

Proposed Rulemaking to Establish Take Prohibitions for the Gulf of Maine Distinct Population  
Segment of Atlantic sturgeon

Regulatory Impact Review  
Report | June 10, 2011

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## **SECTION 1 | INTRODUCTION AND BACKGROUND**

### **1.0 INTRODUCTION**

NOAA’s National Marine Fisheries Service (NMFS) is proposing to implement protective regulations under the Federal Endangered Species Act (ESA) for the Gulf of Maine Distinct Population Segment of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*; hereafter, “GOM” DPS). NMFS has proposed to list the GOM DPS of Atlantic sturgeon as threatened (75 FR 61872). This Regulatory Impact Review (RIR) is conducted in accordance with Presidential Executive Order (E.O.) 12866 (58 FR 51735), providing a comparative analysis of the costs and benefits of the alternatives under consideration for the proposed action. The analysis also compares each alternative against significance criteria found in the Executive Order.

### **1.1 EXECUTIVE ORDER 12866**

As stated above, this RIR is conducted in accordance with E.O. 12866. The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement from the Order:

“In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider. Further, in choosing among alternative regulatory approaches agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.”

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be “significant.” E.O. 12866 defines “significant regulatory action” as an action that is likely to:

- Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, local or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in this Executive Order.

The Regulatory Impact Review is intended to assist NMFS in selecting the regulatory approach that maximizes net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity).

## **1.2 ESA BACKGROUND**

The ESA provides several means for the protection of threatened or endangered species. Section 7 of the ESA requires Federal agencies to consult with NMFS to insure that any activity they authorize, fund, or carry out (called the “agency action”) does not jeopardize the continued existence of an endangered or threatened species, or destroy or adversely modify its critical habitat. The protections under Section 7 of the ESA automatically apply when a species is listed as endangered or threatened. Section 9(a)(1) of the ESA prohibits any person subject to the jurisdiction of the United States from the following activities, with respect to endangered species:

- Import any such species into, or export any such species from the U.S.;
- Take any such species within the U.S. or the U.S. territorial sea;
- Take any such species upon the high seas;
- Possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any such species taken in violation of (2) and (3) above;
- Deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of commercial activity, any such species;
- Sell or offer for sale in interstate or foreign commerce any such species; or
- Violate any regulation pertaining to such species or to any threatened species of fish or wildlife.

All of the ESA Section 9(a)(1) prohibitions automatically apply when a species is listed as endangered but not when a species is listed as threatened. For threatened species, Section 4(d) of the ESA authorizes the Secretary of Commerce to establish protective regulations if the Secretary, on the advice of NMFS, determines that they are necessary and advisable for the conservation of the threatened species. The set of protective regulations is called a 4(d) rule and may include any of the ESA Section 9(a)(1) regulations, or other regulations. NMFS determines what is necessary and advisable based on the biological status, conservation needs, and potential threats to the threatened species.

The primary purpose of a 4(d) rule is to govern take and provide for the conservation of the threatened species. To achieve this purpose, the 4(d) rule may include exemptions from the take prohibitions for activities that may cause take, but that overall, contribute to the conservation and protection of the threatened species. Exemptions may also be included for activities in which measures have been adopted to minimize take to an acceptable level. The 4(d) rule would specify the criteria that must be satisfied to qualify for an exemption. These 4(d) rule “programs” would assure entities that their activities are consistent with ESA requirements and provide sufficient protection to the species.

NMFS may also provide coverage for an otherwise prohibited take through Section 7 or Section 10 of the ESA. Following completion of an ESA Section 7 consultation, NMFS may issue an

incidental take statement to authorize a certain level of take for the Federal agency action. Non-Federal entities may apply for two types of take permits under Section 10 of the ESA: (1) a direct take permit for scientific research or enhancement purposes [Section 10(a)(1)(A)], or (2) an incidental take permit [Section 10(a)(1)(B)]. Federal entities may also apply for an ESA Section 10(a)(1)(A) permit for scientific research and enhancement purposes. Take that results from activities conducted in compliance with an ESA Section 7 incidental take statement, an ESA Section 10 permit, or a 4(d) rule exemption would not be in violation of the ESA prohibitions.

### **1.3 PURPOSE AND NEED FOR THIS ACTION**

NMFS proposed to list the GOM DPS of Atlantic sturgeon as a threatened species under the ESA on October 6, 2010 (75 FR 61872) due to threats posed primarily from bycatch, water quality and dredging. Concurrently, four other Atlantic sturgeon DPSs were proposed to be listed as endangered (75 FR 61872 and 75 FR 61904). As described above, if the five Atlantic sturgeon DPSs are listed as proposed, the ESA Section 9 prohibitions will automatically apply to those DPSs that are listed as endangered. NMFS has, therefore, evaluated the status of the GOM DPS and existing efforts to protect the species to determine whether a 4(d) rule is necessary and advisable to extend some or all of the ESA Section 9 prohibitions to Atlantic sturgeon belonging to the GOM DPS. NMFS has determined that additional regulations as provided in a 4(d) rule are necessary and advisable to protect and conserve the GOM DPS. In this RIR, we describe and evaluate two alternative actions, or alternative 4(d) rules, as well as the status quo (no action).

### **1.4 AFFECTED AREA**

The GOM DPS includes the following: all anadromous Atlantic sturgeon whose range occurs in watersheds from the Maine/Canadian border and extending southward to include all associated watersheds draining into the Gulf of Maine as far south as Chatham, MA, as well as wherever these fish occur in coastal bays and estuaries and the marine environment. The marine range of Atlantic sturgeon from the GOM DPS extends from the Bay of Fundy, Canada to the Saint Johns River, FL.

The proposed 4(d) regulations would apply the ESA Section 9(a)(1)(A) through 9(a)(1)(G) prohibitions to activities impacting the GOM DPS throughout its range with two exemptions applicable only within the riverine range of the GOM DPS. The two exemptions to the Section 9(a)(1) prohibitions apply to watersheds within the defined range of the DPS down to the point at which the waterway in which the sturgeon occurs enters a coastal bay, estuary, or other part of the marine environment (Table 1). For the purposes of these analyses, riverine portions are defined as those portions of a river where the maximum salinity of any portion of the water column (where stratified data are available) throughout the year does not exceed 20 ppt (Table 1), and areas having salinities above 20 ppt are considered to be part of a coastal bay, estuary, or the marine environment. Exemptions to the Section 9(a)(1) prohibitions would apply upstream of this point, whereas downstream, the exemptions would not apply due to the potential presence of fish from an endangered DPS. Exemption cutoff points were selected based on available salinity data and easily recognizable boundaries, such as bridge crossings (Table 1).

Table 1. List of rivers where Atlantic sturgeon are known to occur in the GOM DPS. Upstream of the exemption cutoff (distance upstream from the listed reference location), the exemptions to the Section 9(a)(1) take prohibitions apply. Downstream of these cutoff points, no exemptions to the Section 9(a)(1) prohibitions apply. The exemption cutoff points were chosen based on reported salinities less than 20 ppt at the given location (highest reported value for bottom salinity was used, when available), as well as to be easily recognizable, such as a road crossing. Salinity units are reports as parts per thousand (ppt). Latitude and longitude data, where given, are in decimal degrees.

<u>River</u>	<u>Exemption cutoff</u>	<u>Sample location</u>	<u>Salinity</u>	<u>Source</u>
Merrimack	<u>US Rt. 1 bridge, Newburyport, MA</u>	42.815N, 70.862W	20.74	EPA's NCA <sup>1</sup>
Piscataqua	<u>Leigh's Mill Pond, South Berwick, ME</u>	43.217N, 70.814W	17.9	EPA's NCA <sup>2</sup>
Saco	<u>Main St. bridge, Biddeford, ME</u>	<u>RKM 6</u>	<u>20</u>	Gupta et al. 1994
Kennebec	<u>Main St. bridge, Biddeford, ME</u>	43.877N, 69.7965W	<u>19.38</u>	Mayer et al. 1996
Androscoggin	<u>US Rt. 1 bridge, Bath, ME</u>	43.877N, 69.7965W	<u>5</u>	Mayer et al. 1996
Sheepscot	<u>Sheepscot Rd. bridge, Newcastle, ME</u>	<u>Reversing falls at Alna, ME</u>	<u>19.68</u>	Mayer et al. 1996
Penobscot	<u>Cove Brook, Winterport, ME</u>	<u>Bald Hill Cover, Winterport, ME</u>	<u>0-26.7</u>	<u>Goulette 2004, NMFS unpub. data</u>

Atlantic sturgeon belonging to the GOM DPS overlap in distribution with all other Atlantic sturgeon within their marine range, including coastal bays and estuaries.<sup>3</sup> Atlantic sturgeon are

<sup>1</sup> The Environmental Protection Agency's National Coastal Assessment data is available at <http://www.epa.gov/emap/nca/html/data/mapuse.html>

<sup>2</sup> *Ibid.*

<sup>3</sup> Holland, B.F., Jr., and G.F. Yelverton. 1973. Distribution and biological studies of anadromous fishes offshore North Carolina. Division of Commercial and Sports Fisheries, North Carolina Dept. of Natural and Economic resources, Special Scientific report No. 24. 130pp.

Dovel, W. L. and T. J. Berggren. 1983. Atlantic sturgeon of the Hudson River estuary, New York. New York Fish and Game Journal 30: 140-172.

Waldman, J. R., J. T. Hart, and I. I. Wirgin. 1996a. Stock composition of the New York Bight Atlantic sturgeon fishery based on analysis of mitochondrial DNA. Transactions of the American Fisheries Society 125: 364-371.

visually indistinguishable from each other regardless of the river or DPS of origin. Therefore, NMFS is proposing that the Section 9(a)(1) take prohibitions apply throughout the range of the GOM DPS Atlantic sturgeon except for those certain activities when they occur within the riverine portions, only, of the GOM DPS to ensure that only Atlantic sturgeon belonging to the GOM DPS are taken.

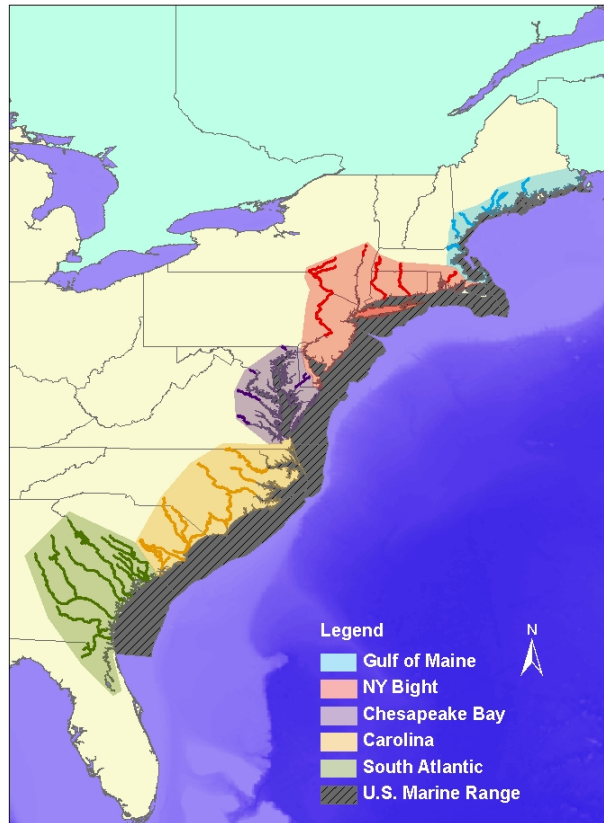


Figure 1. GOM DPS of Atlantic sturgeon showing rivers (up to the first dam where known) in which the species is known to occur. Blue shading denotes the general area in which rivers used by Atlantic sturgeon belonging to the GOM DPS may occur.

