

Species Status Assessment

Class: Actinopterygii
Family: Polyodontidae
Scientific Name: *Polyodon spathula*
Common Name: Paddlefish

Species 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). In 1998, the NYSDEC began a stocking program to restore the paddlefish in the Allegheny Reservoir and River (Kozlowski and Loukmas 2013).

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** SX **Tracked by NYNHP?** Yes

Other Rank:

Canadian Species at Risk Act (SARA) Schedule 1/Annexe 1 Status: Extirpated (05Jun2003)
Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Extirpated (25Apr2008)

Status Discussion:

Populations have been declining in the Mississippi, Missouri, Ohio, and Red Rivers since the turn of the century (Cooper 1983, NatureServe 2012). Some states, including Arkansas and Pennsylvania, have seen increases in populations due to stocking programs which augment existing stocks or attempt to recover historical populations (NatureServe 2012).

II. Abundance and Distribution Trends

a. North America

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: Past 100 years

b. Regional

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Region 5 - Northeast

Time Frame Considered: Past 20 years

c. Adjacent States and Provinces

CONNECTICUT Not Present X No data _____
MASSACHUSETTS Not Present X No data _____
NEW JERSEY Not Present X No data _____
QUEBEC Not Present X No data _____
VERMONT Not Present X No data _____

ONTARIO Not Present X No data _____

i. Abundance

____ declining ____ increasing ____ stable ____ unknown

ii. Distribution:

____ declining ____ increasing ____ stable ____ unknown

Time frame considered: Past 75 years

Listing Status: Presumed extirpated (NatureServe 2012)

PENNSYLVANIA Not Present _____ No data _____

i. Abundance

____ declining X increasing ____ stable ____ unknown

ii. Distribution:

____ declining X increasing ____ stable ____ unknown

Time frame considered: Past 10 years

Listing Status: Not listed – presumed extirpated SGCN? Yes

d. NEW YORK

No data _____

i. Abundance

___ declining X increasing ___ stable ___ unknown

ii. Distribution:

___ declining X increasing ___ stable ___ unknown

Time frame considered: Past 10 years

Monitoring in New York.

Monitoring studies have been conducted to track the location of stocked fingerling paddlefish as well as captured adults in both the Allegheny Reservoir and its tributaries) (Kozłowski and Loukmas 2013). From 2008 to 2011, gill nets were used to capture adult fish to be implanted with transmitters (Brewer 2012). Gill netting occurred each year during May and June, except 2010 when conditions allowed for sampling to start at the end of April (Brewer 2012). Gill nets were fished during the day and over night in the Allegheny River and the upper third of the Allegheny Reservoir (Brewer 2012). All paddlefish caught were measured for total length, eye to fork length, weighed, and some were tagged with a uniquely numbered jaw tag (Brewer 2012). When possible, fish were sexed and examined for signs of reproduction (Brewer 2012). Fish were also examined for the presence of a coded wire tag which was previously implanted in all stocked paddlefish with a handheld wand detector (Brewer 2012). From 2008 to 2011 radio transmitters were implanted in 43 adult fish which were then immediately released (Brewer 2012). These fish are routinely tracked using radio telemetry. When a fish was located during radio tracking, certain habitat characteristics such as depth, current flow, location within the reservoir (Main res., upper res., river/res., river), secchi disk reading, water color, cloud cover, shoreline habitat, site (main navigation channel, secondary channel, channel border), and boat traffic were recorded (Brewer 2012). This information will be used to help identify important paddlefish habitat.

Trends Discussion:

Paddlefish populations across the United States have been in decline for close to 100 years (Cooper 1983, Smith 1985, Pikitch et al. 2005, NatureServe 2012). 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 (see Table 1 for stocking numbers). 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).

Table 1: Stocking data for Paddlefish in New York State (M. Clancy, personal communication).

