

Management Strategy for Goal 1: Thriving Habitat, Fisheries & Wildlife (THFW)

Goal

Protect, restore and sustain fisheries and wildlife, as well as the network of land and water habitats they depend on, to promote a balanced and resilient ecosystem and support local economies and recreational opportunities.

Introduction & Overview

Governance Context & Implementation Directives

While the Chesapeake Bay Program (CBP) facilitates regional alignment of resources, priorities, policy, scientific integration, and progress monitoring, the CBP partnership does not directly manage land, water, or living resources. Statutory authority over fish and wildlife management and protection, land use, and habitat restoration resides within individual signatory jurisdictions (states, the District of Columbia, and federal management agencies). Water quality regulations are separately administered under Clean Water Act (CWA) authorities by the U.S. Environmental Protection Agency (EPA) and watershed jurisdictions.

Achieving THFW outcomes relies on leveraging regional science, funding, and management to guide local, state, and federal decision-making, ensuring that voluntary and regulatory actions achieve maximum ecological impact.

Situation Analysis for Goal 1: Thriving Habitat, Fisheries & Wildlife

Across all of the Goal Team's eight outcomes, living resources face cumulative stressors from environmental shifts, land-use changes, and resource constraints.

Challenge Category	Shared Chapter-Level Challenge	Blue Crabs	Brook Trout	Fish Habitat	Fish Passage	Oysters	Stream Health	SAV	Wetlands
Changing Environmental Conditions	Climate-driven impacts (rising water temperatures, sea level rise, altered hydrology, extreme weather) degrading tidal and freshwater habitats and shifting species distributions.	X	X	X	X	X	X	X	X

Ecosystem-Based Science & Management	Gaps in science and data integration needed to support ecosystem-based fisheries management, multi-species forage assessments, and targeted habitat restoration.	X	X	X	X	X	X	X	X
Habitat Degradation & Land Use	Historical and ongoing habitat loss driven by land-use changes, coastal development, altered stream channels, and legacy water quality impairments.	X	X	X	X	X	X	X	X
Capacity & Living Resource Leadership	Sustaining the funding, long-term technical partnerships, staffing pipelines, and leadership commitments required for ongoing living resource conservation.	X	X	X	X	X	X	X	X
Cross-Jurisdictional Alignment	Coordinating policy, regulations, and resource allocation across multiple state and federal jurisdictions with differing statutory frameworks.	X	X	X		X	X	X	X

Community & Shallow Water Engagement	Engaging local communities and waterfront stakeholders—especially in shallow-water areas where human activities and critical habitats overlap most heavily—to build stewardship and guide local actions.		X	X	X	X		X	X
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Chapter-Wide Strategic Connections & Synergies

The success of the THFW Goal is deeply interwoven with other Chesapeake Bay Watershed Agreement goals, requiring explicit integration across teams:

- **Clean Water Goals (TMDL Synergy):** Fish and wildlife habitat assessments, stream health metrics, and SAV targets directly align with the Agreement’s clean water objectives. Best available science from fish habitat mapping provides a framework to prioritize water quality practice implementation (such as TMDL Best Management Practices) in areas that deliver the highest co-benefits for living resources.
- **Healthy Landscapes:** Conserving riparian buffers, forested watersheds, and coastal shorelines preserves the structural land-water connections needed to sustain coldwater species (e.g., brook trout), freshwater mussels, and upland and aquatic ecosystems.
- **Engaged Communities:** Connecting local decision-makers, private landowners, and waterfront residents with habitat science drives stewardship. Engaging tidal and nontidal shallow-water users helps mitigate local user conflicts while promoting habitat protection and ecosystem services.

High-Level Chapter Management Approaches

To address cross-cutting challenges and support outcome attainment across all eight subchapters, the THFW Goal Team will pursue the following core management approaches:

Management Approach 1.0.1: Advance Ecosystem-Based Science for Fisheries, Habitat and Wildlife.

Leverage best available science, spatial modeling, and watershed-wide fish habitat assessments to support ecosystem-based aquatic resource management, evaluate forage availability, and prioritize habitat restoration and protection.

Management Approach 1.0.2: Strengthen Cross-Jurisdictional Coordination & Living Resource Policy.
Facilitate alignment among state and federal resource agencies as well as Non Governmental Organization and private entities to harmonize management policies, support joint monitoring, and coordinate regional restoration priorities.

Management Approach 1.0.3: Align Habitat Restoration with Clean Water & Landscape Initiatives.
Partner with Clean Water and Healthy Landscapes Goal Teams to target TMDL practices, wetland creation, enhancement and/or restoration, and stream connectivity in areas that maximize living resource resilience and water quality co-benefits.

Management Approach 1.0.4: Expand Community Engagement in Shallow-Water & Living Resource Zone.

Collaborate with the Engaged Communities Goal Team to build awareness among local leaders, tidal and nontidal shallow-water users, and landowners, empowering local stewardship to protect aquatic and adjacent upland habitats.

Management Approach 1.0.5: Build Capacity, Technical Networks, and Adaptive Leadership.

Support partner capacity by identifying, implementing, and institutionalizing long-term funding mechanisms, technical assistance networks, and workforce development strategies necessary to sustain living resource programs over the six-year cycle.

Blue Crab Outcome Sub-Chapter

Blue Crab Outcome: Achieve a sustainable Bay-wide blue crab fishery through cross-jurisdictional coordination that supports healthy blue crab populations and thriving fish communities.

- Maintain blue crab abundance and harvest rate targets as determined by the most recent benchmark status assessment.
- Achieve cross-jurisdictional coordination by annually evaluating and communicating blue crab population status to resource managers and the public through the Blue Crab Advisory Report.

Note: CBSAC clarifies that the term “fish communities” in the outcome should be interpreted as “fishing communities,” reflecting the Committee’s focus on sustainable fishery management and support for the crabbing industry rather than broad ecosystem health. Additionally, CBSAC recommends updating the term “status assessment” to “stock assessment” in the first target statement. “Benchmark stock assessment” is the standard fisheries management term for a formal, comprehensive evaluation of population health, which more accurately aligns with the intent and underpinning science of this target.

Baseline and Current Condition

A significant decline in the blue crab population in 1998 followed by continued low abundances through 2008 drove jurisdictions to rethink the management framework for the blue crab fishery in the Chesapeake Bay. A 2011 benchmark stock assessment emphasized the need to protect the spawning stock and identified female-specific biological reference points for management. These reference points were revised in the 2017 stock assessment update and adopted for management in 2020. Through 2026, the status of the Chesapeake Bay blue crab stock was evaluated by comparing estimates of adult female abundance from the Chesapeake Bay Blue Crab Winter Dredge Survey (WDS) and female exploitation rates from harvest reports to these female-specific biological reference points.

Since 2014, the stock has not been overfished and overfishing has not been occurring as defined by the management reference points; however, concerns resurfaced in 2020 with declining abundances and, in particular, low recruitment (juvenile crabs). In 2023, a new benchmark stock assessment was conducted to re-evaluate the dynamics of the population and the fishery. The benchmark, completed in June 2026, revised the outlook of the stock and recommended new management reference points for both mature females and males. Starting in 2027, the status of the Chesapeake Bay blue crab stock will be determined through an annual stock assessment update that will provide a comparison of sex-specific estimates of abundance and fishing mortality relative to the new corresponding reference points. A recruitment reference point was also developed and can be used to provide additional context for changes in the population and fishery.

Monitoring Progress and Indicators

The status of the Chesapeake Bay blue crab population is assessed annually by the Chesapeake Bay Stock Assessment Committee (CBSAC). Historically, stock status was evaluated solely based on WDS estimates of adult female abundance and calculated female exploitation rates from harvest reports. These estimates were compared to target and threshold reference points for adult female abundance and female exploitation identified in the 2011 benchmark stock assessment and 2017 update. If adult female abundance fell below the threshold reference point, the stock was considered overfished (or depleted). If the female exploitation rate exceeded the threshold reference point, overfishing was occurring.

Starting in 2027, CBSAC will conduct annual stock assessment updates by running the 2026 benchmark stock assessment model using new data from the previous year, including the most recently completed WDS data. Model-estimated abundances and fishing mortalities for both males and females will be compared to the corresponding management reference points. Stock status will be determined based on where the model estimates fall in relation to the threshold reference points. If abundance estimates fall below the threshold, the stock will be considered overfished (or depleted). If fishing mortality estimates exceed the threshold, overfishing is occurring. Abundances below the threshold and fishing mortality above the threshold would indicate that fishery managers need to limit harvest to conserve the population. A recruitment reference point developed in the 2026 stock assessment can also be used as a population indicator.

Each year, CBSAC publishes the abundance and harvest estimates, the stock status, and the resulting management advice in the annual Blue Crab Advisory Report, which is distributed to fishery managers and the public.

Blue Crab Outcome Situation Analysis

The following table identifies challenges that will impact progress towards attaining the Blue Crab Outcome and its targets. This analysis considers scientific, environmental, fiscal or policy-related developments that have already or may influence work during the upcoming six-year Management Strategy cycle. Consideration is given to which challenges are within and outside of CBP's ability to influence. Challenges associated with Changing Environmental Conditions are denoted with an asterisk (*). Challenges listed in bold font have been identified by the Thriving Habitat, Fisheries & Wildlife Goal Team as being priorities for the Blue Crab Workgroup (CBSAC) to seek to address or make progress against through the development of Workplan activities.

Challenges	CBP Within Sphere of Influence	CBP Outside Sphere of Influence
Consistent high male exploitation rates	X	
Improved commercial and recreational harvest estimates	X	
Land-based pollution (hypoxia)*	X	
Changing Environmental Conditions (temperature/salinity)		X
Predation pressure (e.g., blue catfish, red drum)*		X
Standardization of data across jurisdictions (Data Hub)	X	
Habitat availability (SAV, marsh)*	X	
Interjurisdictional Coordination	X	

Snapshot of Signatory Programs

Managing a large and difficult restoration and conservation program with “no assurance about the level of funds that may be available beyond the short term” (GAO, 2028) is a challenging undertaking that requires individual and collaborative action from signatory partners, as well as the many communities and individuals who live, work, play and learn in our region. This “Snapshot of Signatory Programs” seeks to better recognize the significant contribution that individual signatory partners and federal agencies make towards outcome attainment. The existing programs and funding spotlighted below are not intended to represent the full range of resources available or required to support progress towards outcome attainment; only the “biggest ticket” programs are included for each outcome and signatory partner. It is important to note that funding is reported from a single point in time (fiscal year 2025) and is not representative of future investments. Identifying the most critical programs and resources that exist at a particular moment in time can help the partnership focus its collaborative efforts on activities that have the greatest impact, and which don’t duplicate the work of existing programs.

Maryland Department of Natural Resources

- [Blue Crab Winter Dredge Survey](#) (\$80K in FY25, and 3 FTEs) Estimates the abundance of the Chesapeake Bay blue crab population each winter to inform fishery management decisions.
- [Cooperative Data Collection Program](#) (\$28K in FY25, and 2 FTEs) Collects catch composition data in the Maryland blue crab fishery to better understand harvest trends and changes in the population.

Virginia Marine Resource Commission

- Blue Crab Monitoring (\$289K in FY25) Funding to the Virginia Institute of Marine Science for collecting blue crab data, including conducting the Blue Crab Winter Dredge Survey

Management Approaches for Outcome 1: Blue Crabs

Management Approach 1.1.1: Maintain Sustainable Population Based on Best Available Science

CBSAC will assess blue crab stock status annually based on sex-specific abundance and fishing mortality estimates and the corresponding reference points identified in the stock assessment update. CBSAC will make management recommendations for the upcoming crabbing season based on the status of the stock. Jurisdictions will be responsible for responding to CBSAC recommendations through appropriate management action that will ensure a sustainable population.

Management Approach 1.1.2: Enhance Harvest Estimates and Quantification

Jurisdictions will continue to promote electronic reporting systems for commercial crabbing to improve real-time harvest data. Work will continue to address gaps in recreational harvest data and better quantify effort to determine the efficacy of limited-entry, pot-limit, and seasonal closure regulations.

Management Approach 1.1.3: Quantify Environmental and Ecological Drivers

CBSAC will identify and support research needs that will improve understanding of blue crab population dynamics and inform management decisions. Research priorities include habitat availability, predation (e.g., blue catfish), food availability, and environmental stressors (hypoxia, temperature, and oceanic conditions).

Management Approach 1.1.4: Standardization and Accessibility of Data

CBSAC will develop and maintain a data hub to house all relevant blue crab data sets including commercial harvest data, trawl survey data, and WDS data. Standardizing and compiling all of these data sets in one location will streamline the annual stock assessment update process and provide more opportunities for collaborative, Bay-wide blue crab research projects. Access to these data will be provided at the discretion of the data custodians and will be limited to CBSAC members conducting the stock assessment and other applicable research projects and approved research partners.

Participating Partners

The following partners participated in the creation of this Management Strategy and expressed their intention to collaborate on Management Strategy implementation over the next six years. Per the Chesapeake Bay Watershed Agreement, “participation in developing Management Strategies or in the achievement of Outcomes varies by signatory based on differing priorities across the watershed. This participation may include commitments such as sharing knowledge, data or information, educating the public, working on future legislation and developing or implementing programs or verified practices” (2025). Signatory partners may join implementation efforts at any time. Partners also recognize that Signatory participation is voluntary and may vary accordingly.

