

## Species Status Assessment

**Class:** Osteichthyes (bony fishes)  
**Family:** Cyprinidae (minnow)  
**Scientific Name:** *Hybopsis amblops*  
**Common Name:** Bigeye chub

### Species synopsis:

The bigeye chub was historically found from New York southward to Georgia and westward to Oklahoma and Michigan in the north. It occurs throughout the larger streams and their tributaries of western New York in areas with clean gravel. It is native in 4 of 18 watersheds. Since 1977, it has been found in half of its former range and has not been taken in the Ontario and Oswego watersheds. In the Allegheny watershed stream surveys of the 2000s, it was encountered six times less frequently than in the 1930s. There has been a six-fold increase of catches in the Erie watershed although its overall range has been decreasing.

### I. Status

#### a. Current and Legal Protected Status

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

#### b. Natural Heritage Program Rank

- i. **Global** G5  
ii. **New York** S2 **Tracked by NYNHP?** Yes

### Other Rank:

None.

### Status Discussion:

Bigeye chub is globally ranked as Secure because it has a widespread distribution in the eastern and central U.S. It is common to abundant in the south and has been reduced in abundance or extirpated from many agricultural areas in north. In New York, bigeye chub is ranked as Imperiled due to its decreased range throughout the state and its sensitivity to siltation (NatureServe 2012).

Bigeye chub is listed as SGCN in Michigan and Ohio, where it is ranked as SH and S4 respectively. The Ohio DNR website notes that, "Bigeye chubs were once common throughout Ohio but today are almost entirely absent from the Northwest part of the state and have disappeared from many other river systems as well." This species is listed as endangered in Illinois. Other states throughout the range note steep declines.

## 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/3 generations (NatureServe 2012)

### b. Regional

#### i. Abundance

declining  increasing  stable  unknown

#### ii. Distribution:

declining  increasing  stable  unknown

Regional Unit Considered: Region 5 - Northeast

Time Frame Considered: \_\_\_\_\_

c. Adjacent States and Provinces

CONNECTICUT                      Not Present  No data \_\_\_\_\_

MASSACHUSETTS                      Not Present  No data \_\_\_\_\_

NEW JERSEY                      Not Present                       No data \_\_\_\_\_

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

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

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

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

i. Abundance

declining     increasing                       stable                       unknown

ii. Distribution:

declining     increasing                       stable                       unknown

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

Listing Status: \_\_\_\_\_ Not Listed \_\_\_\_\_ SGCN?  No \_\_\_\_\_

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

i. Abundance

declining     increasing                       stable                       unknown

ii. Distribution:

declining     increasing                       stable                       unknown

Time frame considered: \_\_\_\_\_ 1970s - present \_\_\_\_\_

## **Monitoring in New York.**

Monitoring programs are carried out by the Rare Fish Unit (1998-present).

## **Trends Discussion:**

The short term trend for this species over the past 10 years or three generations is uncertain but probably relatively stable or slowly declining (30%). Long-term trends show that distribution and abundance have declined greatly in the north (NatureServe 2012). It is common to abundant in the south but reduced in abundance or extirpated from many agricultural areas in the northern portion of its range. Historically, bigeye chub were found in over 19 waters (now only in 6) and are declining in their range (or gone or dangerously sparse) in all 4 watersheds. Abundance has declined in the Ontario, Allegheny, and Oswego watersheds.

More widely distributed in the Allegheny in the 1930s, they were collected in more than 13% of the stream sites. Other watersheds in the 1930s contained fewer, like 1.1% in the Erie, 0.6% in the Ontario and the only catch in Oswego was near Montezuma Marsh in 1886. During the 1950s and after 1979 when there were extensive surveys in the Allegheny, the bigeye chub was less commonly caught.

The distribution of this species among sub-basins within each watershed (HUC 10) have also changed substantially, with records from 20 of the units from before 1977 and only 7 units occupied since 1977. Statewide, the number of records for this species in the last 35 years has been 19, compared to 103 reports prior to 1977. Since 1993 it has been caught 20 times (some sites with multiple catches). This trend of decline in all 4 of the watersheds causes imminent concern for this species.

