

## Species Status Assessment

**Class:** Osteichthyes (bony fishes)  
**Family:** Cyprinidae (minnow)  
**Scientific Name:** *Notropis anogenus*  
**Common Name:** Pugnose shiner

### Species synopsis:

The original range of pugnose shiner extended from western New York and eastern Ontario west to southeastern North Dakota, south to northern Iowa, Illinois, Wisconsin, Michigan, northern Indiana, and northern Ohio. In New York, the pugnose shiner's native range is in near-shore areas of Cayuga Lake, Lake Ontario bays and the St. Lawrence River where submerged aquatic vegetation dominates. It has been reported in 3 of 18 watersheds, but has been extirpated from Cayuga Lake and the Oswego watershed. In Lake Ontario, two of the three historic populations have declined. There are more populations now than were reported historically in bays in the St. Lawrence watershed. It is sensitive to change in these specialized habitats dominated by aquatic vegetation.

Studies on genetics were initiated in 2009 by McCusker at the University of Toronto, and unique characteristics were described to distinguish those from Sodus Bay, the Thousand Islands Area and Lake St. Clair farther west.

### I. Status

#### a. Current and Legal Protected Status

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

#### b. Natural Heritage Program Rank

i. **Global**      G3  
ii. **New York**      S1      **Tracked by NYNHP** Yes

### Other Rank:

Canadian Species at Risk Act (SARA) Schedule 1/Annexe 1 Status: E (12Jan2005)

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Endangered (01Nov2002)

**Status Discussion:**

Pugnose shiner is fairly widespread but has a spotty distribution in the Great Lakes, Mississippi River, and Red River drainages from New York to North Dakota. It is generally uncommon to rare but sometimes locally abundant. This species is globally ranked as Vulnerable and it has declined greatly in some areas, especially at the periphery of the range, such as in New York where it is ranked as Critically Imperiled. Habitat degradation and destruction continue throughout the range (NatureServe 2012). Pugnose shiner is said to be one of the rarest minnows in the North America (Bailey 1959).

