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):

- Expand the linear/areal extent of high-condition habitat;
- Increase population size for specific FWM taxa; and,
- 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**