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Dadswell, M. 2006. A review of the status of Atlantic sturgeon in Canada, with comparisons to populations in the United States and Europe. *Fisheries* 31: 218-229.

Atlantic Sturgeon Status Review Team (SRT). 2007. Status Review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Report to National Marine Fisheries Service, Northeast Regional Office. February 23, 2007.



## 1.5 DESCRIPTION OF ALTERNATIVES

As indicated above, NMFS proposes to establish an ESA Section 4(d) rule for the GOM DPS. NMFS is considering the following two alternative 4(d) rules for the GOM DPS of Atlantic sturgeon as well as the status quo:

- No Action/Status Quo: Do not apply ESA Section 9(a)(1) prohibitions or any other protective regulations to the GOM DPS.
- Alternative 1: Apply all ESA Section 9(a)(1) prohibitions to the GOM DPS.
- Alternative 2 (Preferred): Alternative 2 is the same as Alternative 1, but with two exemptions to the take prohibitions. The exemptions would apply to activities conducted under NMFS-approved plans or criteria for scientific research and for salvage and aid/resuscitation – the retrieval of dead or live, injured Atlantic sturgeon by NMFS personnel or our designated agents.

Table 2. The main features of each alternative.

ALTERNATIVE	ACTIVITIES SUBJECT TO THE PROHIBITIONS	EXEMPTIONS
<b>No Action/Status Quo</b>	n/a	n/a
<b>Alternative 1</b>	All activities under Section 9.	None
<b>Alternative 2 (preferred)</b>	All activities under Section 9.	<ul style="list-style-type: none"> <li>• Activities conducted under NMFS-approved plans or criteria for scientific research within the riverine range of the GOM DPS.</li> <li>• Salvage and aid/resuscitation – the retrieval of dead or living, injured Atlantic sturgeon by NMFS personnel or NMFS designated agents.</li> </ul>

The following sections describe each alternative in detail.

### 1.6.1 NO ACTION/STATUS QUO

Under the No Action/Status Quo, NMFS would not establish a 4(d) rule (i.e., no protective regulations for the GOM DPS of Atlantic sturgeon). This scenario represents the physical, biological and economic status quo. In accordance with Section 7 of the ESA, Federal agencies would still need to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of the GOM DPS. However, actions that result in take of Atlantic sturgeon belonging to the GOM DPS and which do not have a federal nexus would not be subject to additional regulations under the ESA (i.e., the take prohibitions of Section 9(a)(1) would not apply), and none of the other Section 9 prohibitions (e.g., on import, export) would apply to Atlantic sturgeon of the GOM DPS.

## 1.6.2 ALTERNATIVE 1

Alternative 1 would apply all prohibitions under Section 9(a)(1) of the ESA to the GOM DPS by: (1) prohibiting the take of GOM DPS fish within the U.S., the U.S. territorial sea, and upon the high seas [“take prohibitions”, ESA Sections 9(a)(1)(B) and 9(a)(1)(C)]; and (2) prohibiting the import, export, possession, sale, delivery, carrying, transport, or shipping of GOM DPS Atlantic sturgeon in interstate or foreign commerce or for commercial activity, and the violation of any regulation pertaining to the species [ESA Sections 9(a)(1)(A) and 9(a)(1)(D) through (a)(1)(G)]. Alternative 1 would apply the same prohibitions to Atlantic sturgeon belonging to the GOM DPS as those that will automatically apply to any Atlantic sturgeon listed as endangered. These include activities that result in take of GOM DPS Atlantic sturgeon, such as:

- Incidental catch resulting from commercial and recreational fisheries;
- Intentional, directed, collection and handling for any purpose (e.g., scientific research, emergency fish rescue, commercial sale, consumption, recreational fisheries);
- Construction, maintenance, or operation of barriers to migration in spawning or rearing habitats;
- Take as a result of construction, maintenance, or operation of hydrokinetic projects;
- Take as a result of activities which negatively affect water quality or quantity (e.g., discharges of pollutants, changes in water temperature and dissolved oxygen, or nutrient loading);
- Operation of water diversions, dredging, and/or power plant operations that result in entrainment or impingement of GOM DPS Atlantic sturgeon;
- Artificial propagation and stocking of Atlantic sturgeon within the range of the DPS;
- Vessel strikes of Atlantic sturgeon; and
- The release or introduction of non-native species.

If Alternative 1 were implemented, proposed or ongoing activities that were likely to result in take of Atlantic sturgeon belonging to the GOM DPS would: (a) need to be modified to avoid take of GOM DPS Atlantic sturgeon; (b) would require a permit issued under Section 10 of the ESA authorizing the take; or, (c) for actions carried out, authorized, or funded by a federal agency, need to be in compliance with an incidental take statement provided in a biological opinion following consultation conducted under Section 7 of the ESA.

## 1.6.3 ALTERNATIVE 2 (PREFERRED)

Alternative 2 recognizes that not applying the Section 9(a)(1)(B) take prohibitions for certain activities can provide conservation benefits to GOM DPS Atlantic sturgeon in comparison to extending all of the Section 9(a)(1) prohibitions to the GOM DPS. Therefore, under Alternative 2, NMFS would apply the ESA Section 9(a)(1)(A) through 9(a)(1)(G) prohibitions to activities impacting the GOM DPS throughout its range except for certain activities that occur within the riverine range of the GOM DPS, only. Specifically, take of GOM DPS Atlantic sturgeon would not be prohibited for: (a) scientific research conducted on GOM DPS Atlantic sturgeon when the research is conducted in the manner specified in this proposed rule; and, (b) salvaging dead, and aiding/resuscitating living stranded, injured Atlantic sturgeon by NMFS personnel or NMFS

designated agents. NMFS is proposing that these exemptions apply only to Atlantic sturgeon found within the riverine range of the GOM DPS to ensure that only Atlantic sturgeon listed as threatened will be taken.

### Scientific Research

The collection of needed scientific information is recognized as providing a benefit to ESA-listed species. The permits process described in regulations (50 CFR 222, 223 and 224) is intended to ensure that research is conducted in a manner that minimizes harm (including injury and death) to the species or individuals in the course of bona-fide scientific research. However, requiring properly trained researchers to obtain a Section 10(a)(1)(A) permit before conducting research using methods and technologies that NMFS has already determined do not harm (i.e., do not kill or injure wildlife; 50 CFR 222.102) will not provide any additional conservation benefit to the GOM DPS of Atlantic sturgeon. In addition, research of the GOM DPS that is already in progress may be impeded if researchers are required to stop field work until they obtain a Section 10(a)(1)(A) permit, given that permit processing times can take 90 days or more, and NMFS cannot process and finalize a permit request until publication of a final rule listing the GOM DPS under the ESA. Such delays could negatively affect the ability to maintain time series data thus delaying the acquisition of information necessary for the survival and recovery of the species. Therefore, this alternative would not impose the ESA-take prohibitions on research that result in take, but not harm, of Atlantic sturgeon belonging to the GOM DPS under certain specified conditions. This alternative would include scientific research conducted within the riverine range of the GOM DPS and in accordance NMFS-approved research techniques as an exemption to the ESA Section 9(a)(1)(B) take prohibitions for the GOM DPS of Atlantic sturgeon in order to provide a conservation benefit to the species.

### Salvage and Aid/resuscitation: Retrieval of Dead or Live, Injured Atlantic sturgeon

Atlantic sturgeon carcasses and live, injured sturgeon can provide pertinent life history information and information on activities affecting the GOM DPS; thus, affording a conservation benefit to the species. In order to obtain the most information from carcasses, carcasses must be collected and transported as quickly as possible to an appropriate facility. Similarly, prompt attention to a live, injured sturgeon would increase its chances of survival. NMFS does not have sufficient personnel throughout the riverine range of the GOM DPS to respond promptly to all Atlantic sturgeon salvage and live aid/resuscitation events. NMFS does, however, work cooperatively with the U.S. Fish and Wildlife Service (FWS), and state wildlife agencies for salvage and aid/resuscitation events of other protected species. Therefore, this alternative would provide an exemption from the take prohibitions of Section 9(a)(1) for any agent or employee of NMFS, the FWS, or any other Federal land or water management agency, or any agent or employee of a state agency responsible for fish and wildlife who is designated by his or her agency for such purposes, when acting in the course of his or her official duties to take Atlantic sturgeon belonging to the GOM DPS (i.e., found within the riverine range of the GOM DPS) without a permit if such taking is necessary to salvage a dead specimen which may be useful for scientific study, dispose of a dead specimen, or aid a sick, injured, or stranded specimen.

## **SECTION 2 | DESCRIPTION OF AFFECTED ENTITIES**

## **2.1 OVERVIEW**

This analysis focuses on understanding the economic impacts of changes that would occur as a result of implementing the ESA Section 4(d) regulations for the GOM DPS of Atlantic sturgeon. This approach does not assume the world will remain unchanged in the absence of an ESA Section 4(d) regulation. Instead, it projects a future state of the world as a baseline, one that may involve substantial changes in economic and other conditions. Such changes may arise from a variety of economic factors as well as regulatory factors, including the proposed ESA listing for Atlantic sturgeon. It then projects another state in which the ESA Section 4(d) regulation has taken effect. The impacts of the ESA Section 4(d) regulation are then analyzed in terms of the differences between the two courses. Changes that would exist in the absence of the ESA Section 4(d) regulation are included in the baseline, and thus do not add to the regulation's benefits or costs.

### **2.1.1 SECTION 7 CONSULTATIONS**

Section 7 of the ESA requires each Federal agency to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species. Section 7 consultations conducted to determine whether actions are likely to jeopardize the continued existence of the GOM DPS of Atlantic sturgeon are part of the baseline for the , as these consultations would be conducted in absence of the 4(d) rule. This analysis assumes that changes to economic activities, required by Section 7 consultations addressing take (but not jeopardy) of Atlantic sturgeon, are directly related to implementation of the 4(d) rule, i.e., these impacts are not baseline.

From the period of March, 2005, through March, 2010, NMFS conducted 107 (11 formal) Section 7 consultations addressing impacts on shortnose sturgeon in the GOM DPS affected area (section 1.5). After implementation of this 4(d) rule, NMFS estimates that future Section 7 consultations addressing impacts on shortnose sturgeon in the GOM DPS affected area would also address impacts on GOM DPS Atlantic sturgeon.

### **2.1.2 OVERLAP WITH OTHER SPECIES CURRENTLY PROTECTED OR PROPOSED FOR PROTECTION**

GOM DPS Atlantic sturgeon are sympatric with shortnose sturgeon occupying many of the same stretches of rivers within the DPS, and they occupy some of the same habitats as Atlantic salmon. As stated previously, in the estuarine and marine environment, GOM DPS Atlantic sturgeon overlap with the other four Atlantic sturgeon DPSs that are proposed to be listed as endangered. ESA protections and economic impacts of the proposed Atlantic sturgeon endangered listings and listings for other species are included in baseline conditions (i.e. in absence of a 4(d) rule, Atlantic sturgeon may still receive some protection which is afforded to other protected species).