**II. Abundance and Distribution Trends**

**a. North America**

**i. Abundance**

  X   declining \_\_\_increasing \_\_\_stable \_\_\_unknown

**ii. Distribution:**

  X   declining \_\_\_increasing \_\_\_stable \_\_\_unknown

**Time frame considered:** 10 years or three generations (NatureServe 2012)

**b. Regional**

**i. Abundance**

  X   declining \_\_\_increasing \_\_\_stable \_\_\_unknown

**ii. Distribution:**

  X   declining \_\_\_increasing \_\_\_stable \_\_\_unknown

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

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

**c. Adjacent States and Provinces**

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

**i. Abundance**

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

**ii. Distribution:**

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

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

Listing Status: \_\_\_\_\_ Endangered \_\_\_\_\_

\*Listed as extirpated in Ohio

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

**Abundance**

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

**Distribution:**

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

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

## **Monitoring in New York.**

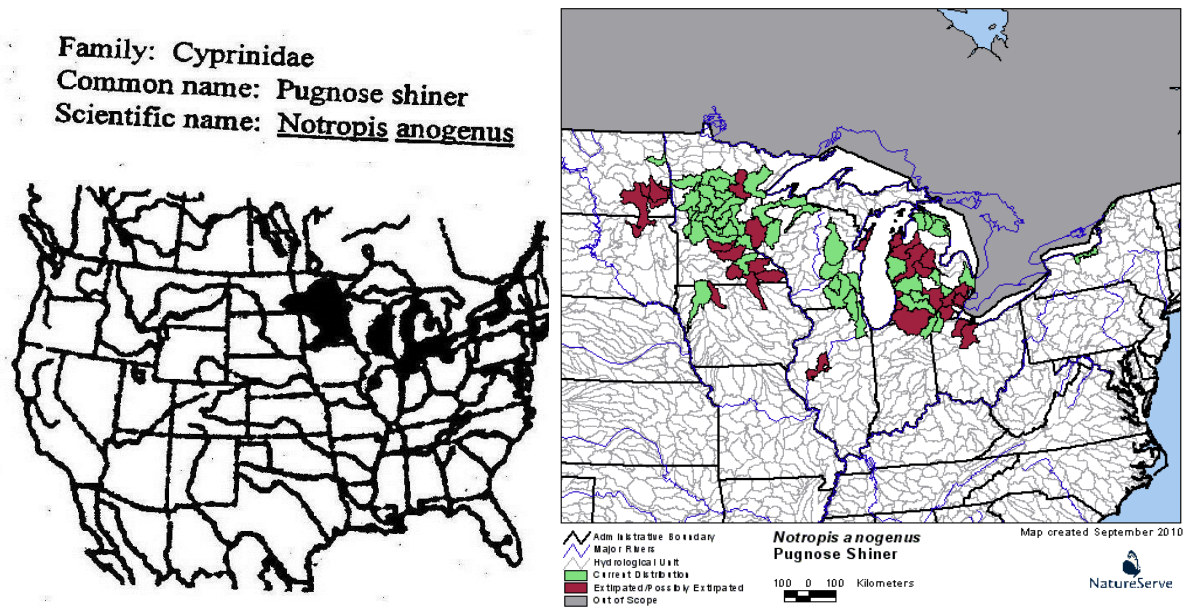
Monitoring programs carried out by the NYSDEC Rare Fish Unit, 1998-2012.

### **Trends Discussion:**

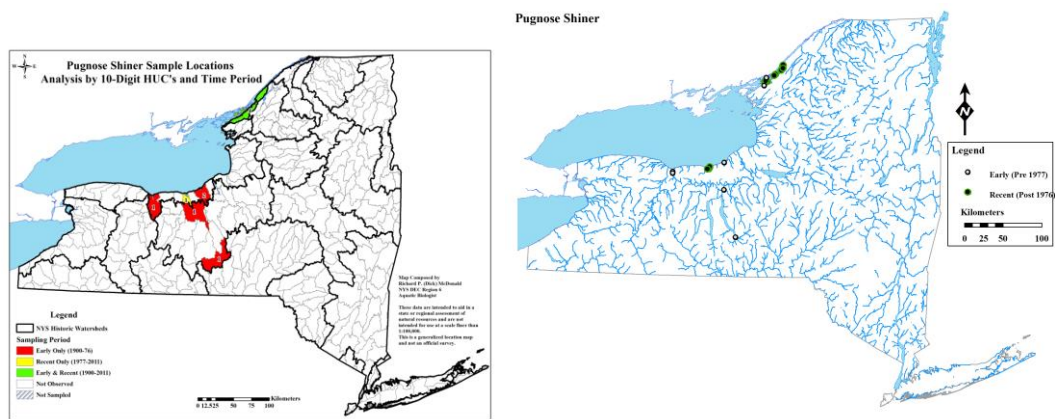
Short-term trend indicates that ongoing declines seem likely, but the rate of decline probably does not exceed 30%; long-term trends show a decline of 30-70% (NatureServe 2012). In New York, pugnose shiner has historically been found in six waters (still in four) and otherwise their range is not declining (or gone or dangerously sparse) in the two watersheds. Their abundance appears to be stable in the St. Lawrence, but the species is apparently gone from the areas near Cayuga Lake, Irondequoit Bay and Little Sodus Bay. In Sodus Bay, both the habitat and population are vulnerable to change and are poorly understood. St. Lawrence River sampling in 2009-10 by USGS Cortland showed a possible increase in their abundance.

More subtle indications came from comparisons for the sample periods of 1930s, 1970s and 2000s, and there were similar catches in the bays of Lake Ontario (0.3% to 0% to 0.6%) between periods. In the St. Lawrence River there were additional samples in 2009-10 and catch frequencies were favorably high as in 1993-2003. There may be an increase in their abundance here in the last 20 years, similar to trends of blackchin shiner.