- **Signatory Partners:**
 - Maryland Department of Natural Resources (MDNR)
 - Virginia Marine Resources Commission (VMRC)
- **At-Large Members of the Blue Crab Workgroup (CBSAC):**
 - Potomac River Fisheries Commission (PRFC)
 - University of Maryland Center for Environmental Science (UMCES)
 - Virginia Institute of Marine Science (VIMS)
 - National Oceanic and Atmospheric Administration (NOAA)
 - Morgan State University, PEARL

Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

The law and regulation of signatory partners may support, justify or motivate their participation in the collaborative work of the Chesapeake Bay Program related to the attainment of specific Outcomes and Targets of the Watershed Agreement.

The following documentation identifies core statutory authorities that provide part of the impetus for the attainment of Chesapeake Bay Watershed Agreement Outcomes and their related Targets. While Chesapeake Bay Program partners acknowledge that the Chesapeake Bay Watershed Agreement is voluntary, subject to the availability of appropriated funds, and does not preempt, supersede or override any other law or regulation applicable to each signatory, they also acknowledge that the law or regulation of individual signatories can support each partner’s participation in outcome attainment. The table below is not an exhaustive list of all relevant laws and regulations. Rather, this appendix identifies the driving motivators that can bring about signatory partner engagement in efforts described in this Strategic Plan, associated Management Strategies, and Workplans.

Goal 1: Thriving Habitats, Fisheries, and Wildlife

Outcome: Blue Crabs

Signatory	Statutory Authority
Maryland	MD Code, Natural Resources § 4-801 et seq.
Virginia	VA Code § 28.2-200 et seq.

Brook Trout Outcome Sub-Chapter

Brook Trout Outcome: Protect and enhance brook trout within the Chesapeake Bay watershed by increasing occupancy, abundance and resilience to changing environmental conditions.

- By 2040, increase brook trout occupancy by 1.5% (233 miles) in watersheds supporting healthy populations while achieving no net loss in other watersheds.
- By 2040, increase abundance at 10 long-term monitoring sites.
- By 2040, reduce identified threats by 15% to increase brook trout resilience in watersheds supporting healthy populations.

Baseline and Current Condition

Wild (stream born) brook trout populations occupy approximately 30% of their historic range. Within the Chesapeake Bay watershed, most wild brook trout are found in headwater streams where human disturbance is minimal and forest cover is greater than 68-75% (Hudy et al. 2008, Wagner et al. 2013).

The 2016 Eastern Brook Trout Joint Venture (EBTJV) assessment, established as a baseline, indicated 1,713 wild brook trout patches in the Chesapeake Bay watershed, covering 33,250 square kilometers. The 2024 CBP Brook Trout Workgroup *Facilitating Brook Trout Outcome Attainability* report documented a 0.5% net increase in occupancy from 2016–2023. This net increase, combined with newly discovered populations, brings the total area of allopatric (i.e., brook trout only) occupied habitat to 15,305 square kilometers.

Population Category	2016 Baseline Area (km ²)	2024 Apparent Total Area (km ²)	Apparent Net Gain (km ²)	Adjusted Net Gain (km ²)	Confirmed True Net Gain (km ²)
Total Occupied Brook Trout	33,213	36,168	+2,955	+742	+167
Allopatric (Brook trout only)	19,402	15,305	-4,097	Unknown	Unknown
Sympatric (With brown/rainbow trout)	13,811	20,863	+7,052	Unknown	Unknown

Table 1. 2024 changes in brook trout occupancy in the Chesapeake Bay Watershed (Rummel et al. 2024)

Explanation of Net Gain Categories:

- Apparent Net Gain (+2,955 km²): The raw difference in total area between the 2016 and 2024 assessments, representing an 8.9% increase.
- Adjusted Net Gain (+742 km²): The recalculated gain after removing 2,212 km² of newly sampled "unassessed waters". State biologists noted that these areas were likely already occupied by brook trout in 2016, but simply hadn't been sampled yet, making this an estimated 2.2% "true" increase rather than an 8.9% increase.
- Confirmed True Net Gain (+167 km²): The most accurate, verified estimate of newly occupied habitat. This is calculated by taking the adjusted net gain and additionally removing any

catchments where brook trout presence was only assumed through modeling rather than verified by direct sampling, resulting in a 0.5% confirmed true gain.

Specific Area Shifts for Allopatric and Sympatric Populations: The final assessment does not provide the exact final net gain totals for the allopatric and sympatric sub-categories, but instead details the following specific spatial changes between 2016 and 2024:

- +3,114 km²: Catchments that had no brook trout in 2016 became **allopatric** in 2024.
- +1,739 km²: Catchments that were **sympatric** in 2016 shifted to **allopatric** in 2024.
- -1,347 km²: Catchments that were **allopatric** in 2016 shifted to **sympatric** in 2024.
- -665 km²: Catchments that were **allopatric** in 2016 shifted to having no brook trout present in 2024.

Monitoring Progress and Indicators

Indicator: Brook Trout Occupancy.

Progress is assessed using the EBTJV's 3–5 year range-wide assessment. Jurisdictions report annual habitat gains and losses (km²) to the EBTJV using a standardized occupancy reporting protocol for integration into their range-wide assessment reports. Progress will be assessed relative to percentage gains in [healthy watersheds](#) and no net loss in other watersheds.

Indicator: Abundance Monitoring.

Jurisdictions conduct annual monitoring at 10 long-term Brook Trout Abundance Monitoring Sites (BTAMS), and report population census data to the Brook Trout Workgroup (BTWG).

Indicator: Reducing Identified Threats.

The BTWG uses the [Habitat Tracker](#) to document restoration projects (e.g., forested riparian buffers, [aquatic organism passage](#), acid mine drainage, dirt and gravel road improvements) and land conservation projects to monitor progress toward this outcome.

Challenges	Within CBP Sphere of Influence	Outside CBP Sphere of Influence
Land development and habitat fragmentation	X	
Climate change: Increased water temperature, droughts, flashier storms*		X
Changes in water chemistry (e.g., 6PPD-q, fracking water)	X	X
Legacy Acid Mine Drainage (AMD)	X	
Undersized/blocking culverts (fish passage)	X	
Livestock access to streams	X	
Increasing human population strain		X
Consistency in interjurisdictional funding		X
Data consistency in eDNA/occupancy monitoring	X	

Snapshot of Signatory Programs

All signatory states with historic wild brook trout populations list Brook Trout as a Species of “Greatest Conservation Need” in Wildlife Action Plans.

Maryland (DNR):

- Operates under a statewide Brook Trout Fisheries Management Plan; focuses on western Maryland mining impact mitigation and county DOT partnerships for aquatic organism passage (AOP).

New York (DEC):

- Focuses on Chemung and Susquehanna watersheds; habitat enhancement (e.g., Wylie Brook) and trout stream surveys.

Pennsylvania (PFBC):

- Statewide trout management plan, annual sampling plans, and unassessed waters initiative to monitor population trends and identify new brook trout patches.

Virginia (DWR):

- Maintains a statewide Coldwater Stream Database.

West Virginia (DNR):

- Chesapeake Bay Heritage Strain breeding and reintroduction program; maintains a comprehensive Stream Fish Database.

Federal/NGO Partners (USGS, USFWS, NPS, USFS, NRCS, TU, EBTJV):

- Provide decision support tools (e.g., ecoSHEDS, Trout Unlimited’s Range-Wide Assessment and Conservation Portfolio Analysis), technical/financial assistance for riparian buffers and other water quality improvements, and scientific research on groundwater/climate resiliency.

Management Approaches for Outcome 2: Brook Trout

Management Approach 1.2.1: Identify and Communicate Priority Focal Areas.

Use Trout Unlimited’s Conservation Portfolio and Management strategy to identify restoration priorities in watersheds supporting healthy populations (i.e. stronghold and persistent patches).

Management Approach 1.2.2: Refine and Apply Decision Support Tools.

Educate managers on the use of [Trout Unlimited's Eastern Brook Trout Conservation Portfolio](#), the [Chesapeake Bay Fish Passage Prioritization Tool](#), [NAACC](#), and the [USGS ecoSHEDS](#) website to adapt to changing environmental conditions.

Management Approach 1.2.3: Continue and Expand Monitoring.

Jurisdictions will continue annual assessment reporting to EBTJV to track occupancy. A minimum of two BTAMS will be identified in each jurisdiction in 2026 to establish a new long-term monitoring network to track abundance of brook trout (10 total). Expand the use of eDNA to complement ongoing monitoring efforts to better inform brook trout losses and track occupancy progress.

Management Approach 1.2.4: Targeted Restoration of Strongholds.

Implement priority restoration practices that address aquatic organism passage, AMD, dirt and gravel road runoff, riparian forest buffers, livestock exclusion, and unprotected lands to expand occupancy and increase resiliency in priority watersheds. Use the [Habitat Tracker](#) to track progress.

Management Approach 1.2.5: Address Emerging Stressors.

Coordinate with academic and federal partners to model groundwater influence on stream temperatures, emerging water quality threats, and assess the impacts of land use and climate change on population dynamics.

Management Approach 1.2.6: Coordinate with other CBP workgroups.

Work collaboratively with other workgroups to identify overlapping outcome priorities.

Management Approach 1.2.7: Implement recommendations of 2026 STAC Report, as funding and partner interest allows.

Establish and maintain Brook Trout Collaborative with State, Federal, County, and NGO partners. Work with partners to share conservation grant opportunities and coordinate project tracking.

Participating Partners

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- **Signatory Partners:**
 - TBD, will need to be added after November by signatory partners
- **Other Partners:**
 - U.S. Fish and Wildlife Service
 - U.S. Geological Survey
 - National Park Service
 - USDA Forest Service
 - USDA Natural Resource Conservation Service
 - EBTJV
 - Trout Unlimited
 - Western Pennsylvania Conservancy
 - West Virginia University
 - Eastern and Western Pennsylvania’s Coalitions for Abandoned Mine Reclamation
 - Various county governments/DOTs.
 - Maryland
 - New York
 - Pennsylvania
 - Virginia
 - West Virginia

Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

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Goal 1: Thriving Habitats, Fisheries, and Wildlife

Outcome: Brook Trout	
Signatory	Statutory Authority
Maryland	📄 File
New York	📄 File
Pennsylvania	📄 File
Virginia	📄 File
West Virginia	📄 File

Literature Cited

Hudy, M., Thieling, T. M., Gillespie, N., & Smith, E. P. (2008). Distribution, status, and land use characteristics of subwatersheds within the native range of brook trout in the eastern United States. *North American Journal of Fisheries Management*, 28(4), 1069-1085.

Rummel, S. M., M. Mayfield, L. A. Maloney, H. C. Smith, and O. H. Devereux. 2024. Facilitating Brook Trout Outcome Attainability through Coordination with CBP Jurisdictions and Partners. Final Report to the Chesapeake Bay Trust. Trout Unlimited, Arlington, Virginia.

STAC 2026. Blueprint for Building Partnerships and Recommendations for Scaling Brook Trout Restoration in Stronghold and Persistent Patches.

Wagner, T., Deweber, J. T., Detar, J., & Sweka, J. A. (2013). Landscape-scale evaluation of asymmetric interactions between Brown Trout and Brook Trout using two-species occupancy models. *Transactions of the American Fisheries Society*, 142(2), 353-361.

Fish Habitat Outcome Sub-Chapter

Fish Habitat Outcome: Achieve and maintain suitable shallow water fish habitat in tidal and nontidal areas for key species through focused water quality conservation and restoration improvements informed by assessments of habitat and fisheries information.

- Improve the quantity and quality of tidal shallow water fish habitat above baseline conditions as determined by a Bay-wide assessment of fish habitat conditions.
- Increase the consideration of forage species in fishery management decision-making for key predators by developing annual reports of prey status as, \ good, uncertain, or poor.
- Improve the quality of nontidal fish habitat by continuing to assess the overall condition and suitability in the watershed to support healthy communities and inform effective restoration, conservation and management actions.
- By 2040, improve 270 stream miles of waters impaired by acid mine drainage to continually increase available habitat supporting fish populations.
- Develop comprehensive freshwater mussel conservation plans for 10 tributaries and implement key recommendations from at least five of these plans by 2040.

Baseline and Current Condition

Tidal Fish Habitat

The Bay-wide assessment will provide the quantitative baseline for tidal shallow water fish habitat, utilizing the Habitat Suitability Index (HSI) to score 92 tidal segments. The model will be integrating substrate, wetlands, SAV, bathymetry, shoreline armoring, and WQ data along with fish survey data for three species (croaker, juvenile striped bass and bay anchovy). The HSI is under development with initial demonstration models expected late 2026-early 2027.

Forage Fish

The foundational work for assessing forage baseline is [here](#).

Nontidal Fish Habitat

Baseline assessments are ongoing to identify healthy fish communities and target conservation and restoration. Efforts have compiled needed predictors and response data sets that have led to completion of an interim 1:100k assessment and a soon to be released 1:24,000 assessment that satisfies this need.

