

# Species Status Assessment

**Class:** Osteichthyes (bony fishes)  
**Family:** Hioidontidae (mooneye)  
**Scientific Name:** *Hiodon tergisus*  
**Common Name:** Mooneye

## Species synopsis:

The mooneye is found in waters from south-central Canada (Hudson Bay Basin) southward through the Great Lakes Basin (except Lake Superior), the St. Lawrence River, and the Lake Champlain drainage basin. It lives in low gradient, clear-water streams and lakes and is native to 7 of 18 watersheds in New York. Populations have declined to levels below detection in the Allegheny watershed and it is thought to be extirpated from New York portions of Lake Ontario. Steep declines have been noted in the Champlain and Erie watersheds. It has recovered in the Oswegatchie and St. Lawrence watersheds, particularly in tributaries downstream of Massena. Other watersheds with records include Ontario and Raquette.

## I. Status

### a. Current and Legal Protected Status

- i. **Federal** None **Candidate:** No
- ii. **New York** Threatened, SGCN

### b. Natural Heritage Program Rank

- i. **Global** G5
- ii. **New York** S1 **Tracked by NYNHP** Yes

## Other Rank:

Species of Northeast Regional Conservation Concern (Therres 1999)

## Status Discussion:

The mooneye is globally ranked Secure because it is represented by a large number of occurrences and is locally common. In New York, the moon eye is ranked Critically Imperiled and Threatened due to a decrease in both numbers and locations where it is found.

**II. Abundance and Distribution Trends**

**a. North America**

**i. Abundance**

declining  increasing  stable  unknown

**ii. Distribution:**

declining  increasing  stable  unknown

**Time frame considered:** Past 10 years or 3 generations (NatureServe 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   X                        No data \_\_\_\_\_  
**MASSACHUSETTS**                      Not Present   X                        No data \_\_\_\_\_  
**NEW JERSEY**                      Not Present   X                        No data \_\_\_\_\_

**ONTARIO**                      Not Present \_\_\_\_\_                      No data \_\_\_\_\_

**i. Abundance**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                        X   stable                      \_\_\_\_\_ unknown

**ii. Distribution:**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                        X   stable                      \_\_\_\_\_ unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Not Listed \_\_\_\_\_

**PENNSYLVANIA**                      Not Present \_\_\_\_\_                      No data \_\_\_\_\_

**i. Abundance**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                      \_\_\_\_\_ stable                        X   unknown

**ii. Distribution:**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                      \_\_\_\_\_ stable                        X   unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Threatened \_\_\_\_\_ SGCN?   Yes  

**QUEBEC**                      Not Present \_\_\_\_\_                      No data \_\_\_\_\_

**i. Abundance**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                        X   stable                      \_\_\_\_\_ unknown

**ii. Distribution:**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                        X   stable                      \_\_\_\_\_ unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Not Listed \_\_\_\_\_

**VERMONT** **Not Present** \_\_\_\_\_ **No data** \_\_\_\_\_

**i. Abundance**

\_\_\_ declining \_\_\_ increasing \_\_\_ stable  X  unknown

**ii. Distribution:**

\_\_\_ declining \_\_\_ increasing \_\_\_ stable  X  unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Not Listed \_\_\_\_\_ SGCN?  Yes

