Species Status Assessment

Common Name: Atlantic sturgeon **Date Updated:** January 2024

Scientific Name: *Acipenser oxyrinchus* **Updated by:** Gregg Kenney

Class: Actinopterygii

Family: Acipenseridae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

The Atlantic sturgeon, *Acipenser oxyrinchus*, is in the family Acipenseridae which includes 26 species worldwide. Atlantic sturgeon is an anadromous fish that can be found along the entire Atlantic Coast from Labrador, Canada to St. Johns River, Florida. The Atlantic sturgeon is the largest sturgeon found in New York and is found year round within the Hudson River Estuary, Long Island Sound, and the waters of the south shore Long Island. The Hudson River is a vital spawning habitat and nursery for the Atlantic sturgeon. In the United States, the Atlantic sturgeon is currently present in 32 rivers, and spawning occurs in at least 14 of these rivers (Atlantic Sturgeon Status Review Team 1998, NMFS 1998).

This prehistoric fish was once plentiful in the Hudson until the late 1800s through the early 1900s when overfishing depleted the population dramatically. Pollution, sedimentation, and blockage of access to spawning areas by dams also played a role in the population decrease as well as inhibiting population recovery (Gilbert 1989, Burkhead and Jenkins 1991, Marine and Coastal Species Information System 1996). In 1997 the New York State Department of Environmental Conservation passed a statewide moratorium and the Atlantic States Marine Fisheries Commission passed a coast wide moratorium on fishing and possession of Atlantic sturgeon.

I. Status

a. Current legal protected Status

i. **Federal:** Endangered **Candidate:** _____

ii. **New York:** Endangered

b. Natural Heritage Program

i. **Global:** G3

ii. **New York:** S1 **Tracked by NYNHP?:** Yes

Other Ranks:

-New York 2025 SGCN status: High Priority Species of Greatest Conservation Need

-IUCN Red List: Vulnerable

-Northeast Regional SGCN: High responsibility, Concern: Very High

Status Discussion:

In 1997 the Atlantic States Marine Fishery Commission instituted a coast wide moratorium on the harvest of Atlantic sturgeon in effect until there are at least 20 protected year classes in each spawning stock which could take 40 years. In addition in February of 2012 was listed under the

Endangered Species Act by the National Marine Fishery Service. The Hudson River population is one of two populations that are presumed to be the healthiest in the United States (Atlantic Sturgeon Status Review Team 2007) but this stock is at its lowest level in the past 120 years (NYSDEC 2005).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Stable	Last 50 years		Choose an item.
Northeastern US	Yes	Declining	Stable	Last 50 years		Yes
New York	Yes	Unknown	Stable	Last 20 years		Yes
Connecticut	Yes	Choose an item.	Choose an item.			Yes
Massachusetts	Yes	Choose an item.	Choose an item.			Yes
New Jersey	Yes	Choose an item.	Choose an item.			Yes
Pennsylvania	No	Choose an item.	Choose an item.			Yes
Vermont	No	Choose an item.	Choose an item.			Choose an item.
Ontario	No	Choose an item.	Choose an item.			Choose an item.
Quebec	Yes	Choose an item.	Choose an item.			Choose an item.

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

From the stock assessment advisory report (ASFMC, 2017):

Given historic removals and estimated effective population sizes, Atlantic sturgeon are currently depleted. The current analysis indicates that anthropogenic mortality (e.g., bycatch and ship strikes) may exceed acceptable levels, reducing recovery rates. There are indications that anthropogenic effects may be higher at the DPS level, though this is confounded with greater uncertainty in tagging model total mortality Z estimates.

The quality and quantity of data available to determine stock status degrades progressing from coastwide to DPS to river level. The inability to distinguish DPS origin of historical catches and many current anthropogenic sources of mortality (e.g., bycatch in coastal fisheries) precludes the use of conventional stock assessment methods at any spatial resolution other than coastwide. The only quantitative assessment which could produce conventional metrics of stock status was the stochastic stock reduction analysis. Results for sSRA should not be used to determine stock status given the uncertainty in historical catches, potential changes in productivity and carrying capacity, and concerns as to the suitability of the derived coastwide index of abundance.

The 1998 assessment determined that populations of Atlantic sturgeon throughout the species range are either extirpated or at historically low abundance. The 2017 assessment, an exhaustive evaluation

of available data, provides evidence that at the coastwide scale there has been some population recovery since the moratorium in 1998. Evidence for the beginning of population recovery at the DPS level is mixed. Significant improvements in the quality of data available to assess sturgeon must be made if stock status is to be credibly determined at any spatial resolution.

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

New York State conducts annual monitoring of both juvenile and adult Atlantic Sturgeon. The adult Atlantic Sturgeon monitoring currently collects only biological information, as required by ASMFC. The juvenile monitoring data is used to generate a relative juvenile abundance index that is composed of fish aged approximately 1-6 years old.