Year	Number of Paddlefish Stocked
1998	48
1999	535
2000	132
2001	1,878
2002	762
2003	778
2004	803
2005	1,433
2006	367
2007	177
2008	1,660
2009	164
2010	1,592
2011	2,150
2012	2,061
Total	14,540

U.S. States and Canadian Provinces

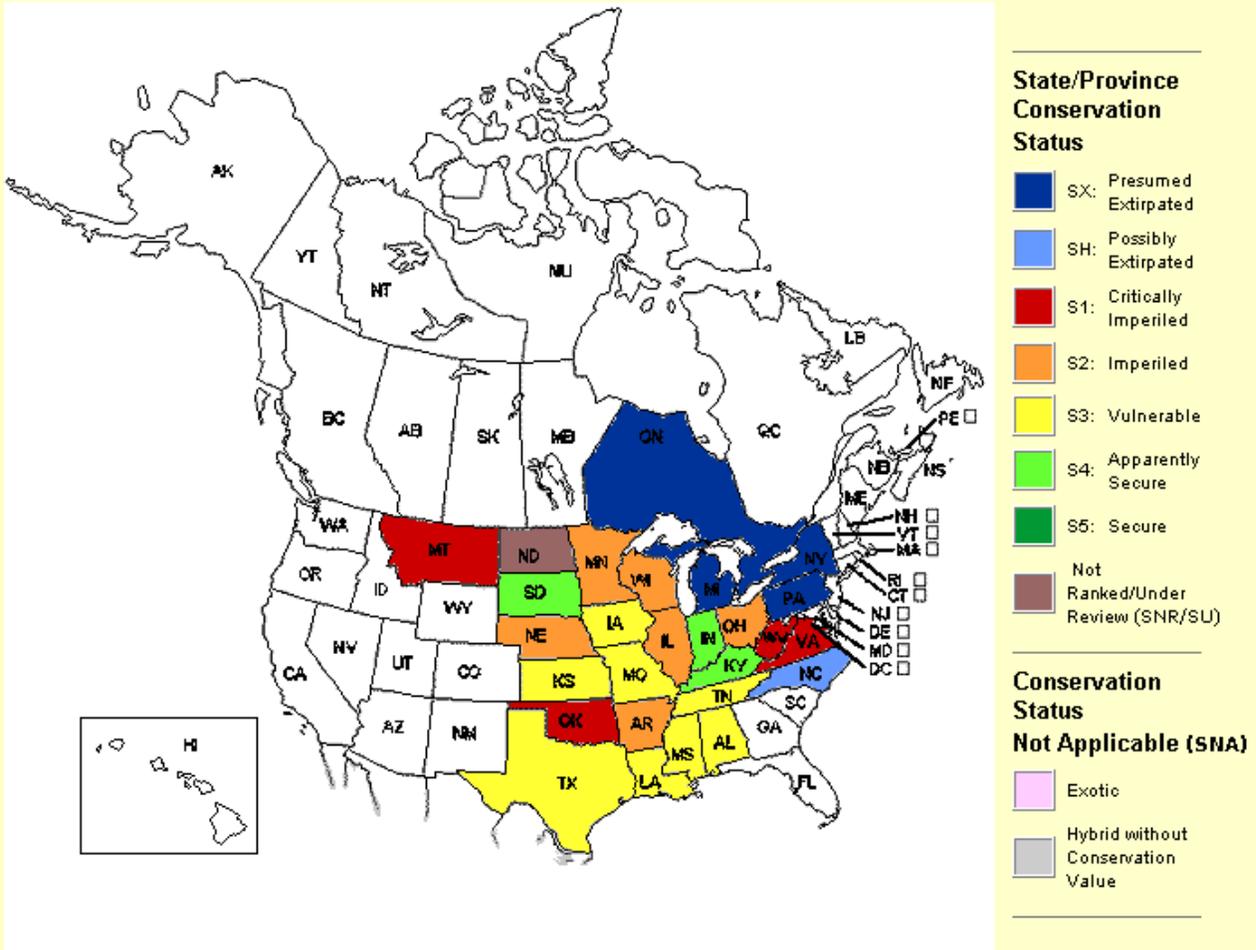


Figure 1: Paddlefish conservation status in North America (NatureServe 2012).

