Beyond 2025 Shallow Water Habitats Small Team

Scope: Edges and Nearshore Waters of 3 ecological zones: Non-tidal Fresh, Tidal Fresh, and Tidal Estuarine.

Vision: Healthy and sustainable shallow water habitats that support resources, communities, and economies that are resilient to long-term changes in watershed conditions.

Goals:-

(Listening Session question #1- What do healthy and sustainable shallow water habitats look like to you?)

1. Integrated Ecosystem Management:

- Manage and regulate non-tidal and tidal shallow waters as a connected, integrated ecosystem.
- Promote habitat conservation as a management and economic priority.
- Promote holistic restoration, considering biology, chemistry, physical structure, and habitat connectivity.

2. Biodiversity and Resilience:

- Foster diverse and resilient habitats supporting ecosystem function and services.
- Ensure the coexistence of species, clear water, natural vegetation, and minimal human impact.

3. Community Access and Engagement:

- Enhance equitable access to coastal areas for recreation, and resilience of coastal communities.
- Promote public engagement and safe, enjoyable access to diverse ecosystems.

4. Sustainable Practices and Climate Adaptation:

- Implement sustainable practices that account for climate change, sea level rise, and maintain high-quality shallow water habitats.
- Focus on sustainable fisheries, habitat conservation, and adapting to changing climate conditions.

5. Effective Governance and Accountability within and Beyond the Chesapeake Bay Program:

- Effective monitoring programs for habitat, biodiversity, and water quality conditions.
- Hold responsible parties accountable for progress, ensuring continuous improvement in habitat health.
- All outcomes oriented toward a broad suite of ecosystem service benefits and with equitable focus and sustainable funding.
- Leverage long-term trust that has been established through decades of collaboration and partnership.

Executive Summary:

Shallow water habitats play a crucial role in supporting diverse and vibrant ecosystems, improving water quality, and engaging people in the outdoors and nature. These aquatic edges connect or support many of the Bay Agreement Outcomes. Shallow water habitats are often rich in biodiversity and serve as nurseries and essential habitat for the early stages of many aquatic species. Many commercially and recreationally important species call these areas home as they offer protection from predators and access to abundant food. People value the recreational activities available in shallow water and these activities contribute to local economies and create jobs. People also value the protection these areas can provide as they can act as natural buffers against

flooding, storm surges, and erosion. Shallow water habitats, such as marsh, wetlands and submerged aquatic grass beds, act as natural filters and carbon sinks. They trap sediment, absorb nutrients, and store carbon dioxide, helping to improve water quality and mitigate the impacts of climate change. This natural filter is essential for maintaining a healthy aquatic environment and reaching the TMDL goals.

Enhancing and conserving shallow water habitats is essential for maintaining the health of the watershed and these benefits, but we have been approaching this effort as a co-benefit or a by-product of other intentional work. The shallow water habitat team has had the opportunity to take a step back and look at the great work that is happening in the watershed, how it impacts shallow water habitats, and where we are falling short. Through a thoughtful and engaged process with outcome teams, stakeholders, and experts we have highlighted five opportunities to greatly improve our focus and effectiveness in maintaining quality functioning shallow water habitat. Climate, people, and living resource considerations are woven through each shallow water recommendation. Strategies provide more depth and detail to the recommendations. By integrating cross-cutting considerations into strategies and embracing climate adaptation measures, we can safeguard these vital shallow water habitats for the future. The shallow water recommendations do not suggest that revisions are needed to the current Chesapeake Bay Partnership Vision statement. The vision is holistic and appropriate, it is the focus, resources, and accountability of actions to meet that vision that need to be updated.

Climate-Resilient Restoration efforts should focus on areas that benefit from large-scale initiatives and investments, targeting shallow water habitats most vulnerable to climate change. By leveraging existing infrastructure and expertise, these efforts can maximize impact and ensure continued performance in the future. Emphasis should also be placed on enhancing social and ecological benefits in locations with the longest-lasting potential impact. This may involve building on existing restoration projects or identifying new sites that offer significant benefits under future climate scenarios. Moreover, degraded systems should not be overlooked, as they may offer both social and ecological benefits through restoration efforts.

Taking a top-down approach to watershed management by including headwaters in system-scale restoration can yield significant benefits. This approach considers the interconnectedness of habitats across the watershed and integrates sustainable land use planning to support watershed and stream health. Efforts should target the root causes of habitat degradation to prevent future failures. To ensure consistency and effectiveness, improving training opportunities and promoting consistency among restoration practitioners is essential. Further, incentivizing ecosystem services, such as carbon sequestration, and incorporating social needs into restoration metrics can provide a more balanced assessment of project success.