Trends Discussion *(insert map of North American/regional distribution and status):*

From Atlantic Sturgeon Review Report: Presently, there are only two U.S. populations for which an abundance estimate is available; the Hudson (870 spawning adults/yr) and Altamaha (343 spawning adults/yr) (Schueller and Peterson 2006, Kahnle et al. in press,). The Hudson and Altamaha are presumed to be the healthiest populations within the U.S. Thus, other spawning populations within the U.S. are predicted to have less than 300 adults spawning per year. Atlantic sturgeons in the Hudson River have supported subsistence and commercial fishing since colonial times (Kahnle et al. 1998). More recently, a research team using a novel estimation technique estimated the Hudson River spawning run size in 2014 as being composed of 310-745 individuals (Kazyak et al. 2020).

NYSDEC has also monitored juvenile Atlantic Sturgeon and developed a relative abundance index since 2004. The trends in this survey were initially positive, but have declined in recent years.

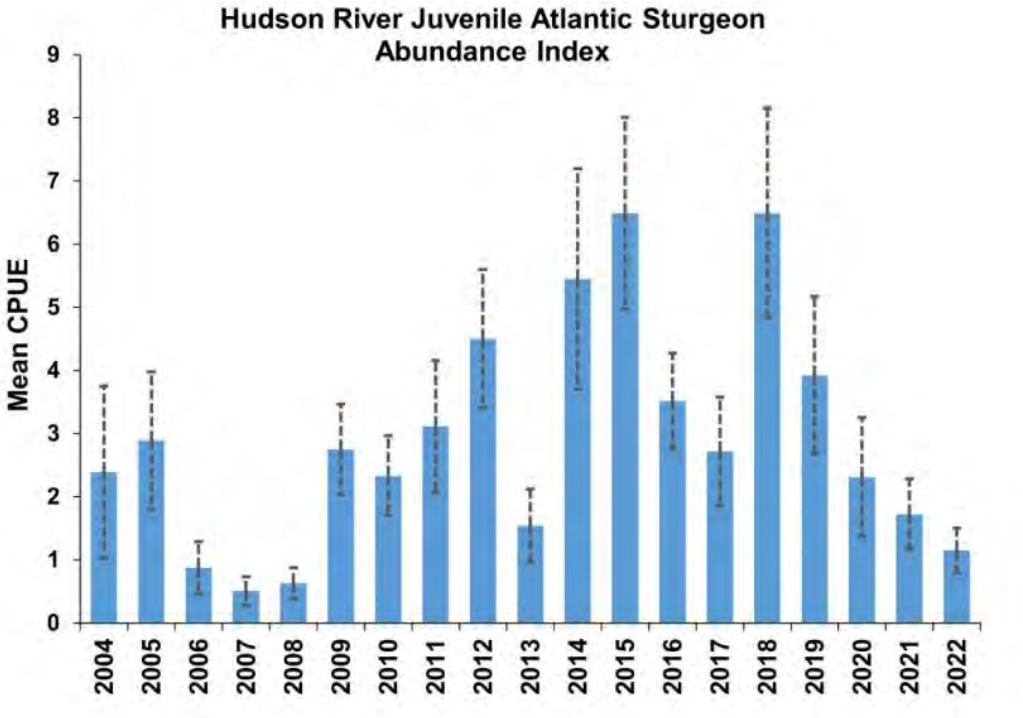

Figure 1. NYSDEC abundance index for juvenile (1-6 year old) Atlantic Sturgeon collected in the Hudson River.

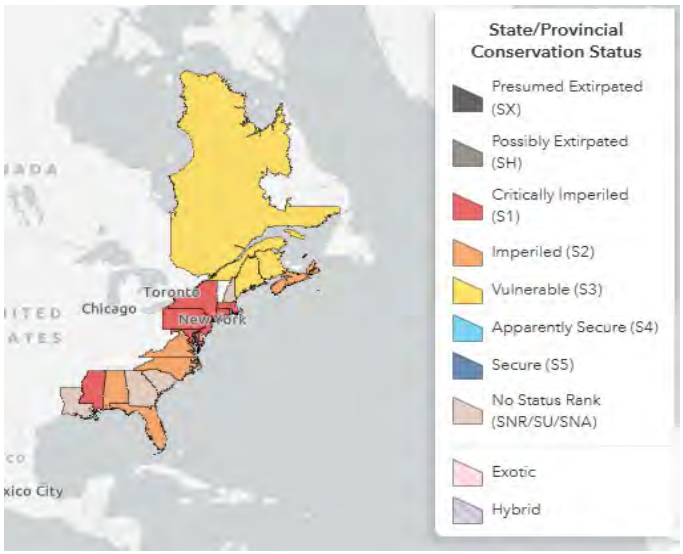

Figure 2. Conservation status of Atlantic Sturgeon in North America (NatureServe 2024).

