



North Carolina Brook Trout Conservation Strategies

Background

North Carolina boasts the largest number of brook trout populations in the southeastern United States. To date, more than 500 populations of brook trout have been documented in 32 counties of western North Carolina. Brook trout in North Carolina have been severely impacted by alterations to the landscape, however and are now found in less than 80% of their historic range. The majority of brook trout populations are currently found in the Pisgah and Nantahala National Forests and the Great Smoky Mountains National Park. The distribution and status of brook trout on private lands in North Carolina remains to a large extent unknown. Although brook trout are the only trout species native to North Carolina, wild populations of rainbow trout and brown trout currently occupy most of the brook trout's former range. Recent genetic assessments of North Carolina's brook trout populations indicate that 39% are the native Southern Appalachian strain, 9% are direct descendents of northern stocks, and 52% are a mixture.

Brook trout populations located on publicly owned lands are relatively stable, as a result of their location in protected forested watersheds, but face threats from acid rain, global climate change, and competition from rainbow and brown trout. Brook trout on private lands in North Carolina, however face the additional threats of unrestricted commercial silviculture, agriculture, road construction, and extensive residential development.

Management agencies including the North Carolina Wildlife Resources Commission, United States Forest Service, Blue Ridge Parkway, and the Great Smoky Mountains National Park in conjunction with the conservation organizations Trout Unlimited and the Federation of Fly Fishers have jointly developed this brook trout conservation strategy for North Carolina. This conservation strategy lists short term and long term goals as well as strategies to meet the goals deemed necessary to protect, enhance, and restore populations of brook trout in North Carolina. Although the broad goal categories in this report are listed in priority order, those distinctions are slight and used to denote likely order of completion. It is the consensus among the cooperators that all components are integral to meeting the goals listed in this document and to meet the broader goals of the Eastern Brook Trout Joint Venture.

Priority 1: Assessment

Short Term Goals

- 1.1 Complete North Carolina brook trout assessment.**
Strategy: Complete electrofishing surveys designed to locate all populations of wild brook trout in North Carolina.

- 1.2 Complete North Carolina brook trout genetics assessment.**
Strategy: Genetically test all brook trout populations in North Carolina to strain (Southern Appalachian, northern, or mixed).



- 1.3 Develop a comprehensive brook trout distribution GIS data layer.**
Strategy: Create electronic storage platform to archive historic and current brook trout distribution and genetic information.

Long Term Goals

- 1.4 Produce or revise comprehensive trout management plans.**
Strategy: Develop and update agency trout management plans to include expanded sections focused on brook trout.
- 1.5 Conduct research on causative factors for brook trout population loss.**
Strategy: Conduct GIS based land use study to determine how land use patterns relate to brook trout population status.
- 1.6 Develop a long term brook trout monitoring program.**
Strategy: Develop and implement long-term brook trout monitoring program designed to collect quantitative information on brook trout population characteristics (range, age and growth, density, and biomass) across western North Carolina.
Strategy: Develop concurrent long-term water quality (chemical and biological) monitoring studies on brook trout waters included in long term monitoring program.

Priority 2: Habitat Protection

Short Term Goals

- 2.1 Initiate a compliance program for USACE Section 404 permits issued for waters containing brook trout populations.**
Strategy: Follow up on permits issued by USACE that affect brook trout waters to document degree of compliance with permit requirements. Report on compliance and make appropriate recommendations to USACE.
- 2.2 Obtain the highest State water quality classification for brook trout waters.**
Strategy: Petition State for highest water quality rating obtainable on all waters that contain brook trout populations.
- 2.3 Investigate effects of stream acidification on brook trout populations in North Carolina.**
Strategy: Develop a research project to determine current acidification status of streams in North Carolina; identify trends and determine actions necessary to protect brook trout populations from acid precipitation.



- 2.4 Avoid impoundment of brook trout streams.**
Strategy: Develop criteria for State and Federal agencies that issue permits for impoundment construction to avoid and minimize impacts to brook trout waters.

Long Term Goals

- 2.5 Incorporate brook trout streams and watersheds on private lands in North Carolina into the public trust.**
Strategy: Develop program that prioritizes brook trout streams and watersheds for fee-simple purchase or conservation easement based on potential benefits for brook trout protection, public access, and recreational fisheries.
Strategy: Develop comprehensive assessment GIS based data layer which would include information from the Eastern Brook Trout Joint Venture habitat assessment, state aquatic surveys, water quality information, land ownership, and other variables needed to make prioritization decisions.
Strategy: Actively pursue internal and external funding mechanisms for acquisition of prioritized streams and watersheds.
- 2.6 Establish vegetated buffers on all North Carolina waters.**
Strategy: Support North Carolina Environmental Management Commission's (EMC) attempts to require functional vegetated buffers on all waters in North Carolina, particularly waters supporting brook trout. Provide technical assistance to EMC as needed.

