
Common Name:	American eel	SGCN – High Priority
Scientific Name:	<i>Anguilla rostrata</i>	
Taxon:	Freshwater Fish	

Federal Status:	Candidate	Natural Heritage Program Rank:
New York Status:	Not Listed	Global: G4
		New York: S3
		Tracked: No

Synopsis:

The American eel, *Anguilla rostrata* lives in nearshore areas of lakes and streams with various bottom types, including rocks. The American eel has a very large range in the Atlantic Ocean and estuaries and rivers of the Atlantic and Gulf coasts of the United States and southeastern Canada, as well as much of the Mississippi River basin and the West Indies and Caribbean regions. Individuals travel to ocean spawning areas near the end of its life. The American eel is considered a single stock since all mature eels from the entire range migrate the Sargasso Sea to spawn. They only spawn once during their lifetime, making it especially difficult to protect this species.

The American eel is native to 17 of 18 watersheds in New York and is still found in 15. Its New York range has been extended into the Erie and upper Genesee watersheds, while the Erie is the only one where it is entirely non-native. It continues to be found in many of the areas previously known in the Long Island, Delaware, and Lower Hudson watersheds but has declined to near absence in all the others. Extensive information on New York's inland population is reported by Dittman et al. (2010a).

A 2010 petition seeking protection of the American eel under the Endangered Species Act resulted in a 90-day finding in 2011, and an extensive status review is now being conducted to determine whether federal protection is warranted (USFWS 2011).

Rangewide, the short term trend for this species is unknown and the long-term trend is thought to have shown up to 50% a decline (NatureServe 2012). According to the 2012 ASMFC benchmark stock assessment, the population of American eels is depleted and is at or near historic low levels (ASMFC 2012).

Once highly abundant in Great Lakes and Atlantic watersheds, eel numbers have declined drastically (ASMFC 2000, Haro et al. 2000). Historically, they contributed up to 25 to 50% of the fish biomass in stream and lake habitats. They are still found in 15 of the 18 watersheds (all but Allegheny, Erie and the Genesee above Rochester), as well as the marine district of New York, but their range has dramatically declined in all of these watersheds in the last 25 years. There were significant populations in the Susquehanna, Chemung and Newark Bay areas, and they have declined to the point that there are none or almost no recent reports.

Comparison catches from three periods (1930s, 1970s, and 2000s) with comprehensive surveys are not good indicators of decline because much of the reduction occurred earlier. The highest frequency occurrences for all three periods (1930s, 1970s and 2000s) were from Long Island, lower Hudson and Delaware watersheds, averaging 10–55% for the three periods combined. Watersheds where there are only remnants of earlier numbers include the Susquehanna, Raquette, Oswego, Black, Champlain, upper Hudson, Mohawk, St. Lawrence (including tributaries to the east), and Ontario. Statewide, the number of records for this species has been declining for decades, but there were over 2,800 reports prior to 1986. The number of records in the watersheds within the native range of the St. Lawrence drainage, Mohawk, Upper Hudson, Susquehanna and Chemung were 532 before 1977 and 234 after 1977.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant		Stable	Moderate Decline
6% to 10%		Common			
11% to 25%		Fairly common	X		
26% to 50%		Uncommon			
> 50%	X	Rare			

Habitat Discussion:

American eels occupy the broadest diversity of habitats of any fish species (Helfman et al. 1987), using fresh water, marine and brackish habitats. All freshwater systems are used including large rivers and their small tributaries as well as reservoirs, canals, farm ponds and subterranean springs (USFWS 2011).

Spawning occurs in the Sargasso Sea, in the western Atlantic Ocean east of the Bahamas and south of Bermuda. Spawning has never been directly observed, and suitable conditions for it remain speculative. Larvae drift and swim in prevailing currents (Antilles Current, Florida Current, and Gulf Stream) that take them to areas near continental coasts or continental slope waters.

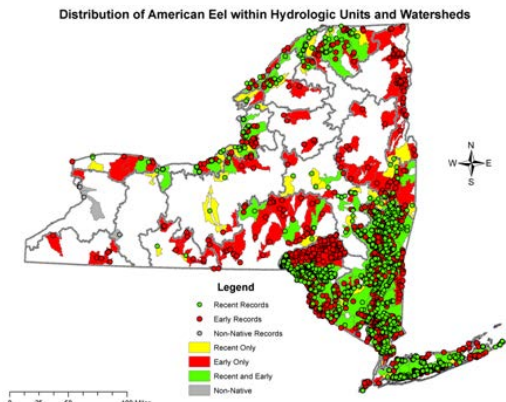
Some elvers travel upstream to spend the majority of their life growing as yellow eels in rivers, streams, ponds, and the shallow, more productive areas of lakes; other eels remain in estuaries for their entire development prior to migration to the ocean. Based on otolith microchemistry, Secor et al. (2002) found three modes of habitat use by yellow-phase eels in the Hudson River: freshwater (only freshwater use since elver stage), brackish water (no evidence of freshwater use), and "mixed" modes (use of freshwater for 2–19 years, followed by migration to environments with brackish salinities).

Soft, undisturbed bottom sediments may be important to migrating elvers for shelter. Postlarval eels tend to be bottom dwellers and hide in burrows, tubes, snags, plant masses, other types of shelter, or in the substrate. They are inactive in bottom mud during winter in the north. Mature adults migrate back downstream to return to the Sargasso Sea, and die after spawning. In the ocean, American eels have been taken at depths greater than 6,000 meters (NatureServe 2012).

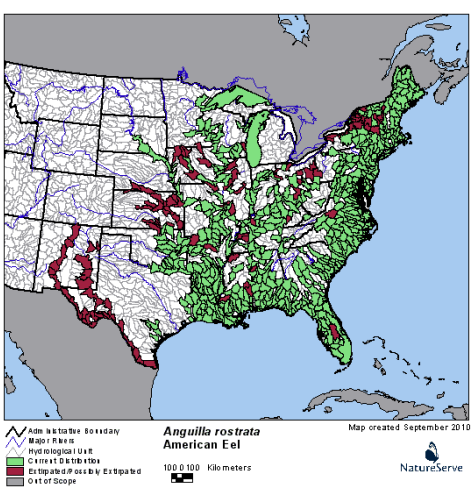
Primary Habitat Type
Large/Great River; Low-Moderate Gradient; Assume Moderately Buffered (Size 3+ rivers); Warm
Marine; Deep Sub-tidal
Medium River; Low-Moderate Gradient; Assume Moderately Buffered (Size 3+ rivers); Warm
Small River; Low-Moderate Gradient; Moderately Buffered, Neutral; Warm

Distribution:

The highest frequencies of occurrence for American eel are in the Long Island, lower Hudson and Delaware watersheds. Watersheds where there are only remnants of earlier numbers include Susquehanna, Raquette, Chemung, Newark Bay, Oswego, Black, Champlain, upper Hudson, Mohawk, St. Lawrence (including tributaries to the east) and Ontario.



American eel distribution in New York, depicting fish sampled from before and after 1977, as shown with corresponding HUC units (after 1977) where they were found.



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Natural System Modifications	Dams & Water Management/Use (dams)	W	M	H
2. Natural System Modifications	Other Ecosystem Modifications (channelization and dredging)	N	L	M
3. Biological Resource Use	Fishing & Harvesting Aquatic Resources (overharvest/baitfish)	W	H	M
4. Pollution	Agricultural & Forestry Effluents (poor land use practices associated with farming/groundwater)	N	L	H
5. Pollution	Industrial & Military Effluents (thermal and toxic discharges, PCBs)	N	L	H
6. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch)	W	L	H
7. Climate Change & Severe Weather	Habitat Shifting & Alteration (increasing ocean temperatures/spawning)	P	M	V
8. Energy Production & Mining	Renewable Energy (hydropower turbines)	N	M	H
9. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (Asian parasite, <i>Anguillicola crassus</i>)	N	L	V
10. Biological Resource Use	Fishing & Harvesting Aquatic Resources (illegal harvest-commercial and recreational)	R	L	M

References Cited:

Atlantic States Marine Fisheries Commission (ASMFC). 2012. Stock Assessment Report No. 12-01 of the Atlantic States Marine Fisheries Commission: American Eel Benchmark Stock Assessment. 342 pp.

Dittman, D.E., L.S. Machut, and J.H. Johnson. 2010. Overview: American Eel History, Status, and Management Options. Final Report for C005548, Comprehensive Study of the American Eel. State Wildlife Grant. NYSDEC, Bureau of Wildlife, Albany, NY. 36 pp.

Haro, A., W. Richkas, K. Whalen, A. Hoar, W.-D. Busch, S. Lary, T. Brush, and D. Dixon. 2000. Population decline of the American eel: implications for research and management. *Fisheries* 25(9):7-16.