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

Details of historic and current occurrence:

Catch depletion analysis estimated conservatively that 6,000-6,800 females contributed to the Hudson River spawning stock during the late 1800s (Secor 2002, Kahnle et al. 2005). More recent estimates put the population size at 300 spawning adults (Kahnle et al. 1998) and between 310-745 spawning adults (Kazyak et al. 2020).

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Core	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):*

a. Marine, Shallow Subtidal
b. Marine, Deep Subtidal
c. Large/Great River, Low-Moderate Gradient, Assume Moderately Buffered, Warm
d. Estuarine Subtidal, Tidal River
e. Estuarine, Brackish Shallow Subtidal, Benthic Geomorphology, Tidal Creek

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
Choose an item.	Choose an item.	Unknown	

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item

Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

The Atlantic sturgeons are benthic bottom feeders that utilize both estuary and marine habitats. The Hudson River Estuary is important spawning and nursery habitat for young of year and juveniles up to 6 years old. Juveniles leave the estuary between 1-6 years old and head out into the ocean to spend the rest of their lives only returning to spawn.

From T-4 Grant Progress Report: Results indicate that NY is an important year-round habitat for Atlantic sturgeon and that sturgeon mainly utilizes shallow inshore waters of less than 15 meters. There is a strong seasonal component, with spring and fall having the highest catches of Atlantic sturgeon. Data from the random stratified surveys and the targeting trawling suggest that in particular the Rockaway area Queens County NY represents an area where sturgeon aggregate and may warrant protection as essential habitat.

V. Species Demographics and Life History

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Yes	Choose an item.	Choose an item.	Yes	Yes	Anadromous

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

Atlantic sturgeons are an anadromous fish. Most juveniles remain in the Hudson River between one to six years before moving out to the ocean until returning to the river as mature adults to spawn (Smith 1985). In the Hudson females become sexual mature at 15-30 years, while males reach maturity at younger ages and smaller sizes than females at 11-20 years in the Hudson River (Dovel 1979, Dovel and Berggren 1983, VanEenennaam et al. 1996). VanEenennaam et al. (1996) measured fecundity of Atlantic sturgeon in the Hudson River at between 400,000 and 2.6 million eggs. As females age they lay more eggs making older females very valuable to the spawning population. Spawning occurs in flowing water between the salt front and fall line of large rivers. Females spawn every 3-5 years while males spawn every 1-3 years. Males usually begin their spawning migration early and leave after the spawning season, while females make rapid spawning migrations upstream and quickly depart following spawning (Bain 1997). Atlantic sturgeon has been aged to 60 years (Mangin 1964); however, this should be taken as an approximation as the only age validation study conducted to date shows variations of ±5 years (Stevenson and Secor 1999).

VI. Threats *(from NY 2015 SWAP or newly described)*

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
4. Transportation & Service Corridors	4.3 Shipping Lanes	4.3.1 Shipping (Boat strikes)					
5. Biological Resource Use	5.4 Fishing & Harvesting Aquatic Resources	5.4.2 Commercial fishing (bycatch)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 1: Threats to Atlantic sturgeon.

Atlantic sturgeon are caught as bycatch in a variety of fisheries. It is difficult to determine the extent and nature of this mortality source.

Atlantic sturgeon are struck and killed by boats. In the Delaware River, boat strike mortality may be exceptionally high. In the Hudson River, Atlantic sturgeon have been reported dead in the last 10 years, many of which had either mortality causing, or post-mortem, propellor injuries. Actions that reduce the likelihood of boat strike mortality would constitute a conservation benefit for the species.

A wide variety of projects are proposed every year that have the potential to have negative impacts on the habitats used by Atlantic sturgeon for essential behaviors like foraging and migration. Diligent project review by NYSDEC staff is critical to minimize the impacts of these projects and identifying ways to provide conservation benefits to the species.

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

Yes: X **No: _____** **Unknown: _____**

If yes, describe mechanism and whether adequate to protect species/habitat:

The Atlantic sturgeon is listed as an endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as threatened or endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species. It is also protected as a federally-listed endangered species and due to their federal listing, there are no legal fisheries or by-catch allowances in U.S. waters.

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

Action Category	Action	Description
A.2 Direct Species Management	A.2.1.5.0 Prevent mortality or injury from humans	Harvest Management – Reduce bycatch mortality
A.2 Direct Species Management	A.2.1.5.0 Prevent mortality or injury from humans	Species Recover – Reduce other sources of mortality, especially boat strike mortality
C.8 Research and Monitoring	C.8.1.0.0 Basic research and status monitoring	Species Recovery – Conduct research to inform management, especially with respect to habitat use and effective data collection and analysis

Table 2: Recommended conservation actions for Atlantic sturgeon.

VII. References

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