Design and implement system-scale shallow water habitat restoration to include multiple practices (i.e., oysters, wetlands, SAV, and reforestation) that provides social, economic, and ecological benefits while also providing resilience and connectivity under changing land-use and climate conditions. A disconnected restoration project will have limited benefits, particularly in upstream areas of the watershed (Shallow Water Habitats #1)

Habitat loss due to multiple stressors is a concern for non-tidal and tidal shallow waters and impairs the human and ecological benefits these habitats provide. When designed appropriately, habitat restoration can provide climate resilience or the ability to bounce back following climate change-induced stress. It can also provide refugia for living resources and protection for nearby communities.

Impact to how we work: This would require a change in the way habitat restoration is targeted, designed, and implemented and would require better coordination with nearby stakeholders and improved integration with climate change and water quality. To be successful, living resource and climate resilience benefits must be prioritized equally to water quality. The current structure does not promote prioritizing restoration efforts in areas with existing large-scale initiatives and investments or focusing on shallow water habitats vulnerable to climate change. This requires targeting locations to address stressors of shallow water habitats by collecting and using more shallow water habitat data and modeling to guide the appropriate restoration practices. NOAA's Habitat Focus Areas are an example of working with the community to understand needs and interests, pulling partners together, and working together to find resources and tackle bigger things collectively.

Impact on Chesapeake Bay Watershed Agreement: Transformational. Changes to the water quality and assessment outcome to require actions described above would catalyze this effort.

General Level of Effort: High. This would require additional partnership staff time and resources to develop assessment methods that incorporate the expanded collection of data, and to develop meaningful stakeholder engagement feedback loops. Funding for restoration would need to elevate consideration of climate impacts and living resource habitat needs.

How to Strategies (Phase 2 Actions):

- Emphasize the enhancement of social and ecological benefits in locations with the longest-lasting impact. This may be places where existing restoration is already taking place or maybe new locations that become "more bang for the buck" under future conditions.
- Identify a regional restoration champion or lead, and collaboratively set realistic restoration goals based on stakeholder priorities.
- Incorporate ecosystem services and social needs into restoration success metrics to provide a more balanced assessment of project success.
- Improve training opportunities and consistent monitoring requirements for the restoration industry.
- Include degraded systems where possible because there will be social benefits in addition to ecological benefits at these sites.
- Balance restoration with future landscape condition. (i.e. marsh migration corridors, conservation easements for salt marsh sparrow) and set goals that are realistic and account for off-setting losses.

Shallow Water Habitat Scope: Edges and Nearshore Waters of 3 Ecological Zones: Non-tidal Fresh, Tidal Fresh, and Tidal Estuarine. This includes the rivers and streams that flow to the waters of the Chesapeake Bay and the nearshore habitats where the plants and animals live and people interact with the water.

Improve the understanding of connectivity and habitat function under changing conditions by expanding Chesapeake Bay and watershed monitoring and modeling to include continuous shallow water habitats. (Shallow Water Habitats #2)

Shallow water habitats in the Chesapeake Bay and its watershed are not adequately monitored or modeled. Relatively little is known about how shallow water habitats and how living resources respond to changes in water quality and management actions. Implementation of continuous, long-term shallow water living resource monitoring and assessment, with focused fine-scale modeling, is needed to understand habitat connectivity and habitat function under changing land-use and climate conditions.

Impact to how we work: This recommendation will require a more thorough integration of monitoring and modeling efforts, as well as a potential expansion of efforts, to assess shallow water habitat conditions and response to stressors. This may require a rebalancing of resources as well as the development of a comprehensive tracking system for habitat restoration projects. This system should complement the CAST system and not require dual data submissions.

Impact on Chesapeake Bay Watershed Agreement: Extend/ No changes needed.

General Level of Effort: Med-High. The level of effort is associated with the time needed for partners to expand monitoring programs, and the additional resources needed by the Partnership to develop new or modify existing assessment methods to incorporate the expanded collection of data and model integration.