### **2.1.3 LAWS AND REGULATIONS THAT PROTECT GOM ATLANTIC STURGEON**

Federal laws other than the ESA as well as state and local laws and regulations may protect Atlantic sturgeon even in the absence of Section 4(d) take prohibitions. In some cases, a law or regulation may directly affect an activity that also has the potential to affect Atlantic sturgeon. In those cases, this analysis incorporates the economic impacts of these other measures into the baseline. Laws and regulations that may provide some protections to Atlantic sturgeon are presented in 3.0 Appendix A.

## **2.2 AFFECTED INDUSTRIES**

This analysis classifies activities potentially affected by take prohibitions into industry groups. The following sections describe how entities in potentially affected industries may change their activities in response to the 4(d) rule for GOM Atlantic sturgeon. A great deal of uncertainty exists with regard to how potentially regulated entities will attempt to avoid take for Atlantic sturgeon. This uncertainty is compounded by the fact that relatively little data exists on Atlantic sturgeon abundance and behavior for the GOM DPS.

In addition, the habitat for GOM Atlantic sturgeon overlaps habitat for other species protected under the ESA (shortnose sturgeon, Atlantic salmon and some marine mammals) as well as with the other four Atlantic sturgeon DPSs that are proposed to be listed as endangered. Thus, while a great deal of baseline protections are expected to be afforded to Atlantic sturgeon on behalf of other protected (and proposed to be protected) species, the degree to which additional measures will be required for Atlantic sturgeon has not been determined. As such, this analysis does not provide estimates of total costs of conservation measures likely to be undertaken for Atlantic sturgeon. Instead, the analysis characterizes potential impacts on affected industries in a qualitative fashion.

### **2.2.1 COMMERCIAL, RECREATIONAL AND TRIBAL FISHERIES**

At the turn of the 20<sup>th</sup> century, Atlantic sturgeon were among the top three species in weight of fish harvested commercially along the Atlantic coast (US Bureau of Fisheries 1907, US Commission of Fish and Fisheries 1884-1905). Reported landings peaked in 1890 at three and one-half million kilograms.<sup>4</sup> Landings declined precipitously soon after and remained relatively low through 1995, as seen in Figure 1.<sup>5</sup>

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<sup>4</sup> ASMFC (Atlantic States Marine Fisheries Commission). 1990. Interstate fishery management plan for Atlantic sturgeon. Fisheries Management Report No. 17. Washington, D.C. 73 pp.

<sup>5</sup> Kahnle, Andrew W. Hattala, Kathryn A. and McKown, Kim A. Stock Status of Atlantic sturgeon of Atlantic Coast Estuaries. Report for the Atlantic States Marine Fisheries Commission. June 1998. p. 2

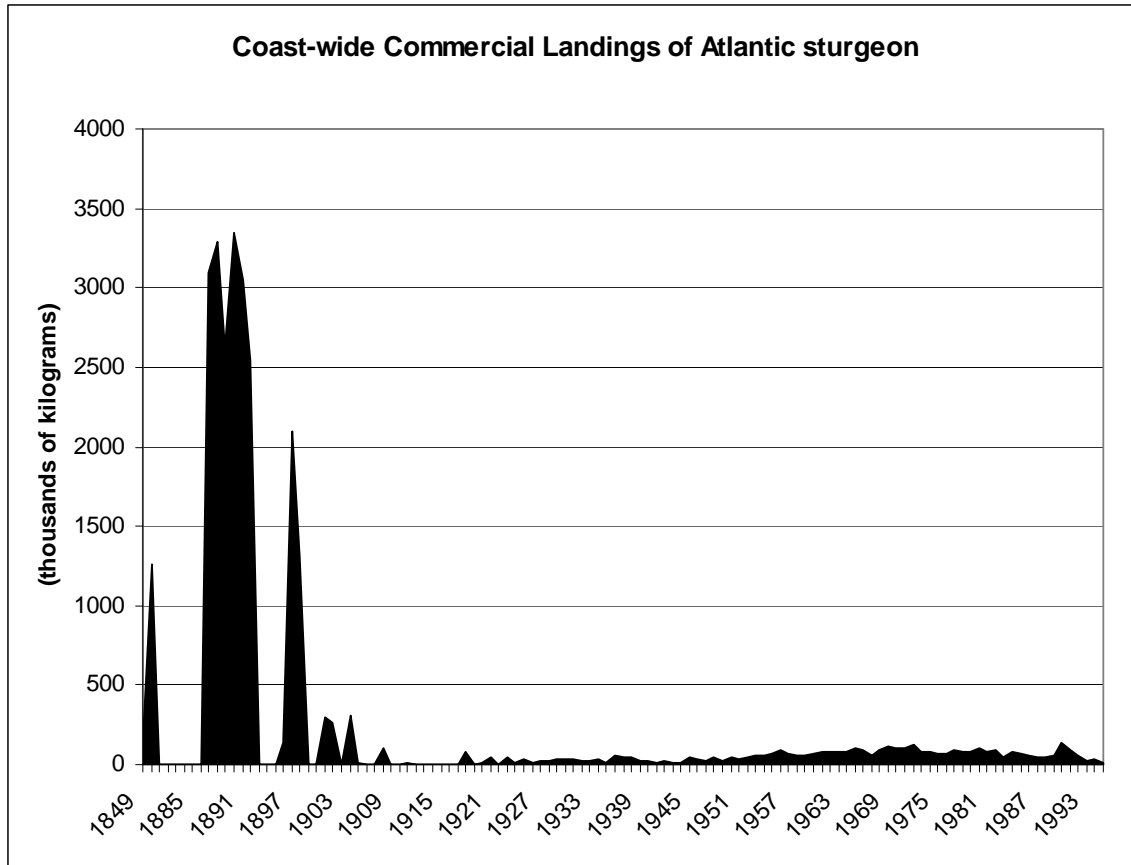


Figure 2. Coast wide commercial landings of Atlantic sturgeon 1849-1995<sup>6</sup>.

In 1998, the Atlantic States Marine Fisheries Commission (ASMFC) instituted a coast wide moratorium on fishing for Atlantic sturgeon. In 1999, NMFS imposed a prohibition on the retention and landing of Atlantic sturgeon. As a result, there are currently no directed commercial or recreational fisheries for Atlantic sturgeon; however, they are taken as bycatch in some commercial fisheries (Tables 2 and 3). Based on the best available information, there are no significant directed recreational or tribal fisheries for Atlantic sturgeon.

<sup>6</sup>Tbid.

Tables 3 and 4. Observed Atlantic sturgeon bycatch 2001-2006.

<b>Observed Atlantic sturgeon in gillnet bycatch 2001-2006</b>	
<b>Year</b>	<b>Total</b>
2001	84
2002	50
2003	63
2004	143
2005	67
2006	104
<b>Total</b>	<b>511</b>
Source: Special Report to the ASMFC Atlantic sturgeon Management Board: Estimation of Atlantic sturgeon Bycatch in Coastal Atlantic Commercial Fisheries of New England and the Mid-Atlantic. August 2007 p. 11	

<b>Observed Atlantic sturgeon in otter trawl bycatch 2001-2006</b>	
<b>Year</b>	<b>Total</b>
2001	6
2002	2
2003	6
2004	16
2005	12
2006	25
<b>Total</b>	<b>67</b>
Source: Special Report to the ASMFC Atlantic sturgeon Management Board: Estimation of Atlantic sturgeon Bycatch in Coastal Atlantic Commercial Fisheries of New England and the Mid-Atlantic. August 2007 p. 12	

### **2.2.1.1 CONSERVATION MEASURES TO PROTECT THE ATLANTIC STURGEON**

With regard to fisheries, measures which may be implemented in order to protect the GOM DPS include:

- minimizing incidental catch in both commercial and recreational fisheries;
- monitoring of incidental catch;
- increased enforcement;
- fisheries closures in areas important to the species; and
- outreach and education on proper catch/release and resuscitation methods.

### **2.2.1.2 IMPACTS ON THE FISHING INDUSTRY**

Impacts on the fishing industry in affected states will depend on the particular responses by managing agencies, but could include, given the additional measures described in the Alternative 2:

- Loss of fishing days/value of catch due to fishing area closures, or altering the length of fishing seasons. Depending on the extent and duration of closures, impacts could vary widely. Of potential impacts, fishing closures may result in the largest economic impacts on the fishing industry.
- Gear modifications/restrictions. While it is possible that specific gear modifications could be found to reduce the incidental catch of Atlantic sturgeon, they have not been identified to date and thus, it is not possible to estimate a cost of this measure.
- Costs of expanding NOAA’s Observer Program to include observers on additional vessels and/or during additional periods.

To the extent that fisheries closures are undertaken or gear modifications or restrictions are required for Atlantic sturgeon, Atlantic sturgeon take prohibitions could affect commercial and recreational fishing efforts. However, the degree to which closures may be implemented are unknown at this time for any alternative. Given the overlap of GOM Atlantic sturgeon in the marine environment with the other four Atlantic sturgeon DPSs that are proposed to be listed as endangered, it is very likely that any mitigation measures associated with reducing the likelihood of bycatch in marine fisheries would need to be implemented even in absence of this regulation and those measures would then be considered part of the baseline.

### **2.2.1.3 COMMERCIAL ATLANTIC STURGEON FISHERIES**

As indicated earlier, there are currently no directed U.S. commercial fisheries for Atlantic sturgeon due to the moratoria on their retention. Atlantic sturgeon were commercially fished throughout most of the 1800s and 1900s for their flesh and roe (caviar) and there is still a commercial Atlantic sturgeon fishery in Canada. Therefore, it is conceivable that commercial Atlantic sturgeon fisheries may reopen in the U.S. if the moratoria were to be lifted. In absence of take prohibitions under Section 9(a)(1) of the ESA (considered the baseline), the ASMFC moratorium could be lifted as early as 2018 – with the rebuilding of 20 year classes.<sup>7</sup> Since the best available economic data from past commercial Atlantic sturgeon fisheries is dated, a great deal of uncertainty exists when attempting to project the size and scope of a future Atlantic sturgeon fishery. It is conceivable that there could be some economic impact resulting from the proposed 4(d) rule, if the establishment of future commercial Atlantic sturgeon fisheries were prohibited under the ESA when the ASMFC moratoria would otherwise have been lifted. However, given the overlap of GOM Atlantic sturgeon in the marine environment with the other four Atlantic sturgeon DPSs that are proposed to be listed as endangered, it is reasonable to conclude that any potential commercial fishery in the marine environment that might intercept GOM DPS Atlantic sturgeon may also intercept Atlantic sturgeon from the other DPSs and therefore, the economic impacts resulting directly from the proposed 4(d) rule would be low.

### **2.2.1.4 OTHER COMMERCIAL FISHERIES**

Atlantic sturgeon bycatch has been reported in commercial trawl and sink gill net fisheries off the coasts of Maine through Cape Hatteras, NC. Approximately 15% to 19% of observed Atlantic sturgeon bycatch in sink gillnet and otter trawl gear in 2001 to 2006 occurred in coastal marine waters north of Chatham, MA.<sup>8</sup> The Atlantic sturgeon status review team also reported that there are limited gill net fisheries for menhaden, alewives, blueback herring, sea herring, and mackerel in the estuarial complex of the Kennebec and Androscoggin Rivers.<sup>9</sup> While there have not been documented cases of bycatch in these fisheries, bycatch has occurred in similar fisheries within the freshwater geographic range of some of the other Atlantic sturgeon DPSs.

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<sup>7</sup> ASMFC gives a more conservative estimate of between 20 to 40 years for this to occur, allowing for the moratorium to be lifted as late as 2038.

