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. However, when watersheds are developed and nearshore areas hardened, fish habitat is threatened as well as the many benefits these fish provide to people.

Tree Planting at Stream Restoration Site in Annapolis, MD

Reedville VA Living Shoreline. Photo: Northern Neck Master Gardeners

Local land use decisions impact the production and sustainability of fish resources. While fishery managers can adjust the harvest of fish resources to ensure sustainable and healthy fish populations, these protective measures are limited by the availability and condition of fish habitat. For that reason, fish habitat depends on more than good water quality. Fish Habitat comprises the water or substrate necessary for fish or aquatic organisms to live and thrive, including areas for spawning, feeding, growing, or migrating. 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 aquatic predators.

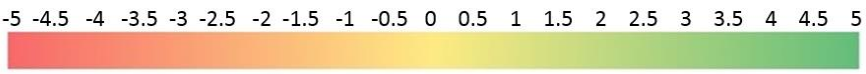
Fortunately, many of these habitat requirements can be generated through infrastructure projects. If designed effectively, infrastructure projects can improve fish habitat, create resiliency to projected climate change impacts, and decrease erosion. Reducing contaminants into the water can also improve fish health and provide a healthier food product when fish are consumed. Recent research suggests that BMPs designed to trap sediment can effectively suspend non-soluble toxins.

Our future and the future of fish in the Chesapeake Bay are tied to the protection, restoration, and enhancement of our shared habitat. Fishable and swimmable waters can be achieved with careful planning, conservation, and Total Maximum Daily Load (TMDL) reductions.

Water Quality Improvement Practices Benefit Fish Habitat

*Values were taken from the Quantification of BMP Impact on the Chesapeake Bay Program Management Strategies project by Tetra Tech Appendix E. Final Impact Scores evaluates BMP effects on outcomes on a scale of +5 (very beneficial) to -5 (very harmful). **This table shows select BMPs that scored a 3.5 and higher for the Fish Habitat Outcome, however, not all of these BMPs would merit this score for all projects. Closer evaluation of project site designs, including those BMPs shown in the above table is warranted when interpreting these scores.**

Best Management Practice	Fish Habitat	Additional Co-Benefits						
		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



Guiding Principles for Incorporating Fish Habitat

WIP Implementation Principles

- Consider Existing Conditions and Stressors: Evaluate how site-specific conditions can influence overall BMP impact.

  Conserve Habitat:
  - Natural shorelines provide suitable habitat health for fish and other important watershed resources.
  - Continuous habitat is more favorable for supporting fish and shellfish populations than fragmented habitat.
  - Conserving high quality habitat will maintain ecosystem services at a lower cost than restoration.
  - Fish are more responsive to restoration efforts in less developed areas.

  Prevent Fish Habitat Degradation:
  - Tree canopy cover lowers stream temperature by providing shade. However, some BMPs impound water, resulting in increased water temperature on sunny days. This adversely impacts sensitive aquatic species, such as brook trout.

  Improve Water Quality:
  - Nutrient reductions help reduce algae which improves oxygen resources for fish and shellfish. These reductions improve light conditions, which support healthy aquatic vegetation structure and function for fish diversity.
  - BMPs that slow runoff flow 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, reduced water treatment costs, improved water quality, and reduced human health risks associated with fish and shellfish contaminant exposures through consumption.
- Capitalize on Co-benefits: Prioritize BMPs that enhance fish habitat or offer other ecosystem benefits. Projects with ecosystem benefits such as maintaining stream health, enhancing wetland function, or conserving submerged aquatic vegetation often result in a positive impact.
- Engage Partners: Use the fish habitat contacts provided below to help you plan a project that supports water quality improvements and protects or restores fish habitat. These contacts can 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 here.

- Link to detailed BMP table
- Link to maps and datasets with multiple ecosystem benefits
- Living Shorelines Resources : Virginia, Maryland, Delaware
- More information on Fish Habitat Outcome can be found at the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team webpage.

Contacts for More Information on Fish Habitat in Your Jurisdiction

Jurisdiction	Lead	Phone	Email
Delaware	Edna Stetzar	(302) 735-8654	Edna.Stetzar@state.de.us
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