Integrated Modeling and Monitoring is needed to have focused shallow water protection and restoration efforts that benefit both living resources and people. The Bay Program understands the benefits of shallow water habitats, but a lack of resources and vision could challenge an expansion of monitoring efforts. We need to try new and innovative technologies to be more efficient and cost-effective. The Bay program should pursue focused sentinel sites, satellite technology, artificial intelligence (AI), and enhanced modeling capabilities to implement long-term monitoring and modeling. Providing standardized terms and tools and conducting economic valuations of habitat services would enable the integration of environmental considerations into land use planning and decision-making. The habitat tracker has been a good start for the tracking of habitat and restoration projects, but there are data gaps and we need landscape-scale data synthesis. In addition, metric development for habitat function should be investigated as a method to monitor and evaluate the effectiveness of conservation and restoration efforts.

An adaptive process is recommended to address the challenges of shallow water habitats. Climate is a stressor to shallow water habitat equivalent to or greater than nutrient and sediment. A climate **adaptation strategy to inform habitat management and project planning** would incorporate the best available science, improve planning and implementation of projects, engage stakeholders, and evaluate success. Shallow water habitat and the communities surrounding them would benefit from a structured approach to developing adaptation solutions and implementing actions. The approach includes conducting vulnerability assessments, modeling future climate change scenarios for habitats, communities, and living resources to inform decision-making, targeting critical habitats and living resources for shallow water health, engaging communities for a holistic approach to planning consistent with local priorities, implementing sound measures at local and system scales, evaluating their success over short and long terms, and implementing learnings to re-assess vulnerabilities and risks.

Communication and Engagement entails developing active and sustained engagement with communities to understand their values and utilize social science strategies to develop stewards of their local waterways. With this understanding, management actions and funding allocations should be adjusted to prioritize benefits for people and communities. It is important that local governments, communities, and stakeholders understand the value of shallow water habitats and the value of participating with the Chesapeake Bay Program. Partnership actions should include developing plans for two-way communication with local partners, promoting habitat workshops, and setting realistic goals that consider population growth and climate change impacts. Collaboration among networks of people and communities should be structured and targeted, showcasing restoration efforts and engaging the public through various avenues such as trails, educational events, and community science. Actions should include exploring opportunities for increased landowner incentives, fully integrating social science best practices, and focusing management actions on promoting healthy and sustainable shallow water habitats while addressing quality of life issues. Marketing and communication efforts should highlight economic and ecological values, emphasize public access and stewardship, facilitate education about Best Management Practices (BMPs), and be tailored to each community's priorities, values, and history, utilizing imagery and storytelling to communicate the significance of shallow water habitats in an accessible, engaging, and relevant manner.

Governance and Accountability needs to shift the effort, resources, and accountability evenly across the outcomes. In addition, there is a need for greater collaboration and engagement between the outcomes and throughout the partnership. Shallow water habitats should be managed as an interconnected ecosystem that leverages collaboration among the Bay Program partnership and organizational structure. Product over process should be prioritized and outcomes and funding adjusted accordingly. The Bay Program currently emphasizes nutrient reduction to meet TMDL requirements, but the CESR report highlights the need for a greater focus on living resources and biodiversity in shallow water habitats. Balancing regulatory and voluntary requirements presents a challenge and requires a more deliberate and transparent approach to prevent bias towards the TMDL. The Watershed Improvement Plans have been successful focusing jurisdictions and local governments on TMDL, but an unintended consequence is that we did not bring habitat and living resources along for the ride. The Bay Program needs to fix what needs fixing, and evolve the system, but not start over. Accountability within the partnership's framework should prioritize incentivizing success rather than penalizing failure, with dedicated funding for goals and outcomes. The current agreement lacks direct geographic accountability for outcomes beyond the TMDL, hindering effective monitoring. Short-term outcomes tied to long-term aspirational goals are essential for accountability and a more adaptive process. Establishing local geographic-level short-term goals and watershed-level long-term goals can facilitate this shift. Additionally, dedicated funding should accompany any new goals and outcomes to ensure their feasibility.