Helfman, G. S., D. E. Facey, L. S. Hales, Jr., and E. L. Bozeman, Jr. 1987. Reproductive ecology of the American eel. *American Fisheries Society Symposium* 1:42-56.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 10, 2012).

Secor, D. H., J. E. Baker, W. E. Morrison, and J. C. Steinbacher. 2002. Ecology and contamination of the Hudson River American eel. Report submitted to Hudson River Foundation, 40 West 20th Street, Ninth Floor, New York, NY 10011. University of Maryland Center for Environmental Science Tech. Series No. TS-367-02-CBL.

United States Fish and Wildlife Service (USFWS). 2011. 90-Day Finding on a Petition to list the American eel as Threatened. *Federal Register* 76(189):60431-60444.

Common Name: Bigeye chub
Scientific Name: *Hybopsis amblops*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: G5
 New York: S2
 Tracked: Yes

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.

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.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant		Severe Decline	Severe Decline
6% to 10%	X	Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

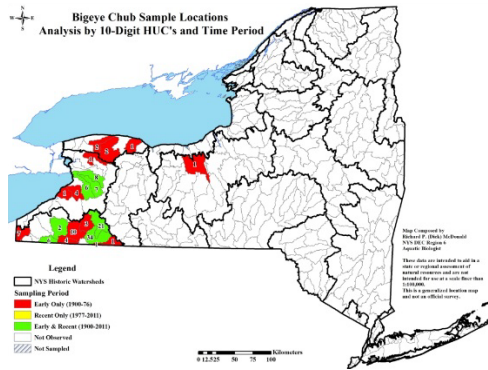
Habitat Discussion:

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.

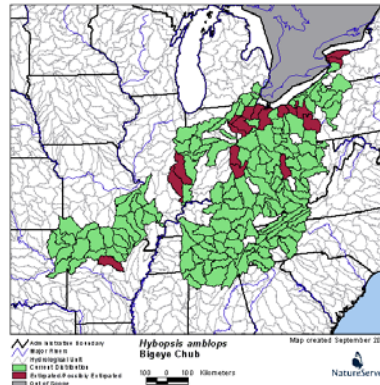
Primary Habitat Type
Medium River; Low Gradient; Assume Moderately Buffered
Small River; Low Gradient; Moderately Buffered

Distribution:

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.



Carlson (2012)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Natural System Modifications	Dams & Water Management/Use	N	L	V
2. Pollution	Industrial & Military Effluents	W	L	M
3. Pollution	Agricultural & Forestry Effluents (siltation)	W	M	M
4. Climate Change & Severe Weather	Drought	R	M	M

References Cited:

Carlson, D.M. 2012 (draft). Species accounts of inland fishes of NYS considered as imperiled, 2012. NYDEC, Watertown, NY.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 5, 2012).

Common Name: Bloater
Scientific Name: *Coregonus hoyi*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: G4
 New York: SX
 Tracked: Yes

Synopsis:

This species is one of four ciscoes, which were once the most abundant prey fish in the Great Lakes (Baldwin 1999). It is a deepwater, benthic freshwater fish found in large lakes at depths of 30–190m (125–400ft) that migrates vertically at night to feed on Mysis and other invertebrates in the water column. This species is extirpated from the waters of New York State; it was previously found in New York only in Lake Ontario. Currently, bloater is only present in Lake Huron, Superior, and Michigan; it is considered extirpated from Lake Ontario and Lake Nipigon (Ontario). Populations in New York declined dramatically by the mid-20th century, possibly due to over-harvest and expanding populations of invasive alewife and rainbow smelt (NYSDEC 2012). Reintroduction efforts are currently underway in New York and Ontario.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

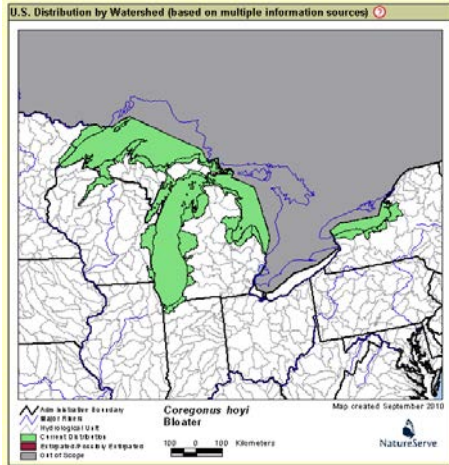
Habitat Discussion:

The bloater is found in deep water of large lakes usually at depths of 30–190 meters. Spawning occurs on the bottom usually at about 50–100 meters. It preys mainly on crustaceans, including zooplankton and crustaceans on or near the bottom (NatureServe 2012).

Primary Habitat Type
Lake; Large Lake

Distribution:

There are currently no self-sustaining populations of bloater in New York. It is suspected that the bloater is extirpated from Lake Ontario since the last collected specimen was found in 1983 (Miller et al. 1990, Baldwin 1999, NYSDEC 2012). The distribution map for the Great Lakes shows Lake Ontario as a part of the current distribution, however this was incorrect in 2010. Bloater fall fingerlings (1,200) were released by NYSDEC/USGS in 2012 near Oswego, NY. Larger stockings are planned in 2013-2014 by NYSDEC/USGS and Ontario.



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Biological Resource Use	Fishing & Harvesting Aquatic Resources	R	H	M
2. Invasive & Other Problematic Species & Genes	Invasive Non-native/Alien Species (alewife, rainbow smelt)	P	H	V
3. Invasive & Other Problematic Species & Genes	Problematic Native Species (lamprey)	P	L	M

References Cited:

Baldwin, B. 1999. Discussion Paper – Native prey fish re-introduction into Lake Ontario. Great Lakes Fishery Commission, Lake Ontario Commission, Lake Ontario Technical Committee.

Miller, T., L.B. Crowder, and F.P. Binkowski. 1990. Effects of changes in the zooplankton assemblage on growth of bloater and implications for recruitment success. Transactions of the American Fisheries Society 119: 483-491.

NYSDEC. 2012. Deepwater Ciscoes to be re-introduced into Lake Ontario. 2012 Press Releases. Press Office. Available at: <<http://www.dec.ny.gov/press/86806.html>> (Accessed: February 5, 2012).

Common Name: Bluebreast darter
Scientific Name: *Etheostoma camurum*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Endangered

Natural Heritage Program Rank:
 Global: G4
 New York: S1
 Tracked: Yes

Synopsis:

Bluebreast darter occur in large streams from Tennessee and North Carolina through Kentucky, Illinois, Indiana, Ohio, West Virginia, Pennsylvania, and southwestern New York. In New York it is native to the Allegheny watershed and prefers stream sections with fast-flowing currents and sandy gravel or large stone substrates. Recent surveys record infrequent catches of bluebreast darter below detection levels prior to 1973. Abundance remains low and the habitat needs are very specific.

Across its range, bluebreast darter is found in several disjunct populations in Tennessee, North Carolina, Kentucky, Illinois, Indiana, Ohio, West Virginia, Pennsylvania, and New York. Its range-wide short-term trend is thought to be relatively stable (NatureServe 2012). New York’s position within this range is disjunct. In New York, bluebreast darter was historically found in two waters in the Allegheny watershed but their abundance is low and habitat needs are very specific.

There have been continuing and very low level catches in comprehensive stream surveys of the watershed, in about 2% of the river samples since 1985. The distribution of this species among subbasins (HUC 10) within one watershed has increased slightly, with records from one of the units prior to 1977 and from an additional one unit since 1976. Statewide, the number of individual site records for this species is 15 for all time periods, 13 in the last 30 years, and 10 since 1993. Elements of recovery of bluebreast darter abundance in PA was noted by Koryak et al. (2009).

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Increasing	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:

The bluebreast darter prefers warmer stream sections, typically clear or slightly turbid, with moderately swift to fast runs and riffles current, where the substrate consists of sandy gravel and large stones. The stones provide protection for the darter, which is usually found behind, beside or under the stones. This species is much less commonly found in areas of large slab rock and in shallow runs over gravel; it has low tolerance of silt (NatureServe 2012).

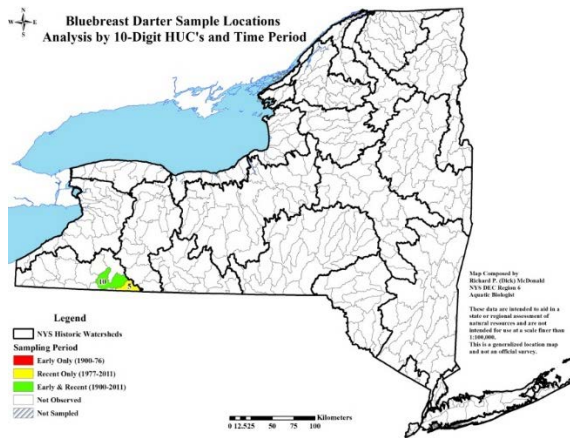
At time of spawning, the females bury themselves in sand and the eggs are laid in the sand or fine gravel beside large rocks at heads of riffles, and in riffles (Jenkins and Burkhead 1994, NatureServe 2012).

