UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

APR 15 2010

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE: Environmental Assessment on the Effects of the Issuance of a Protected Species Cooperative Conservation Grant to the Maine Department of Marine Resources (Award No. NA10NMF4720023) to Conduct Research on Sturgeon in Maine.

LOCATION: Research would take place in Maine.

SUMMARY: The current EA analyzed the effects of the proposed Atlantic and shortnose sturgeon research in Maine. Specifically, the funded work would be used to: collect information using regionally standardized methods to estimate population size of sturgeon in major river systems; characterize intersystem movements- including determining which coastal river systems are being used, what paths fish take to traverse between them, and the timing and duration of such movements; determine feeding habitat and trophic position of sturgeon in each river; determine the sex and stage of maturity using circulating levels of reproductive hormones; determine whether elemental analysis of scutes can be used to accurately reconstruct the river of juvenile origin for subadult and adult fish captured in a given system; expand regional collaboration among Gulf of Maine (GoM) researchers to place demographic connectivity and correspondence into its broader research and management context.

The proposed action analyzed in the EA would not have significant environmental effects on the target or non-target species; public health and safety would not affected; no unique geographic area would be affected; and the effects of this study would not be highly uncertain, nor would they involve unique or unknown risks. Issuance of this award would not set a precedent for future actions with significant effects, nor would it represent a decision in principle about a future consideration. There would not be individually insignificant but cumulatively significant impacts associated with the proposed action, and there would not be adverse effects on historic resources. The award would contain mitigating measures to avoid unnecessary stress to the subject animals.

RESPONSIBLE OFFICIAL:

James H. Lecky
Director, Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910
(301) 713-2332

The environmental review process led us to conclude this action will not have a significant effect on the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the finding of no significant impact (FONSI) including the supporting EA is enclosed for your information.

Although NOAA is not soliciting comments on this completed EA/FONSI, we will consider any comments submitted assisting us to prepare future NEPA documents. Please submit any written comments to the responsible official named above.

Sincerely,

for Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

Environmental Assessment
Issuance of a Protected Species Conservation and Recovery Grant to the Maine Department of Marine Resources (Award File 4720023) to Conduct Research on Sturgeon in Maine

Lead Agency:	USDC National Oceanic and Atmospheric Administration National Marine Fisheries Service, Office of Protected Resources
Responsible Official:	James H. Lecky, Director, Office of Protected Resources
For Further Information Contact:	Office of Protected Resources National Marine Fisheries Service 1315 East West Highway Silver Spring, MD 20910 (301) 713-2332
Location:	State of Maine

CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF PROPOSED ACTION

The National Marine Fisheries Service, Office of Protected Resources (NMFS PR) proposes to provide financial assistance in the form of a grant to the Maine Department of Marine Resources (MDMR) (Gail Wippelhauser, P.I.). This award would be issued through the Protected Species Conservation and Recovery Grant Program (CFDA no. 11.472, Unallied Science Programs) authorized under section 6 of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1535). The federal government would provide 75 percent of the cost of the project, and the state would provide the remaining 25 percent. This financial assistance award would extend for three years (three annual payments) and is subject to semi-annual review by NMFS. The grant would support monitoring activities for Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), a candidate for listing under the ESA, and conservation activities for the endangered shortnose sturgeon (*Acipenser brevirostrum*) in Maine.

Purpose and Need

Under section 6 of the ESA, NMFS is authorized to cooperate with states to the maximum extent practicable in carrying out programs for the conservation of threatened and endangered species. It is likewise authorized to assist in monitoring the status of candidate species. Scientific research is an important means of gathering valuable information about protected species to inform conservation and management measures to recovery listed species, and avoid the listing of candidate species. The purpose of this proposed action is to provide financial assistance to support research that helps determine the degree of demographic correspondence and connectivity among Maine Atlantic and shortnose sturgeon populations to address the extent to which local and regional scale processes dictate population characteristics and status. Specifically, the funded work will be used to 1) collect information using regionally standardized methods to estimate population size of sturgeon in major river systems; 2) characterize intersystem movements- including determining which coastal river systems are being used, what paths fish take to traverse between them, and the timing and duration of such movements; 3) determine feeding habitat and trophic position of sturgeon in each river; 4) determine the sex and stage of maturity using circulating levels of reproductive hormones; 5) determine whether elemental analysis of scutes can be used to accurately reconstruct the river of juvenile origin for subadult and adult fish captured in a given system; 6) expand regional collaboration among Gulf of Maine (GoM) researchers to place demographic connectivity and correspondence into its broader research and management context. Section 6(d) of the ESA allows NMFS to provide financial assistance to any State, through its respective State agency that has entered into a section 6 agreement with NMFS, to support conservation activities for threatened and endangered species, and to monitor the status of candidate species and recently de-listed species. Many of the specific activities that would be funded through the proposed action addressing endangered shortnose sturgeon have been authorized under ESA section 10(a)(1)(A) permits (permit nos. 1595, 1578 and 1614); thus, these activities have also been previously analyzed under NEPA (documents available by request: Environmental Assessment of Issuance of a Scientific Research Permit to Michael M. Hastings, University of Maine, (File No. 1595) to Conduct Research on Endangered Shortnose Sturgeon; Environmental Assessment of Issuance of a Scientific Research Permit to the Maine Department of Marine Resources (Gail Wippelhauser, Principal Investigator) (File No. 1578) to Conduct Research on Endangered Shortnose Sturgeon; Categorical Exclusion Memorandum regarding issuance of a Scientific Research Permit to the NOAA Fisheries Northeast Region, Protected Resources Division File No. 1614) and are incorporated by reference. Atlantic sturgeon are candidate species and are not yet listed under the ESA; therefore, issuance of a scientific research permit under section 10(a)(1)(A) of the ESA for these activities is not required.

