

Species Status Assessment

Class: Agnatha (jawless fish)
Family: Petromyzonidae (lamprey)
Scientific Name: *Ichthyomyzon greeleyi*
Common Name: Mountain brook lamprey

Species synopsis:

The mountain brook lamprey has a fragmented range in the Mississippi basin with populations occurring in New York, Pennsylvania, and adjacent areas of Ohio. It is also found in the Cumberland and Tennessee Rivers in Tennessee, northern Alabama, Kentucky, and Virginia. Mountain brook lamprey occurs in medium-sized and smaller streams with clean sand. In New York, it lives in the French Creek, and other northern and central parts of the Allegheny basin. In the last 30 years mountain brook lamprey increased in range and abundance and although populations are restricted it seems secure.

Genetics studies by Docker in 2002 are controversial, but contend that the two species of this genus (including Ohio lamprey) might be morphs of one species (Docker 2009, Docker et al. 2012).

I. Status

a. Current and Legal Protected Status

- i. **Federal** Not Listed **Candidate:** No
ii. **New York** Special Concern, SGCN

b. Natural Heritage Program Rank

- i. **Global** G4
ii. **New York** S1 **Tracked by NYNHP** Yes

Other Rank:

Species of Northeast Regional Conservation Concern (Therres 1999)

Status Discussion:

Mountain brook lamprey is globally ranked as Apparently Secure. It occurs in the Ohio River basin, from New York to northern Alabama and Georgia, and has been extirpated from some areas as a result of habitat degradation due to pollution, siltation, and dams. This is a secretive species and it is likely more abundant than available information indicates. Populations are now probably relatively stable, but better information is needed. In New York it is state listed as Special Concern and ranked as Critically Imperiled (NatureServe 2012). The native range of this fish includes 10 states. Of those, 4 states list this species as critically imperiled (S1), 4 list it as imperiled (S2), and the remaining 2 list it as vulnerable (S3) (Nature Serve 2013).

II. Abundance and Distribution Trends

a. North America

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: 2002-2012

b. Regional

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Region 5 – Northeast (Species of Concern)

Time Frame Considered: _____

c. Adjacent States and Provinces

CONNECTICUT	Not Present <u> X </u>	No data _____
MASSACHUSETTS	Not Present <u> X </u>	No data _____
NEW JERSEY	Not Present <u> X </u>	No data _____
ONTARIO	Not Present <u> X </u>	No data _____
QUEBEC	Not Present <u> X </u>	No data _____
VERMONT	Not Present <u> X </u>	No data _____

PENNSYLVANIA **Not Present** _____ **No data** _____

i. Abundance

____ declining ____ increasing X stable ____ unknown

ii. Distribution:

____ declining ____ increasing X stable ____ unknown

Time frame considered: 1980-1995

Listing Status: Threatened (S2) SGCN? Yes

Pennsylvania Wildlife Action Plan indicates that populations may be stable or declining. The distribution has dropped from 7 counties to 3 according to PA Natural Heritage Program.

d. NEW YORK

No data _____

i. Abundance

___ declining ___ increasing ___ X stable ___ unknown

ii. Distribution:

___ declining ___ increasing ___ X stable ___ unknown

Time frame considered: _____ 1970 – present _____

Monitoring in New York.

Monitoring programs are carried out by the NYSDEC Rare Fish Unit, 1998-2012.

Trends Discussion:

This species is relatively widespread in its fragmented range, and it is not known to be locally abundant in nearby Pennsylvania today (Cooper 1985, J. Stauffer letter to NYSDEC 1993). It was found to be common in earlier years in Pennsylvania in studies by Raney, and it was also common in the same area in 1975 (Cooper 1983). The largest collection from Virginia (aside from spawning groups) contained only five adults (Jenkins and Burkhead 1994).

The short-term/recent trend for area of occupancy, number of subpopulations, population size, and habitat quality for this species is thought to be relatively stable (=10% change). It is probable that most of the decline for this species occurred many years ago; long term trends show a decline of 30-70% and some populations have been extirpated (NatureServe 2012).