Sampling for this species was most successful in June, and the faster stream velocities were preferred (Stauffer et al.1993). In New York, the bluebreast darter is found only in the upper reaches of the Allegheny drainage basin. Schwartz (1965) found them in the lower 2/3 of riffles in April, in the deepest portion of the riffle in spring and they were absent from the riffle in November. Habitat measurements were completed in 2007–08 by NYS Museum (Morse et al. 2009).

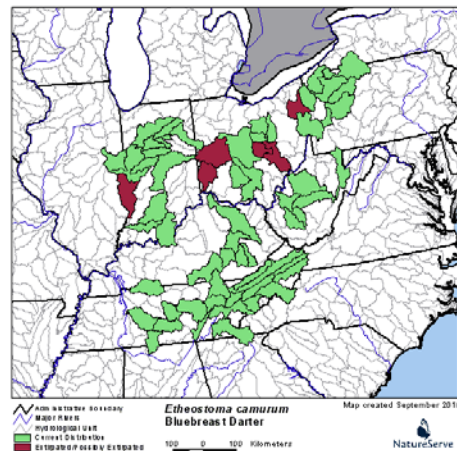
Primary Habitat Type
Medium River; Low-Moderate Gradient; Assume Moderately Buffered (Size 3+ rivers); Transitio

Distribution:

Recent surveys from Oswayo Creek near the state line at Carroll, NY, found bluebreast darter in 1989 (Daniels 1989), 1992 (contract studies by Penn State Univ., letter from Martin Gutowski, 1992) and 2001-08 (DEC and NYSM).



Carlson (2012)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Pollution	Household sewage & Urban Wastewater	N	M	H
2. Pollution	Industrial & Military Effluents	N	M	H
3. Pollution	Agricultural & Forestry Effluents (siltation)	W	M	H
4. Climate Change & Severe Storms	Drought	W	H	V

References Cited:

- Daniels, R.A. 1989. Preliminary report, Allegheny River fish survey, 1989. NYS Museum. Albany, NY.
- Jenkins, R.E. and N.M. Burkhead. 1994. Freshwater fishes of Virginia. Am. Fish. Soc. Bethesda, MD
- Koryak, M. P.S. Bonislawsky, D.D. Locy and B.A. Porter. 2009 Typical channel fish assemblage of the recovering lower Allegheny River navigation system, PA. J. Freshwater Ecol. 24(3):509-514.
- Morse, R., B. Weatherwax, and R. Daniels. 2009. Rare fishes of the Allegheny River and Oswayo Creek. Final report to NYS State Wildlife Grants- Grant T-5, Study 2. NYS Museum, Albany 30pp.
- NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 5, 2012).
- Schwartz, F.J. 1965. Densities and ecology of the darters of the upper Allegheny River watershed. pp 95-103 in C.A. Tryon, Jr., R.T. Hartman, and K.W. Cummins, (ed). Studies on aquatic ecology of the upper Ohio River system. Pymatuning Laboratory of Ecology, Special Publ. 3, Univ. Pittsburgh, Pittsburgh, PA.
- Stauffer, J.R., J.M. Boltz, K.A. Kellogg and E.S.van Snik. 1996. Microhabitat partitioning in a diverse assemblage of darters in the Allegheny River system. Environ. Biol. Fish.46:37-44.

Common Name: Comely shiner
Scientific Name: *Notropis amoenus*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: G5
 New York: S3
 Tracked: Yes

Synopsis:

The comely shiner occurs in Atlantic Slope drainages (upper Coastal Plain and Piedmont) from the Hudson and Susquehanna watersheds southward through the Cape Fear drainage in North Carolina. It occurs in medium-sized streams with clean gravel and is native to the Chemung, Susquehanna, and Delaware watersheds in New York, also occurring as a non-native species in four adjacent watersheds. Populations seem secure in the Delaware watershed but there has been a decline in frequency of occurrence in both the Chemung and Susquehanna watersheds.

In New York, comely shiner were historically found in over 50 waters and their range appears to be declining (or gone or dangerously sparse) in at least 2 of the 3 watersheds where native. It still occurs in two of these non-native watersheds: the southernmost part of the Oswego watershed by Seneca Lake and the lower Hudson. Samples from the 2000s showed presence at 21 locations, but no individuals from Chemung, Mohawk or Newark Bay. Argent et al. (1998) reported on dramatic changes in this species in Pennsylvania.

Early records from the Susquehanna (1935) were confounded with mistaken identifications (Snelson 1968), and catches from that period were adjusted according to later records (from many of those same specimens) stored at museums.

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 time period. Overall there are records from 33 units for all time periods in its native range, and from recent times there are 14 units, showing a loss of its former range. The Chemung watershed had the most dramatic decline in range, and both Chemung and Susquehanna had significant declines in frequency of occurrence between the 1930s and 2000s. Statewide, the number of individual site records for this species has been 142 for all time periods, 47 in the last 30 years, and 20 since 1993.

Most of the recent records—since 1993—are from the Delaware (11), Susquehanna (8) and lower Hudson (1), and there are none from the Chemung, Mohawk or Newark Bay. The population appears stable in the Lower Hudson and possibly Delaware, but has disappeared from many streams of the Susquehanna and Chemung watersheds. This trend causes concern.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant		Moderate Decline	Unknown
6% to 10%		Common			
11% to 25%	X	Fairly common	X		
26% to 50%		Uncommon			
> 50%		Rare			

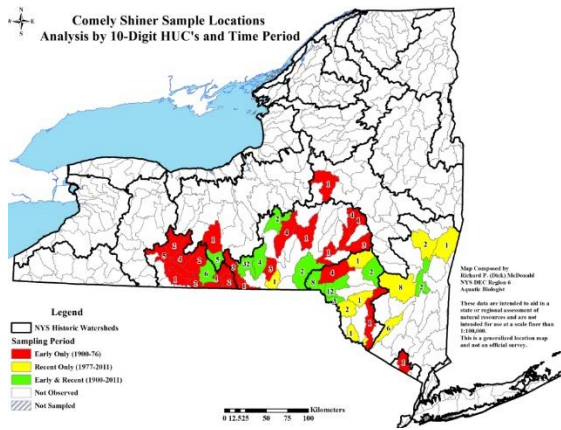
Habitat Discussion:

The comely shiner is found in moderate to larger sized streams, over sand, gravel, or rubble substrates. It tolerates a wide range of current but seems to prefer pools and backwaters (Smith 1985).

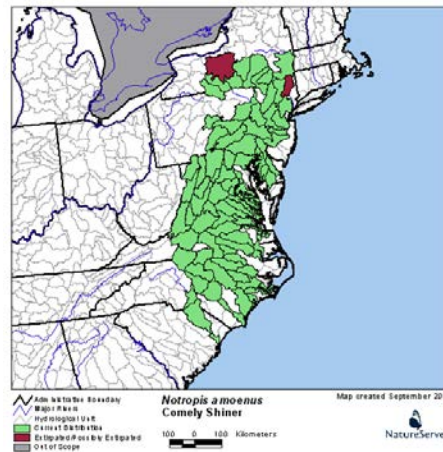
Primary Habitat Type
Medium River; Low-Moderate Gradient; Assume Moderately Buffered (Size 3+ rivers); Transitio

Distribution:

Most of the recent records, since 1993, are from the Delaware (11), Susquehanna (8) and lower Hudson (1), and there are none from the Chemung, Mohawk or Newark Bay. Comely shiner are known to still exist in only Seneca Lake of the Oswego watershed, in the nearby Catharine Creek.



Carlson (2012)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
Invasive & Other Problematic Species & Genes	Non-Native Species (predation by bass and trout, competition with mimic shiner)	W	M	H

References Cited:

Argent, D. G., R.F. Carline and J.R. Stauffer. 1998. Changes in the distribution of Pennsylvania fishes: the last 100 years. J. Penn. Acad. Sci. 72 (1):32-37.

Carlson, D.M. 2012 (draft). Species accounts of inland fishes of NYS considered as imperiled, 2012. NYDEC Watertown, NY.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 5, 2012).

Smith, C.L. 1985. The inland fishes of New York State. New York State Dept. of Environmental Conservation. Albany, NY. 522 pp.

Snelson, F.F. 1968. Systematics of the cyprinid fish *Notropis amoenus*, with comments on the subgenus *Notropis*. *Copeia* (4):776-802.

Common Name: Gilt darter
Scientific Name: *Percina evides*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Endangered

Natural Heritage Program Rank:
 Global: G4
 New York: SH
 Tracked: Yes

Synopsis:

The gilt darter is a small freshwater fish that can grow up to 3 inches long. Its preferred habitat is riffles in streams or rivers (NYSDEC 2013). It is a widely distributed species across the United States, occurring as far west as Minnesota and as far south as Mississippi (NatureServe 2012). Populations in the Northeast are in decline (NYSDEC 2013). It has only been found once in New York in 1937 in the Allegheny River and is considered possibly extirpated.

