

Brook Trout:

Principles for Phase III Watershed Implementation Plans

Protecting Brook Trout for the Benefit of Watershed Residents

Brook Trout are a valuable species to the Chesapeake Bay watershed, providing social, economic, and ecological benefits to residents. Designated as the state fish in New York, Pennsylvania, Virginia, and West Virginia, Brook Trout play an important part in the natural heritage of the watershed. Brook Trout are highly prized by recreational anglers who spend millions of dollars annually on related goods and services, including travel, that directly benefit local and state economies.

The presence of Brook Trout indicate healthy waters as they rely on clean, cold headwater stream habitat for survival. They are particularly sensitive to changes in water temperatures (preferring waters under 68°F) and to human actions impacting land use. Increases in impervious surface, tree clearing, and water impoundments can warm stream temperatures above 68°F, leading to stress on and possible death of Brook Trout populations. Brook Trout are also very sensitive to sediment deposits, which degrade habitat and smother eggs in spawning nests built in the gravel of streams.

As they are just one of the many species that inhabit headstream waters, the protection of Brook Trout also safeguards additional fish habitat. Adopting certain Brook Trout habitat protection practices, like streamside and agricultural buffer plantings, can also benefit other priorities like water quality and stream health.

If Brook Trout are present in your area, you have a unique location that is worthy of conservation and attention.

Best Management Practices with Brook Trout in Mind

Best management practices (BMPs) are designed to improve water quality and achieve the Chesapeake Bay TMDL, but many of these same measures may enhance Brook Trout habitat as well. Incorporating the protection of Brook Trout habitat into project design does not necessarily require large changes. With deliberate planning, you can maximize your water quality investment by implementing practices that result in the improvement of Brook Trout habitat and added ecosystem value. The chart below highlights current BMPs that experts have rated based on the value a BMP provides to several Chesapeake Bay Program (CBP) outcomes. **Comparing across multiple CBP outcomes demonstrates how a BMP can provide co-benefits to more than one outcome.** However, case-by-case evaluation of co-benefits is recommended.



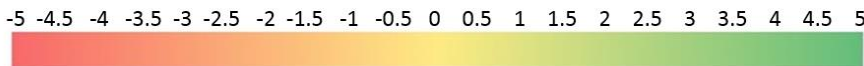
Photo: Chesapeake Bay Program



Photo: Chesapeake Bay Program

Best Management Practice	Brook Trout	Additional Co-Benefits					
		Habitat and Biodiversity	Stream Health	Fish Habitat	Healthy Watersheds	Forest Buffer	Tree Canopy
Agricultural Forest Buffer	4.5	4	4	4.5	4	5	4.5
Streamside Forest Buffer	4.5	4	3	4.5	3	5	5
Forest Conservation	4	5	4	4	5	3.5	5
Agricultural Stream Restoration	3	3	5	3	1	1	0
Agricultural Stream Access Control with Fencing	3	2	1	1.5	1	1	1

*Values were taken from the [Quantification of BMP Impact on the Chesapeake Bay Program Management Strategies](#) survey by Tetra Tech and are based on the best professional judgment of subject matter experts. [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 or higher for the Brook Trout Outcome, however, not all of these BMPs would merit the score of +3 for all projects. Closer evaluation of project site designs, including those from BMPs shown in the above table, is warranted when interpreting these scores.** More information on Brook Trout and the outcome’s guiding documents can be found at the Chesapeake Bay Program’s Habitat Goal Implementation Team [webpage](#).



Guiding Principles for Phase III Watershed Implementation Plan

WIP Development

1. Know where your Brook Trout populations exist (use EBTJV Spatial Tool, State Identified Priority Brook Trout Sub-watershed, Contacts links below).
2. Recognize and consider existing stressors: extent of agriculture, mining, and impervious surface in the watershed, water impoundments, impassable dams/culverts, and brown trout competition (use USFWS Fish Habitat Tool, NAACC, and Chesapeake Dam Prioritization links below).
3. Reduce impacts to Brook Trout - design and implement BMPs to reduce impervious surface, avoid/minimize creating permanent pools, increase forest buffers, consider brown trout competition when planning in-stream work, protect groundwater sources (consider streamside wetland restoration), and reduce blockages to fish passage. Avoid BMPs that may increase stream temperature or high velocity flow events.

WIP Implementation

1. Capitalize on co-benefits: choose water quality BMPs that also protects other fish habitat, stream health, and healthy watersheds. Streambank stabilization, access control fencing, floodplain reconnection, and off-stream watering systems improve fish habitat and reduce sedimentation and phosphorus loading.
2. Engage partners: Collaborate with Federal and state agencies, elected officials, and NGOs to share resources, help identify watersheds and streams important to Brook Trout, and incorporate conservation efforts into your WIPs (use Contacts links below).

Tools and Resources

- [Eastern Brook Trout Joint Venture Spatial Tool](#)
Includes information on the extent of Brook Trout habitat and habitat status.
- [State Identified Priority Brook Trout Sub-watersheds](#)
Includes description, HUC12 codes, and map.
- [USFWS Fish Habitat Decision Support Tool – Chesapeake Bay Brook Trout Assessment](#)
Includes information on Brook Trout habitat stressors and future habitat quality change.
- [North Atlantic Aquatic Connectivity Collaborative \(NAACC\)](#)
Includes information, maps, and a regional database on road-stream crossings (bridges/culverts).
- [Chesapeake Fish Passage Prioritization Tool](#)
Includes map and information on dams.

Contacts for More Information

For more assistance on how to build Brook Trout habitat benefits into your Watershed Implementation Plan, please reach out to your jurisdictional contact below or contact the Chesapeake Bay Program’s Brook Trout Action Team Lead, Dr. Stephen Faulkner at faulkners@usgs.gov.

Jurisdiction	Website	Lead	Email
CBP Contact	Habitat Goal Implementation Team	Jennifer Greiner	Jennifer_greiner@fws.gov
Maryland	MD Dept. of Natural Resources	Alan Heft	Alan.heft@maryland.gov
New York	NY Dept. of Environmental Conservation	Fred Henson	Fred.henson@dec.ny.gov
Pennsylvania	PA Fish and Boat Commission	Jason Detar	jdetar@pa.gov
Virginia	VA Dept. of Game and Inland Fisheries	Steve Reeser	Steve.reeser@dgif.virginia.gov
West Virginia	WV Dept. of Natural Resources	David Thorne	David.w.thorne@wv.gov