In New York State, mountain brook lamprey is now found in 5 waters within the Allegheny Watershed and their range is not declining (or gone or dangerously sparse). Its abundance in New York remains poorly understood because of its secretive habits.

The differences in frequency occurrence in comprehensive stream surveys from this watershed show no evidence of decline, and there were low levels during all three periods, 1% to 4% to 5% for periods of 1930s, 1970s, and 2000s.

The distribution of this species among sub-basins (HUC 10) within the one watershed has increased, with records from 1 of the unit prior to 1977 (French Creek) and from 3 additional units since 1976. Statewide, the number of individual site records for this species has been 22 for all time periods, 19 in the last 30 years, and 15 since 1993.

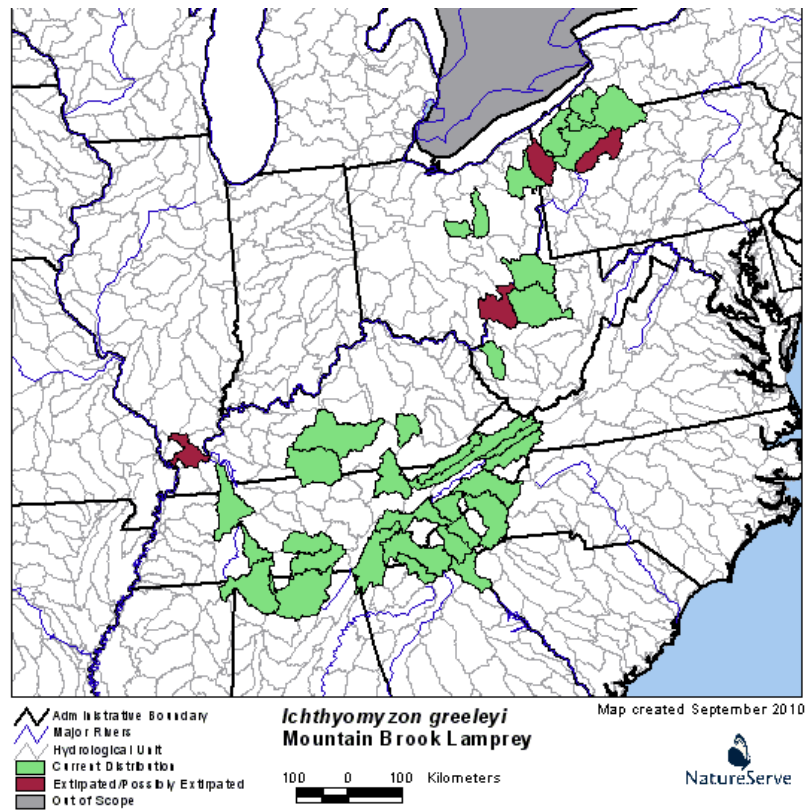


Figure 1. U.S. distribution of mountain brook lamprey by watershed (NatureServe 2012).