In November of 2012, the NYSDEC, in cooperation with SUNY Cobleskill, released 1,200 gilt darter juveniles into the Allegheny River (NYSDEC 2012). In addition, 500 native gilt darter juveniles were relocated from the Pennsylvania population to be stocked with the hatchery raised fish (Carlson and Foster 2012). Stocking occurred in three locations on the Allegheny River near Olean and Portville, New York and near South Carrollton on the Seneca Nation of Indian's Reservation (Carlson and Foster 2012, NYSDEC 2012). A partnership between New York and Pennsylvania has formed to work to restore the gilt darter population in New York. Field operations led by the Pennsylvania Fish & Boat Commission have included locating and/or capturing gilt darters for habitat assessments, brood stock collection, and genetic analysis. The collaboration between PA and NY SWG-funded projects has also afforded opportunities to assess additional species of greatest conservation need within PA that occupy habitats overlapping those of the gilt darter (PFBC 2012). Stocking will continue in 2013 (Carlson and Foster 2012).

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Stable	Stable
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

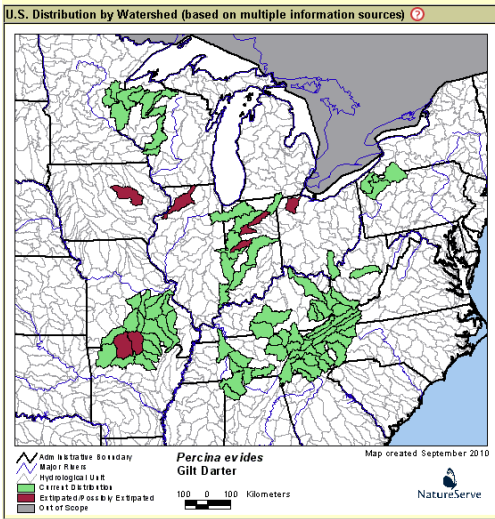
Habitat Discussion:

The gilt darter is a small fish that inhabits clear water in small to medium sized streams and rivers (NatureServe 2012). This species can be found in moderate to fast, deep riffles and pools, normally over gravel, rubble, and small boulders (Skyfield and Grossman 2008). Gilt darters will occupy deeper pools during winter months (NatureServe 2012). This species is intolerant of slow water and silt, and thus is a good indicator of environmental quality.

Primary Habitat Type
Large/Great River

Distribution:

Because of stocking efforts, the gilt darter now occurs in the Upper and Lower Allegheny sub-watersheds of the Allegheny River.



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Pollution	Household Sewage & Urban Wastewater	N	M	H
2. Pollution	Industrial & Military Effluents	W	H	H
3. Pollution	Agricultural & Forestry Effluents (siltation)	W	M	H
4. Climate Change & Severe Storms	Droughts	W	H	V
5. Natural System Modifications	Dams & Water Management/Use (dams)	P	V	V

References Cited:

Carlson, D. and J. Foster. 2012. SWG progress report and evaluation October 1, 2011-September 30, 2012 - restoration of gilt darter (*Percina evides*) and the lotic-benthic community in the Allegheny River, New York. NYS Department of Environmental Protection.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available at: <http://www.natureserve.org/explorer>. (Accessed: February 5, 2013).

NYSDEC. 2013. Gilt darter fact sheet. NYSDEC Bureau of Fisheries. Available at: <http://www.dec.ny.gov/animals/26039.html> (Accessed: February 5, 2013).

NYSDEC. 2012. Collaborative recovery effort returns rare gilt darter fish to the Allegheny River. NYSDEC Region 9. Available at: <http://www.dec.ny.gov/press/86781.html> (Accessed: February 5, 2013).

PFBC. 2012. Pennsylvania Fish & Boat Commission 2012 Annual Summary. State Wildlife Grants Program. Available at fishandboat.com/promo/grants/swg/summary2012swg.pdf (Accessed: February 15, 2013).

Skyfield, J.P. and G.D. Grossman. 2008. Microhabitat use, movements and abundance of gilt darters (*Percina evides*) in southern Appalachian (USA) streams. *Ecology of Freshwater Fish* 17: 219-230.

Common Name: Mooneye
Scientific Name: *Hiodon tergisus*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Threatened

Natural Heritage Program Rank:
 Global: G5
 New York: S1
 Tracked: Yes

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.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant		Stable	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%	X	Uncommon			
> 50%		Rare	X		

Habitat Discussion:

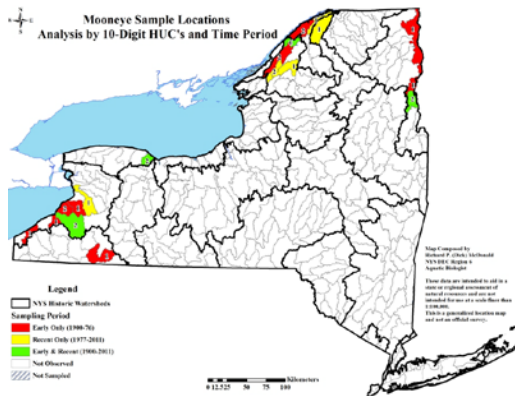
The mooneye prefers clear water habitat of large streams, rivers and lakes, including deep pools and backwaters. It is often in non-flowing waters but feeds mostly in swift water. Spawning may occur upstream in large clear streams; eggs are semi-buoyant and drift downstream or into quiet water (NatureServe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

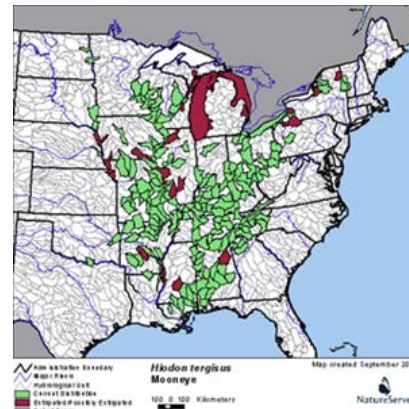
Primary Habitat Type
Large/Great River; Low-Moderate Gradient; Assume Moderately Buffered (Size 3+ rivers); Warm

Distribution:

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



Carlson (2012)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Pollution	Agricultural & Forestry Effluents (siltation)	W	M	H
2. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (alewife)	N	L	V
3. Natural System Modifications	Dams & Water Management/Use	P	M	H

References Cited:

Carlson, D.M. 2012 (draft). Species accounts of inland fishes of NYS considered as imperiled, 2012. NYDEC Watertown, NY.

Greeley, J.R. and C.W. Greene. 1931. Fishes of the area with annotated list. in: A biological survey of the St. Lawrence watershed. Suppl. 21st Ann. Rept. New York Conservation Dept. (1931):54-92.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 10, 2012).

Common Name: Northern sunfish
Scientific Name: *Lepomis peltastes*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Threatened

Natural Heritage Program Rank:
 Global: GNR
 New York: S1
 Tracked: Yes

Synopsis:

The longear sunfish subspecies found in New York was designated as a full species by the American Fisheries Society in 2013. It is now called the northern sunfish, *Lepomis peltastes*. This species is restricted in range to certain large streams in eastern-central North America, occurring from southern Quebec and Ontario through the eastern United States and west to Oklahoma, Texas, and northeastern Mexico. It is found in clear, low gradient streams and lakes with submerged aquatic vegetation and a gravelly to sandy bottom. It is native to 3 of 18 watersheds in western and central New York. It has declined to levels below detection in the Oswego watershed, and there are major declines in tributaries of Lake Ontario. The only remaining area with a sustained population is a 6 km segment of Tonawanda Creek near Buffalo and a small introduced population in Cayuga Creek, Niagara County. The species has not been captured in Tonawanda Creek since 2006.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Severe Decline	Severe Decline
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:

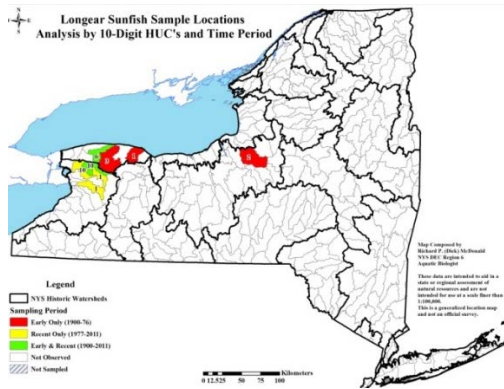
The northern sunfish prefers streams with clear, shallow, quiet and warm waters, but can tolerate turbidity (i.e. lower Tonawanda Creek). It prefers densely weeded areas with a gravel or sand bottom but is found over silt substrate as well (Wells and Haynes 2006). It generally avoids strong currents and silt but tolerates current more than other sunfishes in New York. Habitat includes areas of clear streams where preferred habitat such as submerged aquatic vegetation exists over sand in backwaters and current breaks (lower Huron River, MI) or in emergent vegetation and LWD in turbid streams with a high silt load (lower Tonawanda Creek, NY). The species is often found along redbfin shiner in such area as the confluence of Tonawanda and Mud Creeks (Millersport, NY) (Wells 2009).

