Fish Habitat Outcome

Management Strategy

2015–2025, v.1

I. Introduction

Fish and shellfish in the Chesapeake Bay and its watershed rely on a variety of important habitats throughout the watershed. These habitats, which are key to sustaining fisheries, are being threatened by a suite of stressors such as increased urbanization, poor water quality and climate change. Successful fisheries management depends on knowing where these important habitats are and addressing the potential and realized threats to their integrity. This strategy targets habitats that are used by fish and shellfish species at critical points in their life history including spawning, nursery, and forage areas.

II. Goal, Outcome and Baseline

This management strategy identifies approaches for achieving the following goal and outcome:

Sustainable Fisheries Goal

Protect, restore and enhance finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem in the watershed and Bay.

Fish Habitat Outcome

Continually improve effectiveness of fish habitat conservation and restoration efforts by identifying

and characterizing critical spawning, nursery and forage areas within the Bay and tributaries for important fish and shellfish, and use existing and new tools to integrate information and conduct assessments to inform restoration and conservation efforts.

Baseline and Current Condition

Fish habitat quantity and quality is declining in the Chesapeake Bay as a result of several factors including poor water quality, population increases and development pressure, wetland loss, declines in submerged aquatic vegetation (SAV), energy development, shoreline hardening, toxic contaminants, and rising sea level. Issues impairing water quality include development and increased impervious surfaces, mineral extraction, loss of vegetated riparian buffers, livestock in streams, non-point sources of pollution, failing waste management systems and disturbances of riparian and upland areas.

Due to the various areas that comprise "fish habitat" (SAV, streams, water column, wetlands, shorelines, etc.) and gaps in understanding of which areas are of highest value to supporting fish reproduction, feeding, juvenile growth, and refuge from predation, there is no established baseline for "fish habitat" at this time.

Existing information such as *The Habitat Requirements for Chesapeake Bay Living Resources* (1991), state wildlife action plans, and various spatial tools include general maps of habitats and fish distributions for many species and include information on the water quality requirements of these species. However, the maps do not characterize the "quality" of these areas. A primary component of the management approach outlined later in this document is to build on existing efforts by developing criteria that describes "high quality" fish habitat. With this information, partners will work to identify areas that meet the criteria, quantify and prioritize the areas, and target them for management action.

This strategy adopts the definition of "fish habitat" from the National Fish Habitat Partnership (NFHP) Action Plan 2nd edition: "Any area on which an aquatic organism depends, directly or indirectly, to carry out the life processes of the organism, including an area used by the organism for spawning, incubation, nursery, rearing, growth to maturity, food supply, or migration, including an area adjacent to the aquatic environment if the adjacent area: (1) Contributes an element, such as the input of detrital material or the promotion of a planktonic or insect population providing food, that makes fish life possible; (2) Affects the quality and quantity of water sources; (3) Provides public access for the use of fishery resources; or (4) Serves as a buffer protecting the aquatic environment."

III. Participating Partners

The following partners have participated in the development of this strategy. A workplan to accompany this management strategy will be completed within one year after this document is finalized. It will identify specific partner commitments for implementing the strategy.

Chesapeake Bay Watershed Agreement Signatories

- State of Maryland
- Commonwealth of Virginia
- District of Columbia
- Commonwealth of Pennsylvania

- State of Delaware
- State of New York
- Chesapeake Bay Commission
- National Oceanic and Atmospheric Administration (NOAA)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS)
- U.S. Geological Survey (USGS)

Key Participants

The regulatory agencies within each jurisdiction that are responsible for fisheries serve as key participants. These include:

- Maryland Department of Natural Resources (MD DNR)
- Virginia Department of Game and Inland Fisheries (DGIF)
- Virginia Marine Resources Commission (VMRC)
- District Department of the Environment (DDOE)
- Pennsylvania Fish and Boat Commission (PFBC)
- Delaware Department of Natural Resources and Environmental Control (DNREC)
- New York State Department of Environmental Conservation (NYSDEC)

Federal partners including the National Oceanic and Atmospheric Administration (NOAA), U.S. Fish and Wildlife Service (USFWS), U.S. Department of Agriculture (USDA), Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE) and U.S. Geological Survey (USGS) are engaged in critical research, spatial tool development, data collection and restoration projects that support fish habitat in the Chesapeake Bay. Many projects are in collaboration with key state and non-profit partners.