The 1:24,000 map scale assessment is also predicting watershed-wide conditions back to 1985, which can help evaluate long-term trends and thus optimal improvement goals. Going forward, the non-tidal fish habitat team will increase its interaction with the Stream Health WG (and other WGs like Brook Trout and Invasives and Goal Teams) to leverage their efforts to improve our assessment of fish habitat. The assessment would also benefit from adding additional measures to the existing metric-based assessment, including incorporating key fish species of interest, fish health, and important instream stressors.

Acid Mine Drainage (AMD)

Baseline mileage established; progress measured from the 2027 reporting cycle.

Freshwater Mussels

The availability of historic as well as contemporary freshwater mussel survey data varies considerably across the Bay watershed; therefore, uncertainty about current conditions for freshwater mussels is generally high. Despite uncertainties, most of the Bay watershed's native freshwater mussel species populations are declining. Of the approximately two dozen extant native species, four species are federally listed as endangered (2) or threatened (2) and ten are considered vulnerable/at-risk by at least one Bay jurisdiction. Only three species are considered to have secure/stable populations in the Bay watershed.

Monitoring Progress and Indicators

Indicator: Tidal Fish Habitat Assessment

Use of the Habitat Suitability Index (HSI) scores across 92 tidal segments to assist in the prioritization of water quality improvements and habitat conservation & restoration opportunities.

The HSI is still under development and decisions regarding which elements will serve as indicators and how often the HSI will be updated will need to be determined by both the Fish habitat WG and Clean Water Goal Team.

Indicator: Forage Status Reports

Potential suite of forage metrics: (1) Relative prey abundance/biomass, (2) Diet-based indices, (3) Prey-Predator Ratios (PPR), (4) Consumption-Prey Ratios (CPR), (5) Other (e.g., predator condition) tracking 14 dominant forage groups that also assess when status is good, marginal or poor.

The foundational work for developing these forage indicators is provided in more detail [here](#).

Indicator: Nontidal Habitat Suitability

Refinement of the existing metric-based assessment of fish habitat. Occupancy and/or abundance for key species of interest. Identify key invasive species and their effect on fish habitat in partnership with the Invasives WG. Refinement and expansion of health assessments of key species.

Indicator: AMD Remediation Progress

Stream miles restored per reporting cycle.

Indicator: Freshwater Mussel Plan Implementation

Conservation plans developed for ≥ 10 prioritized tributaries. Number of key recommendations implemented.

Fish Habitat Outcome Situation Analysis

The following table identifies challenges that will impact progress towards attaining the Fish Habitat Outcome and its targets. This analysis considers scientific, environmental, fiscal or policy-related developments that have already or may influence work during the upcoming six-year Management Strategy cycle. Consideration is given to which challenges are within and outside of CBP's ability to influence. Challenges associated with Changing Environmental Conditions are denoted with an asterisk (*). Challenges listed in bold font have been identified by the Thriving Habitat, Fisheries & Wildlife Goal Team as being priorities for the Fish Habitat Workgroup to seek to address or make progress against through the development of Workplan activities.

Challenges	Within CBP Sphere of Influence	Outside CBP Sphere of Influence
Tidal Fish Habitat		
Shoreline Condition*/Local Land Use	X	
Availability of data	X	
Environmental Drivers of Recruitment*		X
Forage		
Data Gaps in Forage Monitoring	X	
Variable Habitat Requirements by Species	X	
Environmental Drivers of Recruitment*		X
Nontidal Fish Habitat		
Changes in flow regimes*		X
Shoreline Condition*/Local Land Use	X	
Acid Mine Drainage		
Regulatory/Fiscal Constraints on AMD Restoration	X	
Freshwater Mussels		
Data sharing across jurisdictions	X	
High uncertainty within FWM population demography		X
Knowledge gaps regarding biologic response to current threats & stressors*		X
Invasive Species*	X	
Challenges for all Targets		
Changing Environmental Conditions*		X
Differences in management strategies across jurisdictions	X	
Funding availability	X	

Snapshot of Signatory Programs

This “Snapshot of Signatory Programs” seeks to better recognize the significant contribution that individual signatory partners and federal agencies make towards outcome attainment. The existing programs and funding spotlighted below are not intended to represent the full range of resources available or required to support progress towards outcome attainment; only the “biggest ticket” programs are included for each outcome and signatory partner. It is important to note that funding is reported from a single point in time (fiscal year 2025) and is not representative of future investments. Identifying the most critical programs and resources that exist at a particular moment in time can help the partnership focus its collaborative efforts on activities that have the greatest impact, and which don’t duplicate the work of existing programs

Maryland Department of Natural Resources

- Name of program with link (x amount for Fiscal Year 2025)) [one sentence max description of how program relates to Outcome attainment]

Virginia Marine Resources Commission

- Name of program with link (x amount for Fiscal Year 2025)) [one sentence max description of how program relates to Outcome attainment]

D.C Department of Energy and Environment

- Name of program with link (x amount for Fiscal Year 2025)) [one sentence max description of how program relates to Outcome attainment]

Pennsylvania Fish and Boat Commission

- Name of program with link (x amount for Fiscal Year 2025)) [one sentence max description of how program relates to Outcome attainment]

Management Approaches for Outcome 3: Fish Habitat

Management Approach 1.3.1: Conduct 2026 Baseline Assessment for Tidal Fish Habitat and Utilize Results for Water Quality Prioritization

Habitat conditions are not currently used by the CBP to target water quality and habitat restoration actions that could have a greater positive impact on living resources. The development of a HSI creates a common science based baseline by which the CBP can better target water quality and habitat improvements with the goal of more effectively improving living resource outcomes. This approach executes a Bay-wide HSI analysis. Workflow includes habitat data compilation (NOAA), statistical analysis (UMCES/USGS/EPA), modeling (VIMS), and segment scoring/review (CBP). Tiered targeting will identify "hot spots" for restoration based on HSI scores. The HSI outputs will be shared through a coordinated process between THFW GT and Clean GT to utilize the results in identifying priority areas for water quality improvements that can be integrated into WIPs and to identify synergies with other outcomes where joint restoration initiatives could occur. Updated tidal fish habitat assessments will be planned and implemented to track changes through 2040.

Management Approach 1.3.2: Integrate Forage Species into Fisheries Management

Many forage species in the Chesapeake Bay are not managed, however, their importance as food for managed predators (such as Striped bass) is well known. Changes in forage species composition and abundance in the Bay can therefore impact managed predators, yet information on forage dynamics and impacts to higher trophic levels is not currently considered when making fishery and habitat management decisions. The development of forage indicators can address this gap by developing clear and useful information that can inform fishery and habitat management decisions. Development of annual forage status reports to inform knowledge of predator-prey dynamics. Monitor 14 forage groups (e.g., Menhaden, Anchovy, Mysids, Polychaetes). Utilize gastric evacuation models to quantify predatory demand by six biomass-dominant predator fishes (Striped bass, summer flounder, weakfish, Atlantic croaker, white perch, spot). Information will be shared via annual forage reports.

Management Approach 1.3.3: Continuous Assessment of Nontidal Habitat Quality

Refinement of assessment tools to monitor habitat suitability, supporting informed land management and planning.

Management Approach 1.3.4: Prioritize Acid Mine Drainage (AMD) Restoration Sites

Identify and prioritize watersheds heavily impacted by AMD to achieve the 2040 target of 270 improved stream miles.

Management Approach 1.3.5: Develop and Implement Freshwater Mussel Conservation Plans

Develop conservation plans that contain the following:

1. Synthesize existing/available information to: map and categorize habitat in order to define historic range and prioritize according to matrix combination of population status (diverse; secure – extirpated), habitat condition (optimal – dismal), and habitat vulnerability (protected – vulnerable). ***Note that key recommendations are likely to be: conduct FWM surveys to close data gaps; develop habitat suitability models; generate conservation/restoration opportunity maps.***
2. Take actions to maintain and conserve existing populations that occupy “high-quality/low-risk” settings.
3. Implement actions to improve population health and diminish threats to key populations where habitat quality is “good” and risks are “modest”.
4. Increase species representation and population redundancy through augmentation and reintroduction in settings where habitat is good, risks are modest, but species are functionally extirpated.
5. Adopt monitoring programs to inform recovery and adaptive management strategies.

Aside from identifying ≥ 10 prioritized tributaries and counting implementation for key recommendations from ≥ 5 prioritized tributaries, the ultimate criteria for forward progress with respect to FWM could include (as fraction HUC 8 or designated according to HUC4):

- o Expand the linear/areal extent of high-condition habitat;
- o Increase population size for specific FWM taxa; and,
- o Recover to viable FWM populations where functionally extirpated.

Participating Partners

The following partners participated in the creation of this Management Strategy and expressed their intention to collaborate on Management Strategy implementation over the next six years. Per the Chesapeake Bay Watershed Agreement, “participation in developing Management Strategies or in the achievement of Outcomes varies by signatory based on differing priorities across the watershed. This participation may include commitments such as sharing knowledge, data or information, educating the public, working on future legislation and developing or implementing programs or verified practices” (2025). Signatory partners may join implementation efforts at any time. Partners also recognize that Signatory participation is voluntary and may vary accordingly.

- **Signatory Partners:**
 -
- **Other Participating Partners:**
 - Chesapeake Bay Foundation
 - NOAA
 - EPA
 - USGS

Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

The law and regulation of signatory partners may support, justify or motivate their participation in the collaborative work of the Chesapeake Bay Program related to the attainment of specific Outcomes and Targets of the Watershed Agreement.

The following documentation identifies core statutory authorities that provide part of the impetus for the attainment of Chesapeake Bay Watershed Agreement Outcomes and their related Targets. While Chesapeake Bay Program partners acknowledge that the Chesapeake Bay Watershed Agreement is voluntary, subject to the availability of appropriated funds, and does not preempt, supersede or override any other law or regulation applicable to each signatory, they also acknowledge that the law or regulation of individual signatories can support each partner’s participation in outcome attainment. The table below is not an exhaustive list of all relevant laws and regulations. Rather, this appendix identifies the driving motivators that can bring about signatory partner engagement in efforts described in this Strategic Plan, associated Management Strategies, and Workplans.

Goal 1: Thriving Habitats, Fisheries, and Wildlife

Outcome: Fish Habitat	
Signatory	Statutory Authority

Fish Passage Outcome Sub-Chapter

Fish Passage Outcome: Improve habitat and water quality while creating more resilient and sustainable populations of fish and other aquatic organisms by removing barriers throughout the Chesapeake Bay watershed's coastal and freshwater rivers and streams.

- Restore passage and connectivity to at least 150 miles of aquatic habitat every two years.

Baseline and Current Condition

Across the Chesapeake Bay watershed, over 6,960 dams and 1,397 road-stream crossings are classified as 'severe barriers' that fragment our rivers and streams. Fish passage projects are vital to restoring connectivity to aquatic communities including migratory and resident fish and freshwater mussels throughout the watershed.

Dams, road-stream crossings, and other instream barriers block diadromous fish (those that migrate between sea and freshwater to complete their life cycle) from accessing their historic spawning and rearing habitats, contributing to declines of migratory species including American Shad, Hickory Shad, Alewife, Blueback Herring, and American Eel. Resident fish, including species of conservation concern and Brook Trout, are also significantly impacted by habitat fragmentation caused by instream barriers. Fish populations may also be negatively impacted by degraded habitat quality (e.g., water quality including acid mine drainage and thermal barriers), and other impacts driven by changing environmental conditions.

The Fish Passage Workgroup (Workgroup) supports efforts to restore aquatic connectivity through actions such as removing obsolete dams, installing fish lifts or technical fishways, and replacing culverts. Aquatic communities in the Chesapeake Bay will benefit from increased access to habitats necessary for spawning, rearing, refuge, and foraging. These efforts also improve habitat and water quality and deliver social benefits including increased safety, recreational opportunities, and lower infrastructure maintenance and repair costs.

Workgroup members and their partners remove dams, install fishways (when dam removal is not feasible), and replace culverts to restore fish passage across the watershed. From 1989 to 2025, approximately 28,919 miles of river and stream habitat in the Chesapeake Bay watershed have been re-opened to fish passage. These projects are evaluated and prioritized across the watershed using the Chesapeake Fish Passage Prioritization Tool (Tool) jointly developed by the Workgroup and The Nature Conservancy.

Monitoring Progress and Indicators

Indicator: Miles of Aquatic Habitat Opened

Workgroup members and coordinators from each jurisdiction use the Tool to document completed fish passage projects and calculate upstream functional network (UFN, Figure 1) restored annually. The UFN is reported as the river and stream miles of habitat opened every two years through the Strategy Review System. This standardized process maintains consistency and comparability of reporting from across the watershed, and results in a reliable dataset that supports integrity of the indicator.

