

Species Status Assessment

Class: Osteichthyes (bony fishes)
Family: Catostomidae (sucker)
Scientific Name: *Moxostoma carinatum*
Common Name: River redhorse

Species synopsis:

The river redhorse 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.

I. Status

a. Current and Legal Protected Status

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

b. Natural Heritage Program Rank

i. **Global** G4
ii. **New York** S2? **Tracked by NYNHP?** Yes

Other Rank:

Species of Northeast Regional Conservation Concern (Therres 1999)
Canadian Species at Risk Act (SARA) Schedule 1/Annexe 1 Status: SC (13Dec2007)
Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Special Concern (29Apr2006)

Status Discussion:

River redhorse is globally ranked as Apparently Secure and ranked in New York as Imperiled. It is uncommon to rare and has declined greatly from historic times (NatureServe 2012).

II. Abundance and Distribution Trends

a. North America

i. Abundance

___ declining ___ increasing X stable ___ unknown

ii. Distribution:

___ declining ___ increasing X stable ___ unknown

Time frame considered: Over the past 10 years (NatureServe 2012)

b. Regional

i. Abundance

___ declining ___ increasing ___ stable X unknown

ii. Distribution:

___ declining ___ increasing ___ stable X unknown

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

Time Frame Considered: _____

c. Adjacent States and Provinces

CONNECTICUT Not Present X No data _____

MASSACHUSETTS Not Present X No data _____

NEW JERSEY Not Present X No data _____

VERMONT Not Present X No data _____

d. NEW YORK

No data _____

i. Abundance

___ declining ___ increasing X stable ___ unknown

ii. Distribution:

___ declining ___ increasing X stable ___ unknown

Time frame considered: since 1977

Monitoring in New York.

There are monitoring programs carried out by the Rare Fish Unit, 1998-2012.

Trends Discussion:

Over the last 10 years, this species has shown trend of relatively stable to decline of 30%. Numbers have diminished in the United States since 1925 (Scott and Crossman 1973). After severe declines in Pennsylvania during the 1970s and 1980s, populations have increased. Populations in Ohio are now believed to be stable after declines in the 1940s. In Kansas the river redhorse formerly was common; in the last 20 years only one record has been documented. Populations are declining in Canada (NatureServe 2012).

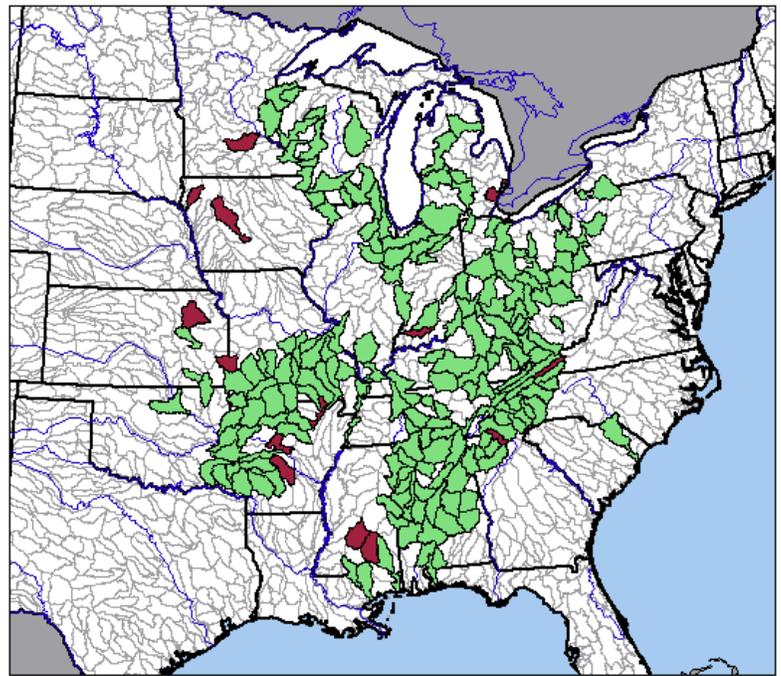
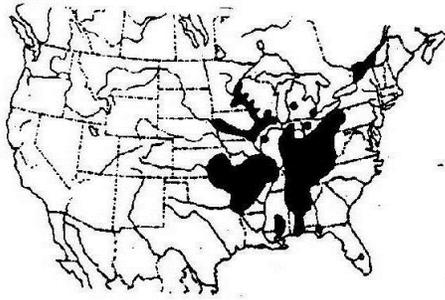
In New York, river redhorse has historically been found in 4 waters and their range is not declining (or gone or dangerously sparse) in the eastern sub-basin of the one watershed. The population has been recognized here for 20 years and is poorly understood. The frequency of occurrence in samples from 1998-2006 was very low (1%) and it was only in the 20 mile reach of the Allegheny River. There were 7 records, all occurring since 1978.

