



South Carolina Brook Trout Conservation Strategy

Background

South Carolina's brook trout resource currently consists of self-sustaining (wild) populations inhabiting about 95 km in 16 streams in the northwestern portion of the state. Brook trout inhabit northern portions of Oconee, Pickens and Greenville Counties along the Blue Ridge Escarpment and Chattooga Ridge. Wild brook trout habitat is found exclusively in the Crystalline Blue Ridge Eco-Region in first and second order (headwater) streams at elevations as low as 1,700 feet, but generally above 2,000 ft. Over 50% of SC brook trout streams by number occur on the Andrew Pickens District of the Sumter National Forest. However, brook trout streams, primarily along the Chattooga Ridge, on the National Forest tend to be represented by smaller and shorter stream segments. Brook trout streams draining the Blue Ridge Escarpment in the Mountain Bridge section of Greenville County tend to be less numerous, but longer and larger. Brook trout are considered to be South Carolina's only native salmonid, although there is much debate over pre-European distribution in the Atlantic slope streams in SC. Brook currently represent only about 11% of the state's wild trout resources. Generally speaking, rainbow trout occupy most of the coldwater habitat that once supported brook trout along the eastern flank of brook trout habitat in SC. Brown trout have generally displaced brook trout in lower gradient high elevation streams along the Chattooga Ridge in the eastern portion of SC brook trout range. These introduced species have displaced brook trout up to barriers to upstream fish movement. In a few cases only, brook trout co-exist with these species. Genetic assessment of SC's brook trout populations is nearly complete. Only 2 out of the twelve populations tested (17%) are descended from native, southern Appalachian stocks. Two additional populations show "little introgression of northern alleles." Since that time two additional brook trout populations have been reclaimed through stock relocation. At this point, 4 of 16 (25%) of SC brook trout are known to harbor pure southern, with two additional populations exhibiting such low levels of northern alleles that they should be protected as pure southern populations, but perhaps not used as stock for restoration efforts. Seven SC populations (44%) were intergrades between northern and southern strains, indicating stocking of northern fish over southern populations and/or stocking of intergrades from the hatchery system. South Carolina's brook trout continue to be limited by competition from introduced species, as well as residential development and poor land uses practices. Acidic deposition and stream warming associated with climate change are also potential threats.



Priority 1: Assessment

Short Term Goals

1.1 **Develop a comprehensive brook trout data GIS layer.**

Strategy: Archive and map historic and current brook trout distribution/habitat and genetic information by 2010.

1.2 **Develop a baseline habitat inventory for all brook trout streams.**

Strategy: Conduct baseline habitat inventory of all brook trout streams using the Basin-wide Habitat Inventory Technique (BVET) by 2010. Comparisons with reference streams (ex. Indian Camp, Slicking Creek, Joyce Kilmer streams) will be used to identify habitat deficiencies and prioritize habitat restoration projects. Habitat surveys should also be conducted on non-brook trout streams being considered for brook trout restoration.

1.3 **Develop baseline water quality data for brook trout streams.**

Strategy: Collect baseline water quality parameters such as: temperature (summer thermographs), pH, ANC, Alkalinity, Conductivity, Nutrients, Turbidity, metals etc. ANC will be particularly important to document the threat posed by acid deposition.

1.4 **Complete South Carolina's brook trout genetics assessment.**

Strategy: Determine the genetic identities (Southern Appalachian, northern, or mixed) of one recently-documented brook trout population by 2010.

Long Term Goals

1.5 **Develop a long-term brook trout population monitoring program.**

Strategy: Obtain quantitative population data for all SC brook trout populations (emphasis on allopatric populations) following sampling procedures outlined by the Southern Division Trout Committee. Once baseline quantitative data is available for all streams conduct rotational monitoring where each stream is quantitatively sampled every 3-5 years (ideally).

1.6 **Long-term water quality monitoring of SC's brook trout populations.**

Strategy: Water quality samples are collected per 1.4 above for SC brook trout streams every 3-5 years. Intended to monitor long-term changes in water quality.

1.7 Long-term habitat monitoring of SC brook trout streams.

Strategy: BVET habitat surveys will be conducted periodically on an as needed basis.

1.8 Refine current knowledge of brook trout distribution.

Strategy: Refine knowledge on the distributional limits of brook trout in streams. This particularly deals with sympatric populations as allopatric population distribution is largely defined.

Priority 2: Habitat Protection and Enhancement

Short Term Goals

2.1 Protect brook trout habitat.

Strategy: Coordinate with the SCNDR's environmental permitting review section to verify compliance with all Clean Water Act (Section 404) and SCDHEC Permits issued for projects affecting waters supporting brook trout. Make appropriate recommendations to the US Army Corps of Engineers and the South Carolina Department of Health and Environmental Control to ensure that permit requirements adequately protect brook trout habitat.

Strategy: Coordinate with the South Carolina Forestry Commission (SCFC) to assure that forestry operations along SC brook trout streams comply with SC Best Management Practices for forestry operations. Make SCFC BMP Foresters aware of the location of SC brook trout streams for use in aerial surveys of forestry operations. These flights can be used to locate recent forestry activity and unauthorized pond/lake construction.

Strategy: Recommend to SCDHEC that all SC brook trout streams and stream segments harboring potential allopatric brook trout habitat (where restoration is eminent) are given the highest protective classification as "Outstanding Resource Waters" (Class ORW).

Long Term Goals

Strategy: Develop a database of critical property owners along SC brook trout streams. Educate property owners through outreach programs (examples: mailing of Eastern Brook Trout Joint Venture "Status and Threats" publication to all land owners, hosting day meeting(s) designed to educate landowners of conservation

and protection needs – opportunities for easements, conservation bank purchases, etc.).