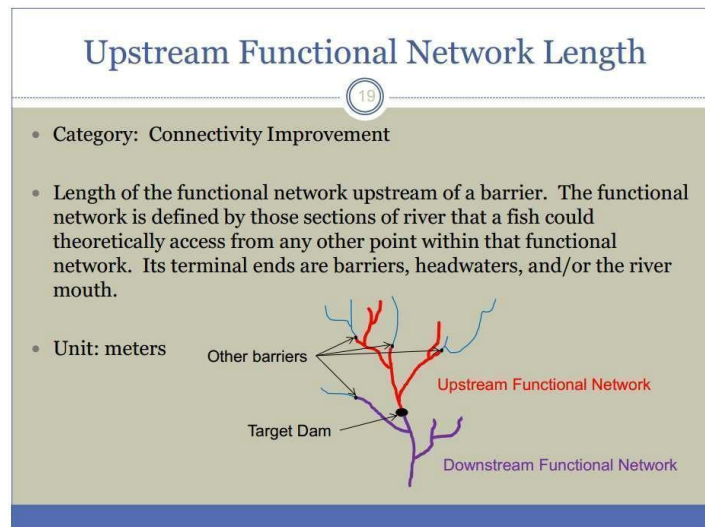


Figure 1: Description of Upstream Functional Network Length

Fish Passage Outcome Situation Analysis

The following table identifies challenges that will impact progress towards attaining the Fish Passage Outcome and its targets. This analysis considers scientific, environmental, fiscal or policy-related developments that have already or may influence work during the upcoming six-year Management Strategy cycle. Consideration is given to which challenges are within and outside of CBP's ability to influence. Challenges associated with Changing Environmental Conditions are denoted with an asterisk (*). Challenges listed in bold font have been identified by the Thriving Habitat, Fisheries & Wildlife Goal Team as being priorities for the Fish Passage Workgroup to seek to address or make progress against through the development of Workplan activities.

Challenges	Within CBPs ability to influence	Outside of CBP's ability to influence
Community/landowner willingness to allow barrier removal projects	X	
Limited State and Federal Legislation to facilitate fish passage	X	
Insufficient funding to incentivize projects or support implementation and capacity building	X	
Limited understanding of ancillary social and safety benefits among dam owners, policymakers, and local governments	X	
Lengthy, complex permitting processes and infrastructure conflicts (e.g., sewer/water line relocations) for barrier removal and road-stream crossing projects	X	
Target species populations in decline region-wide*		X
Selecting the most cost-effective projects for implementation given limited funding	X	

Snapshot of Signatory Programs

Managing a large and difficult restoration and conservation program with “no assurance about the level of funds that may be available beyond the short term” (GAO, 2028) is a challenging undertaking that requires individual and collaborative action from signatory partners, as well as the many communities and individuals who live, work, play and learn in our region. This “Snapshot of Signatory Resources” seeks to better recognize the significant contribution that individual signatory partners and federal agencies make towards outcome attainment. The existing programs and funding spotlighted below are not intended to represent the full range of resources available or required to support progress towards outcome attainment; only the “biggest ticket” programs are included for each outcome and signatory partner. It is important to note that funding is reported from a single point in time (fiscal year 2025) and is not representative of future investments. Identifying the most critical programs and resources that exist at a particular moment in time can help the partnership focus its collaborative efforts on activities that have the greatest impact, and which do not duplicate the work of existing programs.

[Signatory Name]

- [Featured Program with hyperlink] ([Appropriations for Fiscal Year 2025]) [one sentence max description of how program relates to Outcome attainment]

[Signatory Name]

- [Featured Program with hyperlink] ([Appropriations for Fiscal Year 2025]) [one sentence max description of how program relates to Outcome attainment]

[Signatory Name]

- [Featured Program with hyperlink] ([Appropriations for Fiscal Year 2025]) [one sentence max description of how program relates to Outcome attainment]

Management Approaches for Outcome 4: Fish Passage

Management Approach 1.4.1: Prioritization Efforts for Fish Passage Projects

To prioritize projects, the Workgroup will use the Tool to assess the likely ecological "return on investment" associated with a fish passage project. Project prioritization may be conducted in coordination with the state barrier removal communities of practice (e.g., [Virginia Stream Barrier Removal Task Force](#)). The Tool provides data on 39 metrics available from 5 prioritization categories including: Connectivity Status, Connectivity Improvement, Watershed and Local Condition, Ecological, and Size/System Type. Other available map layers will be used to prioritize fish passage restoration at instream barriers and to ensure projects provide socioeconomic benefits to local communities. In general, high-priority barrier removal projects have the following qualities (not in order of priority):

- Reconnects habitat for migratory and resident fish
- Provides benefits to multiple species including species of conservation concern and species supporting commercial and recreational fisheries
- Achieves the largest habitat gains
- Improves access to high-quality habitat
- Provides community co-benefits

Management Approach 1.4.2: Funding Fish Passage Projects

Leverage Workgroup to identify and secure all available sources of funding in support of aquatic habitat connectivity efforts to include traditional and innovative sources. Continue to participate in the grant application process to either directly apply for grants to fund feasibility, design, and fish passage implementation or provide technical assistance to partners that apply. Restoration funding is often available through the National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service,

Chesapeake Bay Trust, and National Fish and Wildlife Foundation. Further, infrastructure funding may also be used to fund fish passage projects with transportation or dam safety nexuses

Work collaboratively with dam owners and hydropower operators to voluntarily explore, maintain, and improve fish passage facilities in support of aquatic connectivity objectives. Work with bank sponsors to implement fish passage as form of compensatory mitigation

Management Approach 1.4.3: Project Development

Develop new barrier removal projects using the Tool that also provide ancillary benefits to owners and communities. Collaborate with state and federal regulatory programs to streamline permitting activities and accelerate project timelines for priority passage enhancement projects. This could include identification of common permitting challenges and/or development of guidance documents for the regulated community

Management Approach 1.4.4: Dam Removal

Share effective strategies to increase dam owner and local community support for dam removal projects and foster a system of cooperation for fish passage restoration

The Workgroup will strive to develop:

- A model for dam owner (and broader community) engagement that can be replicated in communities throughout the region and beyond
- A pool of three to five high-priority dam removal projects with willing dam owners and completed baseline (i.e., feasibility) assessments that are ready for implementation

Management Approach 1.4.5: Road-Stream Crossings

Invite federal and state Departments of Transportation (DOT) to become Workgroup members and to attend Workgroup meetings, prioritize potential projects, and work collaboratively to implement restoration

Management Approach 1.4.6: Local Participation

Engage with local governments, watershed associations, nonprofits and the private sector, including private landowners, and disseminate information regarding the benefits of aquatic habitat connectivity.

Participating Partners

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- **Signatory Partners**
 -
- **Other Participating Partners**
 - American Rivers
 - Anne Arundel County's Department of Public Works

- o BioHabitats
- o Chesapeake Research Consortium
- o Delaware Department of Natural Resources and Environmental Control
- o District of Columbia Department of Energy and Environment
- o Interstate Commission on the Potomac River Basin
- o Maryland Department of Natural Resources
- o National Aquatic Connectivity Collaborative
- o National Oceanic and Atmospheric Administration
- o Natural Resources Conservation Service
- o New York State Department of Environmental Conservation
- o Pennsylvania Fish and Boat Commission
- o Princeton Hydro
- o Smithsonian Environmental Research Center
- o Trout Unlimited
- o U.S. Environmental Protection Agency
- o U.S. Fish and Wildlife Service
- o U.S. Geological Survey
- o Virginia Department of Wildlife Resources
- o West Virginia Department of Natural Resources

Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

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Goal 1: Thriving Habitats, Fisheries, and Wildlife

[illegible]

Oyster Outcome Sub-Chapter

Oyster Outcome: Increase ecosystem benefits from oysters through reef habitat restoration, sustainable harvest, and aquaculture.

- By 2040, restore or conserve at least 2,000 additional acres of oyster reef habitat concentrated primarily in restoration focus areas to provide ecosystem service benefits.
- Maintain sustainable oyster abundance through oyster fisheries and aquaculture practices.
- Maintain reefs established under the 2014 *Chesapeake Bay Watershed Agreement* to achieve restoration success metrics.

The Oyster Workgroup will oversee Targets 1 and 3, while a dedicated Action Team will spend the next 12 months developing the detailed implementation plan for Target 2. Following this planning phase, the Action Team's efforts will be integrated into the Oyster Workgroup's operations.

The 2025 outcome transitions from a tributary-specific model to a broad, large-scale restoration strategy in focus areas determined by the Oyster Workgroup. This updated framework also facilitates greater participation from community organizations, whose projects will contribute toward the overall acreage targets.

Baseline and Current Condition

Oyster Restoration

The 2014 Chesapeake Bay Watershed Agreement guided the restoration of native oyster habitat and populations in 10 Bay tributaries. Partners achieved this goal in late 2025.

- **Tributaries Restored:** 10 (5 in Maryland, 5 plus a 6th "bonus" tributary in Virginia).
- **Total Reef Habitat Restored (10 Tributaries Initiative):** 1,905 acres.
- **Total Oysters Planted:** 7.3 billion.
- **Total Bay-wide Cost:** \$121.16 million.

Oyster Maintenance

- **Tributaries Restored:** 10 (5 in Maryland, 5 Virginia).
- **Total Reef Habitat Restored (10 Tributaries Initiative):** 1,905 acres.

Oyster Fishery

- **Total acreage of oyster reefs monitored within the fishery (VA & MD):** ~10,000 acres monitored in Virginia.
- **Estimate of non-monitored oyster reef acreage:** Establishing this baseline will require further discussion of the Action Team.
- **Harvest trends in MD and VA:** Harvest is stable and more impacted by market conditions than resource health. In Virginia, the level of harvest is determined by season length and market conditions and is not limited by available resources or the market oyster population.
- **Brief description of sustainable management practices in each jurisdiction (MD, VA, PRFC):** Season lengths, harvest gear, and areas can be adjusted based on condition of the resource (abundance) and the ability to target replenishment effort inputs at a level that can sustain fishing effort. Maryland works with the county Oyster Committees and other stakeholders on closing and opening areas to oystering based on market abundance and effort; seasons and daily limits can be adjusted by public notice based on stakeholder input, survey results, and stock assessments. The Potomac River Fisheries Commission (PRFC) is advised by its Oyster/Clam Committee and Oyster

Strategic Planning Panel to revise seasons, harvest restrictions and areas.

- **Assessments of Population in MD and VA:** Stable or increasing over long-term average. Maryland completed a Benchmark Oyster Stock Assessment in 2024 and is currently working on an update assessment for 2026. A five year review of the Oyster Management Plan will be completed in 2026 to evaluate the management of the public fishery, sanctuaries, and aquaculture sectors to the objectives in the plan.
- **Aquaculture baseline VA:** Containerized hatchery-based aquaculture (surface and bottom cages) production is stable or increasing over 10-year average.
- **Aquaculture baseline MD:** Maryland's hatchery-based oyster aquaculture has grown steadily in both scale and production since the state overhauled its leasing and permitting system in 2010. Most operations are relatively small, averaging about 20 acres, with leaseholders managing just one or a few plots. Roughly 20 percent of these businesses use intensive containerized gear, while the remainder focus on extensive bottom culture.

Monitoring Progress and Indicators

2,000-Acre Reef Restoration Goal

- **Indicator:** The primary indicator will be the number of restored reef acres that meet the updated success metrics. NOAA will lead a process to evaluate the 2014 Chesapeake Bay Watershed Agreement metrics and recommend revised standards for the 2025 outcome.
- **Monitoring:** Future monitoring will focus on ensuring the 2,000 acres of restored or conserved reefs meet revised success metrics as determined by the oyster success metrics review process.
- **Reporting:** Implementation and performance tracking will be the responsibility of the Oyster Workgroup.

Maintenance (Stewardship) of '10 tributaries'

- **Indicator:** The workgroup will consider continuing the current success metrics for these areas or developing new metrics through the review process.
- **Monitoring:** When revised oyster metrics are available, the Oyster Workgroup will identify specific indicators and monitoring protocols to apply to this target.
- **Reporting:** Performance assessments will be based on monitoring results, and tracking will be the responsibility of the Oyster Workgroup.

Oyster Fishery

The Oyster Fishery and Aquaculture Action Team will spend the next 12 months developing a detailed implementation plan including indicators.

- **Indicator:** TBD by Oyster Fishery and Aquaculture Action Team.
- **Monitoring:** TBD by Oyster Fishery and Aquaculture Action Team.
- **Reporting:** TBD by Oyster Fishery and Aquaculture Action Team.

Oyster Outcome Situation Analysis

The following table identifies critical challenges that may impact progress towards attaining the 2040 Oyster Outcome and its targets. Challenges associated with Changing Environmental Conditions are denoted with an asterisk (*).

Challenges	Within CBP Sphere of Influence	Outside CBP Sphere of Influence
Funding for long-term restoration and monitoring	X	
Permitting and regulatory compliance	X	
Environmental changes (temperature, salinity, disease, oyster reproduction levels)*		X
Funding for seed production capacity	X	
Substrate availability, cost and acceptability	X	
Maintaining reef structural integrity		X
Public outreach, coordination and support	X	

Snapshot of Signatory Programs

This section highlights critical existing programs supporting oyster restoration and sustainability.