Primary Habitat Type
Small River; Low-Moderate Gradient; Moderately Buffered, Neutral; Warm

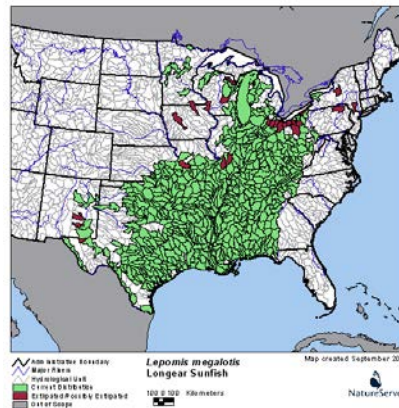
Distribution:

Stocking programs have been underway in all 3 watersheds and the number of occurrences does not include stocked fish.

There are more than 40 authenticated catches since 1974, with all but two in Tonawanda Creek. The two catches in Johnson Creek (2003–04) are thought to be incidental and not part of an established population. Other records (likely introduced or incorrect) are shown by Lee et al. (1980). Smith (1985) feels these were other sunfish species or were hybrids of redbreast sunfish and pumpkinseed. Large adult male pumpkinseed sunfish resemble longear sunfish, but in eastern New York many records were redbreast sunfish. In 2010, there were captures in Murder Creek and Cayuga Creek at Slate Bottom Creek (Carlson 2012b). In 2011, sampling occurred but nothing was seen. In 2012, adults were captured in Elliot Creek.



Carlson (2012a)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Pollution	Agricultural & Forestry Effluents (siltation)	P	H	H
2. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (round goby, green sunfish)	P	H	V
3. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (Hydrilla treatment)	N	H	V

References Cited:

Carlson, D.M. 2012a (draft). Species accounts of inland fishes of NYS considered as imperiled, 2012. NYDEC Watertown, NY.

Carlson, D.M. 2012b. Progress with recovery of longear sunfish. New York State Department of Conservation.

Lee, D. S., C. R. Gilbert, C. H., Hocutt, R. E. Jenkins, D. E. McAllister, and J. R. Stauffer, Jr. 1980. Atlas of North American freshwater fishes. North Carolina State Mus. of Nat. His. 867 pp.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 10, 2012).

Smith, C.L. 1985. The inland fishes of New York State. New York State Dept. of Environmental Conservation. Albany, NY. 522 pp.

Wells, S.M. and J.M. Haynes. 2007. Status of the longear sunfish (*Lepomis megalotis*), in western New York, USA. final rpt. - SWG T-5, proj. 2. NYS Dept. of Environmental Conservation. Albany. 174pp.

Wells, S.M. 2009. Habitat Associations of Fish Species and their Assemblages in the Tonawanda and Johnson Creek Watersheds of Northwestern New York State. SUNY Brockport. Thesis. 365 pp.

Common Name: Paddlefish
Scientific Name: *Polyodon spathula*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: G4
 New York: SX
 Tracked: Yes

Synopsis:

The paddlefish is a large prehistoric freshwater fish. Its historical range once spanned from as far west as Montana and Texas eastward to the Allegheny River in New York and Pennsylvania. Paddlefish prefer slow moving rivers and backwater areas rich in plankton; they also occur in large reservoirs (Kozlowski and Loukmas 2013). During the early 19th century, construction of dams cut this species off from much of its spawning habitat, resulting in its extirpation from New York and threatening many other populations (Smith 1985, Brewer 2012, Kozlowski and Loukmas 2013).

Many states recognize the importance of the paddlefish fishery and have initiated stocking programs. From 1998-2010 New York State stocked approximately 13,000 fingerlings in the Allegheny Reservoir (Kozlowski and Loukmas 2013). Starting in 1991, Pennsylvania began stocking an average of 6,800 paddlefish annually (Lorson and Argent 2005). Monitoring efforts in Pennsylvania have shown that fish have moved into the Monongahela River, which is significant because they were not stocked there prior to the survey (Lorson and Argent 2005). Also, there is evidence that there are mature paddlefish in the Three Rivers system in Pennsylvania, so natural reproduction is possible (Lorson and Argent 2005). In 1998, New York began a stocking program in the Allegheny Reservoir and its tributaries to try and re-establish the population. It is estimated that 25% of stocked fish move through or over the Kinzua Dam; this is an issue because the dam is not equipped with fish passage (M Clancy, personal communication). To date, no natural reproduction has been recorded (M. Clancy, personal communication).

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Stable	Stable
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

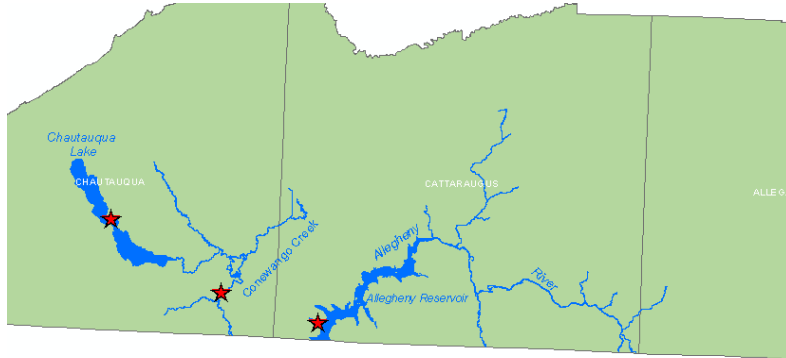
Habitat Discussion:

This species is confined to lakes and low gradient sections of large rivers (Cooper 1983, Smith 1985). It prefers depths greater than 1.5 meters and seeks deeper water in late fall – winter (NatureServe 2012).

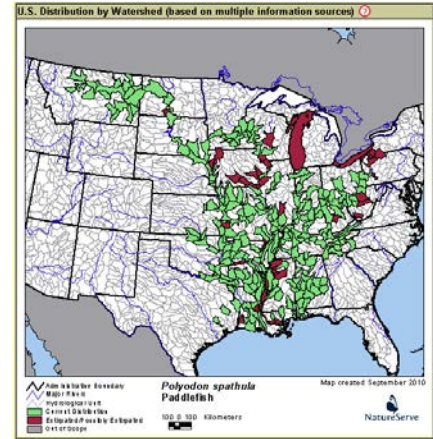
Primary Habitat Type
Lake
Large/Great River

Distribution:

Fish are stocked annually in the Allegheny Reservoir and the Allegheny River (Kozlowski and Loukmas 2013, M. Clancy, personal communication).



Allegheny River Drainage Basin of Pennsylvania showing Allegheny Reservoir, Conewango Creek, and Chautauqua Lake stocking locations (Brewer 2012).



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Natural System Modifications	Dams & Water Management/Use (dams)	P	V	V
2. Natural System Modifications	Other Ecosystem Modifications (channelization)	W	H	V
3. Biological Resource Use	Fishing & Harvesting Aquatic Resources (bycatch, egg poaching)	P	H	M
4. Human Intrusions & Disturbance	Recreational Activities (Recreational boating/boat strikes)	R	L	H
5. Pollution	Industrial & Military Effluents (toxic spills)	W	L	M

References Cited:

Brewer, J. 2013. Assessment of paddlefish (*Polyodon spathula*) restoration in the Allegheny River system final report for management of New York State’s fish species of greatest concern. NYS Department of Environmental Conservation, Region 9, sub-office, Allegany.

Clancy, Michael. 2013. Personal communication: E-mail and excel spreadsheet about paddlefish stocking information. NYSDEC, Region 9, Allegany.

Cooper, E.L. 1983. Fishes of Pennsylvania and the northeastern United States. The Pennsylvania State University Press. United States of America.

Kozlowski, G. and J. Loukmas. 2013. Preserving New York's fisheries diversity. NYS Department of Environmental Conservation. Bureau of Fisheries. Available at: <<http://www.dec.ny.gov/animals/77478.html>> (Accessed: February 15, 2013).

Lorson, R. and D. Argent. 2005. Paddlefish restoration in Pennsylvania assessment results for 2005. Biologist Reports. Pennsylvania Fish & Boat Commission. Available at: <http://fishandboat.com/images/fisheries/afm/2005/8x12_19paddle.htm> (Accessed: February 19, 2013).

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available at: <http://www.natureserve.org/explorer>. (Accessed: February 15, 2013).

Smith, L.C. 1985. The Inland Fishes of New York State. NYSDEC. Albany, NY.