Priority 3: Habitat and Population Restoration

Short Term Goals

- 3.1 Identify candidate streams for brook trout population restoration.**
Strategy: Use historic brook trout distribution data and genetic information to develop prioritized list of streams suitable for restoration.
Strategy: Develop guidelines and procedures for restoration of brook trout populations.
Strategy: Utilize relocation, supplementation, and chemical removals where appropriate for brook trout restorations.
- 3.2 Identify brook trout habitat improvement projects.**
Strategy: Develop criteria for habitat improvement projects based on brook trout genetics information, trout distribution data, land ownership, likelihood for success, and angling access.



3.3 Initiate brook trout habitat improvement projects.

Strategy: Utilize prioritized list to seek funding for habitat improvement projects. Seek existing funding mechanisms such as highway mitigation work, mitigation banks, State and Federal agricultural incentive programs, or other established funding sources. Utilize a variety of stream restoration techniques including livestock exclusion, site re-vegetation, and in-stream channel modification.

Long Term Goals

3.4 Pursue opportunities for brook trout restoration.

Strategy: Select streams based on likelihood for success, location relative to other brook trout populations, and presence of other trout species.

Strategy: Conduct long term monitoring on restored brook trout populations to assess viability of program.

Priority 4: Protect and Maintain Biological Diversity

Short Term Goals

4.1 Conserve North Carolina's native, southern Appalachian brook trout.

Strategy: Implement the management actions and guidelines recommended by the American Fisheries Society's Southern Division Trout Committee in its position statement on managing southern Appalachian brook trout (SDAFSTC 2005). This document provides guidance regarding issues such as protecting biodiversity, genetic integrity and conducting restoration and enhancement projects.

4.2 Protect the genetic integrity of brook trout populations.

Strategy: Prohibit introduction of hatchery-reared trout into waters containing self-sustaining populations of brook trout.

Strategy: Require stocking permit for fish introductions in all public or private waters in North Carolina.

4.3 Stop loss of fragmented brook trout populations.

Strategy: Identify brook trout populations that have critically low population levels or are at risk of extirpation.

Strategy: Seek funding solutions to protect vulnerable or at-risk brook trout populations through conservation easements or fee-simple purchase.

Strategy: Relocate imminently threatened brook trout populations in accordance with restoration guidelines.



Long Term Goals

- 4.4 Develop and implement guidelines to protect the genetic integrity of North Carolina brook trout populations.**
Strategy: Initiate research to test efficacy of producing triploid catchable trout for recreational stocking.
Strategy: Initiate research on producing viable line of tetraploid trout.
Strategy: Prohibit stocking reproductively viable trout in North Carolina waters.
Strategy: Require use of sterile trout for all stocking permits issued by the North Carolina Wildlife Resources Commission for public and private waters.
- 4.5 Maintain brook trout genetic diversity.**
Strategy: Develop program that seeks protection of all brook trout populations located on private lands in North Carolina. Options would include conservation easements, fee-simple purchase, buffer restrictions, or other incentive programs.
Strategy: Seek highest water quality and land management standards from State and Federal regulatory agencies in watersheds with brook trout populations.

Priority 5: Outreach

Short Term Goals

- 5.1 Create public interest and knowledge about brook trout program.**
Strategy: Seek funding to develop public outreach programs specific to brook trout in North Carolina.
Strategy: Develop specific outreach programs for targeted audiences.
Strategy: Incorporate and enhance existing educational programs currently administered by Cooperators.
Strategy: Incorporate and promote the Eastern Brook Trout Joint Venture on Cooperator's web sites and through earned media campaigns.
Strategy: Utilize comprehensive media approach (TV, print, web) to emphasize plight of brook trout in North Carolina.

Long Term Goals

- 5.2 Disseminate agency trout management plans to the public.**
Strategy: Disseminate agency management plans to the public using a variety of media outlets and Cooperator's outreach programs.
- 5.3 Establish relationships that foster protection of brook trout populations.**
Strategy: Establish contacts and relationships with NGOs, city and county governments, land trusts, and grass roots organizations to foster brook trout protection goals.



5.4 Increase interest in current environmental improvement programs by landowners.

Strategy: Increase landowner interest in ongoing Federal and State programs that improve wetland function, establish stream buffers, exclude livestock, and provide incentives for best management practices by fostering relationships with those agencies, maintaining an active technical role, and providing educational materials.

Priority 6: Recreational Fishing

Short Term Goals

6.1 Provide and enhance brook trout recreational fishing opportunities.

Strategy: Maintain current level of public access on all public and private lands in North Carolina.

Strategy: Pursue additional access to brook trout streams on private lands through fee-simple purchase, access easements, conservation easements, or other long-term agreements with landowners.

Long Term Goals

6.2 Maximize recreational fishing opportunities for brook trout.

Strategy: Use appropriate size and creel regulations to protect brook trout populations from over-harvest and provide fishing opportunities.

Strategy: Develop incentive program for private landowners that encourages protection of brook trout habitats and allows public access for angling. This could be accomplished through the use of recognition programs, special signage, tax breaks or credits, or other financial incentives.

Strategy: Explore opportunities to legislate legal access to all public waters in North Carolina.

Reference:

Southern Division American Fisheries Society Trout Committee (SDAFSTC). 2005. Managing southern Appalachian brook trout: a position statement. Fisheries 30(7):10-20.