating harvest rate and accounting for shell budgets.~~
~~F. Number of full-time harvesters that the fishery can support under most environmental conditions. [need to define full-time]~~
~~G. Harvest (annual total biomass) by size category, location and gear type~~
H. ~~Timing of harvest during the fishing season [need to define]~~
~~I. Catch per unit effort (catch per trip)~~
~~J. Number of poaching violations and amount of captured illegal harvest (including illegal sale).~~
~~K. Amount of harvest from rotation areas~~
~~L. Fraction of total oyster population that is being harvested~~
~~M. How many oysters can be harvested without a net loss of oysters.~~
~~N. Creation of a harvest management plan that is ecologically sustainable and acceptable to stakeholders and includes plans for actions in case of unpredictable but inevitable environmental disturbances.~~
O. ~~An updated oyster fishery and aquaculture enforcement plan that is approved by fishers, farmers, distributors (fish houses), FWC Law Enforcement, and local judicial system.~~
P. ~~Number of large oysters (>3") by location (different reefs, fished vs. closed areas, intertidal vs. subtidal).~~
~~Number of sanctuaries [moved from Goal A]~~
~~R. Number of closed areas [moved from Goal A]~~
S. ~~S. Inclusion of oyster areas closed to fishing.~~

- ~~Creation of a harvest management plan that is ecologically sustainable and acceptable to stakeholders and includes an adaptive plan of actions to rapidly respond to unpredictable but inevitable environmental disturbances~~.
- ~~An updated oyster fishery and aquaculture enforcement plan that is approved by fishers, farmers, distributors (fish houses), FWC Law Enforcement, and local judicial system~~.

C.) THE ECOSYSTEM-BASED 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

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

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

[The following are outside the scope of the ABSI project]

~~Related Draft Performance Measures to Evaluate Strategies~~

~~A. Value of harvest that meets an economic minimum for sustainability of watermen.~~
~~B. Cost/value per bags~~
~~C. Revenue per harvester (and perhaps its distribution)~~
~~D. Travel time costs, and distance travelled~~
~~E. Cost of management measures (e.g., restoration efforts)~~
~~F. Revenue raised in fees/bag taxes~~
~~G. Social benefits (value of ecosystem services)~~
~~H. Value of harvest per day (bags per day)~~
~~I. Performance metric for economic sustainability of the community~~
~~J. Total economic investment versus economic benefit~~
~~K. Socio-economic benefits – Improved/enhanced recreational fishing on oyster reefs including restored reefs.~~
~~L. Total market activity (revenue) associated with commercial sale of oysters (including aquaculture, wild harvest, and any partial-ownership methods that fall in between the two).~~
M. ~~Total (amount or proportion) of jobs in Franklin County (should this include surrounding counties too?) associated with working waterfront (i.e., fishing, aquaculture, and tourism).~~

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 x. 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