1.2 PROPOSED AREA AND METHODS

The proposed research under Award File 4720023 to MDMR would take place in the waters of Maine including the Penobscot, Kennebec complex (Androscoggin and Sheepscot), Saco, Royal, Presumpscot, Scarborough, Mousam, Webhannet, and York rivers. Further descriptions of much of the action area are provide in the Environmental Assessments for permit Nos. 1595 (Penobscot River) and 1578 (Kennebec River complex) and are hereby incorporated by reference. The applicant has also filed a “Request for Major Modification” to permit No 1578

that allows expanded sampling throughout the Kennebec complex and Saco rivers. Netting and marks for mark recapture would occur in June-July for Atlantic sturgeon and July-August and October for shortnose sturgeon in 2010, 2011, 2012. DIDSON sonar sturgeon counts and habitat surveys would occur in the Penobscot in November 2010, 2011, 2012, and summer of 2010; in the Kennebec December-February 2011, 2012 and April-May 2010, 2011, and 2012 and Summer of 2010; and in the Saco River summer of 2011 or 2012. Acoustic receivers would be placed at the mouth of the Royal, Presumpscot, Scarborough, Mousam, Webhannet, and York rivers (6 new receivers) and existing receivers would continue to be monitored.

All capture and handling protocols for shortnose sturgeon would be followed as described in permit conditions and previous NEPA analyses (permit nos. 1595 and 1578); methods described in prior NEPA analyses associated with issuance of these scientific research permits are hereby incorporated by reference. All sampling and handling of Atlantic sturgeon would be conducted following these same requirements, as applicable, or the guidelines established in "A Protocol for the Use of Shortnose and Atlantic Sturgeon", as applicable (Moser *et al*. 2000).

Collection Methods

Sturgeon would be captured using 152 mm and 305 mm stretch multi-filament gillnets, 45.7 m or 91.4 m long, fished on the bottom for up to six hours (but more typically one hour). Gillnetting will take place up to 5 days per week. Once captured, sturgeon would be removed and placed in an in-river holding pen. The applicants would sample approximately 200 SNS and 20 ATS in the Penobscot in 2010, 2011, and 2012 (600 SNS and 60 ATS total). In the Kennebec complex there would be approximately 300 SNS and 50 ATS sampled in 2010, 2011, and 2012 (900 SNS and 150 ATS total). In the Saco River a total of 50 ATS and 10 SNS would be sampled in 2011 and 2012 (20 SNS and 100 ATS total). Nets would be attended regularly (checked every two hours or less) and would be removed if pinnipeds were present.

Fish Sampling and Handling

To minimize handling stress, each fish would be moved and handled by researchers using latex gloves. Each fish, minimum size approximately 30 cm TL, would then be tagged with a PIT tag (primary tag) at the base of the second dorsal fin (fish less than 33 cm would only be tagged with 11.5 mm tags), and an external Carlin or Floy anchor tag (secondary tag) would be attached through the musculature just below or anterior to the dorsal fin; a fin clip would be taken (for genetic records), the total length, fork length, weight, inter-orbital length, inner and outer mouth length (for species ID), and general heath would be recorded. Sturgeon would be weighed with a standard hanging scale or on a platform scale fitted with a small waterproof cushion attached to the surface of weighing platform. Total length of each sturgeon would be measured using a standard measuring board. When possible the sex and reproductive stage of individuals would be determined via internal observation of gonads through the urogenital canal with a borescope (Kynard and Kieffer 2002). This is anticipated to be performed on 3 SNS and 10 ATS per river system per year except for the Penobscot where each sturgeon would be inspected with a borescope. The time required to complete the standard sampling (i.e., measuring, weighing, tagging) would be 5 minutes per fish. The time required for sexing would be approximately 1 minute.

