## **Outcome: Fish Habitat**

Principles for Phase III Watershed Implementation Plans

## Improving habitat benefits people and fish

Fish provide tremendous benefits to both our society and environment. They support multi-billion dollar industries including tourism, food service, commercial and recreational fishing, all while nourishing and sustaining the ecosystems in which they live. When watersheds are being developed and nearshore areas hardened, this threatens fish habitat and the many benefits these fish provide to people.

Local land use decisions impact the production and sustainability of fish resources. While fisheries managers can adjust the harvest of fish resources, it will not help restore sustainable populations if available fish



habitat is not sufficient for the fish to spawn and thrive. Fish habitat is more than good water quality. It is any area on which a fish or aquatic organism depends to live and thrive including areas for nursery, food supply, or migration. Fish need shade from trees to cool rivers to a livable temperature, roots and underwater grasses to inhabit as juveniles, unimpeded waters to spawn, and shallow areas to hide from predators. Some infrastructure projects have improved fish habitat as well as climate resiliency while decreasing erosion. Reducing contaminants into the water can also improve fish health and provides a healthier food product. Recent research suggests that BMPs designed to trap sediment can effectively suspend non-soluble toxins. Our future and that of these valuable fish are tied to the protection, restoration, and enhancement of our shared habitat. "Fishable and Swimmable" may be achieved with careful planning, conservation, and Total Maximum Daily Load (TMDL) reductions.

### **Water Quality Improvement Practices Benefit Fish Habitat**

Best management practices (BMPs) are designed to improve water quality and achieve the Chesapeake Bay TMDL, but many of these same measures may enhance fish habitat. With deliberate planning, you can maximize your water quality investment by conducting practices that result in the improvement of fish habitat and added ecosystem value. The chart below highlights current BMPs that experts have appraised, with their best professional judgement, the added value the BMP provides to multiple natural resource benefits. However, case-by-case evaluation of co-benefits is recommended.

Natural Resource Value									
Best Management Practice	Fish Habitat	Protected Lands	Habitat Biodiversity	Brook Trout	Blue Crab	Recreation	Forage Fish	Wetlands	
Agricultural Forest Buffer	4.5	3.5	4	4.5	4.5	4	4	3.5	
Narrow Forest Buffer	3.5	2	2.5	3.5	3	1.5	2	2	
Streamside Forest Buffer	4.5	3	4	4.5	4	3	3	3	
Urban Forest Buffer	4	3.5	5	5	2.5	3	3	3.5	
Forest Conservation	4	5	5	4	3	3.5	3	2.5	
Urban Shoreline Management	4.5	4.5	4	1.5	5	4.5	4.5	4.5	
Wetland Restoration	3.5	3.5	3	1.5	2.5	2	1.5	5	
Urban Stream Restoration	4	3	3.5	4	3	3	4.5	3.5	

<sup>\*</sup>Values were taken from the <u>Quantification of BMP Impact on the Chesapeake Bay Program Management Strategies</u> project by Tetra Tech <u>Appendix E</u>. Scores range in scale from +5 (very beneficial) to -5 (very harmful). <u>However, not all of these BMPs would merit this score for all projects</u>. Closer evaluation of project site designs is warranted when interpreting these scores.

-5 -4.5 -4 -3.5 -3 -2.5 -2 -1.5 -1 -0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5

Very Harmful No Impact Very Beneficial

# **Guiding Principles for Incorporating Fish Habitat**

### **WIP Implementation Principles**

- 1. Consider Existing Stressors:
- Continuous habitat is more favorable for supporting fish and shellfish populations than fragmented habitat.
- Conserving high quality habitat for maintaining ecosystem services and healthy habitats is cheaper than restoration.
- Fish are more responsive to restoration efforts in less developed areas.
- Tree canopy cover lowers stream temperature by providing shade. However, some BMPs impound water, raising the temperature from heat absorbed from the sun. This adversely impacts sensitive aquatic species, such as brook trout.
- Nutrient reductions help reduce algae which improves oxygen resources to fish and shellfish. These reductions improve light conditions that support healthy aquatic vegetation structure and function that support fish diversity.
- Slowing and treating runoff benefits native fish communities while reducing impacts of nutrient and sediment loading.
- Reducing toxic contaminants supports improved survival, growth and reproduction of fish and shellfish, lower water treatment costs, the potable state of the water, and lowers human health risks with reduced contaminant exposures through fish and shellfish consumption.
- Natural shorelines provide suitable habitat health for fish and important watershed resources.
- 2. <u>Capitalize on Co-benefits</u>: Select BMPs that enhance fish habitat or offer other ecosystem benefits. There is often a positive impact on fish habitat when you plan a project with ecosystem benefits such as maintaining stream health, enhancing wetland function, or conserving submerged aquatic vegetation.
- 3. <u>Engage Partners</u>: Use the fish habitat contacts provided below to help you plan a project that also protects or restores fish habitat and help you determine if you have temperature sensitive species in your area.

### **Tools and Resources**

A wide variety of fish habitat tools and datasets can help you capitalize on multiple ecosystem benefits when selecting and designing water quality improvement projects. Find a full listing of fish habitat mapping tools and spatial datasets <a href="here">here</a>.

- Link to detailed BMP table
- Link to maps and datasets with multiple ecosystem benefits
- Virginia <u>Living shorelines</u>, Maryland <u>Living shorelines</u>



#### Contacts for More Information

For more assistance on how to build fish habitat benefits into your water quality improvement projects, please reach out to your jurisdictional contact below or contact the Chesapeake Bay Program's Fish Habitat Action Team Chair, Gina Hunt at gina.hunt@maryland.gov.

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