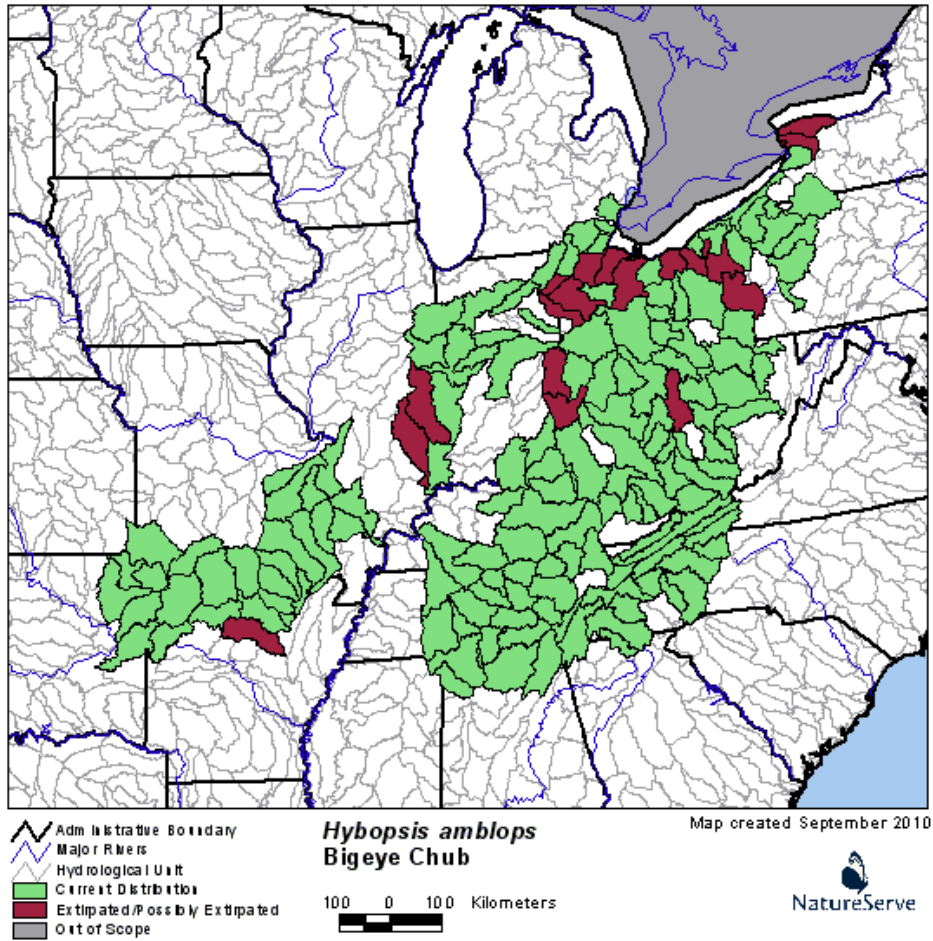
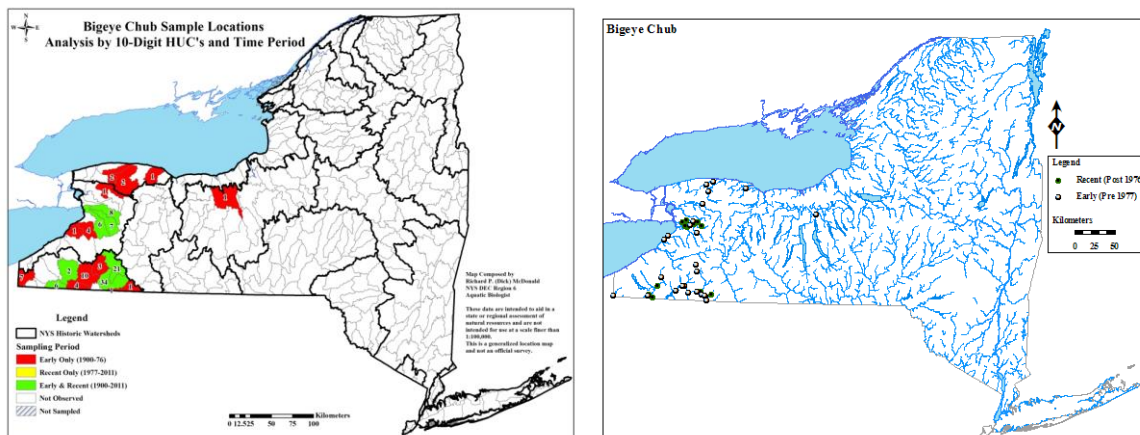


Figure 1. U.S. distribution of bigeye chub by watershed (NatureServe 2012).



**Figure 2.** Bigeye chub 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 along with the number of records. Left map depicts the range of bigeye chub in New York.

	<b>Total # HUC10</b>	<b>Early only</b>	<b>Rec only</b>	<b>Early &amp; Recent</b>	Watershed status
Allegheny River	<b>10</b>	<b>6</b>	<b>0</b>	<b>4</b>	
Lake Erie - Niagara R	<b>6</b>	<b>3</b>	<b>0</b>	<b>3</b>	
Lake Ontario	<b>3</b>	<b>3</b>	<b>0</b>		Loss
Oswego River	<b>1</b>	<b>1</b>	<b>0</b>		Loss
sum	<b>20</b>	<b>13</b>	<b>0</b>	<b>7</b>	