How to Strategies (Phase 2 Actions):

- Develop appropriate metrics and implement a shallow water habitat sentinel site program.
- Use a combination of remote sensing, sentinel site and other monitoring data, and modeling to understand and predict the effects of climate change and management actions on shallow water habitat function and recovery.
- Use a combination of data synthesis and new research to better understand habitat connectivity, the impacts of competing uses, changing water quality, and changing habitat conditions on living resources.
- Develop economic valuations of ecosystem services for shallow water habitats to better address conflicting uses and habitat trade-offs.
- For all restoration projects, include pre- and post-restoration monitoring of sufficient duration to detect long-term causes of failure or success.
- Develop and implement a comprehensive tracking system and database for habitat restoration projects.
- Consider historical context to improve understanding of habitat condition and performance capacity in the future.
- Based on latest analyses, adjust timelines for expected shallow water habitat and living resource responses to nutrient and sediment reductions.
- Consider changes in land-use (i.e., development) and shorelines (i.e., hardening and erosion control measures) equally with change from climate impacts.

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Implement an active approach to climate adaptation in shallow water habitats that integrates vulnerability assessments for living resources and communities, alternative future scenarios, community engagement, and learning elements. (Shallow Water Habitats #3)

There is a need to better understand and predict climate impacts on shallow water areas and adapt to future conditions since they are critical to both people and living resources. A clear process for assessing relative vulnerabilities both currently and in the future while engaging communities in the setting of priorities is necessary to provide the tools for climate adaptation decision-making and planning.

Impact to how we work: Requires implementation of a formalized adaptive planning process that includes community engagement elements and room to adapt goals within the context of changing conditions.

Impact on Chesapeake Bay Watershed Agreement: Requires revision of the accountability metrics and assessment of outcomes.

General Level of Effort: **Medium**. Level of effort is associated with the implementation of a new framework for collaboration and integrated assessment, along with development of expertise and capacity in vulnerability assessment and construction of alternative future scenarios.

How to Strategies (Phase 2 Actions):

- Co-develop adaptation strategies with communities to take advantage of local knowledge and collaborate with local planning and zoning entities to provide a holistic approach that aligns with local priorities.
- Use alternative future scenarios to provide decision-makers with options reflecting local community priorities.
- Identify critical habitat areas in both tidal and non-tidal waters and develop targeting approaches aligned with maximizing shallow water habitat health.
- Where possible, leverage and partner with other ecosystem habitat function projects, existing large-scale restoration efforts, and significant investments in best management practices (BMPs).
- Train planners in ecosystem services and tools for planning with habitat impact considerations.
- Consider and provide incentives for preservation before restoration.
- Pilot BMP implementation with local non-profits that seek to balance water quality improvements with improvements to habitats, living resources and communities. Identify successful local programs and initiatives and scale up these efforts across rivers, sub-watersheds, and communities.
- Formally and periodically assess effectiveness and implement learnings into updated vulnerability assessments, modeling, and planning.

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Strengthen the connection between people and shallow water habitats by communicating the importance of these ecosystems and their socio-economic benefits to stakeholders. Develop active and sustained engagement with communities to understand their values and utilize social science strategies to develop stewards of our local waterways. Align actions and funding to these values and socio-economic considerations. (Shallow Water Habitats #4)

Stakeholders in the Chesapeake Bay watershed lack awareness of the societal importance and benefits of shallow water habitats, and the Chesapeake Bay Program has not effectively linked shallow water habitats to the tangible benefits they offer to individuals who rely on local waterways for recreation, jobs, and cultural practices. This lack of stakeholder understanding and engagement is compounded by scientific jargon that fails to resonate with communities.

Impact to how we work: Implementing this recommendation would require a shift in operations towards a more meaningful partnership with people and communities, including but not limited to adjusting membership structure, management actions, and funding decisions to prioritize benefits to people and communities.