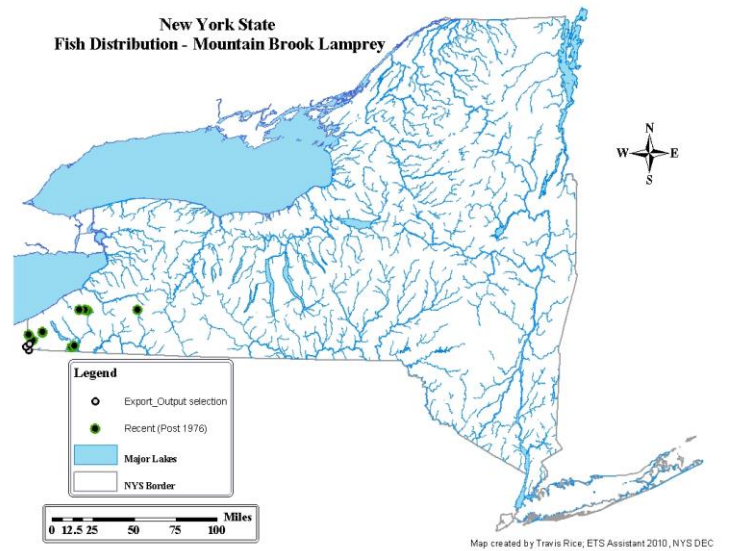
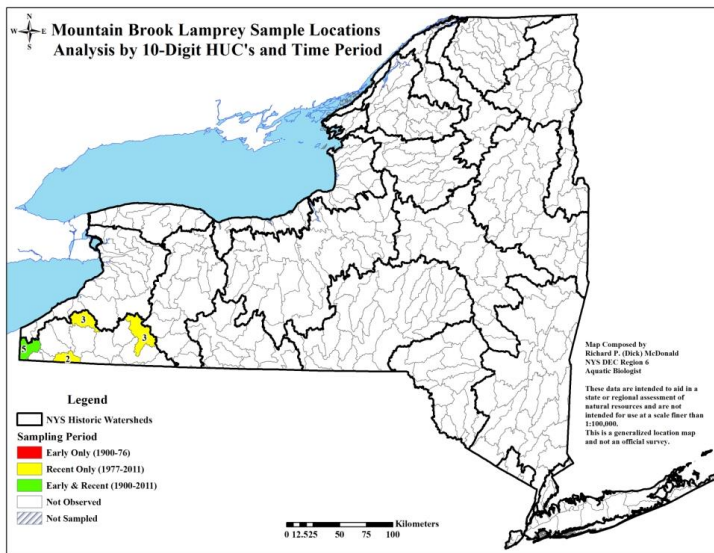


Figure 2. Mountain brook lamprey distribution in New York, depicting fish sampled before 1977 and from 1977 to current time, shown with the corresponding HUC-10 units where they were found and the number of records.

Watershed name	Total # HUC10	Early only	Recent only	both
Allegheny	4	0	3	1

Table 1. Records of rare fish species in hydrological units (HUC-10) are shown according to their watersheds in early and recent time periods (before and after 1977) to consider loss and gains. Further explanations of details are found in Carlson (2012).

III. New York Rarity, if known:

Historic	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1977	_____	<u>3 site records</u>	<u>1/18 watersheds</u>
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

Details of historic occurrence:

In New York, mountain brook lamprey was collected in French Creek in 1937 at 0.05% of the sites within the Allegheny system (Smith 1985). It was also caught in Pennsylvania in tributaries of the Allegheny River upstream and downstream of New York (Cooper 1983). The only early catches of this lamprey are from French Creek in 1937 and 1975 (Daniels 1989).

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
(since 1977)	_____	<u>19 site records</u>	<u>1/18 watersheds</u>

Details of current occurrence:

More recent catches are from French Creek in 1979 (Cornell Univ.), 1981 (Smith 1985) and in 2000-03 (DEC). Most collections have been near the villages of French Creek and Sherman (Chautauqua County). Unconfirmed collections of ammocoetes in 1998 put this species in seven tributaries of Conewango Creek, Cassadaga Creek and Allegheny River (M. Bain & M. Meixler, Cornell U.). Continued sampling by DEC in nearly all of these resulted in confirmation of the species in Ischua Creek at Machias, W. Br. Conewango Creek at Skunk Corners and Stillwater Creek at Rte 62 in 2000-04. An additional location was shown with sampling in the West Branch of the French Creek in 2003. This puts the total number of locations at five waters.