The distribution of this species among sub-basins (HUC 10) within the one watershed has changed in a similar pattern, with records from all the units in the recent period. There were records from 4 of the units for all time periods, and they were all caught in recent times. This narrowly restricted area was in the 20 mi reach of the Allegheny River. There have been only 11 site records for this species, all since 1978. Also, four of these were since 1993.

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

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).

Family: Catostomidae
 Common name: River Redhorse
 Scientific name: Moxostoma carinatum



Moxostoma carinatum
River Redhorse
 Map created September 2010
 Legend:
 - Administrative Boundary (black line)
 - Major Rivers (blue line)
 - Hydrological Unit (grey line)
 - Current Distribution (green area)
 - Extirpated/possibly Extirpated (red area)
 - Out of Scope (grey area)
 Scale: 0 100 Kilometers
 NatureServe logo

Figure 1. National range map of river redhorse (Page and Burr 1991, NatureServe 2012).

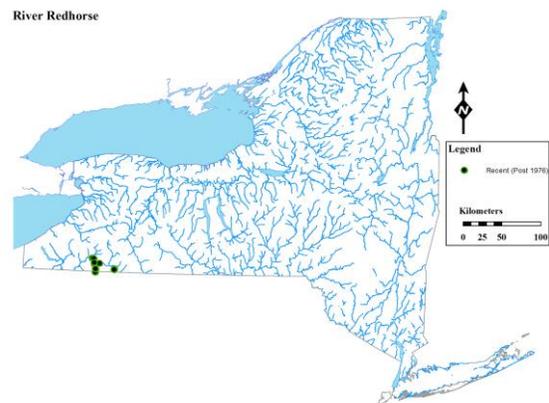
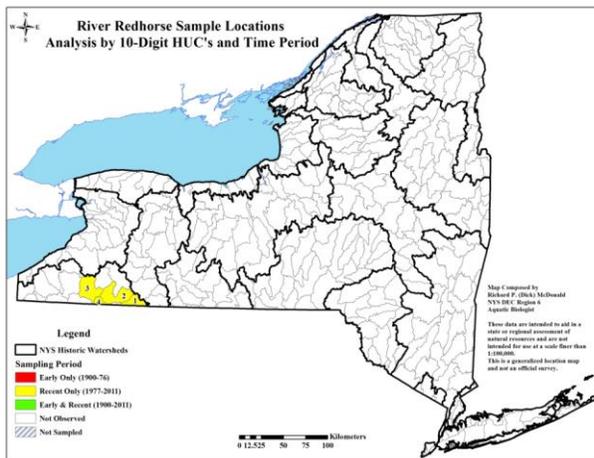


Figure 3. River redhorse distribution in New York, depicting fish sampled before 1977 and from 1977 to current time, shown with the corresponding HUC-10 units where they were found and the number of records.

III. New York Rarity, if known:

Historic	<u># of Animals</u>	<u># of Locations % of State</u>	
prior to 1977	_____	<u>0</u> site records	<u>0/18</u> watersheds
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

Details of historic occurrence:

This species was not reported in 1937 in the biological survey of the Allegheny watershed. It was likely present but not recorded until 1978.

Current	<u># of Animals</u>	<u># of Locations % of State</u>	
(since 1977)	_____	<u>11</u> site records	<u>1/18</u> watersheds

Details of current occurrence:

River redhorse 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.

New York's Contribution to Species North American Range:

% of NA Range in New York	Classification of New York Range
___ 100 (endemic)	___ Core
___ 76-99	<u>X</u> Peripheral
___ 51-75	___ Disjunct
___ 26-50	Distance to core population:
<u>X</u> 1-25	_____ 450 miles _____

IV. Primary Habitat or Community Type:

- 1. Medium River, Low Gradient, Assume Moderately Buffered, Warm

- 2. Reservoir/Artificial Impoundment

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 river redhorse 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 redhorse 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.

They 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).

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:

River redhorse has an intermediate length life span; maximum longevity is 16 years. An estimate of maturity at three years may be an underestimate. Spawning takes place in the spring (NatureServe 2012).