**d. NEW YORK** **No data** \_\_\_\_\_

**i. Abundance**

\_\_\_ declining \_\_\_ increasing \_\_\_ stable  X  unknown

\* no clear trend

**ii. Distribution:**

X  declining \_\_\_ increasing \_\_\_ stable \_\_\_ unknown

Time frame considered:  Since 1977

**Monitoring in New York.**

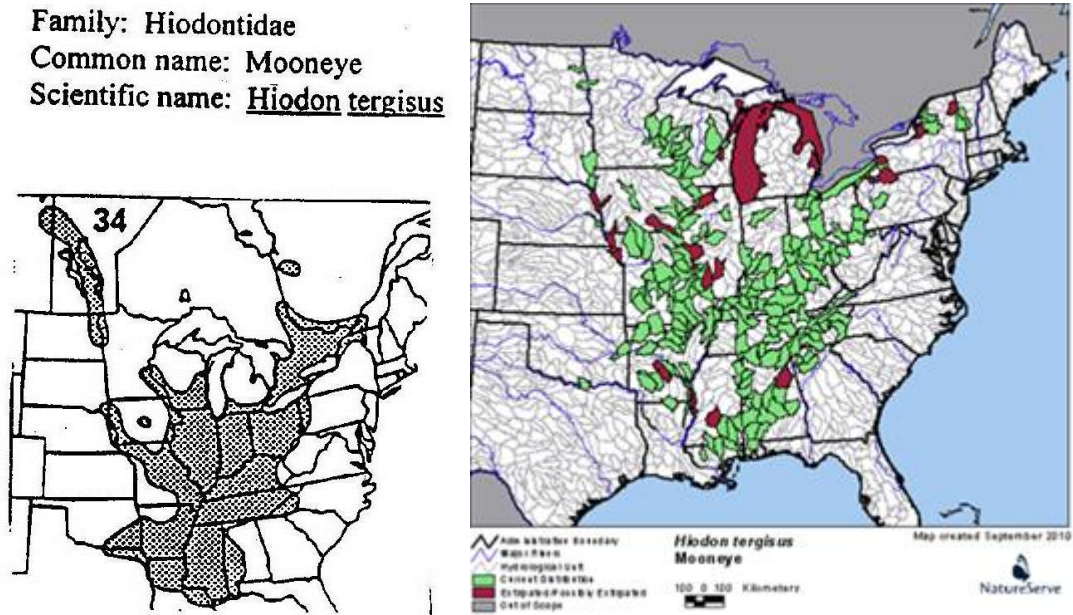
Monitoring programs are carried out by the NYSDEC Rare Fish Unit, 1998-2012.

**Trends Discussion:**

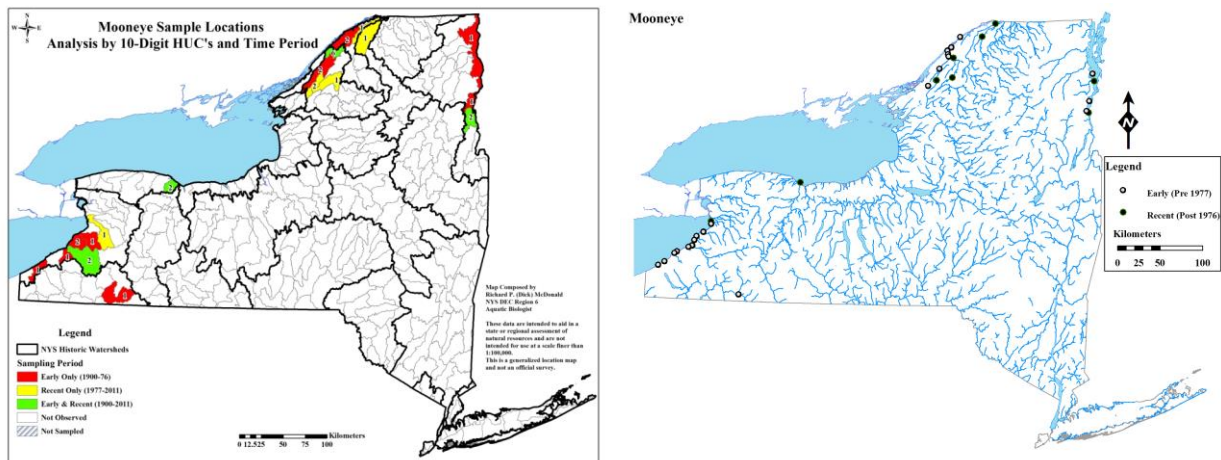
In New York, mooneye has historically been found in 11 waters and its range is declining (or gone or dangerously sparse) in 2 of the 7 watersheds where it is currently known. Abundance seems to be increasing in Black Lake, the section of the Oswegatchie River near Heuvelton and Lake St. Francis of the St. Lawrence; abundance appears to be declining in Lake Champlain. There will be no recovery in the Allegheny River without a reintroduction from a distant source.

The distribution of this species among sub-basins (HUC 10) within each watershed has changed substantially. Overall, there are records from 18 of the units for all time periods, and presently

there are 9 units, showing a major loss of its former range. Statewide, the number of individual site records for this species has been 53 for all time periods, 39 in the last 30 years, and 17 since 1993.