Recommendation #1: Climate-Resilient Restoration

Issue: Climate change is already affecting the shallow water habitats of Chesapeake Bay and its watershed by various combinations of warming, changes in precipitation and runoff patterns, acidification, and sea level rise. Climate change impacts are worsened by historical degradation of the quantity and quality of shallow water habitats. Habitat restoration can be effective in improving the habitat quality along with social, economic, and ecological services within and adjacent to a restoration site. The planning, siting, scale (local to system-wide), integration of multiple community and living resource benefits in the design, and long-term monitoring and evaluation of project performance are all critical to successful restoration. When designed appropriately, habitat restoration can provide climate resilience or the ability to persist and bounce back following climate change-induced stress. It can also provide refugia for living resources and protection for nearby communities. There are many lessons learned from historical restoration that provide a sound basis for designing climate-resilient actions.

Recommendation: Prioritize system-scale shallow water habitat restoration that provides social, economic, and ecological benefits while also providing resilience and connectivity under changing land-use and climate conditions.

Strategies:

- Prioritize restoration efforts in areas benefiting from existing large-scale initiatives and investments, focusing on shallow water habitats vulnerable to climate change. Consider actions or modifications to ensure such investments continue to perform into the future.
- 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 may be new locations that become "bang for the buck" under future conditions.
- Emphasize the restoration and maintenance of multiple habit types in project planning to reestablish ecological connectivity. A disconnected restoration project will have limited benefits, particularly in upstream areas of the watershed.
- Prioritize system-scale restoration (i.e., oysters, wetlands, SAV, and reforestation), incorporating sustainable land use planning that focuses on watershed and stream health**.**
- Incentivize ecosystem services (including carbon sequestration) and social needs and use these as success metrics in restoration efforts, on balance with nutrient and sediment reductions for TMDL credits. Include degraded systems where possible because there will be social benefits in addition to ecological benefits at these sites.
- Consider project and habitat function overtime based on new realities and climate conditions.
- Focus on headwaters for a top-down approach.
- Set realistic goals and account for offsetting losses and possible trade-offs. Current goals are based on habitat acres "restored" but do not account for those lost.
- Target locations that consider and address stressors of shallow water habitats. It is vital to address the stressor creating the problem and the need for restoration prior to pursuing restoration activity. If the stressor is still present when the restoration activity is implemented, the project will eventually fail.
- Improve training opportunities and consistency among practitioners. Promote restoration industry-consistency of application of techniques and terminology.
- To maintain forest cover, need to create forest cover thresholds (by county) to account for population growth.

Recommendation #2: Integrated Modeling and Monitoring

Issue*:* Shallow water habitats in Chesapeake Bay and its watershed are not adequately monitored or modeled. There is limited understanding of the connectivity between upstream, downstream, land, and water. Relatively little is known about how shallow water habitats and living resources respond to changes in water quality and management actions. It is imperative to enhance both monitoring and modeling of shallow water habitats in Chesapeake Bay and its watershed to address these issues.

Recommendation: Improve understanding of connectivity and habitat function under changing conditions by expanding Chesapeake Bay and watershed monitoring and modeling to include continuous shallow water habitats.

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Strategies:

- Implement continuous, long-term shallow water living resource monitoring and assessment to understand habitat connectivity and habitat function under changing conditions.
- Utilize a combination of remote sensing, monitoring data, and modeling to understand and predict the effects of climate change on shallow water habitats.
- Explore new methodologies for long-term habitat monitoring and modeling, potentially including the use of satellite technology and artificial intelligence (AI) to quantify parameters such as temperature, clarity, and chlorophyll-a in shallow water habitats.
- 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.
- 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 shallow water habitat sentinel site program.
- Develop economic valuations of ecosystem services for shallow water habitats.
- Develop and implement a comprehensive tracking system and database of habitat restoration projects.
- Consider historical context to improve understanding of habitat condition and performance capacity in the future.
- Improve understanding of historical changes and ability of habitat to perform in the future.
- Re-balance timelines and resources for shallow water habitat and living resource responses relative to nutrient and sediment reductions.
- Consider change in land-use equally with change from climate impacts

Recommendation #3: Adaptation Strategy to inform Habitat Management and Project Planning

Issue: Shallow water and nearby lands are experiencing the effects of climate change, from sea level rise, increasing temperatures and more, which in turn, affects the living resources and the people in these areas. There is a need to better understand and predict these changes and adapt to future conditions. Shallow water habitats can serve as a tool for adaptation especially at the local level. However, better science application, community engagement and changes to current policy and planning practices need to occur to develop effective climate adaptation strategies.

Recommendation: Implement a process for climate adaptation in shallow water habitats that integrates adaptation science and community engagement elements. Primary steps include conducting vulnerability assessments and modeling habitat transitions under alternative future scenarios, engaging the community in setting priorities for planning, implementing measures at both local and system scales while sharing knowledge, and evaluating effectiveness of the measures to improve the desired outcomes.

