

2000 REVIEW OF THE  
ATLANTIC STATES MARINE FISHERIES COMMISSION  
FISHERY MANAGEMENT PLAN FOR  
**ATLANTIC STURGEON**  
*(Acipenser oxyrhincus)*

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And

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**2000 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR  
ATLANTIC STURGEON (*Acipenser oxyrhincus*)**

**I. Status of the Fishery Management Plan**

<u>Year of plan's adoption:</u>	1990
<u>Amendments:</u>	Amendment 1 (June, 1998)
<u>Management unit:</u>	Migratory stocks of Atlantic sturgeon from Maine through Florida
<u>States with a declared interest:</u>	Maine through Florida, including District of Columbia, Potomac River Fisheries Commission
<u>Active committees:</u>	Sturgeon Management Board, Plan Review Team, Technical Committee, Stock Assessment Subcommittee, Citizen Advisory Panel.

In 1995, the states determined that the original 1990 FMP was insufficient for conservation and restoration of Atlantic sturgeon stocks, and initiated development of Amendment 1. The amendment was approved in June 1998 by ASMFC, and its goal is to restore Atlantic sturgeon spawning stocks to population levels, which will provide for sustainable fisheries, and ensure viable spawning populations. Specific objectives include:

- Establish 20 protected yearclasses of females in each spawning stock;
- Close the fishery for a sufficient time period to reestablish spawning stocks and increase numbers in current spawning stocks;
- Reduce or eliminate bycatch mortality of Atlantic sturgeon;
- Determine the spawning sites and provide protection of spawning habitats for each spawning stock;
- Where feasible, reestablish access to historical spawning habitats for Atlantic sturgeon; and
- Conduct appropriate research as needed, especially to define unit stocks of Atlantic sturgeon

To achieve this goal, states must maintain complete closure, through prohibiting possession of Atlantic sturgeon, and any and all parts thereof including eggs, and of any directed fishery for and landings of Atlantic sturgeon until the fishery management plan is modified to reopen fishing in that jurisdiction. Exceptions to the moratorium on possession were approved via Technical Addendum #1 for the purposes of scientific research and educational display.

In addition, states must report annually (beginning Oct. 1, 1999) on the following topics to ASMFC:

- Results of bycatch monitoring for Atlantic sturgeon in other fisheries
- Monitoring results (tagging, juvenile abundance indices, etc.)
- Habitat status (restoration efforts, FERC relicensing studies, etc.), in accordance with the recommendations in the FMP; and
- Aquaculture operations authorized, status of regulations, disease-free certification status, etc.

Reports should be based on the previous calendar year at a minimum.

## **II. Status of the Stock<sup>1</sup>**

Reported landings peaked in 1890 at 3.4 million kg and declined precipitously thereafter. Currently, populations of Atlantic sturgeon throughout the species' range are either extirpated or at historically low abundance. Recruitment is variable at low levels in all regions. Survival of Atlantic sturgeon during the 20th century implies that enough spawning and nursery habitats exist to perpetuate the species. In the absence of major threats to existing habitat, reduced fishing mortality is of greater importance to stock restoration efforts than habitat limitations.

The target fishing rate was defined as that level of F that generated an eggs-per-recruit (EPR) equal to 50% of the EPR at  $F = 0.0$  (i.e., virgin stock). This rate ( $F_{50}$ ) equals 0.03 (annual harvest rate of 3%) for a restored population. This target is far below recent estimates of F prior to enactment of fishing moratoria, which ranged from 0.01 - 0.12 for females and 0.15 - 0.24 for males in the Hudson River

## **III. Status of the Fishery**

Currently, all states and the National Marine Fisheries Service have enacted bans on harvest and possession of Atlantic sturgeon and sturgeon parts. As per Amendment 1, these moratoria will remain in effect until stocks at least exhibit 20 protected yearclasses of spawning adults and the FMP is modified to permit harvest and possession.

Importation of Atlantic sturgeon and sturgeon parts from Canada is currently not allowed under all state regulations, but could be permitted through the adaptive management process (i.e., addenda).