**Figure 1.** National range map of mooneye (left) and U.S. distribution of mooneye by watershed (right) (Page and Burr 1991, NatureServe 2012)



**Figure 2.** Mooneye distribution in New York, depicting fish sampled before 1977 and from 1977 to current time, shown with the corresponding HUC-10units where they were found, along with the number of records. Right map shows the New York range of mooneye.

Watershed name	Total # HUC10	Early only	Recent only	both	Watershed status
Allegheny	1	1			loss
Champlain	3	2		1	
Erie-Niagara	6	4	2	1	
Oswegatchie	4	1	2	1	
Raquette	1		1		
St. Lawrence	2	1	1		
Ontario	1			1	
sum	18	9	5	4	

**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>14 site records</u>	<u>7/18 watersheds</u>
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

**Details of historic occurrence:**

Mooneye was historically found in 11 waters in the Allegheny, Champlain, Erie-Niagara, Oswegatchie, Raquette, St. Lawrence, and Ontario HUC-10 watersheds.

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
(since 1977)	_____	<u>39 site records</u>	<u>6/18 watersheds</u>

**Details of current occurrence:**

Mooneye is currently found in all historic HUC-10 watersheds, with the exception of the Allegheny.

**New York's Contribution to Species North American Range:**

<b>% of NA Range in New York</b>	<b>Classification of New York Range</b>
<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	<b>Distance to core population:</b>
<input checked="" type="checkbox"/> 1-25	<u>100 miles</u>

**IV. Primary Habitat or Community Type:**

1. Large/Great River, Low Gradient, Assume Moderately Buffered, Warm
2. Winter-stratified Monomictic Lake
3. Summer-stratified Monomictic Lake

**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:**

The mooneye prefers clear water habitat of large streams, rivers and lakes, including deep pools and backwaters. It is often in non-flowing waters but feeds mostly in swift water. Spawning may occur upstream in large clear streams; eggs are semi-buoyant and drift downstream or into quiet water (NatureServe 2012).

The only two known spawning areas in New York are in the St. Lawrence River at Ogdensburg (Tibbits Creek and Oswegatchie River mouth) and upstream of Black Lake at Rossie (Greeley and Greene 1931, Greeley and Bishop 1932). Spawning in the Indian River at Rossie has been assumed

to be in mid-late April when temperatures are about 50F. In New York, habitat in the smaller historic waters is probably still suitable.

**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:**

Mooneye has an intermediate length life span. Individuals up to age 8 have been collected from Lake Erie, and age 11 mooneye have been reported from Canada (Werner 2004). Males usually reach sexual maturity in 3 years, while females are often not mature until 5 years of age. The mooneye migrates into medium to large-sized rivers from March through May to deposit its eggs over rocks in swift water areas (Wallus and Buchanan 1989). Females release approximately 10,000-20,000 eggs.

**VI. Threats:**

While the causes of population declines are not known, one likely factor is increased siltation occurring in clear water areas where mooneye normally occur. Mooneye can be caught by anglers, but it is not expected that angling is a threat to population recovery.



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

No       Unknown  
 Yes

The mooneye is listed as a threatened species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

The Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Conservation Law.

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

Little is known about mooneye in the New York waters of Lake Erie; presently it remains difficult to describe actions needed for recovery. New York may not be encountering mooneye because we are not sampling in a targeted fashion and/or because their preferred habitat is limiting in the New York waters of Lake Erie.

Conservation actions following IUCN taxonomy are categorized in the following table.

Conservation Actions	
Action Category	Action
Land/Water Management	Site/Area Management
Land/Water Management	Habitat/Natural Process Restoration
External Capacity Building	Alliance & Partnership Development

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

**Habitat Restoration:**

---- Restoration of spawning areas may be accomplished with cobble and rubble placed in streams like that done for walleye spawning. Examples near Black Lake include the Oswegatchie River at Ogdensburg and Fish Creek at Pope Mills.

## **Population Monitoring:**

---- The status of the Black Lake and the Lake Erie populations need to be evaluated, and critical habitats needs to be identified.

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