The distribution of this species among sub-basins (HUC 10) within the three watersheds has changed in a similar pattern, with records from fewer units in the recent period. Overall there are records from six of the units for all time periods, and from recent times there are two units, or a loss of its former range. Statewide, the number of individual site records for this species has been 50 for all time periods, 40 in the last 30 years, and 39 since 1993.



**Figure 1.** North American range map of pugnose shiner (Page and Burr 1991, NatureServe 2012).



**Figure 2.** Pugnose shiner 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	Watershed status
Ontario	3	2	1	0	
Oswego	2	2	0	0	loss
St. Law&SLC	1	0	0	1	
sum	6	4	1	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:**

<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>10</u>	<u>3/18 watersheds</u>
<b>prior to 1980</b>	_____	_____	_____
<b>prior to 1990</b>	_____	_____	_____

**Details of historic occurrence:**

The pugnose shiner has been reported from the Thousand Islands of the St. Lawrence River, two bays of Lake Ontario (Little Sodus and Irondequoit Bays) and two areas to the north and south of Cayuga Lake before the 1900's (Fall Creek and Montezuma Marsh).

<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>40</u>	<u>2/18 watersheds</u>

**Details of current occurrence:**

In the St. Lawrence River, sampling in the 1990s documented pugnose shiner in a 20 mile reach of the Thousand Islands area (Picton Island, Deer Island and Oak Island). It was also caught in the nearby Eel Bay of Wellesley Island in 1976. Bays along the south and east shores of Lake Ontario may also contain pugnose shiner, but sampling directed at this species in 25 bays in 1996-97 caught them in only Sodus Bay. Similar efforts to catch this species in Cayuga Lake (mouth of Fall Creek) were unsuccessful in 1997, and current habitat conditions do not look favorable there or in Montezuma Marsh.

**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>100</u> (endemic)	___ Core
___ 76-99	<u>X</u> Peripheral
___ 51-75	<u>X</u> Disjunct
___ 26-50	<b>Distance to core population:</b>
<u>X</u> 1-25	<u>300 mi</u>

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

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

**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 pugnose shiner prefers clear, weedy lakes and slow water areas of large streams with clean sand or marl bottoms. Aquatic plants providing shelter in locations it has been caught include pondweed, *Elodea*, coontail, water milfoil and *Chara* (Doeringsfeld 1993). Pugnose shiners were typically collected together with blackchin shiner during seining. The species is difficult to catch, and it is likely found in more habitats away from shore where seining has not been conducted.

**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 life history of the pugnose shiner has not been well studied. It has a relatively short lifespan and spawns in June-July in Michigan (NatureServe 2012).

**VI. Threats:**

Pugnose shiner is extremely sensitive to turbidity, and this explains why its range has been reduced. In one Wisconsin lake, it disappeared after eutrophication and invasion of Eurasian milfoil, so aquatic invasives are a likely threat (Lyons 1989). The quality of habitat in submerged aquatic vegetation could be at risk in Sodus Bay where water chestnut has become established. And Eurasian milfoil is established throughout nearly all of New York's major waters.

Declines have resulted at least in part from removal of aquatic vegetation to make swimming beaches or allow boat access. Siltation, pollution, boating, and development can all contribute to declining habitat quality. Recent introduction of whole-lake herbicide treatments may be a problem (NatureServe 2012).



Pugnose shiner was classified as “moderately vulnerable” to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program (Schlesinger et al. 2011).

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

No       Unknown  
 Yes

The pugnose shiner is listed as an endangered 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:**

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

Promote policies that protect water quality (especially clarity) and aquatic vegetation (NatureServe 2012).

Determine minimum viable population size, spawning habitat, impacts of aquatic vegetation management, and interactions with competitors and predatory fishes. (NatureServe 2012).

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

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

**Habitat Research:**

\_\_\_ Inventory the habitat requirements of this species and note the influence of the invasive milfoil.

**Life History Research:**

\_\_\_ Life history studies need to be done, and sampling techniques must be improved in order to carry out surveys. We know very little about where they live in large water bodies.

**VII. References**

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