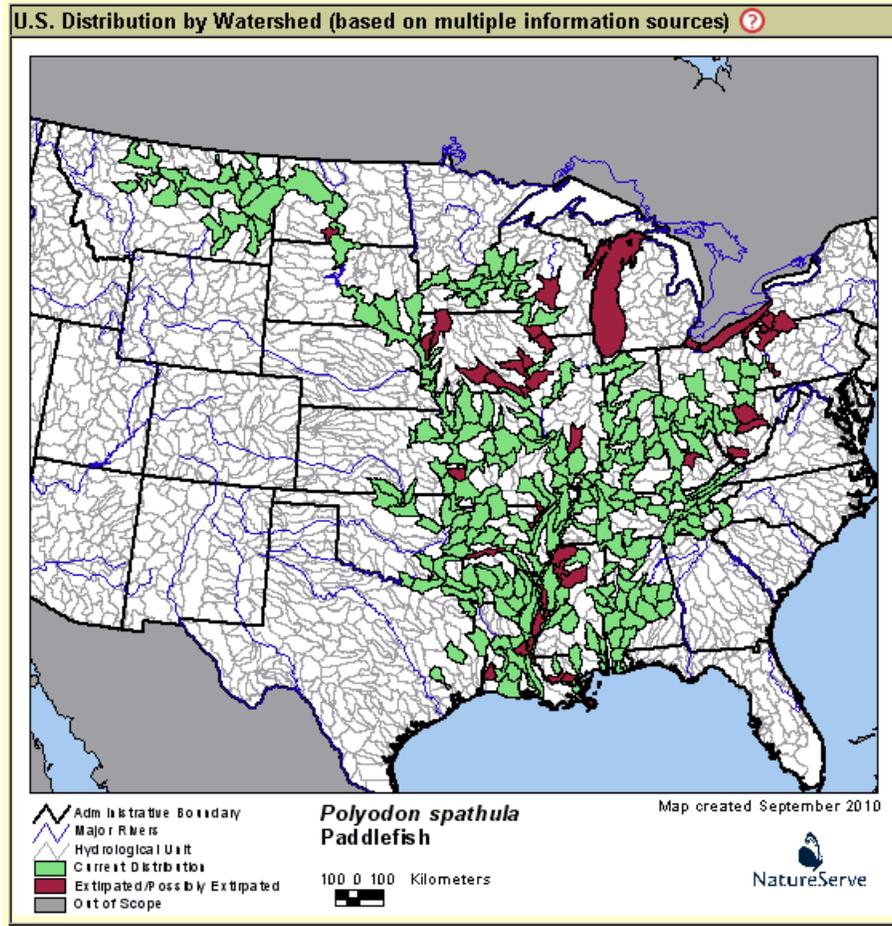


Figure 2: Paddlefish distribution by watershed in the United States (NatureServe 2012). May be inaccurate due to recent stocking efforts.