The Atlantic States Marine Fisheries Commission is participating to address its goal to improve fisheries habitat conservation through partnerships, policy development, and education.

The Atlantic Coast Fish Habitat Partnership (ACFHP) is a key partner that provides support for fish habitat restoration projects along the Atlantic Coast, including the Chesapeake Bay. ACFHP is a coastwide partnership of fish habitat resource managers, scientists and communications professionals from 32 different state, federal, tribal and nongovernmental agencies who have established a commitment to work together for the benefit of aquatic resources.

Implementation of the strategy will also need to include regulatory agencies that address relevant water quality and permitting issues:

- Maryland Department of the Environment (MDE)
- Pennsylvania Department of Environmental Protection (DEP)
- Virginia Department of Environmental Quality (DEQ)

Local Engagement

Local engagement is critical to this outcome. Planning decisions are made at the local level, and ensuring that fish habitat is a part of their planning process and considerations is a primary mechanism to stem the decline of quality fish habitat. Stakeholders from local nonprofit organizations are engaged in

drafting this strategy and provide local knowledge of specific habitats and fish species, as well as insight into local government and citizen stewardship. These stakeholders include representatives from the Mason Springs Conservancy and the Interstate Commission on the Potomac River Basin.

IV. Factors Influencing Success

The following table outlines the natural and human factors that influence the partnership's ability to attain this outcome. It also highlights potential approaches for addressing the factors influencing, which are further outlined in the Management Approach section of this document. For the purposes of this strategy and table, fish habitat is categorized as either tidal saltwater or tidal- or non-tidal freshwater with associated subcategories for each. The highest priority factors for each category are marked with an asterisk* (Prioritization may be further refined in implementing this strategy). The species listed are based on workgroup session and will correspond with the Forage Fish Management Strategy, STSAC Forage Workshop report and with jurisdictional priority species.

Tidal Saltwater

Habitat Classification	Species of Interest	Factors Influencing (* indicates factors with the most votes from the workgroup sessions). Prioritization may be further refined in implementing this strategy.	Approaches
Sub-tidal (<10m)	• Bay Anchovy • Atlantic Sturgeon • Blue Crab • Oyster • Spot • Croaker • Summer Flounder • Striped Bass • Forage species (general)	• Water Quality • Land use change/urbanization* • Bottom type and loss of habitat structure * • Shoreline hardening • Declines in SAV • Climate change • Fishing activities (dredging, etc.)	1. Comprehensive spatial management for competing bottom uses. 2. Proactively identify high quality productivity areas. 3. Integration and synthesis of habitat information. 4. Determine quantity of available habitat and thresholds for species.
Nearshore and Intertidal	• Juvenile sciaenids • Horseshoe Crab • Mummichog • Juvenile crabs • Grass Shrimp • Bay Anchovy	• Land use change/urbanization* • Shoreline hardening* • Climate change (sea level rise)* • Water quality • Declines in SAV and wetlands	1. Proactively identify high quality productivity areas (benthos, water column habitat). 2. Show differences between hardened and natural shorelines. 3. Maximize value of living shorelines (BMPs).