<sup>8</sup> ASMFC. 2007. Special Report to the ASMFC Atlantic Sturgeon Management Board: Estimation of Atlantic sturgeon Bycatch in Coastal Atlantic Commercial Fisheries of New England and the Mid-Atlantic

<sup>9</sup> SRT 2007.



### **2.2.1.5 RECREATIONAL ATLANTIC STURGEON FISHERIES**

According to the ASFMC, there is no historical information to indicate that Atlantic sturgeon supported significant recreational fisheries.<sup>10</sup> Applying Section 9(a)(1) take prohibitions would prevent future development of such recreational fisheries and thus could create a future economic loss – but currently there is not data to support a significant economic loss for Atlantic sturgeon recreational fisheries by applying Section 9(a)(1) take prohibitions to the GOM DPS.

### **2.2.1.6 TRIBAL FISHERIES**

According to the ASFMC, Native American tribes have historically (with archeological evidence dating back 1,000 – 4,000 years ago) harvested Atlantic sturgeon. However, there are currently no Native American tribes which have known subsistence fishing rights for harvest of Atlantic sturgeon.<sup>11</sup> Applying Section 9(a)(1) take prohibitions would prevent future development of such fisheries and thus, could create a future economic loss – but currently there is not data to support a significant economic loss for Atlantic sturgeon tribal fisheries by applying Section 9(a)(1) take prohibitions to the GOM DPS.

### **2.2.2 DAMS**

There are currently 5 dams located within the riverine range (historic and currently occupied) of GOM DPS Atlantic sturgeon, as shown in table 5. There are two primary concerns regarding the impact of dams on Atlantic sturgeon within the GOM DPS:

- 1) Construction, maintenance, or operation of dams and diversions may eliminate, obstruct, or delay upstream and/or downstream passage of Atlantic sturgeon to and from spawning habitats; and
- 2) Take resulting from other various dam operations, including but not limited to entrainment and impingement, as well as take resulting from disturbances to spawning grounds caused by changes in flow regimes.

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<sup>10</sup> ASFMC. 1998. Amendment 1 to the interstate fishery management plan for Atlantic sturgeon. Management Report No. 31, 43 pp. available at: <http://www.asfmc.org/speciesDocuments/sturgeon/fmps/fmps/sturgeonAm1.pdf>. p. 7

<sup>11</sup> Ibid. p. 8

Table 5. Dams within the range of GOM DPS Atlantic sturgeon.

Dam	River	State	% of Habitat Currently Available	% of Historic Habitat Impeded
Veazie <sup>(1)</sup>	Penobscot	ME	79	21
Lockwood	Kennebec	ME	100	0
Brunswick	Androscoggin	ME	100	0
Cataract	Saco	ME	100	0
Essex	Merrimack	NH/MA	42	58
<p>(1) Work to remove the Veazie Dam is currently underway. Once removed, the dams which Atlantic Sturgeon would come in contact with are the Orono Dam and Milford Dam.</p> <p>Source: Atlantic Sturgeon Status Review Team. 2007. Status Review of Atlantic sturgeon (<i>Acipenser oxyrinchus oxyrinchus</i>). Report to National Marine Fisheries Service, Northeast Regional Office. February 23, 2007. p. 146</p>				

Historically, the upstream migration of Atlantic sturgeon in the Kennebec River was limited to Waterville, ME, which is the location of Ticonic Falls (river kilometer (rkm) 98).<sup>12</sup> The construction of Edwards Dam in 1837, downstream of the Ticonic Falls, denied Atlantic sturgeon access to historical habitat in the Kennebec River until 1999 when the dam was removed. Since its removal, access to 100% of historic habitat has been restored. In the Androscoggin River, the Brunswick Hydroelectric Dam is located at the head-of-tide near the site of the natural falls. The location of historical spawning grounds on the Androscoggin is unknown, but it is unlikely that Atlantic sturgeon could navigate the natural falls located near Brunswick Dam.<sup>13</sup> Therefore, the dam is unlikely to have limited access of Atlantic sturgeon to their spawning habitat. Similarly, Atlantic sturgeon upstream migration within the Sheepscot River is thought to have been historically limited to the lower river (rkm 32) just below the first dam on the river (rkm 35); therefore, 100% of the historical habitat (based on river kilometers) is available to Atlantic sturgeon in the Sheepscot River.

In contrast to the aforementioned rivers, access to Atlantic sturgeon spawning habitat is impeded on the Penobscot River. Historically, the falls at Milford, rkm 71, were likely the first natural obstacle to Atlantic sturgeon migration on the Penobscot River.<sup>14</sup> If Atlantic sturgeon were able to ascend the falls at Milford, they could have migrated without obstruction to Mattaseunk (rkm 171).<sup>15</sup> However, in 1833, the Veazie Dam was constructed on the Penobscot River at rkm 56, blocking 29 km (21%) of Atlantic sturgeon habitat. Five kilometers downstream of the Veazie,

<sup>12</sup> NMFS and USFWS (National Marine Fisheries Service and United States Fish and Wildlife Service). 1998. Status review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service and United States Fish and Wildlife Service. 126 pp.

<sup>13</sup> Ibid.

<sup>14</sup> L. Flagg, MEDMR, pers. comm., 1998

<sup>15</sup> SRT 2007

the Treats Falls Bangor Dam also impeded migration upstream during the summer months.<sup>16</sup> However, this dam was breached in 1977.<sup>17</sup> Currently, 79% of Atlantic sturgeon habitat is accessible on the Penobscot.<sup>18</sup> In 2008, the Penobscot River Restoration Trust, a non-profit corporation, exercised its option to purchase the Veazie and two other dams on the Penobscot.<sup>19</sup> In doing so, the Trust has the right to, in part, decommission or remove the Veazie Dam thus reopening miles of habitat for Atlantic sturgeon and other diadromous species.<sup>20</sup> However, funds for the removal need to be generated and permits need to be secured, and it remains uncertain whether all of the goals will be achieved.

Information on Atlantic sturgeon use of the Saco River in Maine became available after completion of the status review report. The last focused study of the Saco River was almost 30 years ago, and continued use of the river by Atlantic sturgeon was uncertain at the time of the status review. However, Atlantic sturgeon have been captured during routine trawl sampling in the river during 2008 and 2009 as part of a two-year monitoring project of the Saco River/Estuary. Tagging and tracking of the captured fish has shown that Atlantic sturgeon are making use of the river up to the first dam.<sup>21</sup> There are several dams on the Saco River known to have blocked fish passage for species such as Atlantic salmon, shad, and alewives.<sup>22</sup> The effect of such dams on the Atlantic sturgeon that currently use the river is unknown. Likewise, there are several dams on the Piscataqua/Salmon River and the effect of such dams on the Atlantic sturgeon that currently use the river is unknown.

Within the GOM DPS, access to historical spawning habitat is most severely impacted in the Merrimack River.<sup>23</sup> Hoover (1938) identified Amoskeag Falls (rkm 116) as the historical limit for Atlantic sturgeon in the Merrimack River. In the 1800's, construction of the Essex Dam in Lawrence, MA (rkm 49) blocked the migration of Atlantic sturgeon to 58% of its historically available habitat.<sup>24</sup> Tidal influence extends to rkm 35; however, in the summer months when river discharge is lowest, the salt wedge extends upriver, resulting in approximately 19 km of tidal freshwater and 9 km of freshwater habitat.<sup>25</sup> Based on a detailed description by Keiffer and Kynard (1993), the accessible portions of the Merrimack seem to be suitable for Atlantic sturgeon spawning and nursery habitat. Nevertheless, the presence of the dam means that only 42% of historical Atlantic sturgeon habitat is currently available.<sup>26</sup>

In response to concern regarding impacts from dams on Atlantic sturgeon passage, there is evidence that indicates that fish lifts and ladders are not successful passage mechanisms for Atlantic sturgeon. While there is not significant information available on Atlantic sturgeon

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<sup>16</sup> Ibid.

<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

<sup>19</sup> Ibid.

<sup>20</sup> Ibid.

<sup>21</sup> J. Sulikowski, UNE, pers. comm., 2009

<sup>22</sup> MEDMR, 1994

<sup>23</sup> SRT 2007

<sup>24</sup> Ibid. And Oakley, N. C. 2003. Status of shortnose sturgeon, *Acipenser brevirostrum*, in the Neuse River, North Carolina. Thesis. Department of Fisheries and Wildlife Science, North Carolina State University, Raleigh, NC.

<sup>25</sup> Kieffer, M. C. and B. Kynard. 1993. Annual movements of shortnose and Atlantic sturgeons in the Merrimack River, Massachusetts. *Transactions of the American Fisheries Society* 122: 1088-1103.

<sup>26</sup> SRT 2007

passage, there are some numbers available for shortnose sturgeon – numbers which support the above claim. For example, in the Connecticut River between 1980 and 2005 – only 112 shortnose sturgeon have been lifted at the Holyoke Dam.<sup>27</sup> For this reason, it is unclear what modifications would be recommended to avoid take resulting from obstructing passage to historic spawning habitats. However, given the current presence of dams in Atlantic sturgeon habitat, modifications might be necessary only in the Penobscot, Saco, Piscataqua/Salmon, and Merrimack Rivers (if these rivers are found to contain extant reproducing populations). Due to the uncertainty of recommendations for such modifications, specific economic impact values resulting from such modifications would be purely speculative.

NMFS acknowledges that activities associated with dam operation may result in take of Atlantic sturgeon. It is unclear what modifications would be required for these operations to avoid take of Atlantic sturgeon. Due to the uncertainty of recommendations for such modifications, specific economic impact values resulting from such modifications would be purely speculative.

### **2.2.3 SCIENTIFIC RESEARCH PROJECTS: TARGETED TAKE OF ATLANTIC STURGEON**

The proposed action would not prohibit “Federal, state or private-sponsored research” within the riverine range of the GOM DPS of Atlantic sturgeon, as long as the research is directed at Atlantic sturgeon belonging to the GOM DPS and is conducted in accordance with NMFS-approved criteria for research. Otherwise, research will require a Section 10 permit from NMFS.

Costs associated with compliance with NMFS-approved criteria could result in increases in labor hours, staffing or equipment needed to implement techniques deemed safe. Many of the current Atlantic sturgeon research projects are conducted in a manner that is consistent with the NMFS approved criteria as the majority of the activities addressed in the criteria are considered best practices for safely and effectively sampling for Atlantic sturgeon; thus, it is likely that such cost increases would be minimal.

Under Alternative 1, all research projects would require a Section 10 permit. The mechanism provided by the preferred alternative allows researchers to bypass the Section 10 permitting process; thus, allowing time and resources to be devoted to other recovery issues that pose a greater threat to the DPS. For this reason, compared to Alternative 1, the Preferred Alternative, with respect to scientific research, is expected to have a positive economic impact– a result of fewer needs for staffing increases to process additional Section 10 permits, a reduction in other costs imposed on NMFS due to a greater number of Section 10 permit applications, as well as a reduction in researcher resources being committed to the Section 10 permitting process.

### **2.2.4 IN-WATER CONSTRUCTION AND DREDGING ACTIVITIES**

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<sup>27</sup> Duchenev, Paul. Murray, Richard. Waldrip, Jesse. Tomich, Christine. “Fish Passage at Hadley Falls: Past, Present, and Future.” Available at: [http://www.kleinschidusa.com/pubs/hadleyfalls\\_fishpage.htm](http://www.kleinschidusa.com/pubs/hadleyfalls_fishpage.htm)

Actions associated with in-water activities that could impact the GOM DPS of Atlantic sturgeon include dredging, construction or repair of breakwaters, piers, pilings, bulkheads, boat ramps, and docks. Economic impacts can result from direct project costs associated with restrictions on the timing, duration and extent of in-water work, erosion and sediment control measures, heavy equipment restrictions, and other efforts to minimize take.