Oyster Restoration and Maintenance

- **Maryland Department of Natural Resources:** Manages the resource, conducts monitoring, outreach, and enforcement. Funding for reef construction, oyster spat on shell or substrate planting, and adaptive management.
- **NOAA Chesapeake Bay Office:** Funding for oyster seeding, monitoring, scientific research, and partner planning and coordination.
- **U.S. Army Corps of Engineers (Baltimore & Norfolk Districts):** Funding and technical support for reef construction, monitoring, and adaptive management.
- **University of Maryland Horn Point Oyster Hatchery:** Production of the vast majority of spat-on-shell larvae for Maryland tributaries, with NOAA and MD DNR funding.
- **Virginia Marine Resources Commission:** Reef construction, monitoring, and coordination of adaptive management on existing reefs.
- **NGOs:** National, River and Watershed groups assisted with reef construction, local knowledge, and public engagement.
- **Academics:** Monitoring; research.

Oyster Fishery

Public Ground (Wild Harvest)

- **Maryland:** In Maryland's portion of the Chesapeake Bay, variable salinity and temperature regimes are the primary environmental determinants of oyster population dynamics due to their influence on reproduction, growth, and mortality. The oyster fishery is dominated by the commercial sector. Recreational catch is unknown but assumed to be small due to the difficulty of finding and collecting oysters subtidally using hand gears along with the relatively small number of calls received by staff by recreational fishermen.

Individuals must have a Maryland commercial fishing license to commercially harvest oysters on public bottom. In addition to their annual license fee, these licensees must pay an annual oyster surcharge fee of \$300 in order to activate their license to harvest oysters prior to each season. Seafood dealers buying oysters are required to pay a \$2 tax per every bushel purchased and an additional \$1 tax on oysters shipped in the shell out of the state; these funds along with the oyster surcharge are required to be used by Maryland DNR for oyster shell and seed purchase and planting on public oyster bars for enhancement purposes. Fishery priorities include obtaining the needed substrate, hatchery spat, and funding to continue assisting fishery enhancement efforts to boost Maryland's seafood economy. Annual decisions on the harvest rules (bushel limits, times, area closures, etc.) are based on survey and stock assessment data and will continue to be made with the resource and sustainability in mind. Monitoring and data priorities include continuing the long-term annual Fall Oyster Survey and other surveys to assess the status of the population, improving the harvest data records which are needed to understand the fishery and build the stock assessment, and to continue the stock assessment using these and other data sources.

- **Virginia:** The Virginia fishery is nearly evenly split between traditional harvest on public oyster ground, primarily during the fall and winter months, and traditional harvest on private oyster leases, during the warmer summer and spring months, with some months of overlap. A significant proportion of harvest areas on both private and public grounds have been heavily and continually manipulated by both harvest and repeated shell or other substrate plantings for many decades. The productivity of both the majority of public and private ground fishery is dependent on a combination of natural recruitment and shell or seed inputs.
- **PRFC:** Commercial harvest in the mainstem of the Potomac River is solely from public oyster grounds during the fall and winter months. The majority of harvest is from hand scrape, a smaller version of a typical dredge no greater than 22 inches wide. The PRFC sets harvest restrictions annually based on survey results and stakeholder feedback. Each harvester is required to pay a \$300 planting surcharge fee each year while each oyster buyer must pay a \$2 tax per bushel purchased; both of these funding sources go towards replenishment activities. Many of the historic oyster grounds in the Potomac River have received shell and/or seed plantings since the PRFC's inception in 1958.

Aquaculture (Private Ground)

- **Maryland:** The majority of oyster aquaculture (80% of leases) is from extensive bottom culture where leaseholders manage their operations similarly to a put-and-take fishery and typically use the same gear as on public grounds. The remaining 20% of leases use containerized culture systems, either floating or on the bottom. Production has, on average, increased since a

regulatory overhaul in 2010 with bottom culturing producing the majority of private landings, 66-75%. Oyster leases are held to an active use requirement that has contributed to an average yield of 13 bushels per acre of private production and ensures that any non-productive lease areas are returned to the public fishery.

- **Virginia:** Containerized hatchery-based aquaculture compromises ~20% of total Virginia commercial oyster landings, and ~40% of total private landings in recent years. The remaining 60% of harvest from private ground is "extensive" aquaculture, is not containerized and is harvested with gears similar to those used on public ground. This segment of oyster production has seen steady growth over the last two decades.
- **PRFC:** There is no aquaculture in the mainstem of the Potomac River at this time.

Management Approaches for Outcome 5: Oysters

Management Approach 1.5.1: Strategic Expansion of new Oyster Reef Habitat Restoration or Conservation:

Partners recognize the success achieved from focused large-scale restoration and intend to apply a similar collaborative approach to restore or conserve 2,000 additional acres of non-harvest oyster reef that follows these key elements:

- **Clear Shared Goal:** Unify regional stakeholders under this single, well-defined restoration target.
- **Strategic Partnerships:** Leverage federal, state, and non-profit strengths to expand operational capabilities.
- **Collaborative Planning:** Jointly design and execute synchronized, in-the-water restoration projects.
- **Collective Metrics:** Use shared science-based protocols to ensure accountability and adaptive management.
- **Engaged Public and Sustained Resources:** Foster community stewardship and secure reliable funding pipelines.

More specifically, the Oyster Workgroup anticipates that implementing restoration or conservation for 2,000 additional acres of non-harvest oyster reef habitat primarily in defined restoration focus areas will require:

- Defining "restoration focal areas," including specific acreage thresholds.
- Identifying locations for the additional 2,000 acres (approximately 1,100 acres in Maryland and 900 acres in Virginia).
- Developing restoration implementation plans in coordination with multiple partners.
- Establishing a process to include and account for community-based restoration projects.
- Establishing revised success metrics to evaluate oyster restoration performance.
- Develop a monitoring program based on the revised oyster metrics.

Management Approach 1.5.2: Adaptive Management and Monitoring:

Continue monitoring tributaries previously restored under the 2014 Chesapeake Bay Watershed Agreement to ensure they meet revised success metrics. Utilize monitoring data to guide adaptive management to ensure these tributaries continue to provide ecosystem services and remain protected as non-harvest areas through 2040.

Establish revised success metrics to evaluate oyster restoration or conservation performance for areas established under the 2025 Chesapeake Bay Watershed Agreement and develop a monitoring program

based on these revised oyster metrics.

Management Approach 1.5.3: Sustainable Oyster Fishery and Aquaculture in each Jurisdiction:

An Action Team will be established to collaborate with jurisdictions to:

- Define sustainable commercial oyster harvest and aquaculture practices.
- Provide recommendations to each jurisdiction based on these definitions and establish coordination between state and federal partners.

The recommendations from this Action Team will be integrated with the Oyster Workgroup for implementation.

Participating Partners

The following partners participated in the creation of this Management Strategy and expressed their intention to collaborate on Management Strategy implementation over the next six years. Per the Chesapeake Bay Watershed Agreement, “participation in developing Management Strategies or in the achievement of Outcomes varies by signatory based on differing priorities across the watershed. This participation may include commitments such as sharing knowledge, data or information, educating the public, working on future legislation and developing or implementing programs or verified practices” (2025). Signatory partners may join implementation efforts at any time. Partners also recognize that Signatory participation is voluntary and may vary accordingly.

- **Signatory Partners:**
 - Maryland Department of Natural Resources
 - Virginia Marine Resources Commission
 - National Oceanic & Atmospheric Administration
 - Chesapeake Bay Commission
- **Other Partners:**
 - Potomac River Fisheries Commission
 - U.S. Army Corps of Engineers
 - Oyster Recovery Partnership
 - Chesapeake Bay Foundation
 - Christopher Newport University
 - Virginia Institute of Marine Science
 - Smithsonian Environmental Research Center
 - Community based organizations

Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

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Outcome: Oysters	
Signatory	Statutory Authority
Maryland Department of Natural Resources	Natural Resources Article, § 4-1001 - § 4-1020, Annotated Code of Maryland
	Part of Maryland's authority for the oyster sanctuaries and public fishery management is provided under Natural Resources Article Title 4 Subtitle 10 - Oysters and Clams.
Maryland Department of Natural Resources	Natural Resources Article, 4-11A-01 - 4-11A-24, Annotated Code of Maryland
	Aquaculture is provided in Natural Resources Article Title 4 Subtitle 11A -Aquaculture.
Maryland Department of Natural Resources	Natural Resources Article, § 4-215, Annotated Code of Maryland
	All three sectors, (sanctuaries, public fishery and aquaculture) are all managed under the objectives in the Oyster Management Plan . Subsequent Code of Maryland Regulations are authorized under MD Natural Resources Code § 4-215.
Virginia Marine Resources Commission	Code of Virginia Chapter 5
	The Commonwealth of Virginia has authority to manage all aspects of its public and private oyster fisheries and aquaculture practices under Code of Virginia, Title 28.2. Fisheries and Habitat of the Tidal Waters.
Virginia Marine Resources Commission	Code of Virginia Chapter 6
	The Commonwealth of Virginia has authority to manage all aspects of its public and private oyster fisheries and aquaculture practices under Code of Virginia, Title 28.2. Fisheries and Habitat of the Tidal Waters.
Virginia Marine Resources Commission	Code of Virginia Chapter 12
	The Commonwealth of Virginia has authority to manage all aspects of its public and private oyster fisheries and aquaculture practices under Code of Virginia, Title 28.2. Fisheries and Habitat of the Tidal Waters.
Potomac River Fisheries Commission	Maryland and Virginia Potomac River Compact of 1958
	The PRFC has authority to manage the oyster fisheries within the mainstem of the Potomac River under the Maryland and Virginia Potomac River Compact of 1958.

Stream Health Outcome Sub-Chapter

Stream Health Outcome: Improve and protect local stream health and function, including their living resources and ecosystem services throughout the watershed, using the best available science to inform land management, planning and conservation.

- Improve the health and the ecological integrity of at least an additional 4,340 (approximately 3%) nontidal stream miles every six years.

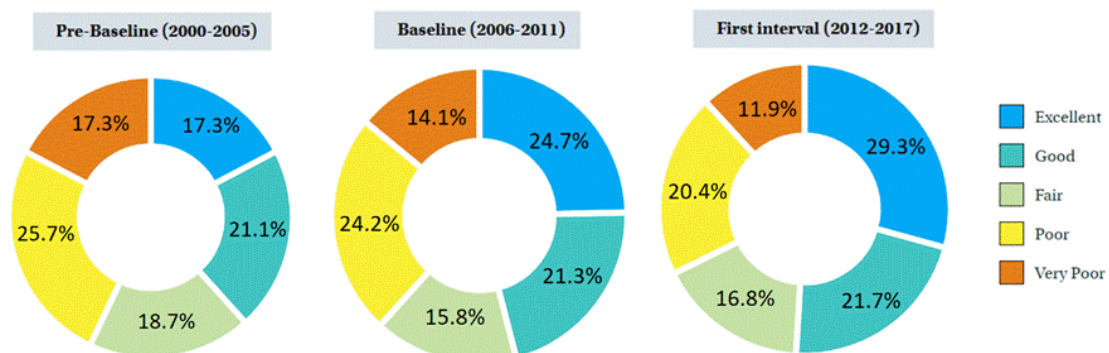
Baseline and Current Condition

Stream Health Outcome

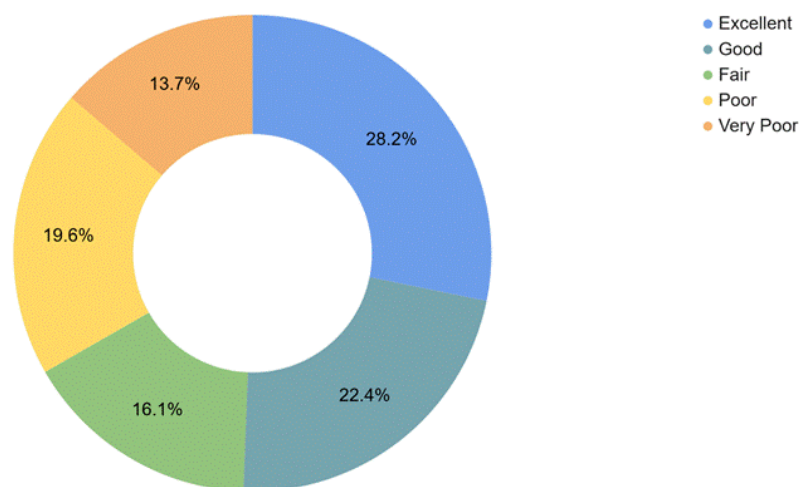
This outcome is currently tracked via improvements in the Chesapeake Basin-wide Index of Biotic Integrity (Chessie BIBI). See the Monitoring Progress and Indicators section for more information about the Chessie BIBI.

The Stream Health Workgroup analyzed the Chessie BIBI scores for stream health between 2000 and 2023 in four distinct intervals for the 2014 Chesapeake Bay Agreement progress. For purposes of CBP reporting, scores that rate Excellent, Good, and Fair indicate “healthy” stream macroinvertebrate populations.

Chessie BIBI Ratings for the Watershed



Chessie BIBI Ratings for the Watershed, Second Interval (2018 - 2023)



The most recent interval, 2018 - 2023, will be used as the new baseline for tracking the Stream Health indicator outcome for the next six year interval.