Freshwater

Habitat Classification	Species of Interest	Factors Influencing (* indicates factors with the most votes for each section)	Approaches
Non-tidal—**Cold and Upstream waters**	• Brook Trout • Trout (general)	• Increasing water temperature and reduced water quality due to land use change/ urbanization* (Impervious surface, loss of forest cover) • Climate change (temperature, freshwater flow) • Gas and mineral extraction; acid mine drainage • Watershed acidification	1. Cold water stream not a top priority for this group, but this team would identify overlaps with interests of groups such as the Eastern Brook Trout Joint Venture. 2. Identify other priority cold water streams that benefit trout species in addition to brook trout.
Non-tidal—**Warm**	• Freshwater Mussels • Black basses • American Shad • American Eel • River Herring	• Land use change/urbanization (impervious surface)* • Water quality • Declines of SAV* • Barriers to fish migration • Watershed fragmentation • Climate change • Gas and mineral extraction	1. Identify high priority areas for conservation/protection (use Maryland Biological Stream Survey and Index of Biological Integrity). a. Link to Pennsylvania Conservation Regulations b. Link to State Wildlife Action Plans. 2. Promote activities to restore affected areas. a. Link to Water Quality GIT (BMPs) 3. Outreach to public and decision-makers.
Tidal	• Striped Bass • Atlantic Sturgeon • Largemouth Bass • American Shad • River herring • American Eel • White Perch • Yellow Perch	• Land use change/urbanization* • Water quality • Loss of wetlands* • Loss of SAV* • sea level rise and saltwater intrusion)* • Predatory invasive species • Barriers to fish migration	1. Identify areas with restoration potential. 2. Identify and map critical spawning and nursery areas for conservation. 3. Develop criteria for healthy habitats. 4. Develop protection policies/regulations.

V. Current Efforts and Gaps

Existing information such as *The Habitat Requirements for Chesapeake Bay Living Resources* (1991), state wildlife action plans and various spatial tools include general maps of fish habitat for many species and include information on the water quality requirements of these species. However, the maps do not characterize the "quality" of these areas. A primary component of the management approach outlined later in this document is to build on existing efforts by developing criteria that describe high quality fish habitat. With geographic habitat information, the criteria can be used to identify areas that meet the criteria, quantify those areas and target them for management action.

Each of the jurisdictions has projects underway to assess fish habitat for respective priority species. As a first step to implementing this strategy the workgroup will complete an inventory of current jurisdictional and other partner efforts that will be used to build a comprehensive plan to fill the following gaps.

Habitat programs throughout the watershed are limited in their capacity to advance habitat science, develop to tools to address challenges to habitat, and establish improved protections.

Gaps

Science

- There is a need to understand how habitats contribute to fisheries production. In other words, how much habitat yields how many fish.
- Improve understanding of how environmental factors affect fish spawning, larval development, and recruitment of adults to the fishery.
- Identifying and quantifying areas of "high quality" fish habitat suggesting which waters are most important to critical life stages for fish.
- Integrating and synthesizing existing data into decision support tools and models. There is limited information available on fish distributions and habitats. Building on current efforts by jurisdictions, new GIS tools can pair fish information with other environmental data to evaluate, for example, what drives the fish distributions and how habitats are connected.
- Valuation of ecosystem services and value of habitats supporting high-priority species. Quantifying the ecological role and the economic returns habitats provide by serving these roles is a way to more effectively communicate the value of habitats.
- Understanding the limits of restoration. Restoration in many cases is not as good as protection. Once a system has reached a state of requiring restoration it is already degraded and restoration may never fully recover what has been lost.

Management

- Since fish habitat is affected by many different factors, effective management needs to include agencies addressing water quality, fisheries, planning and more. As such, multiagency coordination should be improved. This coordination also needs to cover different spatial scales from the Bay watershed to the local level because the impacts of water quality are far reaching and fish use many different areas of the Bay.
- Clear regional and local goals and metrics for fish habitat conservation and restoration.
- Jurisdictions have limited regulatory authority to strengthen habitat protections.
- The public does not fully understand the consequences of habitat loss on fish and services they value. Improved communication on what habitat loss means to people and the threats driving habitat loss are needed.
- Involvement of local communities, specifically inclusion of fish habitat protections in local planning efforts.