## **IV. Status of Research and Monitoring**

Amendment 1 requires States/jurisdictions to report the results of bycatch monitoring for Atlantic sturgeon in other fisheries, monitoring results (tagging, five-year juvenile abundance index studies), habitat status (restoration efforts, FERC relicensing, etc.), and status of

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<sup>1</sup> Portions of this report were taken from "Atlantic States Marine Fisheries Commission: Atlantic Sturgeon stock assessment peer review. Terms of reference and advisory report." ASMFC, Wash., D.C. 29 pp.

aquaculture operations, regulations, and disease-free certifications. Amendment 1 does not require any research in participating jurisdictions. Nonetheless, several state and federal agencies are conducting or have completed research projects on Atlantic sturgeon to further understand the species' life history, genetics, behavior, and aquaculture. Some of these include:

- Reproductive conditions of Hudson River stock (U. Calif./Davis - Hudson River Foundation)
- Diet in marine waters (National Biol. Service, assisted by NJ Dept. of Environmental Protection)
- Hydroacoustic surveys in Connecticut River and Hudson River (National Biol. Service - U.S. Fish and Wildlife Service)
- Mitochondrial DNA analysis to delineate subspecies (NY Univ. and Hudson River Foundation)
- mtDNA analysis to determine stock contributions in NY fishery (NY Univ. and Hudson River Foundation)
- Behavior and diet studies in early life history stages (National Biol. Service)
- Juvenile sturgeon habitat use in Hudson River (U. Mass. and NMFS, Cornell U.)
- Ultrasonic telemetry studies of sturgeon movement (National Biol. Service, Hudson River Foundation, Cornell U.)
- Fin ray aging studies (Chesapeake Biol. Lab and U. Calif./Davis)
- Sturgeon bycatch in Winyah Bay shad fisheries (SC Dept. of Nat. Resources)
- Tagging of juvenile and adult Atlantic sturgeon in the Delaware and Hudson Rivers (National Biol. Service and DE Dept. of Natural Resources & Environmental Control)
- Survival of juvenile Atlantic sturgeon with pectoral spine and barbel removal (SC Dept. of Nat. Resources)
- Seasonal abundance of juvenile Atlantic sturgeon in lower Edisto River (SC Dept. of Nat. Resources)
- Movement and distribution of stocked Atlantic sturgeon in Nanticoke River, MD, through the use of sonic tags (Ches. Biol. Lab, MD DNR, NBS)
- Release of approximately 3,500 coded wire tagged juvenile Atlantic sturgeon of Hudson River parentage in Nanticoke River, MD (Ches. Biol. Lab, MD DNR, and the USFWS)

- Tagging program/rewards for live Atlantic sturgeon captured in Chesapeake Bay (USFWS, VMRC, MD DNR, and the Chesapeake Bay Foundation)
- Tagging of juvenile Atlantic sturgeon in A.C.E. (Ashepoo-Combahee-Edisto) Basin, SC (SC DNR)
- Identification of genetic diversity in Atlantic sturgeon using microsatellite markers is underway at the Leetown Science Center (USGS-BRD).

Several researchers are working on identifying sturgeon habitat needs and preferences, as well as conducting tagging and tracking studies.

The USFWS continues work on development of a culture manual for Atlantic sturgeon including evaluation of diets, rearing densities, handling, and mass-marking techniques at the Northeast Fishery Center in Lamar, PA. In addition, the Maryland DNR is holding four different year classes of Hudson River Sturgeon for future broodstock. In 1998, captive males at Lamar were induced to spermiate and eggs were taken by streamside spawning on the Hudson River. In 1999, USFWS at Lamar completed studies on growth, feed efficiency, and rearing densities for yearling Atlantic sturgeon. In 60-day replicate trials, growth of fish was greatest when fed at 3% of body weight per day (20.5% increase in weekly biomass), but feed conversion rate was highest at the 1.5% feed rate (0.64 compared to 1.09). In the 49-day density study, yearlings were reared at 8 to 24 g/L with feeding rates of 2.5% tank biomass per day. Fish reared at lowest densities displayed a body weight increase of 101% compared to only 55% for those maintained at higher densities. Atlantic sturgeon on hand at Lamar in November 2000 included 20 feral broodstock (8 Hudson; 8 Delaware; and 4 NJ coastal), and the following Hudson River first generation stocks: 1993 - 74; 1994 -115; 1995 - 105; 1996 - 84; and, 1998 - 425.

## **V. Status of Management Measures and Issues**

Mandatory management measures include:

- Complete closure, through prohibiting possession of Atlantic sturgeon, and any and all parts thereof including eggs, and of any directed fishery for and landings of Atlantic sturgeon until the fishery management plan is modified to reopen fishing in that jurisdiction.
- In addition, states shall implement any restrictions in other fisheries as outlined in bycatch reduction sections of the FMP.
- States may grant limited specific exceptions to prohibitions on possession for imports of non-U.S. Atlantic sturgeon and/or cultured Atlantic sturgeon upon adoption of FMP addenda that specify the terms, limitations, and enforcement requirements for each such exception. It is intended that each such addendum shall be developed by a PRT, in consultation with representatives of the ASMFC federal partners, applicable state aquaculture authorities, the

ASMFC Law Enforcement Committee, the state(s) for which shipments are intended, and the party (ies) requesting the exception.