Monitoring Progress and Indicators

[Monitoring: Stream Health Outcome](#)

CBP uses the Chessie BIBI as the primary stream health indicator. The Chessie BIBI is a multi-metric index of biological health from benthic macroinvertebrate data.

Benthic macroinvertebrate indices are a biological endpoint which will reflect overall improvements in stream health. The data comes from individual federal, state, county and volunteer benthic macroinvertebrate datasets which are collected with similar procedures. The CBP Data Center acquires this raw data every six years, along with additional physical habitat and water quality data collected by program partners. The Interstate Commission on the Potomac River Basin (ICPRB) calculates and reports the index with a common method agreed to by the Stream Health Workgroup.

Additional information on the Chessie BIBI and the most recent interval analysis can be found in the ICPRB reports [Stream Biological Health in the Chesapeake Bay Watershed](#) and the [2018 - 2023 Update](#).

Currently, the Chessie BIBI (Chesapeake Basin-wide Indicator of Biological Integrity) is the sole indicator of stream health utilized by the Stream Health Workgroup (SHWG). While it is an excellent indicator of the overall biotic community, the data necessary for analyses are collected in 6-year increments throughout the watershed. The Chessie BIBI does not necessarily reflect Best Management Practice (BMP)-driven improvements in hydraulics, geomorphology, and physicochemical qualities because the site-specific scores are averaged by location and time periods. However, hydraulics, geomorphology and physicochemical parameters are also components of stream health and must be in good condition to support biological communities. The workgroup is exploring additional metrics for a variety of environmental stressors to help future investigations characterize Chesapeake watershed health and assess the reasons for the current trends.

Stream Health Situation Analysis

The following table identifies challenges that will impact progress towards attaining this outcome and its targets. This analysis considers scientific, environmental, fiscal or policy-related developments that have already or may influence work during the upcoming six-year Management Strategy cycle. Consideration is given to which challenges are within and outside of CBP's ability to influence. Challenges associated with Changing Environmental Conditions are denoted with an asterisk (*). Challenges listed in bold font have been identified by the Goal Team and its Workgroups as being priorities for the Workgroup to seek to address or make progress against through the development and implementation of Management Approaches.

Challenges	Within CBPs ability to influence	Outside of CBP's ability to influence
Pressures Directly Influencing Stream Health		

Excessive sediments in-stream		X
Excessive nutrients in-stream (eg.: from untreated runoff, leaky wastewater infrastructure; etc)		X
Loss of forested riparian and wetland areas	X	
Significant changes in watershed hydrology* (eg: overland flow increases in impervious cover; inadequate stormwater management controls)		X
Toxicity of effluent from resource extraction activities (i.e., acid mine drainage, fracking).		X
Increased in-stream temperatures*		X
Increased salts in streams* (Road de-icing practices)	X	
Invasive species*		X
Alterations to channel flow* (eg.: Higher and lower discharges than expected in stream channels; “flashy” flow)		X
Alterations to channel form (eg.: Piped and channelized streams; undersized culverts;		X
Endocrine disrupting chemicals and other contaminants		X
Degraded soils in riparian area		X
Physical and chemical barriers to connectivity increase stream fragmentation*	X	
Limited availability of land to retrofit and implement upland BMPs in urban areas)		X
Challenges to Improving Stream Health		
Lack of common watershed, stressor and stream assessment and restoration guidelines.	X	
Limited integration of water quality and living resource goals during WIP BMP implementation.	X	
Stormwater and other NPDES permits focus on specific aspects of water quality, which may or may not be the only stressors for stream aquatic life.	X	
Inadequate financial resources to support local implementation efforts.	X	
Inadequate infrastructure to communicate newest research and technical guidance to jurisdictions.	X	

Current lack of Chesapeake Bay TMDL crediting for stream health beyond modeled nutrient and sediment reductions	X	
Limited research into resource tradeoffs for BMP implementation	X	
Public perception of stream restoration	X	
Need additional biological stressor identification and prioritization procedures.	X	
Need additional monitored metrics that correlate with priority stressors identified for measurement.	X	
Need to examine the differences between observed and modeled trends in stream health metrics.	X	
Need more robust stream restoration monitoring to evaluate the potential improvement in stream functions and resource trade-offs from BMP implementation.	X	
More research is needed to guide the selection of achievable reference conditions/design approaches based on watershed and stream functions to include an urban reference continuum.	X	
Need BMP site prioritization tools, such as identifying nutrient hotspots in stream valleys where erodible geologic materials and soils contain excess nutrients, or to increase habitat connectivity.	X	

Snapshot of Signatory Programs

Managing a large and difficult restoration and conservation program with “no assurance about the level of funds that may be available beyond the short term” (GAO, 2028) is a challenging undertaking that requires individual and collaborative action from signatory partners, as well as the many communities and individuals who live, work, play and learn in our region. This “Snapshot of Signatory Resources” seeks to better recognize the significant contribution that individual signatory partners and federal agencies make towards outcome attainment. The existing programs and funding spotlighted below are not intended to represent the full range of resources available or required to support progress towards outcome attainment; only the “biggest ticket” programs are included for each outcome and signatory partner. It is important to note that funding is reported from a single point in time (fiscal year 2025) and is not representative of future investments. Identifying the most critical programs and resources that exist at a particular moment in time can help the partnership focus its collaborative efforts on activities that have the greatest impact, and which don’t duplicate the work of existing programs.

U.S. Geological Survey

- [USGS Chesapeake Bay Activities](#) ([Appropriations for Fiscal Year 2025]) The USGS works with Federal, State, local, and academic partners to provide research and monitoring and to communicate results to inform management for the Chesapeake Bay watershed.

[Signatory Name]

- [Featured Program with hyperlink] ([Appropriations for Fiscal Year 2025]) [one sentence max description of how program relates to Outcome attainment]

[Signatory Name]

- [Featured Program with hyperlink] ([Appropriations for Fiscal Year 2025]) [one sentence max description of how program relates to Outcome attainment]

Management Approaches for Outcome 6: Stream Health

Management Approach 1.6.1: The definition of stream health and ecological integrity for this outcome uses a watershed-wide metric, the Chessie BIBI, to measure the changes in stream health and function over time. This Management Strategy proposes a definition of stream health that provides a common framework for additional reporting and tracking incremental improvements in stream health using multi-metric indicators.

Identify an appropriate suite of metrics to measure the multiple facets of stream health to complement, but not replace, the Bay-wide Chessie BIBI.

- Develop metrics/composite indices from routinely collected, non-biological data to measure changes in certain stream functions to assess regional changes and trends.
- Collaborate with the Healthy Landscapes Goal Team to identify marginal streams where restoration activity in-stream or in the watershed may improve stream functions and health. Once identified, work with the partnership and funders to develop incentives to build on existing efforts to target beneficial restoration activity.
- Bring together jurisdictional biological stressor identification approaches and thresholds for comparison. Identify overlaps between the approaches and explore the possibility of Chesapeake Watershed-wide BSID.
- Investigate use of eDNA as an additional biological indicator of stream health.

Management Approach 1.6.2: The provision of adequate funding and technical resources for watershed management practice implementation is necessary to support comprehensive ecosystem and biological improvements, in addition to nutrient and sediment reductions.

- Explore partnerships to provide training to jurisdictions and other entities related to improving stream health and habitat, including BMP design, implementation and cost-effectiveness analysis.
- Continue collaborating with the Chesapeake Bay Trust's Pooled Monitoring program, and partner with other organizations such as the Chesapeake Monitoring Cooperative, for researchers to inform watershed best management practices that demonstrate stream and riparian ecosystem improvement.
- Establish an on-going stream restoration monitoring consortium and data clearinghouse within the CBP to share project data.
- Develop monitoring guidance for stream restoration projects to standardize pre-and post-restoration data collection and reporting.
- Support the continued scientific research and analysis of key topics, including:
 - Information on the co-benefits of BMPs
 - How much upland retrofit implementation is needed to optimize stream functional improvement when stream restoration and stormwater retrofits are installed as part of an integrated restoration plan
 - Investigate the effects and implications of changing environmental conditions, population growth and continued landscape development on stream health, including various metrics associated with healthy streams and future potential.

- Effects and trade-offs of stream restoration BMPs

Management Approach 1.6.3: Active and engaged participation by local communities with federal and state partners is central to Bay watershed restoration. Improvements to stream health and function will rely upon significant investments by local communities, municipal, county governments and watershed groups, to implement restoration and conservation actions. Ongoing coordination with stream health stakeholders (e.g., state and federal stream and wetland regulatory authorities, natural resource agencies, local governments, non-profit organizations, watershed BMP practitioners, researchers and local communities) needs to be improved to identify and remove barriers to improving stream health.

The SHWG should work with CBP partners, including the Engaged Communities Goal Team, to enhance the information available for local governments, organizations and landowners to support beneficial watershed best management practices to improve local stream health.

- Engage with local governments and other entities to inform landowners, as well as the general public, of beneficial stream and riparian best management practices and maintenance practices.
 - This includes individual homeowner practices (e.g. rain barrels, lawn care) and their impact on the community, the streams in their own backyards and public places.
- Provide research or documentation that identifies the nexus between improving stream health and broader public welfare.

Management Approach 1.6.4: Develop and promote holistic Stream Restoration Best Management Practice design guidelines that identify the level of degradation and improvement of stream biology and key stressors/factors limiting potential biological improvement.

- Develop case studies to document biological response in stream with various management interventions, and include consideration of watershed influences, such as where in the watershed the project is located, source of stressors, and nearness to donor reaches.
- Discuss with other CBP Goal Teams how to recognize stream biological function improvement or maintenance of high quality aquatic life as credits towards meeting the Bay TMDL and other agreement outcomes.
- Develop improved stream restoration guidance for biological improvements or maintenance of higher quality systems.
- Develop design guidelines to include greater consideration of resource tradeoffs and other Chesapeake Bay Agreement goals and outcomes.

Participating Partners

The following partners participated in the creation of this Management Strategy and expressed their intention to collaborate on Management Strategy implementation over the next six years. Per the Chesapeake Bay Watershed Agreement, “participation in developing Management Strategies or in the achievement of Outcomes varies by signatory based on differing priorities across the watershed. This participation may include commitments such as sharing knowledge, data or information, educating the public, working on future legislation and developing or implementing programs or verified practices” (2025). Signatory partners may join implementation efforts at any time. Partners also recognize that Signatory participation is voluntary and may vary accordingly.

- **Signatory Partners**

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- ## Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

The following documentation identifies core statutory authorities that provide part of the impetus for the attainment of Chesapeake Bay Watershed Agreement Outcomes and their related Targets. While Chesapeake Bay Program partners acknowledge that the Chesapeake Bay Watershed Agreement is voluntary, subject to the availability of appropriated funds, and does not preempt, supersede or override any other law or regulation applicable to each signatory, they also acknowledge that the law or regulation of individual signatories can support each partner’s participation in outcome attainment. The table below is not an exhaustive list of all relevant laws and regulations. Rather, this appendix identifies the driving motivators that can bring about signatory partner engagement in efforts described in this Strategic Plan, associated Management Strategies, and Workplans.

[illegible]

Submerged Aquatic Vegetation (SAV) Outcome

Sub-Chapter

Submerged Aquatic Vegetation (SAV) Outcome: Sustain and increase the habitat and ecosystem benefits of SAV in the Chesapeake Bay. Achieve and sustain the outcome of 196,600 acres of SAV Bay-wide necessary for a restored Bay.

- Measure progress against the following targets for each salinity zone:
 - Tidal Fresh: 21,700 acres.
 - Low Salinity: 13,100 acres.
 - Medium Salinity: 126,000 acres.
 - High Salinity: 35,800 acres.
- Measure progress toward this Outcome against interim targets of 90,000 acres by 2030, 95,000 acres by 2035 and 100,000 acres by 2040.

Baseline and Current Condition

SAV is a critical component of the Chesapeake Bay ecosystem. It improves water quality by absorbing excess nutrients, attenuates wave and current energy to protect shorelines, supports fish and shellfish by providing habitat and nursery grounds, and mitigates the impacts of changing environmental conditions. The Chesapeake Bay Program's SAV Workgroup has reviewed the historic record, as well as photographic evidence from the 1930s to present, and determined that the Bay has historically supported at least 196,600 acres of SAV. This is the acreage upon which the SAV Outcome is based.