Actions, Tools and Support to Empower Local Government and Others

Identifying high value fish habitat areas will enable sharing of this information with local planners, policy makers, and the public to facilitate discussions on how best to ensure these high value areas are maintained against development pressure and other threats.

VI. Management Approaches

The partnership will work together to carry out the following actions and strategies to achieve the Fish Habitat Outcome. These approaches seek to address the factors affecting the ability to meet the goal.

Habitat loss and degradation have been identified as significant factors affecting the long-term sustainability of Bay and coastal fisheries. The challenge for fishery managers is working across conservation and restoration regulatory and management sectors to ensure maintenance of vital fish habitat. This calls for creative approaches to address the challenges of effectively integrating habitat protection, restoration and enhancement not only into fisheries management programs and plans but more importantly into local planning decisions.

The primary goal of this Fish Habitat Outcome is to maintain and increase the quality and quantity of fish habitat. The first focus of this strategy is to conserve the best of what is left. To accomplish this goal, the workgroup adopted a set of modified principles from National Fish Habitat Partnership:

- Conserve and maintain intact healthy tidal and non-tidal habitats
- Prevent further degradation of tidal and freshwater habitats already impacted
- Reverse declines, where possible, in the quality and quantity of tidal and freshwater habitats to improve the overall quality of fish and shellfish habitat
- Increase the quality of fish habitats that support a broad natural diversity and ecosystem resilience

Several previous efforts, including *The Habitat Requirements for the Chesapeake Bay* (1991), provide maps and descriptions of areas in the Bay that support key species, based largely on presence/absence. However, these maps and descriptions do not adequately describe habitat suitability or quality for these areas. Further refinement of the maps will allow managers to target places of highest importance to fish sustainability. In turn, specific management strategies and actions can be developed for these critical areas and for upstream areas contributing to the habitat impairments.

Fish habitat is considered the core of ecosystem-based fisheries management as stated in the *Fisheries Ecosystem Plan for the Chesapeake Bay* (2006): “An important goal of ecosystem-based management is to maintain, and in many cases increase, the quality and quantity of habitat in the Chesapeake system as a whole.”

The first step to maintain and increase the quality and quantity of fish habitat is to identify where these quality areas are and how they may change in response to multiple factors (land use, environmental variability, climate change, and others). This will allow the focus to addressing the causes of and processes behind fish habitat decline rather than the symptoms of habitat decline.

A set of criteria will be developed that defines high-value fish habitat for critical life stages of focal fish species or guilds and, based on the criteria, identifies data sets that can be integrated or synthesized in models and spatial tools to locate places that meet the criteria. Critical life stages will be defined in terms of their relative contribution to recruitment. Natural recruitment is the influx of new individuals into a population due to reproduction or immigration. High recruitment often yields larger populations, but this is dependent upon the reproductive success of adults and survival of juveniles to adulthood; both of which may be influenced by habitat quality and availability.

The products of this work will support a range of management decisions aimed at achieving the Fish Habitat Outcome. Potential decisions supported include improved regulatory protections for fish habitat including "fish conservation areas;" permits for in-water activities; riparian land use decisions; and prioritizing efforts aimed at curbing water pollution, restoring streams, or restoring in-water connectivity.

In general, the approach will include the five steps outlined below.

1. Identify and prioritize threats to fish habitat at the jurisdictional and Baywide scale and propose actions to manage the threats. The workgroup has started this work with the table in the "Factors Influencing" section. Many of these are existing threats, and the workgroup recognizes the need to watch emerging threats as well. The workgroup developed an initial list of factors and approaches to address the threats outlined in the Factors Influencing table above. This is a starting point and will be further refined to develop clear priorities.

2. Compile and identify available data on habitats, habitat vulnerabilities and fish utilization at different life stages to develop a set of criteria for identifying areas of high-value fish habitat. As a first step to implementing this strategy the workgroup will complete an inventory of current jurisdictional and other partner efforts.