Common Name: River redbhorse
Scientific Name: *Moxostoma carinatum*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: G4
 New York: S2?
 Tracked: Yes

Synopsis:

The river redbhorse occurs in the eastern half of the United States and in southeastern Canada. Its preferred habitat is rivers with clean gravel. The range and abundance have been relatively stable to declining in the last 30 years. In New York, it is present only in the eastern basin of the Allegheny watershed, where it was first documented in 1978. Though restricted, the population appears to be secure.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Stable	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:

The river redbhorse is found in larger streams (sometimes lakes) with moderate currents. Adults generally occupy moderate to swift water over clean gravel, boulders, and rubble, or in deep, fast-flowing portions of pools. Small individuals are often found in pool shallows and backwaters (NatureServe 2012). Parker (1988) felt it has the most restrictive habitat requirements of the redbhorse species.

This species spawns in excavated nests over gravel and gravel-rubble in shoals or large runs (Lee et al. 1980, Becker 1983). Some medium-sized creeks or small rivers are ascended for spawning, but juveniles do not stay long in these smaller waterways.

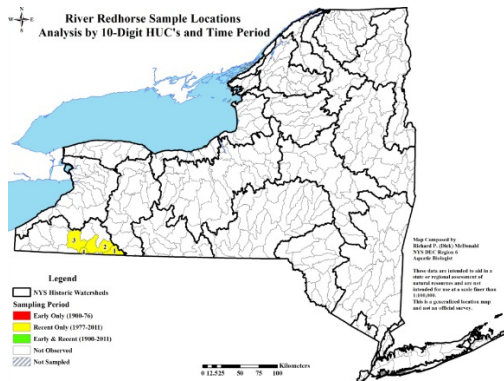
River redbhorse are intolerant of pollution and heavy siltation (NatureServe 2012). Its habitat vulnerability, distribution and trend in the Allegheny River is unknown for New York, but in Pennsylvania these habitats had earlier been severely polluted (Cooper 1985).

Primary Habitat Type
Medium River; Low Gradient; Assume Moderately Buffered (Size 3+ rivers); Warm

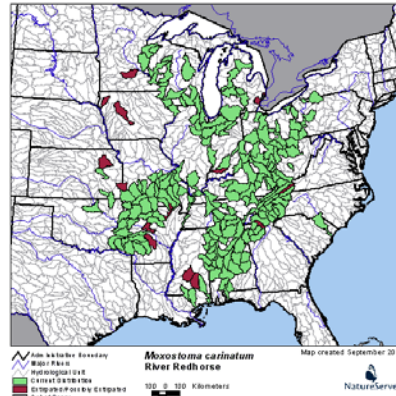
Distribution:

River redbhorse was first detected in New York in 1978 after the impoundment of Allegheny Reservoir, and it has since been known in Allegheny Reservoir (Becker 1982), the Allegheny River (1980), Tunungwant Creek (1978), Oswayo Creek (1998) and Dodge Creek (2003). Perhaps the impounded

conditions of Allegheny Reservoir favored the species. Other recent records by DEC are unconfirmed and remain suspect.



Carlson (2012)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Natural System Modifications	Dams & Water Management/Use (dams, channelization)	W	M	V
2. Pollution	Agricultural & Forestry Effluents (siltation)	W	M	H
3. Pollution	Industrial & Military Effluents (toxic spills)	W	L	M

References Cited:

Becker, G.C. 1983. Fishes of Wisconsin. Univ. Wisconsin Press, Madison. 1052 pp.

Cooper, E.L. (ed) 1985. Chapter 3 - Fishes. pp 169-256. in H.H. Genoways and F.J. Brenner. Species of special concern in Pennsylvania. Carnegie Mus. of Nat. Hist. Spec. Publ. 11. Pittsburgh.

Lee, D. S., C. R. Gilbert, C. H., Hocutt, R. E. Jenkins, D. E. McAllister, and J. R. Stauffer, Jr. 1980. Atlas of North American freshwater fishes. North Carolina State Mus. of Nat. His. 867 pp.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 9, 2012).

Parker, B.J. 1988. Updated status of the river redhorse, *Moxostoma carinatum* in Canada. Can. Field-Nat. 102(1):140-146.

Common Name: Sauger
Scientific Name: *Sander canadensis*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: G5
 New York: S1
 Tracked: No

Synopsis:

Sauger are North American members of the true perch family, Percidae, and closely resemble walleye in both appearance and function. They typically occur in large turbid rivers and lakes and their highly migratory nature reflects their dependence on the diversity of physical habitats that are present in these systems. Their historical range included the St. Lawrence River, Great Lakes, Hudson Bay, and Mississippi River basins from Quebec to Alberta and southward to northern Louisiana. Sauger are common and considered a popular sportfish in portions of their range, but have been declining or disappearing from the Great Lakes and the periphery of their range. In New York, sauger were known to inhabit the Lake Erie, Lake Ontario, St. Lawrence River and Lake Champlain drainage basins, but the Great Lakes/St. Lawrence watershed populations are now extirpated. Lake Champlain may have the last known viable population in New York, but recent records of their occurrence there are scarce. There was a surprising catch of a sauger by an angler in the lower Niagara River in 1990. The population in South Bay of Lake Champlain was studied in the 1960s, and in 1983 and 1984. After a sauger was caught in the southern part of Lake Champlain in 2010, NYSDEC began a monitoring program to help track its occurrence.

The distribution of this species among sub-basins within each watershed (HUC 10) has declined substantially, with records from 13 of the units prior to 1977 and from only 2 units since 1976. Statewide, the number of records for this species in the last 30 years has been 3, compared to only 31 reports prior to 1977. It appears to be nearly eliminated from NY and a draft recovery plan has been developed (Loukmas 2011).

The most proximal sauger populations to New York are those in the Ottawa River, Ontario, Lake Saint Pierre - Saint Lawrence River and Richelieu River, Quebec, and the Allegheny River, Pennsylvania. There is recent evidence to suggest that sauger may be moving from the Richelieu River to northern Lake Champlain through the Vianney-Legendre fishway at the St. Ours Dam (Thiem et al. 2012). This fishway was constructed in 2001 and sauger have been documented in small numbers moving upriver through the fishway every year from late May to late June. In the Allegheny River, sauger are common in the 60 mile stretch of river above Pittsburgh (to Lock and Dam 9) and are found as far north as Warren, PA. The lowhead dam at the mouth of Conewango Creek at Warren was removed in 2009, providing sauger access to the New York portion of the watershed.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Severe Decline	Severe Decline
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

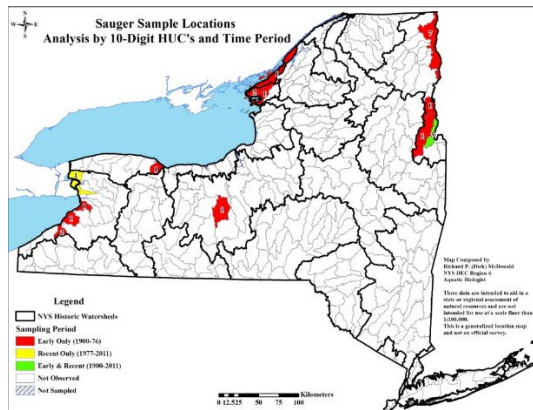
Habitat Discussion:

Sauger typically occur in large turbid rivers and lakes (Becker 1983). The highly migratory nature of sauger reflects their dependence on unimpeded access to the wide diversity of physical habitats that are present in large river and lake systems. Physiological adaptations, such as a highly advanced light-gathering retina, allow sauger to thrive in low light environments, and thus turbidity is considered a key component of suitable habitat (Crance 1987). Other important riverine habitat features include low channel slope and deep, low-velocity pools (Crance 1987, Hesse 1994). Diverse, natural river channels are preferred over relatively simple, uniform channelized segments (Hesse 1994). River impoundments and lakes can be seasonally important as overwintering and pre- and post-spawning habitats (Nelson 1968, Pitlo 1992). In large lakes and reservoirs, sauger may depend on lentic habitats year-round, only using tributaries during spawning (Ickes et al. 1999). It prefers sand and gravel runs, sandy and muddy pools and backwaters. In rivers, it spawns in deep rocky runs, while in lakes it spawns along sandy and rocky shores and over rocky reefs at depths of 0.6-3.6 m. (NatureServe 2012). Spawning areas in the Great Lakes were inventoried by Goodyear et al. (1982).