VI. Threats:

Jenkins and Burkhead (1994) feel this species is one of the least numerous species. It is also said to be trophically and behaviorally the most divergent of the redhorse species. It has fared poorly over the last 100 years, because of impoundments, siltation, and pollution. Habitat alteration, such as channelization, has also been identified as a major threat. These threats act as limiting factors because the redhorse seems to be inflexible in its habitat requirements and is intolerant of pollution and heavy siltation. It is vulnerable to major pollution events (such as toxic spills).

Siltation may be the reason the redhorse has a disjunct distribution (Scott and Crossman 1973). One major reason for the river redhorse's intolerance of turbidity and siltation is that the major food items of this fish require clean gravel-sand stream bottoms and are very susceptible to reduction or extirpation through excessive siltation. Food resources also are sensitive to toxicants. Food resource reductions in turn reduce redhorse populations (NatureServe 2012).

Shooting or gigging of spawners may contribute to local declines. In Oklahoma, the main threats are multiple impoundments in the Illinois River and chicken-farm runoff that enters the river from Arkansas. In Quebec, this species is declining due to the removal of adults and habitat deterioration (Natureserve 2012).

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

- No Unknown
 Yes

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

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

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

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

Obtain better life-history information (NatureServe 2012). Large river habitat makes protection difficult. Identification requires very thorough examinations and often this includes sacrificing the fish.

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

Habitat Research:

---- Inventory the habitat requirements of this species and compare it to what's available in the literature, as part of the State Wildlife Grants project of 2004.

Habitat Restoration:

---- Habitat losses and restoration are part of a State Wildlife Grants project from 2003 that are directed at the Allegheny watershed.

Population Monitoring:

---- Surveys of the Allegheny River and Allegheny Reservoir during the time of spawning should be completed, and representative samples of all redhorse should be closely examined or preserved

VII. References

- Becker, L.R. Jr. 1982. Fishes of the Allegheny River and its tributaries between Salamanca and Allegheny, Cattaraugus County, New York. M.S. thesis. St. Bonaventure Univ., St. Bonaventure, NY.
- Becker, G.C. 1983. Fishes of Wisconsin. Univ. Wisconsin Press, Madison. 1052 pp.
- Carlson, D.M. 2001. Species accounts for the rare fishes of New York. N. Y. S. Dept. Env. Cons. Albany, NY.
- Carlson, D.M. 2012 (draft). Species accounts of inland fishes of NYS considered as imperiled, 2012. NYDEC Watertown, NY
- Cervone, T.H., R.M. Langianese and S.M. Stayer. 1985. The fishes of Tunungwant Creek drainage. Proc. Penn. Acad. Sci. 59:138-146.
- 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.

- Eaton, S.W., R.J. Nemecek and M.M. Kozubowski. 1982. Fishes of the Allegheny River above Kinzua Dam. N.Y. Fish Game Journal 29(2):189-198.
- Hackney, P.A., W. M. Tatum and S.L. Spencer, 1968. Life history study of the river redhorse, M. carinatum (Cope) in the Cahaba River, Alabama, with notes on the management of the species as a sport fish. Proc. Southeast Asssoc. Game Fish Commnrs. 21:324-332.
- Jenkins, R.E., 1970. Systematic studies of the catostomid fish tribe Moxostomatini. Doctoral dissertation. Univ. Mich. Ann Arbor. 770 pp.
- Jenkins, R.E. and N.M. Burkhead. 1994. Freshwater fishes of Virginia. Am. Fish. Soc. Bethesda, MD
- Lee, D.S., et al. 1980. Atlas of North American freshwater fishes. North Carolina State. Mus. Nat. His., Raleigh. 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.
- Tatum, W.M. and P.A. Hackney. 1970. Age and growth of river redhorse, Moxostoma carinatum (Cope) from the Cahaba River, Alabama. Proc. Southeast Asssoc. Game Fish Commnrs. 23(1969):255-261.
- Scott, W. B., and E. J. Crossman. 1973. Freshwater fishes of Canada. Fish. Res. Bd. Can. Bull. 194. 966 pp.
- Smith, P.W. 1979. The fishes of Illinois. Univ. Illinois Press, Urbana. 314 pp.
- Smith, C.L 1985. The inland fishes of New York State. New York State Dept. of Environmental Conservation. Albany, NY. 522.

Date last revised: July 16th, 2013