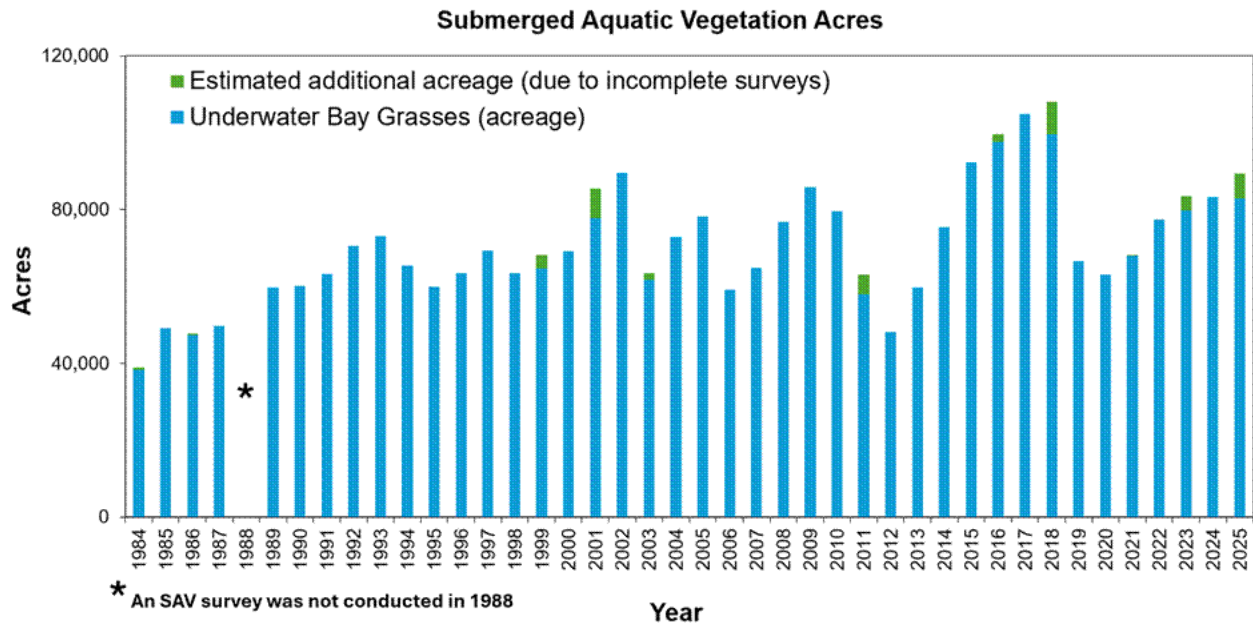
To monitor progress toward the SAV Outcome and goal attainment, impacts from changing environmental conditions, response to management actions, and the functional value of these shallow water habitats, the SAV Workgroup coordinates a three-tiered, hierarchical monitoring effort that includes the [Chesapeake Bay-wide SAV Survey \(Tier 1\)](#), the [Chesapeake Bay SAV Watchers Program \(Tier 2\)](#), and the [Chesapeake Bay SAV Sentinel Site Program \(Tier 3\)](#). The three-tiered approach allows us to not only estimate SAV acreage and density across the Bay, but also collect detailed SAV habitat data while providing educational volunteer opportunities to communities across the watershed.

In 1984, 38,958 acres of SAV were mapped in the Chesapeake Bay and its tidal tributaries. Since then, estimated totals have ranged from that historic low to a high of 108,078 acres in 2019, maintaining a long-term average of 70,898 acres. In 2025, SAV covered an estimated 89,385 acres of Bay bottom.

Monitoring Progress and Indicators:

Indicator: [SAV Acreage](#)

The Chesapeake Bay-wide SAV Survey began in 1984, and is the primary mechanism for tracking SAV Outcome progress and attainment. The Survey uses imagery and data collected from planes and satellites, as well as Tier 2 and Tier 3 ground observations, to delineate SAV beds throughout the Bay and its tidal tributaries. Acreage data from the Survey will be used to assess progress towards the SAV Outcome, as well as its interim and salinity zone goals, on an annual basis. If areas of the Bay are inaccessible for surveys in any given year, additional acreage in those areas is estimated from the previous year's data, as seen in the graph below.



Submerged Aquatic Vegetation Situation Analysis

The following table identifies challenges that will impact progress towards attaining this outcome and its targets. This analysis considers scientific, environmental, fiscal or policy-related developments that have already or may influence work during the upcoming six-year Management Strategy cycle. Consideration is given to which challenges are within and outside of CBP's ability to influence. Challenges associated with Changing Environmental Conditions are denoted with an asterisk (*). Challenges listed in bold font have been identified by the Goal Team and its Workgroups as being priorities for the Workgroup to seek to address or make progress against through the development and implementation of Management Approaches.

Challenges	Within CBP's ability to influence	Outside of CBP's ability to influence
1. Habitat Conditions and Availability: To reach our SAV Outcome and goals, adequate shallow water habitat (space and water clarity) must remain available for SAV to expand into, but multiple challenges threaten habitat conditions and availability. Some challenges include:		
Degraded or Unstable Water Quality*	X	
Shallow Water Use Conflicts	X	
Shoreline Alteration and Armoring that negatively impact SAV	X	
Direct and Indirect Impacts Associated with Changing Environmental Conditions including Increasing Sea Levels, Temperatures, Precipitation, Pathogens, and Invasive Species*		X

2. Protection of Existing and Recovering SAV: Regulations prohibiting certain activities detrimental to SAV must be adequate to protect new and expanding SAV beds throughout the Bay. Some challenges include:		
Dredging and Filling in Potential SAV habitat	X	
Fishing and Aquaculture Practices	X	
Shoreline Alteration and Armoring that negatively impact SAV*	X	
Necessary Regulatory Updates are Challenging, Time Consuming, and Require Legislative Expertise	X	
3. SAV Restoration Potential and Activity: Direct SAV Restoration is an important component of Chesapeake Bay SAV Recovery, but we are lacking in capacity and infrastructure. Some challenges include:		
Lack of Funding for Direct SAV Restoration Projects	X	
Inadequate SAV Restoration Capacity and Infrastructure	X	
Lack of a Commercial SAV Seed Supply	X	
Lack of Tools for Appropriate SAV Restoration Site Selection	X	
Limited Capacity by SAV Restoration Practitioners and Lack of Formal Training Program for SAV Restoration Techniques	X	
4. SAV Research and Monitoring: Annual Bay-wide SAV monitoring at multiple levels of scale is essential to track progress toward the SAV Outcome, to prioritize efforts to minimize impacts, in guiding appropriate management actions, and in guiding needed SAV research; SAV research and monitoring must be more effectively funded and supported. Some challenges include:		
Uncertain Capacity to Maintain Long-Term Funding for the Chesapeake Bay-wide SAV Survey	X	
No funding for the Chesapeake Bay SAV Watchers Program	X	
No funding for the Chesapeake Bay SAV Sentinel Site Program	X	
Limited funding for SAV Research		X
5. Public Perception, Knowledge, and Engagement: Public perception and engagement surrounding SAV in Chesapeake Bay are growing but remain limited. Some challenges include:		
Stakeholders are generally unaware of the importance of SAV or regard it negatively	X	
Need for additional SAV-Specific Curriculum in Public Education		X

Snapshot of Signatory Programs

Managing a large and difficult restoration and conservation program with “no assurance about the level of funds that may be available beyond the short term” (GAO, 2028) is a challenging undertaking that

requires individual and collaborative action from signatory partners, as well as the many communities and individuals who live, work, play and learn in our region. This “Snapshot of Signatory Resources” seeks to better recognize the significant contribution that individual signatory partners and federal agencies make towards outcome attainment. The existing programs and funding spotlighted below are not intended to represent the full range of resources available or required to support progress towards outcome attainment; only the “biggest ticket” programs are included for each outcome and signatory partner. It is important to note that funding is reported from a single point in time (fiscal year 2025) and is not representative of future investments. Identifying the most critical programs and resources that exist at a particular moment in time can help the partnership focus its collaborative efforts on activities that have the greatest impact, and which don’t duplicate the work of existing programs.

Maryland

- [Bay-wide Submerged Aquatic Vegetation Aerial Survey and Monitoring Program](#) (\$95k in FY25) - The Chesapeake Bay-wide SAV Aerial Survey is the first tier in the Chesapeake Bay SAV monitoring effort and tracks progress toward the Bay-wide SAV Restoration Outcome, near-term targets, salinity zone targets, and Maryland and Virginia state-wide and segment-specific targets.
- [Chesapeake Bay SAV Watchers Program](#) (No specific funding; 2 FTEs supported the program in FY25). Chesapeake Bay SAV Watchers is the second tier of the Chesapeake Bay SAV monitoring effort and is a program to provide volunteer scientists with an engaging and educational experience with SAV while also generating useful data for Bay scientists and managers.
- [Chesapeake Bay SAV Sentinel Site Program](#) (No specific funding; 3 FTEs supported the program in FY25). The Chesapeake Bay SAV Sentinel Site Program forms the third tier of the Chesapeake Bay SAV Monitoring effort; SAV sentinel sites are located in each of the Bay’s four salinity zones (tidal fresh, oligohaline, mesohaline, and polyhaline) and are monitored by Bay scientists using a standardized, in-depth data collection protocol.

Virginia

- [Bay-wide Submerged Aquatic Vegetation Aerial Survey and Monitoring Program](#) (\$432 in FY25) - The Chesapeake Bay-wide SAV Aerial Survey is the first tier in the Chesapeake Bay SAV monitoring effort and tracks progress toward the Bay-wide SAV Restoration Outcome, near-term targets, salinity zone targets, and Maryland and Virginia state-wide and segment-specific targets.
- Others will be added by VA rep on THFW Goal Team Rep

District of Columbia - will be added by DC rep on Goal Team -

- [Featured Program with hyperlink] ([Appropriations for Fiscal Year 2025]) [one sentence max description of how program relates to Outcome attainment]

US Federal Government - will be added by federal rep on Goal Team -

- [Featured Program with hyperlink] ([Appropriations for Fiscal Year 2025]) [one sentence max description of how program relates to Outcome attainment]

Management Approaches for Outcome 7: Submerged Aquatic Vegetation

Management Approach 1.7.1: Support Efforts to Conserve and Restore Current and Future SAV Habitat and Habitat Conditions

The SAV Workgroup will support efforts to conserve and restore current and future SAV habitat and habitat conditions. The most critical action for restoring SAV is to achieve the [Clean Water Goal](#). This strategy is being implemented by meeting pollutant allocations set by the [Chesapeake Bay TMDL](#) and

through the work of multiple Chesapeake Bay Program teams, including the [Clean Water Goal Team](#) and the [Healthy Landscapes Goal Team](#).

Management Approach 1.7.2: Protect Existing and Recovering SAV

The SAV Workgroup will work to protect existing SAV by supporting efforts to characterize threats and develop protection measures, evaluate SAV protection laws and regulations, and make recommendations to update laws, regulations, and policies when necessary.

Management Approach 1.7.3: Restore SAV

The SAV Workgroup will lead and support efforts to actively restore and mitigate SAV loss where possible, targeting sites with suitable habitat quality and high potential to benefit living resources, as well as vulnerable coastal communities and infrastructure.

Management Approach 1.7.4: Enhance SAV Research and Monitoring

The SAV Workgroup will lead and support efforts to continue the Bay Program's three-tiered, hierarchical SAV monitoring effort and address data gaps in shallow water habitat and living resource monitoring data.

Management Approach 1.7.5: Enhance Community Involvement, Education, and Outreach

The SAV Workgroup will work to expand efforts to educate and engage the public about the critical importance of SAV, the ecosystem services and socio-economic benefits it provides, and include community scientists and volunteers in SAV monitoring and restoration efforts.

Participating Partners

The following partners participated in the creation of this Management Strategy and expressed their intention to collaborate on Management Strategy implementation over the next six years. Per the Chesapeake Bay Watershed Agreement, "participation in developing Management Strategies or in the achievement of Outcomes varies by signatory based on differing priorities across the watershed. This participation may include commitments such as sharing knowledge, data or information, educating the public, working on future legislation and developing or implementing programs or verified practices" (2025). Signatory partners may join implementation efforts at any time. Partners also recognize that Signatory participation is voluntary and may vary accordingly.

- **Signatory Partners**
 - TBD, will need to be added after November by signatory partners
- **Other Partners**
 - Virginia Institute of Marine Science
 - Old Dominion University
 - University of Maryland
 - St. Mary's College of Maryland
 - Smithsonian Environmental Research Center
 - Tetra Tech, Inc.
 - The Chesapeake Bay Foundation
 - The Nature Conservancy
 - ShoreRivers
 - Arundel Rivers Federation
 - Severn River Association

- Gunpowder Riverkeeper
- Maryland
- Virginia
- Washington, D.C.
- Delaware
- U.S. Federal Government

Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

The law and regulation of signatory partners may support, justify or motivate their participation in the collaborative work of the Chesapeake Bay Program related to the attainment of specific Outcomes and Targets of the Watershed Agreement.