Strategies:

Assess Impacts Vulnerability and Risk

- Conduct both short and long term climate change vulnerability assessments for critical habitats and living resources.
- Model habitat transitions, species shifts, and invasive species dynamics due to warming, sea level rise, saltwater intrusion, and precipitation changes, all under a range of future scenarios.
- Standardize terms, models, and methods for local-use or restoration planning. Model impacts of alternative decisions.

Plan for Adaptation

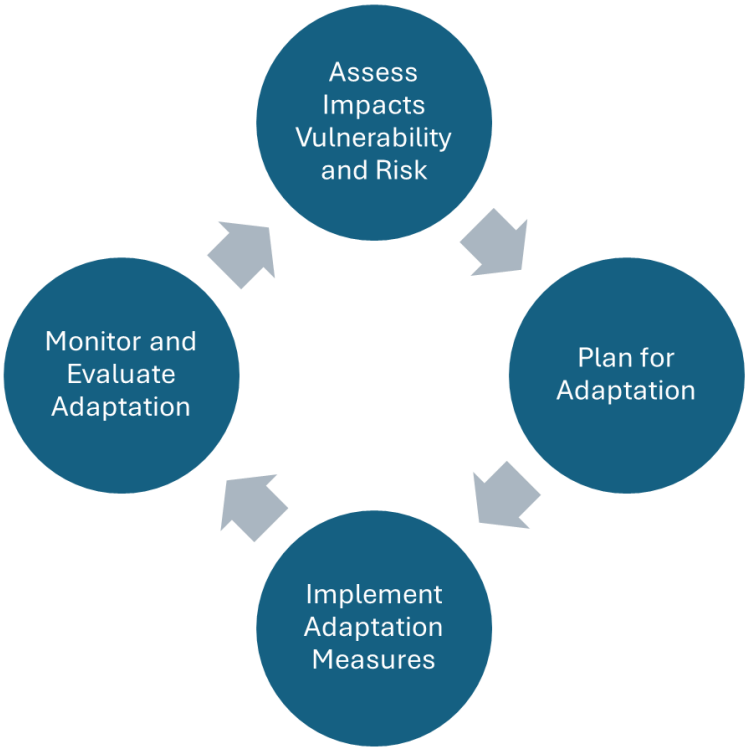
- Co-develop adaptation strategies with communities to take advantage of local knowledge and collaborate with local planning and zoning entities to provide a holistic approach that aligns with local priorities.
- Use alternative future scenarios to provide decision-makers with options reflecting local community priorities.
- Identify critical habitat areas in both tidal and non-tidal waters and develop targeting approaches aligned with maximizing shallow water health.
- Where possible, leverage and partner with other ecosystem habitat function projects, existing large-scale restoration efforts, and significant investments in best management practices.
- Integrate shallow water habitat management with other water resource planning elements, such as managing water withdrawals during droughts.
- Plan for net gain of habitat types, such as wetlands, that may suffer projected loss due to climate impacts.
- Provide community education on the connection between land use and shallow water habitat and services so that on-land decisions align with shallow water health.
- Train planners in ecosystem services and tools for planning with habitat impact considerations.
- Consider preservation before restoration.

Implement Adaptation Measures

- Focus on conserving existing functional shallow water habitats such as marsh migration corridors, fish spawning and nursery areas, and riparian buffers.
- Limit shoreline development and hardening and promote the conversion of hardened shorelines to nature-based alternatives that provide habitat value and shoreline protection.
- Emphasize consistent local zoning ordinances for the protection of existing habitats.
- Create incentives or rewards for decisions that conserve and protect shallow water habitats.
- Pilot best management practices (BMP) implementation with local non-profits that seeks to balance water quality improvements with improvements to habitats, living resources and communities. Empower local entities to experiment with challenging project implementation while reducing risk.
- Identify successful local programs and initiatives and scale up these efforts across different rivers, sub-watersheds, and communities.

Monitor and Evaluate Adaptation

- Develop ecosystem service metrics of success for conservation and restoration projects. Establish regional shallow waters sentinel sites to monitor to evaluate the response of these areas to the implementation actions. Apply monitoring results to improve future project designs and management actions.
- Identify successful local programs and initiatives and scale up these efforts across different rivers, sub-watersheds, and communities.
- Standardize terms, models, and methods for local-use or restoration planning. Model impacts of alternative decisions.
- Formally and periodically assess effectiveness and implement learnings into updated vulnerability assessments, modeling, and planning.



Recommendation #4: Communication and Engagement

Issue: 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.

Recommendation: 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 their local waterways. Align actions and funding to these values and socio-economic considerations.