In addition to these mandatory regulations, states are implementing several recommendations in the FMP including development of a coastwide tagging database, culture techniques, incorporation of shortnose sturgeon issues in Atlantic sturgeon research (and vice versa), stock identification, and habitat restoration.

A number of new habitat restoration initiatives have resulted in the removal of barriers to Atlantic Sturgeon migration. The State of Maine and the Federal Energy Regulatory Commission (FERC) joined efforts to remove the Edwards Dam on the Kennebec River in 1999. This removal resulted in the restoration of 18 miles of historic Atlantic sturgeon spawning and nursery habitat. In addition, the State of North Carolina removed Mill Dam on the Little River, opening up an additional 49 miles of spawning area to sturgeon species.

On September 21, 1998, the Secretaries of Commerce and Interior determined that listing of Atlantic sturgeon under the Endangered Species Act (ESA) is not warranted. This finding was in response to a petition filed on June 2, 1997 for listing the species as endangered or threatened under ESA. Additionally in May of 1998, the National Marine Fisheries Service imposed a harvest and possession moratorium on Atlantic sturgeon in the EEZ.

## **VI. Current State-by-State Implementation of FMP Compliance Requirements (as of October 15, 1999)**

Compliance requirement: Complete closure, through prohibiting possession of Atlantic sturgeon, and any and all parts thereof including eggs, and of any directed fishery for and landings of Atlantic sturgeon until the fishery management plan is modified to reopen fishing in that jurisdiction. As described in Sections 3.4 and 5.1.2 of Amendment 1, states/jurisdictions must report on monitoring programs and provide estimates of bycatch of Atlantic Sturgeon in other fisheries under their jurisdiction.

\*\*\*See Attached Table 1

## **VII. Recommendations/findings of FMP Review Team**

1. All States should implement the requirements and recommendations of Amendment 1.

**TABLE 1**

	<b>ATLANTIC STURGEON AMENDMENT 1 – COMPLIANCE MATRIX</b>				
	Bycatch Monitoring <sup>1</sup>	Monitoring Results <sup>2</sup>	Habitat Status <sup>3</sup>	Aquaculture Operations <sup>4</sup>	Moratorium on Harvest and Possession <sup>5</sup>
ME	C	C	C	C	C
NH	C	C	C	C	C
MA	C	C	C	C	C
RI	C	C	C	C	C
CT	C	C	C	C	C
NY	C	C	C	C	C
NJ	C	C	C	C	C
PA	C	C	C	C	C
DE	C	C	C	C	C
MD	C	C	C	C	C
PRFC	C	C	C	C	C
DC	C	C	C	C	C
VA	C	C	C	C	C
NC	C	C	C	C	C
SC	C	C	C	C	C
GA	C	C	C	C	C
FL	C	C	C	C	N

NOTE \*\* C = IN COMPLIANCE, P = PARTIAL, N = NOT IN COMPLIANCE/NO REPORT SUBMITTED, NA = NOT APPLICABLE

<sup>1</sup>\*\* **REQUIRED** Bycatch Monitoring may be implemented via law enforcement observations, fishery independent surveys, ACCSP and/or at-sea observer programs.

<sup>2</sup>\*\* **RECOMMENDED** Monitoring Results should include:

- a). Programmatic details of how juvenile abundance survey will be performed (recommended every 5 years)
- b). Calculated CPUE estimates of juveniles (when survey is completed)
- c). Report on juvenile tag and release programs
- d). Assessment of spawning stock status including examination of sex ratio, size, and age structure by sex of the larger sub-adults and adults.

<sup>3</sup>\*\* **RECOMMENDED** Habitat Monitoring reports should include:

- a). Assessment of existing and historical sturgeon habitat/habitats of particular concern
- b). Restoration programs
- c). FERC relicensing evaluations

<sup>4</sup>\*\* **RECOMMENDED** Aquaculture Operations monitoring reports should include:

- a). Aquaculture research and development
- b). Collection of brood stock and release of cultured progeny
- c). Translocation of sturgeons and inadvertent spread of diseases
  - d). Introduction of non-native sturgeons for commercial aquaculture
  - e). Collection and archiving tissue samples for genetic analysis
  - f). Monitoring effectiveness of restoration programs

<sup>5</sup>\*\* **REQUIRED** State moratorium on the harvest and possession of Atlantic Sturgeon currently applies throughout ASMFC jurisdictions