

Maine Brook Trout Conservation Strategies

Background

Maine's lentic¹ brook trout resource consists of populations in 1,135 lakes and ponds of which 645 are self-sustaining (wild) populations; 305 of these waters have never been stocked. In addition, brook trout occur in 22,248 miles of stream habitat, the vast majority of which are wild. The value for stream populations is estimated², because many streams have not been surveyed and population status is largely unknown. Maine's wild brook trout populations are concentrated in the interior highlands of the state, much of which is located in privately owned commercial forestlands. Maine's forests have a long history of land use changes associated with commercial wood harvest including extensive modifications to facilitate log driving through streams and rivers. Although log driving was ended statewide over thirty years ago, many aquatic habitats within forested lands retain chronic degraded conditions and channel instabilities. A total of 177 lakes and ponds that have suitable habitat for trout are zoned as Remote Ponds³ by Maine's Land Use Regulation Commission (LURC), which oversees zoning in Maine's 10.4 million acres of unorganized territory.

Maine's coastal plain maintains fewer brook trout populations than the interior highlands and lakes are typically supported by stocking programs. The coast also has many wild, but unquantified, populations of anadromous⁴ brook trout. Habitat in the southern part of the state and along the coastal plain tends to be more heavily developed, has suffered more habitat degradation, and has more introduced fish species that compete with brook trout (Jones 1986). However, illegal introductions of competing fish species into areas away from the coastal plain has accelerated within the last two decades. Habitat loss and degradation in southern and central Maine is mainly attributed to urbanization and agricultural land uses and is a growing concern for brook trout conservation.

Genetic assessment was conducted on more than 32 populations, representing 32 subdrainages throughout the state, in the 1990's. Results indicate that Maine's wild brook trout retain high levels of genetic diversity and uniqueness. Restrictive brook trout fishing regulations were imposed as necessary in 1996 to assure that wild populations were protected from harvest until they attained sexual maturity. As a result, the proportion of larger, sexually mature brook trout has increased in monitored waters. Maine's brook trout management efforts have historically been concentrated on lakes and ponds. Since the 1980's, however, a small number of rivers and streams have been surveyed annually to quantify and qualify brook trout habitat. More recently, a modest number of stream restoration projects have been undertaken and are being evaluated.

¹ Lentic waters are standing water habitats with little to no discernable flow, such as lakes, ponds, wetlands and reservoirs.

² Based on an estimate of 70% of Maine's 31,806 miles of flowing water.

³ This designation is limited to waters that are not accessible within one half mile by two-wheel-drive vehicles; that have no more than one non-commercial remote camp; and that have cold water game fisheries.

⁴ Brook trout that live part of their life cycle in freshwaters and part in seawater estuaries.

Priority 1: Assessment

Short Term Goals

1.1 Determine the status of wild brook trout in watersheds lacking adequate and contemporary data

Strategy 1: Determine wild brook trout status for lotic⁵ habitats in 500 HUC subwatersheds (12 digit HUC⁶) by 2010.

Strategy 2: Determine wild brook trout status for lentic habitats in 100 HUC subwatersheds where current status is unknown by 2010.

Strategy 3: Determine the current status of anadromous brook trout in coastal watersheds and compare to historical distribution.

Strategy 4: Describe and characterize the genetic relationships of Maine's anadromous, lentic and lotic wild brook trout with adequate representation from all seven major river drainages.

Strategy 5: Assist with developing and validating a landscape-scale brook trout habitat relationship model (Thieling 2006).

1.2 Develop statewide GIS datalayers for wild brook trout management and conservation planning purposes

Strategy: Continue efforts at digitizing and converting historical information to GIS formats.

Strategy: Develop a series of GIS datalayers displaying wild brook trout status, overall habitat quality, geomorphic condition⁷ and critical areas for conservation and management. Examples include spawning, nursery, or adult holding habitats.

Long Term Goals

1.3 Maximize the contribution of wild brook trout stocks to the fishery.

Strategy 1: Protect native and wild brook trout populations⁸ by adhering to Department policies including Legislative Act LD 1131⁹ and a Report to the Joint Standing Committee on Inland Fisheries and Wildlife: Managing Maine's Wild Brook Trout Fisheries in Lakes and Ponds.

⁵ Lotic waters represent flowing waters, such as brooks, streams, and rivers.

⁶ HUC is an acronym for Hydrologic Unit Code. The HUC system classifies nested watersheds from large river basins (2 digit code) to small subwatersheds (12 digit code).

⁷ The classification and condition of stream channel types. This contributes to rating stream stability.

⁸ Native brook trout waters are those that have never been stocked. Wild brook trout waters are defined as those that have not been stocked since 1980. Their populations, though self-sustaining, have some level of stocking in their history.

⁹ An Act to Recognize and Protect the Native Eastern Brook Trout as one of Maine's Heritage Fish.