Impact on Chesapeake Bay Watershed Agreement: Extend. This represents a transformative approach to how the Program communicates benefits to people and engages communities but does not create a new outcome.

General Level of Effort: Medium effort is needed for using existing communications products and existing networks. High effort is needed for planning for direct engagement.

How to Strategies (Phase 2 Actions):

Targeted audiences: Underrepresented Communities, Non-tidal and Waterfront Communities

Communications and Engagement Planning:

- Using social science, develop a plan to foster two-way communication with local partners and communities that focus management actions on identified quality of life issues.
- Focus on polluted waterways while ensuring socio-economic and environmental justice dimensions are considered in managing access, use, and local economies.
- Tailor messages to a community's priorities, economic and ecological values, and history. Focus on making content accessible, engaging, and relevant.
- Facilitate education about Best Management Practices (BMPs) and stewardship actions. This may in turn increase public engagement in habitat enhancement projects.

Implementation of Communications and Engagement Plan:

- Structured, targeted engagement with networks of partners utilizing a diverse suite of strategies to showcase ongoing restoration efforts and year-over-year improvements.
- Increase public engagement in habitat enhancement projects, by understanding local priorities, seeking feedback on the project at multiple touch points and adjusting course to meaningfully respond to public comments.
- Invest in training and regional technical assistance to strengthen outreach capacity.
- Improve methods to connect people with shallow water habitats through trails, education, community science, and public access to water.

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Balance accountability, resources, and effort in an equitable way across the outcomes. Manage shallow water habitats as an interconnected ecosystem that leverages collaboration among the Bay Program partnership and organization structure by minimizing rigid bureaucracy without sacrificing inclusivity. Adjusting outcomes and funding accordingly. (Shallow Water Habitats #5)

The clean water regulatory requirements and accountability framework focus on TMDL crediting with little consideration to living resources and their habitats. Water Quality makes up ten percent of the Bay Program outcomes, but commands significantly more in effort and focus. Clean water is only one factor of sustainable and healthy habitats for living resources and the Bay Program needs to balance effort, resources, and responsibility equitably across the outcomes. In addition, there is a need for greater collaboration and engagement between the outcomes and throughout the partnership.

Impact to how we work: A re-envisioning of how the partnership works together and collaborates is necessary, including elimination of redundant or unnecessary processes that do not move the work of the partnership forward. We recommend a multi-objective accountability system that tracks outcomes and engages jurisdictions and local government, similar to CAST, but with broader outcomes and an emphasis on incentives versus punitive measures. Modification to Program structure is also needed for improved collaboration.

Impact on Chesapeake Bay Watershed Agreement: Extend/ Do not need to amend to include strategies and mechanisms for collaboration, responsibility, and dedicated funding.

General Level of Effort: High. This effort requires full participation of stakeholders ensuring equitable responsibility and collaboration. Stakeholder availability will require capacity building in most partnership organizations and significant increases or shifting of current funding.

How to Strategies (Phase 2 Actions)

- Conduct periodic evaluations of GITs/workgroups focused on efficiencies and collaboration. Incorporate social science and utilize existing networks to increase collaboration. Create a formal mechanism for input on Management Board (MB) agendas.
- Establish accountability mechanisms that focus on partnerships and trust, not regulatory approaches, include habitat improvements, and foster this through periodic training for partnership building. Develop mechanisms that track all outcomes as consistently and closely as water quality, with an emphasis on incentives versus punitive measures and a local focus.
- Reward preventative measures, not just corrective measures. Build state capacity, including the creation of markets for water quality, carbon, and other nature-based solutions.
- Utilize partners to navigate funding sources, focus on local governments and NGOs.
- Evaluate the cost curve versus living resources response curve.
- Streamline workgroups to encourage collaboration beyond singular practices and connecting outcomes and broaden representation on MB beyond water quality.
- Improve collaboration among different levels of government and in the permitting process. Consider new studies on permitting processes for restoration projects.

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