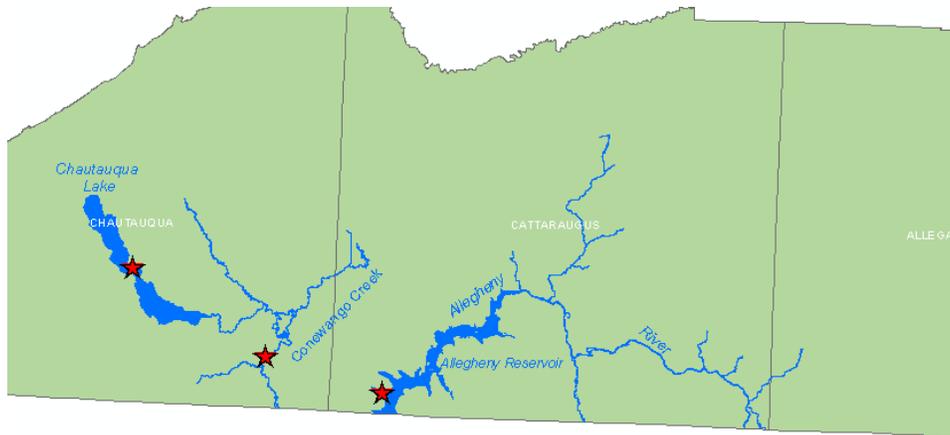


Figure 3: Allegheny River Drainage Basin of Pennsylvania showing Allegheny Reservoir, Conewango Creek, and Chautauqua Lake stocking locations (Brewer 2012).

III. New York Rarity, if known:

Historic	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1970	_____	_____	_____
prior to 1980	_____	_____	_____
prior to 1990	<u> 1 </u>	<u>1 watershed</u>	_____

Details of historic occurrence:

Paddlefish were extirpated from New York in the early 1900s. Prior to the stocking program, there was only one record of a paddlefish in New York based on a photo of a 6 foot 2 inch fish caught in Chautauqua Lake around 1890 (Smith 1985). This fish weighed 123.5 lbs. and was thought to be between 40-60 years old (Smith 1985).

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	<u>1 watershed</u>	_____

Details of current occurrence:

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

New York’s Contribution to Species North American Range:

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

IV. Primary Habitat or Community Type:

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

Habitat or Community Type Trend in New York:

Declining Stable Increasing Unknown

Time frame of decline/increase: _____

Habitat Specialist? Yes No

Indicator Species? Yes No

Habitat Discussion:

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 and winter (NatureServe 2012).

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:

Spawning occurs when water temperatures reach about 50° Fahrenheit and the water level rises during early spring (Smith 1985, NatureServe 2012). Males reach sexually maturity at about 7 years of age, females around 10 years (NatureServe 2012). Individuals probably do not spawn every year (NatureServe 2012). After fertilization, eggs gain an adhesive surface and stick to the bottom (Smith 1985). Eggs that did not stick to the bottom will not hatch, while those that did stick hatch after about a week (Smith 1985). Individual fish in Missouri are noted to migrate as far as 55 miles upstream to spawn and may move up to 200 miles in the absence of barriers (NatureServe 2012).

VI. Threats:

The Kinzua Dam is a threat to the New York paddlefish population. It was authorized by the Flood Control Acts of 1936 and 1938 (USACE 2013). The dam was completed in 1965 and has prevented flood damages estimated to total more than \$1 billion (USACE 2013). The Kinzua Dam collects from a 2,180 square mile watershed forming the 12,080 acre Allegheny Reservoir (USACE 2013). Dams prevent stocked fish from returning upstream, if they make it downstream alive. Dams reduce habitat by restricting access to spawning areas, reducing backflow areas, and altering flow regimes (Smith 1985, Brewer 2012). Channelization has also reduced backflow areas and altered flow regimes, reducing paddlefish habitat across the country (Pikitch et al. 2005).

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

No **Unknown**

Yes (describe mechanism and whether adequate to protect species/habitat)

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Adirondack Park Agency has the authority to regulate smaller wetlands within the Adirondack Park.

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:

Radio telemetry studies and stocking programs should continue to determine how to best conserve and protect paddlefish habitat.

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

Conservation Actions	
Action Category	Action
Land/Water Management	Habitat/Natural Process Restoration
Species Management	Species Recovery
Species Management	Species Reintroduction
External Capacity Building	Alliance & Partnership Development

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for extirpated fishes, which includes the paddlefish.

Habitat Monitoring:

---- Inventories will be completed in all areas where restoration might be practical.

Relocation/reintroduction:

---- Re-establish, if feasible, populations of those endangered fish species now believed to be extirpated from New York.

VII. References

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