

Appendix F

The following are excerpts from the Eastern Brook Trout Joint Venture's Conservation Strategy (Working Draft v.6), **Conserving the Eastern Brook Trout: Strategies for Action**

Found at: <http://www.easternbrooktrout.org/constrategy.html>

Rangewide Status of Brook Trout Populations

A comprehensive assessment of the status of brook trout populations throughout the Appalachian region from Maine to Georgia was recently completed as part of the EBTJV (Hudy et al. 2005). This area encompasses approximately 25% of the native range of brook trout in North America and 70% of the native United States range. Data were compiled from more than 1,300 6th level hydrologic unit watersheds within the historic range of brook trout. Watersheds were classified according to seven brook trout status categories: (1) absent (brook trout not present or never present); (2) no data; (3) present but qualitative data only; (4) present and intact (>90% of historical habitat contained wild, reproducing brook trout); (5) present but moderately reduced (<90% but > 50% of historical habitat contained wild, reproducing brook trout); (6) present but greatly reduced (<50% of historical habitat contained wild, reproducing brook trout); and (7) extirpated.

The assessment revealed wild brook trout populations in the eastern United States are impaired. Intact stream populations of brook trout exist in only 5% of the watersheds assessed. Wild stream populations of brook trout have vanished or are greatly reduced in nearly half of the watersheds. The vast majority of historically occupied large rivers no longer support self-reproducing populations of brook trout.

Regional and Local Status of Brook Trout Populations

In New England, Maine possesses the most intact watersheds (147) for stream brook trout populations as well as the most watersheds (658) where brook trout were present but only qualitative data were available. New Hampshire (195) followed Maine with respect to the number of watersheds where brook trout were present but only qualitative data were available. Connecticut possessed the highest number of watersheds where brook trout are present but severely reduced (129) or extirpated (29).

Among the North Atlantic states of New York, New Jersey, and Pennsylvania, New York contained the most intact watersheds (26). Pennsylvania had the greatest number of watersheds with brook trout status classified as reduced (118), severely reduced (507), extirpated (449), and unknown (218).

Virginia remains a stronghold for stream-dwelling brook trout populations in the Mid-Atlantic region (VA, WV, MD), with 36 watersheds classified as intact and 80 watersheds classified as present but reduced. West Virginia contained the highest number of watersheds with brook trout classified as severely reduced (249) as well as a large percentage of watersheds with insufficient data to determine if brook trout were extirpated or never historically existed. Virginia had the largest number of extirpated watersheds (148) in the region.

Tennessee was the only state in the southeast (NC, SC, TN, GA) with an intact watershed. Tennessee and North Carolina combined had only five watersheds where brook trout populations were present but moderately reduced. North Carolina also has the highest number of present but severely reduced watersheds (116) and extirpated watersheds (95). Brook trout remain in less than 30% of the historical watersheds in Georgia.

Intact brook trout populations in lakes are confined exclusively to Maine (185), New Hampshire (3), New York (2), and Vermont (1). In Maine, brook trout lakes in 323 watersheds have severely reduced status, while lakes in 235 watersheds have an unknown population status. New Hampshire contains the highest number watersheds with lakes of unknown status (250), while Vermont and New York contain the most watersheds (14) where brook trout populations in lakes have been extirpated.

Though the brook trout is not threatened as a species across its vast range in the eastern United States, the assessment illustrates that both stream and lake populations have experienced dramatic declines from historic levels. Brook trout continue to persist, however, in isolated strongholds and in a large number of increasingly fragmented populations.

Assessment of Threats to Brook Trout

In addition to compiling data on brook trout population status over a 17-state region, Hudy et al. (2005) also interviewed regional fishery managers and asked them to rank perturbations and threats for all watersheds that historically supported reproducing brook trout populations. Perturbations and threats were separated into three categories of severity: (1) eliminates a brook trout life cycle component; (2) reduces brook trout population abundance; and (3) potentially impacts brook trout populations. Across the entire study area, the top five perturbations ranked as having a category 1 or 2 severity for stream and lake-dwelling populations were high water temperature, agriculture, riparian condition, one or more non-native fish species, and urbanization. Non-native fish species were considered the greatest threats to lake populations, while acid precipitation, low dissolved oxygen, eutrophication, and poor forestry management practices were also significant concerns.

The findings from the rangewide status and threats assessment serve as the foundation for the EBTJV Conservation Strategy vision, goals, key priorities and strategies.

Vision

The vision of the Eastern Brook Trout Joint Venture is to ensure healthy, fishable brook trout populations throughout their historic eastern United States range.

Principal Goals

The principal goals of the Eastern Brook Trout Joint Venture are:

1. Conserve, enhance or restore brook trout populations that have been impacted by habitat modification or other population level threats.
2. Encourage partnerships among management agencies and stakeholders to seek solutions to regional environmental and ecological threats.
3. Develop and implement outreach and educational programs to ensure public awareness of the challenges that face brook trout populations.
4. Develop support for program implementation that perpetuate and restore brook trout populations throughout their historic range.

Key Priorities

To assist the EBTJV achieve its vision the following key priorities were established:

- A. Protect brook trout populations across the species eastern United States range.
- B. Restore brook trout (subspecies, stocks and populations) throughout their historic ranges where original habitat conditions exist and where habitats can be feasibly restored.
- C. Monitor and evaluate brook trout population responses to habitat protection, enhancement and restoration projects.
- D. Complete quantitative status assessments of brook trout distribution throughout its eastern United States range.
- E. Increase recreational fishing opportunities for wild brook trout.