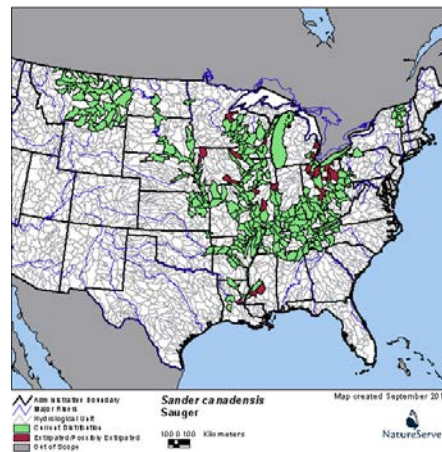
Primary Habitat Type
Large/Great River; Low-Moderate Gradient; Assume Moderately Buffered (Size 3+ rivers); Tran

Distribution:

Sauger has become extirpated in New York's watersheds of the Erie-Niagara, Ontario, Oswego and St. Lawrence River and still may occur at very low levels in Lake Champlain. Some of the recent catches were reported by Anderson (1978), Aquatec (1988), Nettles et al. (2005) and E. Zollweg of DEC (2010).



Carlson (2012)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Pollution	Agricultural & Forestry Effluents (siltation in spawning areas)	R	M	M
2. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (dreissenid mussels resulting in increased water clarity)	W	H	V
3. Natural System Modifications	Dams and Water Management/Use (dams)	P	H	H
4. Invasive & Other Problematic Species & Genes	Non-native Species (predation by white perch, white crappie, alewife)	W	H	V
5. Invasive & Other Problematic Species & Genes	Problematic Native Species (hybridization with walleye)	N	L	V
6. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (sea lamprey)	R	L	L

References Cited:

Anderson, J.K. 1978. Lake Champlain fish population inventory, 1971 to 1977. VT Fish and Wildl. Essex Jct. VT

Aquatec Inc. 1988. Biological and hydrographic studies of South Lake Champlain. International Paper Co. Purchase NY. 193pp.

Becker, G.C. 1983. Fishes of Wisconsin. Univ. Wisconsin Press, Madison. 1052 pp.

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Common Name: Spotted darter
Scientific Name: *Etheostoma maculatum*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Threatened

Natural Heritage Program Rank:
 Global: G2
 New York: S1
 Tracked: No

Synopsis:

The spotted darter is extremely localized and uncommon in Indiana, Ohio, Pennsylvania, New York, West Virginia, and Kentucky. It resides in medium-sized streams with clean gravel and is found in only French Creek of the Allegheny watershed in New York. Its range is severely restricted but secure although changing land-use practices in the basin could affect in-stream habitat, distribution and abundance of this species in the future.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Stable	Stable
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

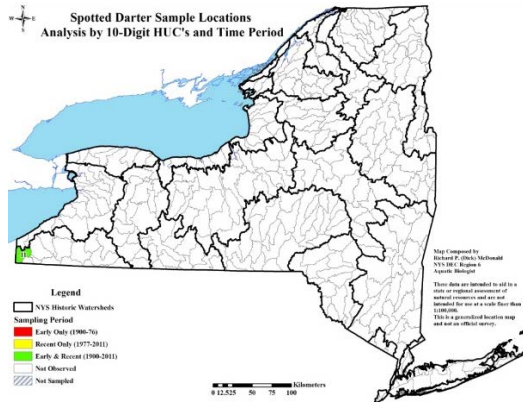
Habitat Discussion:

The spotted darter prefers fast, rocky riffles of small to medium-sized clear streams (Grandmaison et al. 2004). This substrate type of coarse cobble and gravel is distributed throughout the lower 6 miles of French Creek, and additional physical features were reported by Bowers et al. (1992), Hansen (1993) and Daniels (1989). Adults apparently spend the winter in areas somewhat deeper and with slower current. In the Elk River, West Virginia, spotted darters were observed primarily in glide habitats near large rocks and in moderate current velocities. Eggs are laid on undersides of stones in quiet water areas near heads of riffles in water 15-60 cm deep (NatureServe 2012).

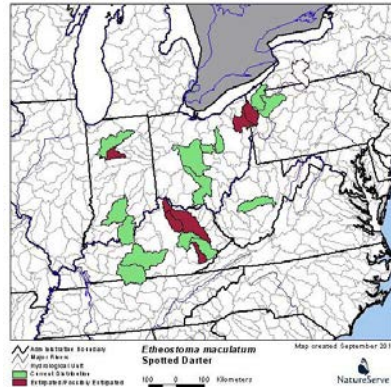
Primary Habitat Type
Small River; Low Gradient; Moderately Buffered, Neutral; Warm

Distribution:

The most thorough studies available in 1991–92 found spotted darter at 5 sites in French Creek, and the abundance and age structure was judged as that of a healthy, self-supporting population (Bowers et al. 1992). Sampling in summer 2000 and 2010 confirmed the species at one site near the state line. Sampling in West Branch French Creek in 1992 found this species for the first and only time (letter from M. Gutowski, Penn. State Univ., to D. Bouton, Sept 30, 1992).



Carlson (2012)



NatureServe (2012) with correction for Genesee

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Pollution	Agricultural & Forestry Effluents (siltation)	W	M	H
2. Climate Change & Severe Storms	Drought	W	H	V
3. Natural System Modifications	Dams & Water Management/Use	P	V	V

References Cited:

Bowers, N.J., J.R. Stauffer and J.R. Pratt. 1992. The distribution, population and ecology of *Etheostoma maculatum* Kirtland in upper French Creek, New York. Penn. State Univ., Univ. Park, PA.

Carlson, D.M. 2012 (draft). Species accounts of inland fishes of NYS considered as imperiled, 2012. NYDEC Watertown, NY

Daniels, R.A. 1989. Preliminary report, Allegheny River fish survey, 1989. New York State Museum, Albany.

Grandmaison, D., J. Mayasich and D. Etnier. 2004. Spotted darter status assessment. NRRI Tech. Rept. No. 2004/02. 30pp

Hansen, M.J. 1983. Selective predation and longitudinal distribution of benthic stream fishes in French Creek, New York. MS thesis Cornell Univ. Ithaca, NY 167 pp.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 9, 2012).

Common Name: Summer sucker
Scientific Name: *Catostomus utawana*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: G2
 New York: S2
 Tracked: No

Synopsis:

Summer sucker has only recently been re-described as a species (Morse and Daniels 2007); it was previously considered a subspecies. It lives in small headwater lakes and streams of the Adirondack Mountains and is native to 6 of 18 watersheds. Of the 6, it is extirpated from the Champlain and St. Lawrence watersheds. In the Black, Oswegatchie, Raquette and Upper Hudson it currently is known from nine areas. Summer sucker is the only endemic fish species in the state, and its range is restricted and poorly defined.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant		Moderate Decline	Stable
6% to 10%		Common	X		
11% to 25%	X	Fairly common			
26% to 50%		Uncommon			
> 50%		Rare			

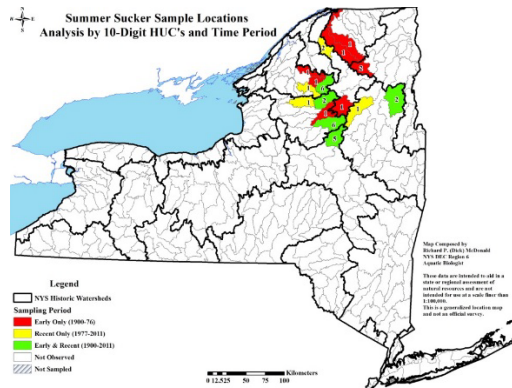
Habitat Discussion:

Lakes, creeks, and small rivers with rocky pools and runs are preferred habitat and large rivers are avoided. Spawning has been documented in ephemeral streams in Squaw Lake (Morse 2007) and in other small tributaries to lakes (Kendall and Dence 1929, Greeley and Greene 1931). Mather (1886) describes summertime habitat (post spawning) as deeper waters of lakes.

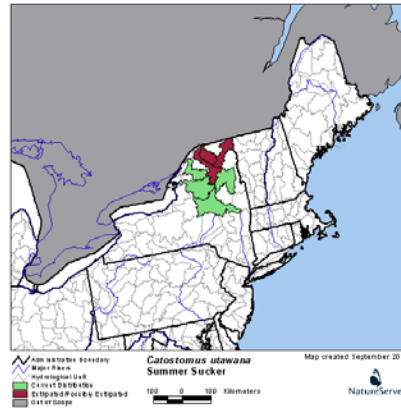
Primary Habitat Type
Headwater/Creek; Low-Moderate Gradient; Low Buffered, Acidic; Transitional Cool
Lake; Small Lake

Distribution:

Summer sucker is currently found in the Black, Mohawk, Oswegatchie, and Raquette watersheds. Summer sucker are still reported in at least 9 of their historic 21 waters.



Carlson (2012)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species	W	H	H
2. Pollution	Industrial & Military Effluents (acid rain)	P	M	M
3. Climate change	Drought	W	M	V
4. Climate change	Severe storms	W	M	V

References Cited:

Carlson, D.M. 2012 (draft). Species accounts of inland fishes of NYS considered as imperiled, 2012. NYDEC Watertown, NY.