Strategies:

Partnership Actions

- Develop a plan to foster two-way communication with local partners and communities.
- Encourage habitat workshops, public demonstration sites, and more inclusive local programming.
- Set reasonable goals that consider population growth and climate change that can demonstrate progress to people connected to their quality of life.
- Determine opportunities for increased landowner incentives through expanded state and federal cost-share programs.
- Fully integrate social science best practices, like community based social marketing, to encourage environmentally friendly practices.
- Focus management action to promote healthy and sustainable shallow water habitats with an eye on identified quality of life issues.
- Consider certification or awards for conservation actions.

Engage Communities. Targeted audiences:

(1) Underrepresented Communities
    - Intentionally address environmental injustices and support communities affected by pollution.
    - Encourage diverse partnerships. Don't institutionalize – keep it relevant to people.

(2) Non-tidal Communities
    - Increase engagement with communities and stakeholders less connected to downstream impacts. This is not just about the Bay.
    - Emphasize connection between non-tidal and tidal habitats.

(3) Waterfront Communities
    - Establish realistic expectations and foster active management of shoreline with shoreline landowners, especially in light of sea level rise.

Collaboration with networks of people and communities

- 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.
- Develop methods to connect people with shallow water habitats through trails, education, community science, and public access to water.

Target Funding

- Focus on polluted waterways while ensuring socio-economic and environmental justice dimensions are considered in managing affecting access, use, and local economies.
- Invest in technical training and regional technical assistance to strengthen outreach capacity.

Potential Messaging Components

- Highlight economic and ecological values to shift perspectives. Improved habitats provide community benefits.
- Emphasize public access to improve and enhance public stewardship.
- Facilitate education about Best Management Practices (BMPs) ongoing management and stewardship actions.
- Tailor messages to a community's priorities, values and history. Use imagery and storytelling to communicate the significance of these habitats for people. Focus on making content accessible, engaging, and relevant.

Recommendation #5: Effective Governance, Collaboration, and Innovative Funding

Issue: 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 the effort and focus. Clean water is only one factor of sustainable and healthy habitats for living resources and the Bay Program needs to shift the effort, resources, and accountability evenly across the outcomes. In addition, there is a need for greater collaboration and engagement between the outcomes and throughout the partnership.

Recommendation: Shift the effort, resources, and accountability evenly across the outcomes. Prioritize product over process and adjust outcomes and funding accordingly. Manage shallow waters as an interconnected ecosystem that leverages collaboration among the Bay Program partnership and organizational structure.

Strategies:

Collaboration

- Conduct a periodic evaluation of GITs/workgroups to create efficiencies and encourage collaboration beyond singular practices and connect outcomes to reflect the ecosystem nature of shallow waters and ensure appropriate stakeholders are part of the discussion.

- Improve collaboration among different levels of government. The WIPs provide a means to engage across federal, state, and local governments but do not include all outcomes.
- Incorporate social science and utilize existing networks to increase collaboration with stakeholders through effective communication and coordination.
- Utilize Management Board meetings to periodically evaluate alignment of priorities among partners by hosting a dialogue on what is working and what is not, and creating a formal mechanism for input on agendas (e.g., top three issues for each jurisdiction.)

Accountability

- Establish accountability mechanisms that focus on partnerships and trust, not regulatory approaches, and foster this through periodic training for partnership building.
- Develop mechanisms that track all outcomes (habitat improvements) as consistently and closely as water quality. The water quality tool engages jurisdictions and local government, but Chesapeake Progress does not. Jurisdictions provide data for water quality bmps, but there is no similar data tool for the other outcomes. A multi-objective system that engages jurisdictions and local government is needed for other outcomes. These can be used to recognize local priorities.
- Reward preventative measures, not just corrective measures.
- Consider riparian and flood plain forest cover thresholds by county with an emphasis on incentives versus punitive measures.
- Encourage more DEIJ considerations in local planning and governance. One method is to incorporate environmental justice areas into existing tools that local governments suggest they will use.

Sustainable Funding Across Outcomes

- Develop a definition of sustainable funding as a marker of progress. Sample definition: Dedicated funding mechanisms tied to ecosystem improvement that support local restoration efforts, permanent landscape conservation, and build state capacity, including the creation of markets for water quality, carbon, and other nature-based solutions.
- Utilize federal partners to better navigate federal grant processes and work with diverse organizations, including schools, faith-based groups, and recreation organizations in implementation.
- Direct STAC in coordination with workgroups to evaluate the cost curve versus living resources response curve to identify the most efficient practices.