New York's Contribution to Species North American Range:

% of NA Range in New York	Classification of New York Range
<input type="checkbox"/> 100 (endemic)	<input type="checkbox"/> Core
<input type="checkbox"/> 76-99	<input checked="" type="checkbox"/> Peripheral
<input type="checkbox"/> 51-75	<input checked="" type="checkbox"/> Disjunct
<input type="checkbox"/> 26-50	Distance to core population:
<input checked="" type="checkbox"/> 1-25	<u>400 mi</u>

IV. Primary Habitat or Community Type:

1. Headwater/Creek, Low-Moderate Gradient, Moderately Buffered, Neutral, Transitional Cool

Habitat or Community Type Trend in New York:

Declining Stable Increasing Unknown

Time frame of decline/increase: _____

Habitat Specialist? Yes No

Indicator Species? Yes No

Habitat Discussion:

This species is found in gravel riffles and sandy runs of clean, clear streams and in the pebbles, sand, mud and debris in pools and backwaters. It spends its life in creeks without moving to larger rivers (Smith 1985). Stream temperatures are usually marginal, or warmer than what is suitable for trout. Adults occur in riffles or runs, under overhanging banks, or occasionally they attach to stones in the current; larvae burrow into beds of mixed sand, mud, and organic debris in pools and backwaters (Burr and Warren 1986, Page and Burr 2011). In Pennsylvania, spawning occurred just above swift riffles and throughout slow to moderate riffles (Raney 1939). In West Virginia, spawning occurred in the middle and lower portions of riffles (Schwartz 1959). In Virginia, Jenkins and Burkhead (1994) observed a spawning group in a gentle, shallow run of mostly small, loose gravel in a stream 2-4 meters wide.

V. New York Species Demographics and Life History

- Breeder in New York**
 - Summer Resident**
 - Winter Resident**
 - Anadromous**
- Non-breeder in New York**
 - Summer Resident**
 - Winter Resident**
 - Catadromous**
- Migratory only**
- Unknown**

Species Demographics and Life History Discussion:

The mountain brook lamprey lives up to 5 or 6 years, and usually dies after spawning. Spawning occurs in spring (late April to early June in several areas), and spawning in N. Conwango Creek has been seen in late May of 2009 and 2012. Larvae metamorphose mid-August to mid-December in western North Carolina (Beamish and Austin 1985).

VI. Threats:

According to The Nature Conservancy (1994), a number of potential threats to French Creek's water quality and aquatic fauna have been identified including 1) siltation from overgrazing, row cropping, road construction, and land clearing 2) elevated nutrients from dairy animal wastes, sewage plant failure and fertilizer spills/runoff and 3) pesticide threats from catastrophic events and agricultural applications. In other areas, stream alteration, including dams that block movements of adults and ammocoetes, have been listed among threats to this species.

Mountain brook lamprey has a general history of depletion, localization, and extirpation in other areas (Trautman 1981). Vladykov (1973) summarized reasons for protecting nonparasitic lampreys. However, no declines are now recognized in New York.

Are there regulatory mechanisms that protect the species or its habitat in New York?

No Unknown

Yes

The Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Conservation Law. However, agricultural activities, which can degrade the high water quality needed by these fish, are exempt from regulation under Article 15. While it is unlikely that mountain brook lamprey occur in any Class C streams, these streams are also exempt from Article 15 regulation.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Better information is needed on current distribution, abundance, and trends. Conservation actions following IUCN taxonomy are categorized in the table below.

Conservation Actions	
Action Category	Action
Land/Water Management	Site/Area Management
Land/Water Management	Habitat & Natural Process Restoration

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for the mountain brook lamprey.

Habitat Research:

Inventory the habitat requirements of this species and protect critical areas, as is part of the State Wildlife Grants project in 2003 focusing on the Allegheny watershed. These efforts will be coordinated with similar programs in place by The Nature Conservancy.

Life History Research:

Also specific information of its life history in the French and Olean Creek systems is needed. Studies in Pennsylvania on the native lamprey species (J. Stauffer, Penn. State Univ.) were to be completed in 1998, and this will provide valuable insight. Sampling in the Allegheny tributaries in 2000 by the author has extended the known range of the genus *Izthomyzon*, but there is yet a limited basis to confirm which species (*I. greeleyi* or *I. bdellium*). More sampling is needed to obtain adults which can be identified to species.

Population Monitoring:

— More information is needed for this lamprey regarding the significance of its occurrence in French Creek.

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Date last revised: July 30, 2013