3. Map and target high-value fish habitat for improved conservation and restoration. Partners will work with the science and management community to develop spatial tools for priority habitats and species to inform management decisions. There is limited information available on fish distributions and habitats. Building on current efforts by jurisdictions, new GIS tools can pair fish information with other environmental data to evaluate, for example, what drives the fish distributions and how habitats are connected. The team will also explore the development of thresholds and/or metrics (a minimum area of fish habitat by region) to set clear fish habitat conservation targets/goals.

4. Communicate importance of fish habitat to the general public and local community leaders by engaging in a conversation about the tradeoffs associated with competing uses of land and water. Planning decisions are made at the local level and ensuring fish habitat is a part of the local planning process and considerations is a primary mechanism to stem the decline of quality fish habitat.

5. Evaluate ways to enhance fish habitat protection by reviewing examples from other regions (e.g., the Puget Sound Partnership) and actively engaging with the Atlantic Coast Fish Habitat Partnership. One example the workgroup identified in the Bay is Pennsylvania's designation of

exceptional value streams and waters. This designation comes with additional antidegradation and protections for these areas.

The threats, species of interest, and management approaches vary throughout the watersheds and jurisdictions. Please see Appendix A for a chart outlining specific management approaches associated with the habitat categories introduced in the "Factors Influencing" section.

Approaches Targeted to Local Participation

Identifying high-value fish habitat areas will enable sharing of this information with local planners, policy makers and the public, and facilitate discussions on how best to ensure these high value areas are protected against development pressure and other threats.

Cross-Outcome Collaboration and Multiple Benefits

This Outcome, while focused on identifying protecting, and restoring fish habitat, is still broad in scope and has connections to many other Management Strategies listed below and with the Fisheries, Habitat, Healthy Watersheds, and Water Quality Goal Implementation Teams (GITs). Collaboration with other outcomes will be necessary for success.

- Water Quality
- Climate Resiliency
- SAV
- Stream Health
- Land Use
- Forage
- Brook Trout
- Public Access
- Fish Passage
- Toxics
- Blue Crab
- Oysters
- Watersheds

VII. Monitoring Progress

Current monitoring programs

Each jurisdiction participating in this strategy has active fish and habitat monitoring programs.

New or proposed monitoring approaches

- Shallow-water fish monitoring as suggested by the 2006 Fish Stock Monitoring Report, Chesapeake Research Consortium.
- Integration and synthesis of fish, benthic habitat, water quality, land use and other key parameters that can be used to develop spatial analysis tools to identify and target high value fish habitat areas.

Monitoring Needs

- Shallow water fish monitoring as suggested by the 2006 Fish Stock Monitoring Report, CRC.

- Early life stage monitoring

VIII. Assessing Progress

This outcome is new and still in a developmental phase. As such, progress will be measured by tracking implementation of jurisdictional habitat priorities and the five focal areas articulated in the Management Approaches Section. The biennial workplan will be developed around these five focal areas with specific actions and timelines.

In the future, the workgroup may begin to define clear habitat thresholds, name specific target areas, and track on-the-ground actions in these places.

IX. Adaptively Managing

The partnership will use the following approaches to ensure adaptive management:

- A key component of this strategy is to develop criteria and spatial tools to better target high-value fish habitat using the best available science. Partners will convene the scientists and managers to evaluate what can be achieved with existing information. Partners will use the results of this meeting to define what is achievable and clarify expectations.
- The Fisheries and Habitat GITs will review progress on a biannual basis as part of their regular meeting schedule and adjust course as necessary. This will include evaluation of what maps and guidelines have been produced, which agencies and jurisdictions are using these materials, and how the strategy is being revised or updated to accommodate improved tools and lessons learned.

X. Biennial Workplan

Biennial workplans for each management strategy will be developed by April 2016. The Fish Habitat Workplan is expected to include the following information:

- Each key action
- Timeline for the action
- Expected outcome
- Partners responsible for each action
- Estimated resources