The following documentation identifies core statutory authorities that provide part of the impetus for the attainment of Chesapeake Bay Watershed Agreement Outcomes and their related Targets. While Chesapeake Bay Program partners acknowledge that the Chesapeake Bay Watershed Agreement is voluntary, subject to the availability of appropriated funds, and does not preempt, supersede or override any other law or regulation applicable to each signatory, they also acknowledge that the law or regulation of individual signatories can support each partner's participation in outcome attainment. The table below is not an exhaustive list of all relevant laws and regulations. Rather, this appendix identifies the driving motivators that can bring about signatory partner engagement in efforts described in this Strategic Plan, associated Management Strategies, and Workplans. **An exhaustive database of statutes and regulations affecting SAV in Chesapeake Bay is available at:** <https://www.chesapeakebay.net/projects/sav-regulatory-review>

Goal 1: Thriving Habitats, Fisheries, and Wildlife

Outcome: Submerged Aquatic Vegetation	
Signatory	Statutory Authority
Virginia Marine Resources Commission	4 Va. Admin. Code § 20-337-30
	Permitting for removal of SAV from state bottom
Virginia Marine Resources Commission	Va. Admin. Code § 20-1130-50
	Limits on aquaculture placed on SAV
Maryland Department of Natural Resources	Article-Natural Resources § 4-213
	General Protections to SAV in MD Waters
Maryland Department of Natural Resources	Article-Natural Resources § 4-1006.1
	Protection from possible disruption by hydraulic escalator clam dredges
Maryland Department of Natural Resources	Article-Natural Resources § 4-11A.01
	Protection from possible disruption by shellfish aquaculture activities
Maryland Department of Natural Resources	Md. Code Regs. 08.02.23.02

	Establishes SAV protection zones for Aquaculture Enterprise Leasing
D.C. Dept of Commerce and Regulatory Affairs	<u>D.C. Mun. Regs. tit. 21, § 1404.</u>
	Defines when SAV can be removed and requires a removal plan.
D.C. Dept of Commerce and Regulatory Affairs	<u>D.C. Mun. Regs. tit. 21, § 1401.</u>
	Approval to harvest or remove SAV.
D.C. Dept of Commerce and Regulatory Affairs	<u>D.C. Mun. Regs. tit. 21, § 1400.</u>
	Provides for the management of submerged aquatic vegetation.
Delaware Department of Natural Resources and Environmental Control	<u>7 DE Admin. Code § 7401-2.0, § 7401-3.0, and § 7401-4.5.6 – Surface Water Quality Standards</u>
	Establishes a Shallow-Water Bay Grass Designated Use and associated water quality criteria for portions of the Nanticoke River and Broad Creek.

Wetlands Outcome Sub-Chapter

Wetlands Outcome: Restore, create, enhance and protect wetlands to support people and living resources, including waterbirds and fish, and provide water quality, flood and erosion protection, recreation and other valuable benefits to people.

- By 2040, restore or create at least 3,000 acres and enhance 15,000 acres of tidal wetlands, focusing on habitats that support populations of waterbirds and represent healthy wetlands across the watershed.
- By 2040, restore or create at least 3,000 acres and enhance 15,000 acres of nontidal wetlands, focusing on habitats that support populations of waterbirds and represent healthy wetlands across the watershed.

Baseline and Current Condition

There is no current consistent Chesapeake Bay tidal and non-tidal watershed-wide wetland acreage and function tracking. There are various tracking approaches using data integrated from federal, state, and local conservation databases, and personal communication. A Bay-wide baseline will need to be established following the 2025 Bay Agreement adjustments, utilizing high-resolution remote sensing and data layer syntheses. The baseline will be used to assess progress towards the Wetlands Outcome.

- **Tidal Wetlands:** Baseline conditions indicate steady losses of coastal marshes due to sea level rise, wave erosion, shoreline hardening and development. Upland migration is heavily restricted by human infrastructure. The current trend shows a net decrease in functional marsh area, though restoration via living shorelines, sediment additions and flood mitigation projects has increased locally ([Chesapeake Bay Program, 2023](#)).
- **Non-Tidal Wetlands:** Baselines established from historical tracking show massive historic losses due to agricultural drainage and urban development. Current conditions show that while degradation of existing wetlands continues due to invasive species and altered hydrology, restoration gains on agricultural lands are slowing the rate of net loss, leading to a trend that remains the same or slightly decreasing ([Chesapeake Bay Program, 2023](#)).

Monitoring Progress and Indicators

Indicator: Wetland Status and Trends

Monitoring wetland aerial extent. Data is collected by multiple entities over various timelines using variable approaches.

Indicator: Wetland Restoration, Creation and Enhancement

Tracks annual additions in wetland acreage achieved through voluntary programs.

Indicator: Waterbird Population Estimates

The waterbird indicator will use population estimates from relevant biological seasons (i.e., breeding pairs, total wintering population, etc.) to assess population trends of focal species identified by stakeholders. This will incorporate a range of scientific and citizen science survey data yet to be determined, to assess historic and present populations.

Expected Changes Under the New 2025 Bay Agreement:

The previous 2014 Agreement focused heavily on gross historical acreage targets (e.g., restoring 85,000 acres and enhancing 150,000 acres). The 2025 Bay Agreement transitioned toward a **wetland tracking effort** focused on acreage with the intention to factor in changing environmental condition losses (like sea level rise) and prioritizes functional resilience and verified wetland performance, and explicitly incorporates living resources including waterbirds and fish.

Wetlands Outcome Situation Analysis

The following table identifies critical challenges impacting both tidal and non-tidal wetland restoration efforts across the watershed.

Challenges	Within CBP Sphere of Influence	Outside CBP Sphere of Influence
CBP and partner capacity to sustain long-term tracking and update inventories	X	
Workforce knowledge and technical capacity for restoration design	X	X
Property owners' willingness to adopt voluntary restoration practices	X	X
Inadequate, fragmented, or unaligned funding streams limit achievement of the Wetlands Goal	X	X
Accelerated tidal marsh loss due to erosion and drowning and erosion from sea level rise and changing environmental conditions		X

Manage for marsh migration potential including retrofits for hardened shorelines and infrastructure blocking upland marsh migration**	X	
Regulatory updates and shifting legal definitions of federally regulated waters (WOTUS)		X
Opportunities to address historic agricultural drainage networks and ongoing land conversion pressures	X	X

***Denotes challenges associated with Changing Environmental Conditions.*

Snapshot of Signatory Programs

New York:

- [New York State Open Space Conservation Plan – NYSDEC](#) The Open Space Conservation Plan (Plan) is a comprehensive statewide plan developed by NYSDEC and the Office of Parks, Recreation, and Historic Preservation (OPRHP) that describes current open space conservation goals, actions, tools, resources and programs administered by state and federal agencies and conservation nonprofits.
- [Water Quality Improvement Project \(WQIP\) Program - NYSDEC](#) (Wetland restoration, creation, and enhancement are eligible for funding, however none were awarded in FY25) – The WQIP program is a competitive, statewide reimbursement grant program that funds projects that directly improve water quality or habitat, promote flood risk reduction, restoration, and enhanced flood and climate resiliency, or protect a drinking water source.

West Virginia:

- Prioritizes non-tidal wetland restoration through agricultural conservation easements and stream restoration programs that enhance interior mountain wetlands.

Delaware:

- Combines tidal marsh protection along its coastal zones with voluntary non-tidal freshwater wetland restoration incentives for agricultural private landowners.

Pennsylvania:

- Directs substantial resources toward non-tidal wetland restoration in agricultural floodplains to optimize nutrient reduction and improve structural stream health.

District of Columbia:

- Maximizes opportunities to expand and enhance freshwater tidal wetlands within the Anacostia River and manages non-tidal wetlands via mapping and targeted restoration and conservation.

Maryland:

- Enforces comprehensive state regulatory protections for tidal and non-tidal wetlands. MD funds large-scale tidal living shorelines and non-tidal wetland restoration, creation and enhancement, primarily with partners on agricultural lands, with additional projects being done on State lands. Maryland's Roots for Resilience effort will restore and protect hundreds of acres of tidal wetlands on the lower eastern shore. To support coastal resiliency efforts, Maryland uses 25-30 year sea level projections in regulatory review.

Virginia:

- Accelerates coastal marsh resilience through mandatory living shoreline regulations while facilitating non-tidal wetland expansion.

Chesapeake Bay Commission:

- Works legislatively to secure state-level funding streams, coordinates regulatory and inter-state policy frameworks.

EPA / Federal Government:

- Provides technical guidance, map inventory updates, and foundational funding through the Clean Water Act, Sikes Act, and others, supporting both coastal projects and inland agricultural wetland projects. The DoW's Sentinel Landscape Partnership Program works with federal, state, and local partners to protect and restore wetlands and migratory corridors. The USGS provides scientific understanding, including the distribution, health, stressors, ecosystem services, management implementation guidance, and response to management of wetlands.

Management Approaches for Outcome 8: Wetlands

Management Approach 1.8.1: Seek Plan Implementation, Enhance Collaboration, Engagement, Funding and Information Transfer.

The WWG/ CBP has recently sponsored two plans: [Accelerating Non-Tidal Wetland Restoration Across the Bay](#) and [The Tidal Wetlands Strategic Plan](#). Both of these extensive plans provide recommendations on a breadth and depth of issues to address voluntary restoration. Additional resources address needs for collaboration, funding, outreach and engagement.

Management Approach 1.8.2: Improve Wetland Tracking, Mapping, Monitoring, and Functional Assessment Capacities

The Wetlands Workgroup will collaborate to address severe data gaps by investigating funding opportunities and options for updating outdated tidal and non-tidal wetland maps. This includes integrating satellite remote sensing and advanced remote data to accurately identify marsh priority migration corridors and interior headwater basins. Develop approaches for measuring tidal and non-tidal wetland health as it relates to wetland function and resilience through either remote sensing or field based data collection.

Management Approach 1.8.3: Scale Up Landowner Outreach and Technical Assistance

To overcome barriers to voluntary landowner participation, the workgroup will partner with outreach and technical experts like NGOS, academia and state entities to support and promote aligned outreach toolkits used by Bay Program Partners. Efforts will focus on demonstrating the wildlife, economic, recreational including wildlife viewing, and ecologic benefits and value of wetlands.

Management Approach 1.8.4: Build Restoration Workforce and Partnership Capacity

Addressing the regional shortage of qualified restoration professionals, this approach establishes localized training pipelines. The Wetlands Workgroup will identify training opportunities and encourage the training of contractors, regulators, and conservation planners in ecological engineering for tidal and non-tidal wetland creation and restoration.

Management Approach 1.8.5: Understand Responses of Living Resources

Supporting thriving populations of living resources, like waterbirds and fish, requires suitable habitat. The partnership will identify key environmental factors influencing these species, assess their capacity to respond to changing threats, and evaluate the impact of watershed restoration efforts. To track populations accurately over time, partners will integrate data across agencies. We will further support data to be collected in a manner that enables incorporation into relevant decision making processes.

Management Approach 1.8.6: Funding

The WWG will recommend new and increased funding to achieve the wetland outcomes. This is critical to be able to access and leverage increased federal funds, and other funding, that will be available.

Participating Partners

The following partners participated in the creation of this strategy and intend to collaborate on its implementation over the next six years:

- **Signatory Partners**
 - TBD, will need to be added after November by Signatory Partners
- **At-Large Members of the Wetlands Workgroup and Other Partners**
 - State of New York
 - State of West Virginia
 - State of Delaware
 - Commonwealth of Pennsylvania
 - District of Columbia
 - Chesapeake Bay Commission
 - EPA / Federal Agencies (USACE, USGS, NOAA, USFWS, DoW)
 - State of Maryland
 - Commonwealth of Virginia
 - The Nature Conservancy (TNC)
 - Chesapeake Bay Trust (CBT)
 - Ducks Unlimited
 - Center for Coastal Resources Management (VIMS)
 - Penn State University
 - University of Maryland Center for Environmental Science

Appendix 1. Signatory Statutory Authorities Driving Outcome Attainment

The law and regulation of signatory partners may support, justify or motivate their participation in the collaborative work of the Chesapeake Bay Program related to the attainment of specific Outcomes and Targets of the Watershed Agreement.

The following documentation identifies core statutory authorities that provide part of the impetus for the attainment of Chesapeake Bay Watershed Agreement Outcomes and their related Targets. While Chesapeake Bay Program partners acknowledge that the Chesapeake Bay Watershed Agreement is voluntary, subject to the availability of appropriated funds, and does not preempt, supersede or override any other law or regulation applicable to each signatory, they also acknowledge that the law or regulation of individual signatories can support each partner’s participation in outcome attainment. The table below is not an exhaustive list of all relevant laws and regulations. Rather, this appendix identifies the driving motivators that can bring about signatory partner engagement in efforts described in this Strategic Plan, associated Management Strategies, and Workplans. An exhaustive database of statutes and regulations affecting SAV in Chesapeake Bay is available at: <https://www.chesapeakebay.net/projects/sav-regulatory-review>

Goal 1: Thriving Habitats, Fisheries, and Wildlife

Outcome: Wetlands	
Signatory	Statutory Authority
New York	ARTICLE 24 Freshwater Wetlands Environmental Conservation (ENV) CHAPTER 43-B NY State Senate
West Virginia	<i>[Placeholder for Statutory Authority]</i>
Delaware	<i>[Placeholder for Statutory Authority]</i>

Pennsylvania	<i>[Placeholder for Statutory Authority]</i>
District of Columbia	DCMR Title 21, Chapters 25 and 26: Critical Areas- Wetlands and Streams
Chesapeake Bay Commission	<i>[Placeholder for Statutory Authority]</i>
EPA / Federal Government	<i>[Placeholder for Statutory Authority]</i>
Maryland	<i>[Placeholder for Statutory Authority]</i>
Virginia	<i>[Placeholder for Statutory Authority]</i>