State-Level Conservation Action Plans

The principal goals and key priorities served as the framework for the development of state-level brook trout conservation action plans, which collectively formed the basis for rangewide and regional conservation strategies. Each state-level action plan prioritizes the specific strategies needed for brook trout conservation within that state. State-level

action plans were developed with input from a variety of federal, state, and nongovernmental partners and reflect a broad approach to brook trout conservation.

Conservation Strategies (Principal Goal 1)

The conservation strategies describe the actions needed to conserve, enhance or restore brook trout populations impacted by habitat modification or other population level threats. Rangelwide strategies serve as guidelines that allow for flexibility while assuring regional and state-level strategies follow the best available scientific knowledge, are consistent with one another, and together, form a well-integrated, well-organized, and comprehensive Conservation Strategy for brook trout.

Habitat

Efforts to improve the status of brook trout should begin by protecting habitat that supports existing relatively healthy and productive populations. The next step is to expand adjacent habitats that have been historically productive or have a likelihood of sustaining healthy populations by reconnecting or improving habitat. In a similar manner, this approach applies to the restoration of weak brook trout populations; the restoration should focus first on the habitat where portions of that population are doing relatively well, and then extend to adjacent habitats.

Regional and state-level actions will vary depending on the current condition and the restoration potential of the habitat (including the ecological functions of the habitat and the habitat structure) available for use by brook trout. Actions should focus on preserving brook trout habitat where it is largely intact as well as bringing brook trout population abundance up to the habitat's sustainable capacity through natural reproduction. Where habitat for brook trout is absent or severely diminished, but can be restored through available techniques and approaches, actions should center around habitat restoration that is based on the biological potential of the brook trout population. Where brook trout populations are self-sustaining, efforts should be directed towards restoring the habitat to intact condition. If brook trout populations have been eliminated as a result of habitat deterioration, they can be restored by transplanting brook trout of the appropriate genetic origin from adjacent streams or watersheds after restoration of the habitat is completed.

Increasing the abundance of self-sustaining brook trout populations may not, by itself, result in long-term recovery. Restoration efforts must focus on restoring habitats and developing ecosystem conditions and functions that will allow for expanding and maintaining diversity within and among species in order to sustain a system of robust populations in the face of environmental variation.

Habitat Strategies

Chagrin River TMDL Appendices

Rangewide

1. Maintain the current number of known subwatersheds that are classified as healthy (>50% occupied; N=773) and strengthen 10% of healthy subwatersheds rangewide.
2. Establish self-sustaining brook trout populations in 10% of known extirpated subwatersheds (N=1,083).
3. Improve 30% of the known reduced subwatersheds to the healthy classification and maintain 70% reduced subwatersheds in existing or improved condition (N=1,481)
4. Validate classification of predicted subwatersheds (N=1,664)

Regional

1. Maintain the current status of 477 known subwatersheds that are classified as healthy in the North region, 157 in the Mid-Atlantic region and 112 in the South region.
2. Strengthen 15 healthy subwatersheds in the North region, 20 in the Mid-Atlantic region and 10 in the South region.
3. Establish self-sustaining brook trout populations in 19 subwatersheds classified as extirpated in the North region, 10 in the Mid-Atlantic region, and 15 in the South region.
4. Improve 15 known reduced subwatersheds to the healthy classification in the North region, 15 in the Mid-Atlantic region and 12 in the South region.
5. Strengthen 30 reduced subwatersheds in the North region, 30 in the Mid-Atlantic region and 30 in the South region.
6. Maintain 505 reduced subwatersheds in existing condition in the North region, 678 in the Mid-Atlantic, and 189 in the South region.
7. Validate the predictive brook trout status model by assessing 50% (or some statistically valid number) of predicted subwatersheds in the North region (n=700), Mid-Atlantic region (n=48) and in the South region (n= 84).

State-Level

Chagrin River TMDL Appendices

1. Work with land management agencies during their planning process to improve protection of brook trout resources.
2. Work with state and federal regulatory agencies to maximize brook trout habitat and water quality protection.
3. Pursue direct land purchase to protect brook trout habitat.
4. Establish land conservation easements that require the use of Best Management Practices and include the development of stewardship plans.
5. Assist landowners in utilizing existing land conservation programs (e.g. LIP, CREP)
6. Partner with local municipalities and developers to study several watersheds to determine if brook trout protection measurements are effective (i.e. brook trout friendly developments).
7. Minimize fish stocking impacts to wild brook trout populations.
8. Mitigate factors that degrade water quality (e.g., liming).
9. Maintain or restore natural hydrologic regimes.
10. Prevent the spread of invasives species through public education and outreach.
11. Expand and integrate state, federal and private programs that support riparian and coastal zone conservation along brook trout streams (e.g., CREP, WHIP, Partners for Fish and Wildlife, and state, county, and private conservation programs). This should include efforts to integrate alternative mitigation programs.
12. Utilize state, federal and private programs that support watershed stewardship programs in systems containing brook trout (e.g., USDA Healthy Forest Restoration Act) through the state forestry agencies.
13. Improve water quality.
14. Enhance and restore stream habitat for brook trout.

**Chagrin River TMDL
Appendices**

15. Improve connectivity of brook trout habitat.
16. Improve instream flow conditions.
17. Control invasives species to minimize or eliminate their negative impacts on brook trout.
18. Partner with organizations on projects that involve nongame species, migratory birds, and brook trout.
19. Eradicate invasive species from brook trout habitat where feasible.
20. Establish brook trout populations in streams where habitat is currently available or has been restored.
21. Re-establish connectivity of brook trout habitat through barrier removal and improved fish passage.
22. Work with landowners in key watersheds that have high potential for habitat restoration (i.e., spring creeks).
23. Remediate Acid Mine Drainage (AMD) and acid deposition impacts to brook trout habitat.