Since in-water construction and dredging activities in rivers and harbors are generally permitted through the U.S. Army Corps of Engineers (USACE), such activities falling within the habitat of endangered Atlantic salmon and shortnose sturgeon would require Section 7 consultations, potentially resulting in some of the project modifications described below, such as dredging work windows. Where Atlantic sturgeon overlap with these species (spatially and temporally), they would receive protection as a result of these consultations and this protection would be considered part of the baseline. Where such project modifications are required in GOM DPS Atlantic sturgeon habitat areas - outside of the range of the GOM DPS of Atlantic salmon critical habitat designated area and outside of the range of shortnose sturgeon (e.g., in the Saco, Piscataqua, or Merrimack) - there could be incremental economic impacts resulting from this rule. According to the USACE, in 2006 a feasibility study was initiated to determine the navigation related needs of the Portsmouth Harbor and Piscataqua River, focusing on the upper basin in the river near Newington, NH.<sup>28</sup> The conclusions from this study could result in dredging activities in the affected area (as described in section 1.5). In addition, the USACE reports on maintenance dredging of the “Simplex Shoal” in the Piscataqua River, an area requiring maintenance dredging every 7-9 years, last maintained in 2000.<sup>29</sup> Table 5 estimates per project costs for potentially required modifications for projects similar to those previously described.

The costs in Table 6 are given for typical conservation measures taken (related to in-water construction and dredging activities) to protect species. These estimates were generated for the Critical Habitat designation for 7 West Coast salmon and steelhead evolutionarily significant units (ESUs). These costs represent the best available data, as similar estimates for projects within the affected area are not available at this time.<sup>30</sup> Costs to modify projects occurring in the Saco, Piscataqua or Merrimack Rivers (those habitat areas which would not be considered for project modifications in absence of this 4(d) rule) could vary based on a variety of factors including, but not limited to, size, scope, location, and working conditions.

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<sup>28</sup> U.S. Army Corps of Engineers. New England District. Update Report for Maine. Current as of December 31, 2009. Available at: <http://www.nae.usace.army.mil/news/me.pdf>. p. 2

<sup>29</sup> Ibid.

<sup>30</sup> Bill Hubbard. U.S Army Corp of Engineers. Operations Division. Pers. Comm., March 25th, 2010

Table 6. Economic impacts from project modifications to in-water construction and dredging activities.

SPECIFIC ACTIONS	TYPICAL CONSERVATION MEASURES TAKEN TO PROTECT SPECIES	PER PROJECT COSTS (Nominal \$2008)	
		LOW	HIGH
<b>In-Water Construction</b>			
Construction or repair of breakwaters, docks, piers, pilings, bulkheads, boat ramp, utility lines, and dredging.	Shoreline planting, construction materials restrictions, use of bubble curtains, habitat restoration, spill prevention contaminant control plan, erosion controls, timing restrictions, requirements to use directional drilling, monitoring.	\$27,561	\$92,603
<b>Dredging</b>			
Dredging activities	Work window constraints, extension of the prescribed work window, additional survey work, and mobilization costs. Could also include identification of disposal sites.	\$366,004	\$1,444,173
<b>Note:</b> Adapted from NMFS, Final Economic Analysis of Critical Habitat Designation for Seven West Coast Salmon and Steelhead ESUs, Long Beach, CA, August 2005. Adjusted to nominal 2008 dollars.			

## 2.2.5 OTHER ENERGY AND MINERAL RESOURCES

### 2.2.5.1 TIDAL AND WAVE ENERGY PROJECTS

Tidal and wave energy projects harness the kinetic energy contained in ocean waves or tidal currents. Tidal and wave energy projects require the placement of equipment such as buoys or turbines into the water column. These projects may occur in Atlantic sturgeon habitat, and therefore, have the potential to affect the species. For example, in summer 2009, nine severed Atlantic sturgeon carcasses were documented on beaches near the Annapolis River Tidal Power Plant which were most likely a result of operations of the tidal turbines.<sup>31</sup>

There are currently no actively generating wave or tidal energy projects located within the GOM DPS. However, applicants have been granted preliminary permits by the Federal Energy Regulatory Commission (FERC) to investigate the feasibility of project development within the GOM DPS.<sup>32</sup> A preliminary permit is the first step in the FERC licensing and permitting process. A preliminary permit covers a three-year time frame, and allows the applicant to test and refine project components. Many of these preliminary permits have been granted for projects proposed to be located in the marine and estuarine portions of the GOM DPS range. Modifications may be required to these marine and estuarine projects, but this action would be considered as part of the baseline given the overlap of GOM DPS Atlantic sturgeon with the other four proposed to be listed as endangered DPSs of Atlantic sturgeon. For this reason, we do not discuss specific wave or tidal energy projects.

<sup>31</sup> Annapolis Royal Heritage. 9/8/2009. Atlantic sturgeon. Available at <http://annapolisroyalheritage.blogspot.com/2009/09/atlantic-sturgeon.html>

<sup>32</sup> Federal Energy Regulatory Commission. Issued Hydrokinetic Permits. Accessed at: <http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics.asp> on March 17th, 2010.

The number of future projects that are likely to be permitted for construction is still speculative. Projects that receive preliminary permits and undergo further scoping ultimately may not be constructed for a variety of reasons. FERC estimates that it may receive up to 134 preliminary permit applications over the next 20 years, and that these applications ultimately could lead to the licensing of approximately 13 tidal energy projects within the area designated as Critical Habitat for GOM Atlantic salmon, which is made up of the freshwater and estuarine watersheds from the Androscoggin River northward along the Maine coast to the Dennys River.<sup>33</sup> There is significant overlap between this range and the Affected Area as outlined in section 1.5.

Because tidal and wave energy projects in Atlantic sturgeon habitat on the East Coast are in the preliminary stages of development, NMFS has yet to make specific recommendations about project modifications that may be required to mitigate potential adverse impacts on Atlantic sturgeon or their habitat. Tidal and wave energy projects have the potential to affect the habitat of a wide range of species, including Atlantic sturgeon, shortnose sturgeon, Atlantic salmon, and marine mammal species. Again, due to the preliminary stages of permitting for most projects, NMFS has made few conservation recommendations related to these species.

In the critical habitat designation for the GOM DPS Atlantic salmon, NMFS considered project modifications that have been required of hydrokinetic projects in other regions to provide some sense of the potential economic impact of critical habitat designation on tidal energy projects in the affected area. As a point of reference, the analysis provides information on a recent hydrokinetic project in Washington State: the Makah Bay Offshore Wave Energy Pilot Project in Clallam County, Washington. FERC completed an Environmental Assessment (EA) of this project.<sup>34</sup> The EA considered the effects of the project on Pacific salmon, among other species, and concluded that the construction and operation of the project may affect the species by increasing the risk of entanglement in abandoned gear; increasing the turbidity of surrounding waters (thereby disrupting feeding and impairing respiration); and increasing the risk of predation due to artificial night-lighting. FERC estimated that the cost of efforts to minimize or avoid these types of threats would be approximately \$45,900 (one-time costs at the time of construction in 2007). The EA also noted the potential for ongoing costs associated with species conservation, attributable either to changes in facility operations or to regular monitoring and reporting requirements.

If such modifications were to be adopted due to the GOM DPS Atlantic salmon critical habitat designation, then the GOM DPS Atlantic sturgeon and their habitat may experience some protection as a result of these project modifications. Requiring similar modifications in the GOM DPS Atlantic sturgeon habitat areas outside of the critical habitat designated area for the GOM DPS Atlantic salmon could result in additional economic impacts resulting from this rule and similar in cost (per project) to those mentioned above.

### **2.2.5.2 WINDFARMS AND LNG TERMINALS**

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<sup>33</sup> Letter from J. Mark Robinson, Director, Office of Energy Projects, FERC, to Assistant Regional Administrator, NMFS, October 23, 2008.

<sup>34</sup> Federal Energy Regulatory Commission. Environmental Assessment for Hydropower License: Makah Bay Offshore Wave Energy Pilot Project. FERC Project No. 12751-000. May 2007.

The construction and operation of other types of energy projects may have an adverse impact on GOM Atlantic sturgeon and their habitat.<sup>35</sup>

Many of these types of projects are located in the estuarine and marine range of the GOM Atlantic sturgeon. Given the overlap of GOM Atlantic sturgeon in this portion of their range with the other four Atlantic sturgeon DPSs that are proposed to be listed as endangered, modifications to wind farms and LNG projects, conducted to protect Atlantic sturgeon, would in all likelihood need to be implemented in absence of this 4(d) rule (i.e., modifications would be considered baseline). Thus, the incremental economic impact of this rule on wind farms and LNG terminals would be low.

### 2.2.5.3 MINERAL RESOURCES

Activities associated with the extraction, production, or use of energy and mineral resources pose a risk of take to GOM DPS fish. For example, mining activities may increase fine sediment input and introduce contaminants into streams used by GOM DPS fish. Sand and gravel mining may be particularly harmful to stream habitats, because this type of mining disturbs sediments and depletes potential sources of spawning substrates for streams.

Mining operations may affect the habitat of GOM DPS fish through the removal of substrates important for spawning and rearing, or the introduction of excess sediments or contaminants into water through runoff. In 2006, Maine's non-fuel raw mineral production was valued at \$158 million, based upon annual U.S. Geological Survey (USGS) data.<sup>36</sup> This was a \$17 million, or 12%, increase from that of 2005, which was up 19.5% from that of 2004. The large majority of the State's non-fuel mineral production resulted from the mining and production of construction minerals and materials— construction sand and gravel, Portland cement, crushed stone, and dimension granite (descending order of value). Much of this production occurs in the lower and coastal portions of the state – areas which may overlap with Atlantic sturgeon and their habitat.

In 2006, New Hampshire's non-fuel raw mineral production was valued at \$112 million, based upon annual USGS data.<sup>37</sup> This was a nearly 27% increase from the State's total non-fuel value of \$88.2 million of 2005, which followed a 25% increase from 2004 to 2005. Construction sand and gravel, a high-volume, low-unit-value mineral commodity, remained New Hampshire's leading non-fuel mineral commodity in 2006, accounting for nearly 55% of its non-fuel raw mineral production value, and it led the State's increase in value in 2006. This production occurs

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<sup>35</sup> The following sources offer a current listing of projects: New England Wind Projects. Available at [http://www.windpoweringamerica.gov/ne\\_projects.asp](http://www.windpoweringamerica.gov/ne_projects.asp). Accessed March 19th, 2010. North American LNG Terminals Proposed. Available at: <http://www.ferc.gov/industries/lng/indus-act/terminals/lng-proposed.pdf>. Accessed March 19, 2010. North American LNG Terminals Approved. Available at: <http://www.ferc.gov/industries/lng/indus-act/terminals/lng-approved.pdf>. Accessed March 19th, 2010. North American LNG Terminals Existing. Available at: <http://www.ferc.gov/industries/lng/indus-act/terminals/lng-existing.pdf>. Accessed March 30, 2010.

<sup>36</sup> USGS 2006 Minerals Yearbook Maine available <http://minerals.usgs.gov/minerals/pubs/state/me.html#myb>.