**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). Further explanations of details are found in Carlson (2012).

**III. New York Rarity, if known:**

<b>Historic</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
<b>prior to 1977</b>	_____	<u>103 records</u>	<u>4/18 watersheds</u>
<b>prior to 1980</b>	_____	_____	_____
<b>prior to 1990</b>	_____	_____	_____

**Details of historic occurrence:**

In the 1930s, bigeye chub were collected in more than 13% of the Allegheny stream sites. Other watersheds in the 1930s contained fewer: 1.1% in the Erie, 0.6% in the Ontario and the only catch in Oswego was near Montezuma Marsh in 1886. Bigeye chub were less commonly caught in extensive surveys of the Allegheny watershed during the 1950s and after 1979; tributaries of the eastern, central and western subbasins of the Allegheny watershed such as Dodge, Olean, Ischua, Oil, Fivemile, Great Valley and Stillwater creeks included this species prior to 1979 (Eaton et al. 1979). Additional areas where it appears to have declined or disappeared are in French Creek (Hansen 1983; NYS Museum 1985-2000) and Little Conewango Creek (Daniels 1989). Salmon Creek, a tributary of Lake Ontario near Rochester, is the only site in that watershed which contained this species as recently as 1957 (Cornell Univ. collection), while other ones like Johnson and Oak Orchard Creeks only have records from the 1930s.

<b>Current</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
<b>(since 1977)</b>	_____	<u>19 records</u>	<u>2/18 watersheds</u>

**Details of current occurrence:**

Bigeye chub is currently found in the Allegheny and Erie basins. In 1985-2000, Daniels only caught individuals in one tributary of the Allegheny, or 1/120 (0.1%) of the sites in the basin. In the tributaries of the eastern, central and western subbasins of the Allegheny, this species was found only in Olean, Stillwater, and Conewango creeks. Populations have declined least in the Erie watershed and individuals have recently been collected from the lower Buffalo River system including Buffalo, Little Buffalo, Cayuga and Cazenovia creeks.

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

<b>% of NA Range in New York</b>	<b>Classification of New York Range</b>
<u>   </u> 100 (endemic)	<u>   </u> Core
<u>   </u> 76-99	<u>  X  </u> Peripheral
<u>   </u> 51-75	<u>   </u> Disjunct
<u>   </u> 26-50	<b>Distance to core population:</b>
<u>  X  </u> 1-25	<u>   400 miles   </u>

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

1. Medium River, Low Gradient, Moderately Buffered
2. Small River, Low Gradient, Moderately Buffered

**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 bigeye chub is found in small to moderate sized streams with clean sand, gravel or rock bottoms. It is abundant in clear-water areas that are well vegetated with minimum current, usually near riffles in quiet water (Smith 1979). It is not found in areas of high turbidity and is exceptionally intolerant of siltation, making it a good indicator of water quality. Habitat trends are currently unknown.



**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:**

Very little is known of the life history of this species, but it is likely similar to other chubs (Werner 2004). It spawns from late spring to early summer and the majority of individuals mature in one year in the southern portion of its range (Jenkins and Burkhead 1994, NatureServe 2012). They feed on microcrustaceans, midge larvae and terrestrial insects.

**VI. Threats:**

This fish is intolerant of water impoundment, siltation, and pollution (NatureServe 2012). Siltation of gravel areas is likely a problem. Trautman (1981) has noted that populations of the bigeye chub declined in prairie streams of west central Ohio as a result of increased siltation of stream bottoms. Undoubtedly this has occurred in New York waters as well, but no studies to assess this or other problems, threats, limiting factors or overall vulnerability of this species or its essential habitat have been conducted. The loss of quality habitats when Montezuma Marsh was drained in the early 1900s was poorly documented, but this elimination of species was echoed with redbfin shiner, pugnose shiner and sauger from the same areas. The species is otherwise quite durable in most parts of its range.

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

No       Unknown

Yes

New York State Environmental Conservation Law, § 11-0535. 6 NYCRR Part 182.

The Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Conservation Law. However, agricultural activity is exempt from these regulations and not all streams are adequately protected by Article 15.

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

Doug Carlson recommends that stocking be considered in its former range in tributaries of Lake Ontario west of Rochester.

- Protect stream drainages from overuse and development
- Obtain life history information
- This is a priority species for restoration work by NYS.

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

<b>Conservation Actions</b>	
<b>Action Category</b>	<b>Action</b>
Land/Water Protection	Resource/Habitat Protection
Land/Water Management	Site/Area Management
Land/Water Management	Habitat/Natural Process Restoration (remediation of stream habitat)
Law/Policy Actions	Legislation Change/Implementation (protect streams from overuse/development)

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

**Habitat Research:**

— Inventory and assess losses of habitat and this species in tributaries of western Lake Ontario. Follow up with remediation efforts.

### **Population Monitoring:**

— More sampling is needed in these basins, like Olean/Ischua Creeks and the Buffalo River system.

## **VII. References**

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