Greeley, J.R. and C.W. Greene. 1931. Fishes of the area with annotated list. in A biological survey of the St. Lawrence watershed Suppl. 20th Ann. Rept., N.Y. Cons. Dept. 1930:49-94.

Kendall, W.C. and W.A. Dence. 1929. The fishes of the Cranberry Lake Region. Roos. Wildl. Bull. 5(2):219-309.

Mather, F. 1886. Memoranda relating to Adirondack fishes with descriptions of new species from researches made in 1882. State of New York Adirondack Survey from appendix to the 12th report (Zoology) 1886:1-56.

Morse, R.S. 2007. The rediscovery of a species: The redescription, biogeography, and ecology of the summer sucker, *Catostomus utawana*. PhD dissertation. SUNY ESF, Syracuse NY. 103 pp.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 5, 2012).

Common Name: Swallowtail shiner
Scientific Name: *Notropis procne*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: G5
 New York: S2
 Tracked: No

Synopsis:

Swallowtail shiner occur from New York southward to South Carolina. It is found in medium-sized streams with clean gravel and there are some records from lakes. It is native to 3 of 18 watersheds and was introduced to the upper Oswego watershed. There is a clear decline in the Susquehanna and a possible decline in the Chemung, but populations have remained stable in the Delaware watershed.

Their abundance has declined in many streams of the Chemung watershed, there has been a significant decline in frequency occurrence between 1930s and 2000s in the Susquehanna, and their population is unknown in the Delaware. The number of records statewide in the 1930's was 79, 1940-74 had 77 records and 1975-present had 21 records. The effort was not consistent between these periods and records were primarily from DEC.

The distribution of this species among sub-basins (HUC 10) within the 3 native watersheds has changed in a similar pattern, with fewer HUC units in the recent period. Overall there are records from 28 of the units for all time periods, and from recent times there are 14 units, or a loss of some of its former range in Susquehanna. Statewide, the number of individual site records for this species has been 233 for all time periods, 31 in the last 30 years, and 25 since 1993.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%		Abundant		Severe Decline	Moderate Decline
6% to 10%		Common			
11% to 25%	X	Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

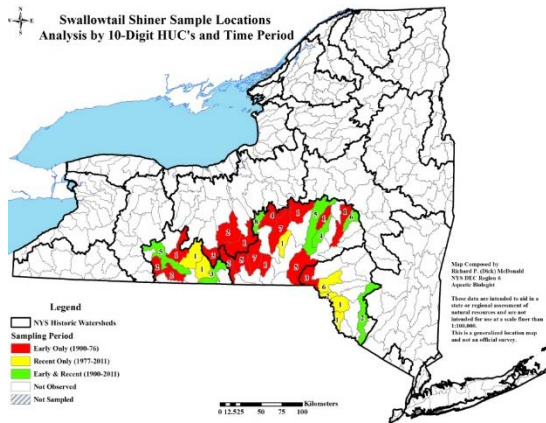
Habitat Discussion:

The swallowtail shiner is found in warm, moderate to low gradient, clear to often turbid, small to moderate sized streams, and it is tolerant of sandy bottoms and turbid water conditions. It usually occupies pools and slow runs with sand, gravel, or rock bottom (Smith 1985, NatureServe 2012). It is usually seen in schools near the bottom and co-inhabits spawning piles of rocks with river chubs, in Virginia (Smith 1985, Jenkins and Burkhead 1994).

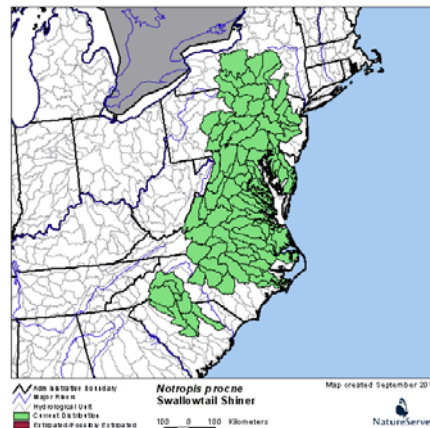
Primary Habitat Type
Medium River; Low-Moderate Gradient; Assume Moderately Buffered (Size 3+ rivers); Transitio

Distribution:

Swallowtail shiner still occur in the Delaware, Susquehanna and Chemung watersheds, but they appear to be less common in the Chemung. They are gone from the Oswego where they were called nonnative. The most recent records in the Susquehanna/Chemung basin were four by Smith, two by Cornell Univ., two stored at the NYS Mus. and eight others since 2001. The records by since 2001 include Mud Creek of Canisteo R. (DEC), Chemung River (DEC), Butternut Creek (DEC), Catatunk Creek (Cornell U), E. Br. Tioughnioga Creek (S. Coglin, ESF) and Unadilla R. (S. Coglin, ESF). The most recent records in the Delaware basin were at Fishs Eddy in E. Br. Delaware R. (by DEC in 1995, 2001 and 2003), from the mouth of Callicoon Creek (USGS, Ross in 1994), from the Delaware R. below Hancock (by Phil. Acad Sci. in 2004) and from a tributary of the Delaware R. (NYS Museum in 2001).



Carlson (2012)



NatureServe (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Invasive & Other Problematic Species & Genes	Non-native Species (competition with mimic shiner)	W	M	H

References Cited:

Carlson, D.M. 2012 (draft). Species accounts of inland fishes of NYS considered as imperiled, 2012. NYDEC Watertown, NY.

Jenkins, R.E. and N.M. Burkhead. 1994. Freshwater fishes of Virginia. Am. Fish. Soc. Bethesda, MD.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: May 5, 2012).

Smith, C.L. 1985. The inland fishes of New York State. New York State Dept. of Environmental Conservation. Albany, NY. 522 pp.

Common Name: Unknown sucker variant
Scientific Name: *Catostomus sp.*
Taxon: Freshwater Fish

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
 Global: Not Ranked
 New York: Not Ranked
 Tracked: No

Synopsis:

This unknown sucker is another type of late-spawning sucker, like summer sucker (*Catostomus utawana*), that has a slightly different body shape, genetic characteristics that are different from it and from white sucker and therefore appears to be a distinctive species. There is no official name yet. It lives in small headwater lakes and streams of the eastern Adirondack Mountains and is known in only 3 ponds, found in 2 of 18 watersheds in New York. This sucker has similar spawning characteristics to summer sucker and when classified as a species, it will be, along with summer sucker, among the only two endemic fish species in the state. Its range is restricted and poorly defined.

Distribution (% of NY where species occurs)		Abundance (within NY distribution)		NY Distribution Trend	NY Abundance Trend
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common	X		
26% to 50%		Uncommon			
> 50%		Rare			

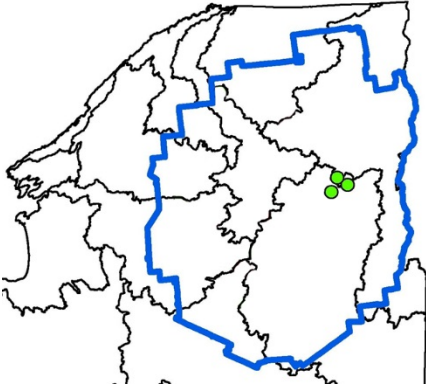
Habitat Discussion:

Lakes, creeks, and small rivers with rocky pools and runs are preferred habitat and large rivers are avoided. Spawning has been documented in streams of Elk Lake (Webster 1973a). Mather (1886) describes summertime habitat (post spawning) of late spawning suckers as in deeper waters of lakes.

Primary Habitat Type
Headwater/Creek; Low-Moderate Gradient; Low Buffered, Acidic; Transitional Cool
Lake; Small Lake

Distribution:

This species has a small range in lakes and tributary streams in the Adirondack Mountains of New York. It has been found in Elk Lake, Ausable Ponds, and Boreas Ponds.



Adirondack region of NY showing ponds inhabited by eastern summer sucker. Modified from Carlson and Morse (2012)

Threats to NY Populations				
Threat Category	Threat	Scope	Severity	Irreversibility
1. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species	W	H	H
2. Pollution	Industrial & Military Effluents (acid rain)	P	M	M
3. Climate Change & Severe Weather	Drought	W	M	V
4. Climate Change & Severe Weather	Storms & Flooding (severe storms)	W	M	V

References Cited:

Carlson, D. and R. Morse. 2012 (Abstract of poster). Suckers of Elk Lake and the dilemma of the cryptic Summer Sucker. NENH Conference, April 15-19, 2012. On Center, Syracuse, NY.

Mather, F. 1886. Memoranda relating to Adirondack fishes with descriptions of new species from researches made in 1882. State of New York Adirondack Survey from appendix to the 12th report (Zoology) 1886:1-56.

Webster, D. 1973. Life history, ecology and population dynamics of suckers. Annual job progress report. Federal Aid Project no. F-28-R-8, Job 8-C for NYSDEC for period Apr 1, 1972 to Mar 31, 1973.