<sup>37</sup> USGS 2006 Minerals Yearbook New Hampshire available at <http://minerals.usgs.gov/minerals/pubs/state/nh.html#myb>.



throughout the state and it is not clear to what degree the production areas would overlap with Atlantic sturgeon and their habitat.

In 2006, Massachusetts non-fuel raw mineral production was valued at \$294 million, based upon annual USGS data.<sup>38</sup> This was a \$44 million, or a 17.6% increase from the State's total non-fuel mineral value in 2005, which then had increased by \$39 million, up more than 18% from that of 2004. Massachusetts leading non-fuel mineral commodities were, in descending order of value, crushed stone, construction sand and gravel, and lime, the former two commodities accounting for 96% of the State's total value. This production occurs throughout the state and it is not clear to what degree the production areas would overlap with Atlantic sturgeon and their habitat.

## **2.2.6 COMMERCIAL AND RECREATIONAL VESSEL ACTIVITY**

As addressed in the proposed rule, one of the threats to Atlantic sturgeon is take resulting from vessel strikes. Vessel strikes, however, are not a primary threat to the GOM DPS. With the application of Section 9(a)(1) take prohibitions, it may still be necessary to modify shipping activity to prevent take in such a manner. Such modifications may cause impacts which result in economic losses. It is unclear what type of modifications may be made to avoid take by vessel strike, and thus, offering specific values for such an economic loss would be purely speculative. Such modifications could include shipping windows or lanes, speed restrictions, vessel size restrictions or reduction in trips. These types of modifications would generally be recommended for the riverine and estuarine environment (where most vessel strikes have been documented). As vessel strikes are not a primary threat to the GOM DPS we estimate that the need for such modifications in the riverine and estuarine portion of the affected area (section 1.5) would be low. Given the overlap of GOM Atlantic sturgeon in the marine environment with the other four Atlantic sturgeon DPSs that are proposed to be listed as endangered, it is very likely that any mitigation measures associated with reducing the likelihood of vessel strikes in the marine environment would need to be implemented even in absence of this proposed 4(d) rule and those measures would then be considered part of the baseline.

## **2.2.7 WATER QUALITY AND INDUSTRY**

Within the GOM DPS, water quality of the rivers and estuaries was severely degraded as a result of many activities including agricultural and forestry practices, industrialization, and land development. Existing regulations, such as the Clean Water Act (CWA) afford significant baseline protection for GOM DPS Atlantic sturgeon and its habitat.

The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States. It gives the Environmental Protection Agency (EPA) the authority to implement pollution control programs such as setting wastewater standards for industry. The

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<sup>38</sup> USGS 2006 Minerals Yearbook Massachusetts available at <http://minerals.usgs.gov/minerals/pubs/state/ma.html#myb>.

CWA also contains requirements to set water quality standards for all contaminants in surface waters.

According to the CWA, it is unlawful for any person to discharge a pollutant from a point source into navigable waters, unless a permit is obtained under its provisions; this requires issuance of Section 404 permits from the U.S. Army Corps of Engineers (USACE). Section 401 of the Clean Water Act gives EPA the authority to prohibit an activity, including a construction project, if it can impact water quality or have other unacceptable environmental consequences. These two regulatory measures (Section 401 and 404) are usually conducted cooperatively through use of a joint application form. As part of pollution prevention activities, the USACE may limit activities in waterways through its 404 permitting process, independent of Atlantic sturgeon concerns. These reductions in pollution may benefit Atlantic sturgeon.

Under the National Pollutant Discharge Elimination System (NPDES) program, EPA sets pollutant-specific limits on the point source discharges for major industries and provides permits to individual point sources that apply these limits. Under the water quality standards program, EPA, in collaboration with states, establishes water quality criteria to regulate ambient concentrations of pollutants in surface waters. In the GOM DPS, point source discharges in the states of MA and NH are permitted under the EPA NPDES program. Authority for the issuance of NPDES permits in ME has been delegated by EPA to the State of Maine, and the Department of Environmental Protection (MDEP) is responsible for issuing permits (MEPDES program). Since there is no Federal nexus for state issued permits, a memorandum of agreement (MOA) was signed on February 22, 2001 by EPA, U.S. Fish and Wildlife Service (USFWS), and NMFS, to enhance coordination under the Clean Water Act and the ESA. Before issuing permits under the MEPDES program, the MDEP provides the Services with draft permits for review and comment. NMFS coordinates with MDEP to determine whether proposed permits would have more than a minor detrimental effect on listed species (e.g., Atlantic salmon and shortnose sturgeon).

Under Section 401 of the CWA, all applicants for a Federal license or permit to conduct an activity that may result in discharge to navigable waters are required to submit a state certification to the licensing or permitting agency. Costs associated with this and other existing water control plans are considered baseline protection in this analysis.

### **2.2.7.1 LAND DEVELOPMENT**

Development, through the associated clearing of land and construction of infrastructure, may adversely affect Atlantic sturgeon and their habitat. For example, the construction of impervious surfaces, such as parking lots and buildings leads to increased erosion and also increases pollutant loads in nearby streams and rivers. Changes in land cover can also disrupt geomorphological and riparian processes and result in excessive nutrient enrichment of a stream or river. At this time, there are not specific development projects which would be recommended for modification or abandonment as a result of this regulation.

In the critical habitat designation for the GOM DPS Atlantic salmon, NMFS recommended a 30-meter riparian buffer along perennial streams and rivers to protect fish habitat from destruction resulting from development activities. The designation of such a buffer may provide Atlantic sturgeon and their habitat some protection. Establishing a similar buffer in GOM DPS Atlantic sturgeon habitat areas outside of the critical habitat designated area for GOM DPS Atlantic salmon (e.g., in the Saco, Piscataqua, or Merrimack) could result in additional economic impacts. However, those impacts would most likely be considered as incremental impacts resulting from the future GOM DPS Atlantic sturgeon critical habitat designation, and not specifically from this rule.

### **2.2.7.2 AGRICULTURAL**

Several activities that enhance agricultural production may have an adverse impact on the GOM DPS of Atlantic sturgeon. Runoff or drift of petro-chemicals (pesticides, herbicides, fungicides, fertilizers, etc.) may affect water quality and the availability of prey species. Petro-chemical runoff may also increase eutrophication, promoting algal blooms that impair the growth of submerged aquatic vegetation and reducing the concentration of dissolved oxygen available to support other forms of life, including Atlantic sturgeon.

Industry could be affected by modifications requiring restrictions of pesticide application within certain distances from Atlantic sturgeon riverine habitat. If it was determined that agricultural pesticides proved a threat to GOM DPS Atlantic sturgeon, NMFS would consult with EPA on label restrictions. At this time, there are not specific agriculture related projects which would be recommended for modification or abandonment as a result of this regulation.

In the critical habitat designation for the Atlantic salmon GOM DPS, NMFS recommended modifications which could include establishing riparian buffers, or restricting pesticide application within certain distances from perennial streams. Implementation of these modifications could provide Atlantic sturgeon and their habitat some protection. Enforcing such requirements in GOM DPS Atlantic sturgeon habitat areas outside of the critical habitat designated area for GOM DPS Atlantic salmon (e.g., in the Saco, Piscataqua, or Merrimack) could result in additional economic impacts. However, those impacts would most likely be considered as incremental impacts resulting from the future GOM DPS Atlantic sturgeon critical habitat designation, and not specifically from this rule.

### **2.2.7.3 FORESTRY**

Silviculture activities have the potential to affect the physical and biological features of habitat for the GOM DPS of Atlantic sturgeon. Where timber harvesting occurs, soil may be loosened, leading to sedimentation of nearby rivers and streams. In addition, herbicides used during forest regeneration may infiltrate streams and rivers, and removal of the forest canopy over waterways can affect stream temperature. In most situations, however, the use of Best Management Practices (BMPs) and compliance with state forest management regulations can adequately control the effects of silvicultural activities on GOM DPS Atlantic sturgeon habitat. Many silviculture operations within the affected area are already managed in a manner consistent with

sturgeon conservation needs, suggesting that the incremental effect of this rule on silviculture operations will not be significant.

### **2.2.8 CLIMATE CHANGE AND INDUSTRY**

The latest report from the Intergovernmental Panel on Climate Change (IPCC) predicts that higher water temperatures and changes in extreme weather events, including floods and droughts, are projected to affect water quality and exacerbate many forms of water pollution, including sediments, nutrients, dissolved organic carbon, pathogens, pesticides, and salt, as well as thermal pollution, with possible negative impacts on ecosystems, human health, and water system reliability and operating costs. The resulting changes in water quality (temperature, salinity, dissolved oxygen, contaminants, etc.) in rivers and coastal waters inhabited by Atlantic sturgeon will likely affect those subpopulations. Effects are expected to be more severe for those subpopulations that occur at the southern extreme of the sturgeon's range, and in areas that are already subject to poor water quality as a result of eutrophication.

Industry actions contributing to climate change can be global in their span and often the effects can be recognized across broad (and even global) geographic ranges. For this reason, it is not possible at the current time to estimate industry economic impacts associated with mitigating climate change (as it pertains to the GOM Atlantic sturgeon DPS). Broadly speaking, however, if large scale climate change mitigation efforts were implemented they would be very costly. It is not clear what, if any, of these costs could be attributed as impacts resulting from this regulation. Given the overlap of GOM Atlantic sturgeon in the marine environment with the other four Atlantic sturgeon DPSs that are proposed to be listed as endangered, it is very likely that any climate change mitigation measures associated with protecting Atlantic sturgeon (any of the five DPSs) would need to be implemented even in absence of this regulation and thus, those measures would then be considered as part of the baseline.

### **2.3 ECONOMIC ANALYSIS OF THE EXPECTED EFFECTS OF EACH SELECTED ALTERNATIVE**

As described above, this analysis classifies activities potentially affected by take prohibitions into industry groups. What follows below is a description of the direct economic impacts associated with each of the considered alternative 4(d) rules. In summary, the economic impacts of the Alternatives 1 and 2 are not considered significant as set forth by the criteria outlined in E.O. 12866. This conclusion has been reached based on the following facts: first, in the marine environment, the GOM DPS of Atlantic sturgeon, proposed to be listed as threatened, will overlap completely with the other four U.S. Atlantic sturgeon DPSs that are proposed to be listed as endangered. Industry projects in the marine environment may require modification to avoid take of endangered Atlantic sturgeon, but this will not represent an impact associated with this proposed 4(d) rule. Second, in the freshwater range, the GOM DPS of Atlantic sturgeon overlaps to a significant degree with endangered shortnose sturgeon and endangered Atlantic salmon. Industry projects in the freshwater environment may require modification to avoid take of endangered shortnose sturgeon, but this will not represent an impact associated with this proposed 4(d) rule. GOM threatened Atlantic sturgeon will receive some protection as a result of

the endangered listings for shortnose sturgeon, the endangered listing for GOM Atlantic salmon and the four other U.S. Atlantic sturgeon DPSs.

### **2.3.1 COMMERCIAL STURGEON FISHERIES**

#### **NO ACTION/STATUS QUO**

Given the fishing moratoria and the proposed endangered listing of the other four U.S. Atlantic Sturgeon DPSs, even in the absence of this 4(d) rule (and the associated application of Section 9(a)(1) take prohibitions), it is reasonable to conclude that the likelihood of a commercial Atlantic sturgeon fishery being established in the status quo is extremely low in the foreseeable future.