2.2 Improve brook trout habitat.

Strategy: Develop selection criteria for brook trout habitat improvement projects based on need (i.e. BVET surveys), genetics and distribution information, land ownership, likelihood for success, and angling access (public versus private).

Strategy: Continue the “Partners-for-Trout” partnership. Partners-for-Trout is partnership comprised of federal and state resource agencies (USFWS, USFS, NRCS, SCDNR, Clemson University), non-governmental organizations (Foothills RCD, SCWF, TU). Employ various stream restoration techniques as necessary (e.g., tree-felling, in-stream channel modification, riparian, etc.). Continue to seek project funding through established sources such as: Sportfish Restoration, USFS fishery programs, USFWS-Partners for Fish and Wildlife, Trout Unlimited-EAS and local chapter donations, Farm Bill programs (Wildlife Habitat Incentives Program-WHIP), mitigation banks, and various grants from non-profit groups.

Priority 3: Outreach

Short Term Goal

3.1 Create and enhance public interest in brook trout.

Strategy: Produce and employ educational materials (e.g. brochures, posters, articles, videos, live fish displays, etc.) highlighting the importance of conservation of South Carolina’s brook trout and associated management activities. Venues include the agency website and magazine, SC Wildlife TV Show, schools, stakeholder meetings, and fishing shows.

Strategy: Promote the Eastern Brook Trout Joint Venture (EBTJV) on the agency web site and other media outlets.

Long Term Goals

3.2 Increase landowner participation in habitat improvement programs.

Strategy: Publicize (via the agency website, magazine, meeting(s) catered to key landowners, and other outlets) information regarding all current Federal and State grants and programs available to landowners for protecting and improving water quality and habitat in brook trout streams. Provide technical assistance as needed.

Strategy: Publicize the application of BMPs, as well as the benefits of protecting and improving water/habitat quality, by presenting success stories (in local

newspapers, on the agency website, etc.) that show how entire communities benefit, not just fish and anglers.

3.3 Develop relationships that foster brook trout conservation.

Strategy: Facilitate achievement of brook trout conservation goals by establishing relationships with federal and state agencies, NGOs, city and county governments, land trusts, key private landowners and other organizations.

Priority 4: Brook Trout Protection, Restoration, and Enhancement

Short Term Goals

4.1 Ongoing Brook Trout Restoration in SC.

Strategy: Monitor the success of the 2005 brook trout restoration project on 3-miles of stream on Sumter National Forest. Monitoring includes: monitoring the spawning success of recently reintroduced southern Appalachian brook trout, continued monitoring of the impacts of antimycin on non-target aquatics, and monitoring the success of tree felling to mobilize sediment, enhance pool habitat and overhead cover for brook trout.

Strategy: Complete the ongoing brook trout restoration projects on the remaining USFS streams identified in the approved EA by 2010.

Strategy: Assist other agencies with technical assistance on brook trout restoration techniques as requested. Publish or present restoration results to assist other agencies with brook trout restoration planning. Provide training opportunities, through ongoing projects, for biologists from other states/agencies to receive on-the-ground technical training in brook trout restoration techniques as requested (antimycin application, BVET, habitat enhancement, etc.).

Strategy: Establish relationships/agreements with neighboring states to provide brook trout needed for restocking renovated streams. This assistance is necessary for SC restoration projects to utilize pure southern Appalachian brook trout in ongoing restoration/renovation efforts.

4.2 Future Brook Trout Restoration in SC.

Strategy: Produce a prioritized list of potential southern Appalachian brook trout restoration or enhancement projects emphasizing streams on Jocassee Gorges (DNR property) and for streams along the Blue Ridge Escarpment in the Mountain Bridge Wilderness by 2010. This list will seek to include restorations in river systems (sub-watersheds) where brook trout have been extirpated or where brook trout distribution is very limited. Factors such as elevation, available

habitat, species composition, physical barriers (waterfalls), water quality, ownership, accessibility and public support will be considered.

Long Term Goals

4.1 Conserve SC's 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 (SDAFSTrout Committee 2005). This document provides guidance regarding issues such as protecting genetic integrity and conducting restoration and enhancement projects.

4.3 Re-establish stable populations of southern Appalachian brook trout in SC.

Strategy: Restore southern Appalachian brook trout populations in SC to a self-sufficient level, defined by having an adequate number of populations in each sub-watershed with sufficient densities to maintain genetic integrity and to support future restoration efforts if needed.

Priority 5: Recreational Fishing

Short Term Goals

5.1 Make brook trout angling opportunities more readily available.

Strategy: Provide some brook trout fisheries in waters that are readily accessible (e.g., larger hatchery supported streams with good access, delayed harvest, Jones Gap C&R, etc.) so that a majority of anglers have the opportunity to catch and develop an appreciation for brook trout.

Strategy: Conduct seasonal stocking of brook trout in at least six remote, hatchery supported streams to provide better back-country angling opportunities for brook trout in larger streams (e.g. Thompson River, Devils Fork Creek, lower Howard Creek, Brasstown Creek, Whetstone Creek, South Pacolet River). Continue to stock larger brook trout in Delayed Harvest waters. This has proven highly successful as the brook trout are in spawning colors in fall-winter programs. Seek to maintain a ratio of 10% brook trout in the spring put-take stocking program in mountain streams.

Long Term Goals

5.2 Comprehensively manage wild brook trout fisheries.

Strategy: Periodically conduct surveys on selected brook trout streams to document angler use, total mortality, exploitation rates, and preferences on an as needed basis. Use this information along with brook trout population monitoring data to adjust angling regulations if necessary or provide quality fishing opportunities.