Strategy 2: For wild brook trout lakes, evaluate angling regulatory efficacy by comparing the proportion of older-age (age IV and greater) fish sampled from waters with differing regulatory severity.

Strategy 3: Increase effort to collect angler use and harvest rates, as well as brook trout population statistics, for management areas that are under-represented in current assessment programs, such as LURC's Remote Ponds, streams, and coastal habitats.

Strategy 4: Continue annual monitoring of wild brook trout streams for fishery independent estimates of population status, fish condition, and size/age structure.

Strategy 5: Prevent, eradicate or control the detrimental effects caused by the intrusion of non-native aquatic species into brook trout habitats.

Priority 2: Habitat Protection

Short Term Goal

2.1 Identify degraded stream habitats and prioritize sites for restoration efforts

Strategy 1: Survey and inventory about 1500 stream reaches per year and rank habitat quality and channel stability for brook trout life history stages by stream reach.

Strategy 2: Identify barriers to fish passage and re-establish habitat connectivity where possible.

Strategy 3: Prevent the intrusion of non-native aquatic species into previously uncolonized habitats where natural landform provides strategic opportunities for optimal or selective barrier placement.

2.2 Identify critical areas and habitats for conservation planning and land protection, such as pursuing conservation easements.

Strategy 1: Survey and inventory about 1500 stream reaches per year and map spawning, nursery and adult holding areas.

Strategy 2: Identify critical spawning, nursery, thermal, and winter refuge¹⁰ habitats for conservation.

Long Term Goal

2.3 Permanently protect critical habitats.

¹⁰ Refuges are specific areas where trout congregate to alleviate stressful seasonal conditions.

Strategy 1: Establish collaborative partnerships with State, Federal, Tribal and private entities for the permanent conservation of critical wild brook trout habitats and refuges.

2.4 Restore degraded brook trout habitats.

Strategy 1: Increase collaborative partnerships with State, Federal, Tribal and private entities to implement stream restoration projects at a rate of at least ten projects annually.

Strategy 2: Monitor efficacy of implemented projects for ecological responses and indicators of success

2.5 Prevent continued degradation of brook trout habitats

Strategy 1: Work with landowners to continue developing riparian use practices that protect or restore streambank stability, eliminate erosion and sedimentation concerns, maintain shading and thermal regimes, and reduce rapid precipitation runoff.

Strategy 2: Negotiate with stakeholders in developing water use, flow, and groundwater withdrawal agreements.

Strategy 3: Cooperate with other state and federal agencies to document environmental degradation, recommend venues of responsible development, and enforce violations.

Strategy 4: Support legislation intended to minimize or eliminate environmental degradation if necessary.

Priority 3: Outreach

Short Term Goal

3.1 Raise public awareness of Maine's wild brook trout resources.

Strategy 1: Advertise Maine's brook trout resource through the Department's Public Information and Education Division and the Maine State Office of Tourism, emphasizing appropriate management and harvest strategies, respect for landowner rights, and the physical beauty of the setting of many of Maine's brook trout waters.

Strategy 2: Encourage volunteer and school group participation in assessment and monitoring programs.

3.2 Foster public/private collaborative stewardship of brook trout resources

Strategy 1: Inform the public and encourage interest and participation in addressing environmental issues.

Strategy 2: Continue public education efforts highlighting the permanent ecological repercussions associated with illegal fish stockings.

Strategy 3: Contribute toward public policy that includes brook trout population health and sustainability as positive indicators toward improving or enhancing environmental quality.

Priority 4: Recreational Fishing

4.1 Optimize brook trout angling opportunities.

Strategy 1: Continue to gain appropriate public access rights over private ways by purchase, negotiation and agreement, easement, gift, cooperation with landowners, and by encouragement of private groups and enterprises.

4.2 Monitor Maine's wild brook trout waters to maximize angling opportunities for principal fisheries¹¹.

Strategy 1: Continue to evaluate annually brook trout populations in lakes, increasing sampling frequency to yield age and growth information from 120 waters, abundance estimates for 12 waters, and harvest estimates for 6 waters.

Strategy 2: Determine angler demand and attitudes through use of the statewide angler questionnaire every fifth year.

Strategy 3: Initiate a systematic statewide sampling regime for estimating angler use, harvest, and fishing quality for lotic habitats.

References

- Jones, J. 1986. The cumulative impacts of development in southern Maine: Important wildlife habitats. Maine State Planning Office, Augusta ME. 70 pp.
- Thieling, T. M. 2006. Assessment and predictive model for brook trout (*Salvelinus fontinalis*) population status in the eastern United States. MS Thesis. James Madison University. 65 pp.

¹¹ A principal fishery is defined as one for which the species is regularly sought after by anglers and which makes up a significant portion of the catch.