#### **ALTERNATIVE 1**

Since the likelihood of a commercial fishery for Atlantic sturgeon being established under the status quo is very low, we do not expect economic impacts associated with this 4(d) rule (and the application of Section 9(a)(1) take prohibitions – which would establish another barrier to such a fishery) and the related industry participants.

#### **ALTERNATIVE 2 (PREFERRED ALTERNATIVE)**

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to commercial fisheries for Atlantic Sturgeon.

### **2.3.2 OTHER COMMERCIAL FISHERIES**

#### **NO ACTION/STATUS QUO**

As described above, other commercial fisheries take (e.g., capture, injure, kill) Atlantic sturgeon as bycatch primarily in the marine environment. Given the proposed endangered listing of the other Atlantic sturgeon DPSs, commercial fisheries would be required to make modifications that would minimize take of Atlantic sturgeon listed as endangered. This would be considered part of the status quo. Such modifications would provide protection for Atlantic sturgeon belonging to the GOM DPS as well since Atlantic sturgeon from each DPS mix in the marine environment, and it is not possible or practical to modify fishing gear or fishing practices that would only avoid the take of Atlantic sturgeon listed as endangered and not those listed as threatened.

#### **ALTERNATIVE 1**

For the reasons above, additional modifications from those made in the status quo would not be necessary to minimize Section 9(a)(1) take of threatened GOM DPS fish. Given this fact, the

economic impact of Alternative 1 on other commercial fisheries is expected to be negligible and not significant.

#### ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to other commercial fisheries.

### 2.3.3 RECREATIONAL ATLANTIC STURGEON FISHERIES

#### NO ACTION/STATUS QUO

Given the fishing moratoria and the fact that there is no historical information to indicate that Atlantic sturgeon ever supported significant recreational fisheries, we conclude that the likelihood of a recreational fishery developing for Atlantic sturgeon is low. At this time, there is not available data to indicate the size or scope of such a fishery if it were to be established within the riverine range of the GOM DPS.<sup>39</sup> In the estuarine and marine environment, recreational fishing for Atlantic sturgeon would be effectively prohibited given the proposed endangered listing for the four other U.S. Atlantic sturgeon DPSs.

#### ALTERNATIVE 1

Since the likelihood of a recreational fishery for Atlantic sturgeon being established under the status quo is very low, we do not expect significant (if any) economic impacts associated with this 4(d) rule (and the application of Section 9(a)(1) take prohibitions – which would establish another barrier to such a fishery) and the related recreational anglers.

#### ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to recreational fisheries for Atlantic sturgeon.

### 2.3.4 TRIBAL FISHERIES

#### NO ACTION/STATUS QUO

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<sup>39</sup> If such a recreational fishery was to be established it would be possible to estimate its economic value by reviewing expenditures by recreational anglers for fishing for Atlantic Sturgeon. “Gentner, Brad, and Scott Steinback. 2008. The Economic Contribution of Marine Angler Expenditures in the United States, 2006. U.S. Dep. Commerce, NOAA Tech. Memo. NMFSF/SPO-94, 301 p.” – give a state wide estimate of such for current recreational fisheries (which would not include Atlantic Sturgeon) – but such a method could be used to determine the value in the future.

Given the fact that there are currently no Native American tribes which have known subsistence fisheries for Atlantic sturgeon, we conclude that the likelihood of tribal fisheries for Atlantic sturgeon developing is low.

#### ALTERNATIVE 1

Since the likelihood of tribal fisheries for Atlantic sturgeon being established under the status quo is very low, we do not expect significant (if any) economic impacts associated with this 4(d) rule.

#### ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to tribal fisheries for Atlantic sturgeon.

### **2.3.5 DAMS**

#### NO ACTION/STATUS QUO

Given the overlap of Atlantic sturgeon belonging to the GOM DPS with endangered shortnose sturgeon in the riverine range and the fact that dam related activities associated with take of endangered shortnose sturgeon would require consultation and subsequent project modifications, Atlantic sturgeon would be provided some protection from dam related activities under the baseline. Under the status quo, then, many projects, which might take GOM DPS fish, would already require modifications because of protections for shortnose sturgeon.

#### ALTERNATIVE 1

In areas where there is not perfect overlap of GOM threatened Atlantic sturgeon with endangered shortnose sturgeon, Alternative 1 will provide additional protection for GOM threatened Atlantic sturgeon. It is possible that such protection may result in direct incremental economic impacts by requiring modifications to dams and their related projects or operations. It is not clear what type of (and to what extent such) modifications would be required and thus we do not estimate exact economic costs associated with Alternative 1 as it pertains to dams.

#### ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to dams and their relationship with Atlantic sturgeon.

### **2.3.6 SCIENTIFIC RESEARCH PROJECTS: TARGETED TAKE OF ATLANTIC STURGEON**

## NO ACTION/ (STATUS QUO)

Under the status quo, research conducted on threatened GOM Atlantic sturgeon could occur without a permit wherever it is possible to differentiate between threatened Atlantic sturgeon and endangered Atlantic sturgeon that originate from one of the other 4 DPSs.

## ALTERNATIVE 1

With the application of Section 9(a)(1) take prohibitions, for continued (or new) research on threatened GOM Atlantic sturgeon to occur, the entities conducting the research would need to apply for and be granted a Section 10 permit. There would be an associated cost for additional staffing (or staffing hours – both for the applicant as well as for NMFS) necessary for the Section 10 permit application processing. The incremental costs associated with these staffing increases would reflect a direct economic impact from Alternative 1. Without this permit, the research would not be allowed to continue under Alternative 1.

## ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

Alternative 2 provides an economic advantage over Alternative 1 in that it limits some of the economic loss associated with Alternative 1. Alternative 2 would allow for “Federal, state or private-sponsored research” to continue (or to be established) as long as it is conducted in accordance with NMFS-approved criteria for research. This exemption, then, would avoid some costs associated with the Section 10 permitting process. There would also be a biological benefit given that properly conducted research is important for the survival and recovery of the species – such an exemption would improve the likelihood that research could continue uninterrupted by streamlining the approval process; thus, providing an important benefit to the species. In addition, the uninterrupted continuance of research may preserve some jobs in the research community resulting in an economic benefit.

Alternative 2 also increases social welfare with its exemption for salvage and aid/resuscitation, characterized as the retrieval of dead or live, injured Atlantic sturgeon by NMFS personnel or designated agents. Atlantic sturgeon carcasses and live, injured sturgeon can provide pertinent life history information and information on activities affecting the GOM DPS; thus, affording conservation benefits to the species. In order to obtain the most information from carcasses, carcasses must be collected and transported as quickly as possible to an appropriate facility. Similarly, prompt attention to a live, injured sturgeon would increase its chances of survival.

Contributions to conservation in this way have a noted social benefit, as protection of the Atlantic sturgeon could have some of the following values: 1) use value: also known as consumption value, this would represent the ability to use the Atlantic sturgeon resource once it is fully recovered and 2) existence value: willingness to pay to maintain the existence of resources even though no future utilization is likely.<sup>40</sup> This is reflected in society’s preference to protect and recover threatened and endangered species. It should be noted that there are costs associated with salvage and standing activities, such as transportation costs, equipment costs, as well as costs to facilities handling live and deceased sturgeon. NMFS concludes that the

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<sup>40</sup> Field, Barry C. *Natural Resource Economics: An Introduction*. p. 148-49



increased conservation benefit, however, would outweigh these costs. Thus, alternative 2 would increase social welfare (as compared to Alternative 1) by enhancing and preserving the above definition of value, by aiding conservation of the species.

### **2.3.7 IN-WATER CONSTRUCTION AND DREDGING ACTIVITIES**

#### **NO ACTION/STATUS QUO**

Given the overlap of GOM threatened Atlantic sturgeon with endangered shortnose sturgeon in many rivers within both species' range and the fact that many in-water construction and dredging activities would require consultation and subsequent project modifications associated with take of endangered shortnose sturgeon, Atlantic sturgeon may be provided some protection from in water construction and dredging activities under the baseline. Under the status quo, then, some of such projects, which might take GOM DPS fish, would already require modifications because of protections for shortnose sturgeon.

#### **ALTERNATIVE 1**

In areas where there is not overlap of GOM threatened Atlantic sturgeon with endangered shortnose sturgeon, Alternative 1 would provide additional protection for GOM threatened Atlantic sturgeon. It is possible that such protection may result in direct incremental economic impacts. Table 6 (on page 20) gives some estimates of potential economic costs associated with possible projection modifications. Since it is not clear to what extent such modifications would be required (and thus, what portion of the costs given in Table 6 represent an economic impact resulting from this rule), we do not estimate exact economic costs associated with Alternative 1 as it pertains to in-water construction and dredging activities.

#### **ALTERNATIVE 2 (PREFERRED ALTERNATIVE)**

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to in-water construction and dredging activities.

### **2.3.8 OTHER ENERGY PROJECTS**

#### **NO ACTION/STATUS QUO**

Tidal and wave energy projects as well as wind farm and LNG terminal construction may present a danger to both threatened and endangered Atlantic sturgeon in the estuarine and marine environment. Under the status quo, future projects may require modifications to protect endangered Atlantic sturgeon DPS fish. Adequate modifications to protect endangered DPS fish would also protect threatened DPS fish where they co-occur.

#### **ALTERNATIVE 1**

To avoid being in violation of the ESA, project modifications may be required (under the status quo) to minimize take of Atlantic sturgeon listed as endangered and/or authorize this take through an incidental take statement. For this reason, incremental economic impacts resulting from Alternative 1 are not expected in the marine and estuarine environment. Where energy projects may occur in the riverine environment, there may be economic impacts resulting from Alternative 1. However, it is expected that these impacts would be minimal as currently such energy projects are located primarily in the marine and estuarine portion of the species range.

#### ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to tidal and wave energy projects.

### **2.3.9 COMMERCIAL AND RECREATIONAL VESSEL ACTIVITY**

#### NO ACTION/STATUS QUO

Under the status quo, modifications for vessel activity in the marine and estuarine environment may be required to minimize take of endangered Atlantic sturgeon, endangered shortnose sturgeon, and other protected marine life. Thus, in areas where threatened Atlantic sturgeon co-occur, incremental economic impacts are not expected. Also, vessel strikes are less common in the GOM DPS than in several other Atlantic sturgeon DPSs.

#### ALTERNATIVE 1

As indicated above, additional modifications for vessel activity are not expected as a result of applying Section 9(a)(1) take prohibitions for the GOM DPS of Atlantic sturgeon. As a result, incremental economic impacts are not expected to result from Alternative 1 as it relates to commercial and recreational vessel activity.

#### ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to vessel activity.

### **2.3.10 WATER QUALITY AND INDUSTRY**

#### NO ACTION/STATUS QUO

Existing state and federal regulations relating to water quality and industry use (e.g., CWA, etc.) combined with protections for other endangered species, such as Atlantic salmon, shortnose sturgeon and Atlantic sturgeon listed as endangered would provide for significant protection for threatened GOM DPS fish in the status quo and this would be considered part of the baseline.

For example, under the National Pollutant Discharge Elimination System (NPDES) program, EPA sets pollutant-specific limits on the point source discharges for major industries and provides permits to individual point sources that apply to these limits. Under the water quality standards program, EPA, in collaboration with states, establishes water quality criteria to regulate ambient concentrations of pollutants in surface waters. In the GOM DPS, point source discharges in the states of MA and NH are permitted under the EPA NPDES program. Authority for the issuance of NPDES permits in ME has been delegated by EPA to the State of Maine, and the Department of Environmental Protection (MDEP) is responsible for issuing permits (MEPDES program). Since there is no Federal nexus for state issued permits, a memorandum of agreement (MOA) was signed on February 22, 2001 by EPA, U.S. Fish and Wildlife Service (USFWS), and NMFS, to enhance coordination under the Clean Water Act and the ESA. Before issuing permits under the MEPDES program, the MDEP provides the Services with draft permits for review and comment. NMFS coordinates with MDEP to determine whether proposed permits would have more than a minor detrimental effect on listed species (e.g., Atlantic salmon and shortnose sturgeon).

#### ALTERNATIVE 1

Alternative 1 may provide additional protections relating to water quality and industry use for the GOM DPS of Atlantic sturgeon by minimizing take associated with activities affecting water quality and industry use of water resources under Section 9(a)(1) of the ESA. While is not clear whether these additional protections (resulting from this rule) would create the need for additional project modifications relating to water quality, many project modifications would already happen as a result of the GOM DPS Atlantic salmon critical habitat designation. In addition, project modifications may be required by a future GOM DPS Atlantic sturgeon critical habitat designation, but these impacts would not be considered as resulting from Alternative 1.

#### ALTERNATIVE 2

As Alternative 2 only addresses an exemption for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to water quality and industry.

### **2.3.11 CLIMATE CHANGE AND INDUSTRY**

#### NO ACTION/STATUS QUO

Climate change has the potential to adversely affect a number of endangered and threatened species. At this time, what types (and the extent) of industry modifications which may occur (in absence of this regulation) is unclear. Atlantic sturgeon may benefit from such modifications, and this benefit would be included in the baseline.

#### ALTERNATIVE 1

It is not clear what, if any, additional project modifications would be required by the application of Alternative 1 as it pertains to climate change and the associated industries. As a result, it is not

possible at this time to estimate the incremental economic impact (if any) of Alternative 1 as it pertains to climate change and the associated industries. Given the overlap of GOM DPS Atlantic sturgeon in the marine and estuarine environment with the other four Atlantic sturgeon DPSs that are proposed to be listed as endangered, it is very likely that any climate change mitigation measures associated with protecting Atlantic sturgeon (any of the five DPSs) would need to be implemented in the No Action/Status Quo state of the world. Therefore, it is unlikely that Alternative 1 would incur incremental impacts relating to climate change and industry.

#### ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

As Alternative 2 only addresses exemptions for research, salvage and aid/resuscitation, there is not a difference between the economic states of Alternative 1 and Alternative 2 as they pertain to vessel activity.

### **3.0 APPENDIX A: LAWS AND REGULATIONS THAT MAY PROVIDE BASELINE PROTECTION FOR ATLANTIC STURGEON**

#### CLEAN WATER ACT (33 U.S.C. 1251 ET SEQ. 1987)

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States. It gives the Environmental Protection Agency (EPA) the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA also continued requirements to set water quality standards for all contaminants in surface waters.

According to the CWA, it is unlawful for any person to discharge a pollutant from a point source into navigable waters, unless a permit is obtained under its provisions; this requires issuance of Section 404 permits from the U.S. Army Corps of Engineers (USACE). As part of pollution prevention activities, the USACE may limit activities in waterways through its 404 permitting process, independent of Atlantic sturgeon concerns. These reductions in pollution may benefit Atlantic sturgeon.

Under the National Pollutant Discharge Elimination System (NPDES) program, EPA sets pollutant-specific limits on the point source discharges for major industries and provides permits to individual point sources that apply to these limits. Under the water quality standards program, EPA, in collaboration with states, establishes water quality criteria to regulate ambient concentrations of pollutants in surface waters. In the GOM DPS, point source discharges in the states of MA and NH are permitted under the EPA NPDES program. Authority for the issuance of NPDES permits in ME has been delegated by EPA to the State of Maine, and the Department of Environmental Protection (MDEP) is responsible for issuing permits (MEPDES program). Since there is no Federal nexus for state issued permits, a memorandum of agreement (MOA) was signed on February 22, 2001 by EPA, U.S. Fish and Wildlife Service (USFWS), and NMFS, to enhance coordination under the Clean Water Act and the ESA. Before issuing permits under the MEPDES program, the MDEP provides the Services with draft permits for review and comment. NMFS coordinates with MDEP to determine whether proposed permits would have more than a minor detrimental effect on listed species (e.g., Atlantic salmon and shortnose sturgeon).

Under Section 401 of the CWA, all applicants for a Federal license or permit to conduct activity that may result in discharge to navigable waters are required to submit a state certification to the licensing or permitting agency.

#### MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT REAUTHORIZATION ACT 2006

This regulation signed by the President in January 2007, updates the older Magnuson-Stevens Fishery Conservation and Management Act (as amended through 1996) that was designed to include identification of essential fish habitat in fishery management plans and consideration of actions to ensure the conservation and enhancement of habitat. The newer Magnuson-Stevens Reauthorization Act mandates the use of annual catch limits and accountability measures to end overfishing, provides for widespread market-based fishery management through limited access programs, and calls for increased international cooperation. While Atlantic sturgeon are managed through ASMFC, the Act could provide for some protection by addressing bycatch in FMPs for fisheries that take Atlantic sturgeon.

#### FEDERAL POWER ACT (16 U.S.C. § 800 1920, AS AMENDED)

The Federal Power Act (FPA) was promulgated to establish a regulatory agency to oversee non-Federal hydropower generation. The resulting Federal Energy Regulatory Commission (FERC), an independent Federal agency governing approximately 2,500 licenses for non-Federal hydropower facilities, has responsibility for national energy regulatory issues.

This Act may provide some protection to Atlantic sturgeon habitat from hydropower activities. Section 10(j) of the Federal Power Act (FPA) was promulgated to ensure that FERC considers both power and non-power resources during the licensing process. More specifically, Section 18 of the FPA states that FERC shall require the construction, operation, and maintenance by a licensee at its own expense of a fishway if prescribed by the Secretaries of Interior (delegated to the Fish and Wildlife Service) and Commerce (NOAA). NMFS has been and continues to coordinate with FERC on appropriate passage facilities for sturgeon where they are needed. However, currently, the ability to pass sturgeon over dams is very limited due to insufficient information regarding safe and effective passage techniques. As noted earlier, currently, dams may block access to spawning habitat for GOM DPS Atlantic sturgeon in the Penobscot, Saco and Merrimack Rivers.

#### FISH AND WILDLIFE COORDINATION ACT (16 U.S.C. §§ 661-666 1934, AS AMENDED)

This regulation provides that, whenever the waters or channels of a body of water are modified by a department or agency of the U.S., the department or agency first shall consult with the U.S. Fish and Wildlife Service and with the head of the agency exercising administration over the wildlife resources of the State where modification will occur with a view to the conservation of wildlife resources.

The purpose of this Act is to ensure that fish and wildlife resources are equally considered with other resources during the planning of water resources development projects by authorizing NMFS to provide assistance to Federal and State agencies in protecting game species and studying the effects of pollution on wildlife. This Act may offer some protection to Atlantic sturgeon habitat by requiring consultation concerning the species with NMFS for all instream activities with a Federal nexus.

#### RIVERS AND HARBORS ACT (33 USC §§ 401 ET SEQ. 1938)

The Rivers and Harbors Act (RHA) places Federal investigations and improvements of rivers, harbors and other waterways under the jurisdiction of the Department of the Army, USACE and requires that all investigations and improvements include due regard for wildlife conservation.

This Act may provide some protection to the Atlantic sturgeon related to in-stream construction activities. Under Sections 9 and 10 of the RHA, the USACE is authorized to regulate the construction of any structure or work within navigable waterways. This includes, for example, bridges and docks.

#### NATIONAL ENVIRONMENTAL POLICY ACT (42 USC §§ 4321-4345 1969)

The National Environmental Policy Act (NEPA) requires that all Federal agencies conduct a detailed environmental impact statement (EIS) in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.

The NEPA process may provide some protection to the Atlantic sturgeon for activities that have Federal involvement, if alternatives are considered and selected that are less harmful to Atlantic sturgeon and its habitat than other alternatives.

#### WILDERNESS ACT (16 USC §§ 1131-1136 1964)

The Wilderness Act established the National Wilderness Preservation System. With a few exemptions, no commercial enterprise or permanent road is allowed within a wilderness area. Temporary roads, motor vehicles, motorized equipment, landing of aircraft, structures and installations are only allowed for administration of the area. Measures may be taken to control fire, insects and disease. Prospecting for mineral or other resources, if carried on in a manner compatible with the preservation of wilderness, is allowed.

The Wilderness Act may offer protections to GOM DPS Atlantic sturgeon by limiting land disturbing activities in Wilderness Areas in National Forests. Human activity in wilderness areas is likely to be greatly reduced when compared to non-wilderness areas, which is likely to benefit Atlantic sturgeon. To the extent that Wilderness Area designations have precluded human activity and plans for activity in areas containing Atlantic sturgeon, then Wilderness Area impacts are incorporated into the baseline.

#### THE SIKES ACT IMPROVEMENTS ACT (16 USC §670 1997)

The Sikes Improvement Act (SIA) requires military installations to prepare and implement an Integrated Natural Resources Management Plan (INRMP). The purpose of the INRMP is to provide for:

- The conservation and rehabilitation of natural resources on military installations;
- The sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and nonconsumptive uses; and
- Subject to safety requirements and military security, public access to military installations to facilitate the use of the resources.

INRMPs developed in accordance with SAIA may provide protection to the Atlantic sturgeon on military lands.

#### COASTAL ZONE MANAGEMENT ACT (16 USC §§ 1451 et seq. 1972)

CZMA establishes an extensive Federal grant program to encourage coastal States to develop and implement coastal zone management programs to provide for protection of natural resources, including wetlands, flood plains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat.

#### OTHER STATUTES AND REGULATIONS THAT APPLY TO LAND USE ACTIVITIES

While the following statutes and regulations may apply to lands and waters located within Atlantic sturgeon habitat areas, they are unlikely to provide significant baseline protections and are not considered in the analysis.

- Fish and Wildlife Conservation Act (16 USC §§ 2901-2911 1980, as amended) – The FWCA encourages States to develop, revise and implement, in consultation with Federal, State, local and regional agencies, a plan for the conservation of fish and wildlife, particularly species indigenous to the State.
- Water Resources Development Act (33 USC §§ 2201-2330 1986, as amended) -WRDA authorizes the construction or study of USACE projects and outlines environmental assessment and mitigation requirements.
- Anadromous Fish Conservation Act (16 USC §§ 757 et seq. 1965) - The AFCA authorizes the Secretary of the Interior to enter into agreements with States and other non-Federal interests to conserve, develop and enhance the anadromous fish resources of the U.S.
- Wild and Scenic Rivers Act (16 USC §§ 1271-1287 2001) - WSRA authorizes the creation of the National Wilderness Preservation System and prohibits extractive activities on specific lands.
- North American Wetland Conservation Act (16 USC § 4401 et seq. 1989) -NAWCA encourages partnerships among public agencies and other interests to protect, enhance, restore and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife.
- Federal Land Policy and Management Act (43 USC §§ 1701-1782 1976) – This Act requires the Bureau of Land Management to employ a land planning process that is based on multiple use and sustained yield principles.

- Executive Order 11988 and 11990 (1977) – These Executive Orders require, to the extent possible, prevention of long and short term adverse impacts associated with the occupancy and modification of floodplains and prevention of direct or indirect support of floodplain development wherever there is a practicable alternative.



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