Implantation of acoustic tags would follow the protocols of Mohler (2004). Surgical implantation of internal transmitters would only be conducted on sturgeon in excellent condition. Captured sturgeon would be placed on the ventral side up in an inclined sling placed in a large open trough or would be secured with a hood that provides a reservoir of water to keep the gills submerged. Sturgeon selected for transmitter implantation would be netted at temperatures 27^{O} C or below. Each sturgeon would be anaesthetized using a solution of 100 mg/L of tricaine methane sulfonate (MS-222) buffered to neutral pH with sodium bicarbonate. The solution is placed in a bath where sturgeon would be allowed to respire until a state of anesthesia is reached (i.e., loss of equilibrium, little reaction to touch stimuli, cessation of movement, except for opercula movement). The anesthetic's induction and recovery time would vary but would be appropriate for shortnose sturgeon under the specific water temperature and oxygen conditions present (Fox *et al*. 2000).

Just prior to the surgical procedure, the sturgeon would be placed on a moist surgery rack. Respiration would be maintained by directing fresh ambient water pumped across the gills with tube inserted in the animals' mouth. Opercular activity of each sturgeon would be monitored during the surgery, and the hood re-filled with aerated water as needed. A small (2-3 cm) incision would be made immediately to the right of the ventral mid-line, starting anterior to the base of the pelvic fins. A 16 mm V16 acoustic transmitter (10 year life for ATS, 3 year life for SNS) would then be inserted into the body cavity. Four to six interrupted cross stitches, using a double-edged cutting needle, would be used to close the incision. After processing, sturgeon would be placed in an adjacent net pen from which there recovery would be monitored before release back into the river (approximately 30 minutes). The acoustic transmitter and other tags would not exceed 2% of the fishes total body weight. The time required for anesthetizing and telemetry tagging would vary, but would average less than 15 minutes per fish. Approximately 180 Sturgeon (90 SNS and 90 ATS) will have acoustic tags implanted within them over the course of the study.

Following the protocols of Schuman and Peters (2007) and Damon-Randall (pers. comm. 2008), gastric lavage using soft flexible intramedic tubing would be used to assess diet. Five to ten fish per month (while netting) would be sampled using this technique. The diameter size of the lavage tube would correspond to the size of the fish under investigation. A smaller tube (2.0 cm outside diameter) would be used for sturgeon between 75.0 and 150.0 cm FL, and smaller diameter tubes for correspondingly smaller individuals. The flexibility of the tubing and control of lavage pressure would be optimized to prevent potential damage to the alimentary canal. The lavage unit would consist of a 7-L spray tank fitted with flexible tubing. This volume would ensure that ample fluid can be delivered to flush contents from the stomachs. The time required for this technique would vary, but would average less than three minutes per fish.

Following the protocols of Sulikowski et al. (2007) and Damon-Randal (pers. comm.. 2008), blood would be collected opportunistically from all individuals that seem healthiest upon capture in the Kennebec, Penobscot, and Saco Rivers using 5 ml heparinized vaccutainers equipped with 20 gauge needles. The applicants would take blood samples from approximately 200 fish. The blood will be stored on ice in the field then centrifuged back at the laboratory. Separated plasma will be stored for later analysis.

Following processing, all fish would be treated with slime coat restorative and placed in a separate net pen to ensure full recovery prior to release.

Groundtruthing for otolith elemental assays would make use of otoliths, fin rays and scutes collected opportunistically from sturgeon mortalities (planned, e.g. hatchery moralities, or otherwise) under ESA permit 1614 to gather elemental signatures in tissues. Up to 70 such opportunistic samples may be obtained from river systems and rearing operations throughout the full species range. Samples of shortnose sturgeon would be collected from mortalities in the wild or as lethal samples from hatchery operations that are known to have transferred fish between different geographic water supplies during the course of their lives. These animals would be culled pursuant to their independent project objectives (e.g., Bears Bluff Hatchery stock). Opportunistic samples from Atlantic sturgeon would be collected from carcass recoveries throughout their range in the wild or as a byproduct of potential hatchery operations should they become available.

Once groundtruthing has been conducted on opportunistic samples, up to twenty apical spine samples from lateral or dorsal scutes of shortnose sturgeon may be directly collected by the PIs from each of the following rivers: Penobscot, Kennebec and Saco. Similar sampling could be conducted for Atlantic sturgeon following suitable groundtruthing. All of these samples are anticipated to be non-lethal and would only involve removal of hard apical spine material without full removal of the scute. Specific methods for optimal removal of the spine material from live specimens (clipping, sawing, drilling or disk ablation) will be developed as part of this project using the aforementioned carcass samples.

Egg Surveys

In the Saco, Kennebec and Penobscot rivers, egg substrates would be placed downstream of the location of females once they move upstream to spawn to determine spawning locations. D-shaped ichthyoplankton nets would be set while river temperatures are between 7 and 15 degrees C, which are temperature conditions considered suitable for spawning in this species. The egg substrate/mat design is based on Marchant and Shutters (1996). A subsample of eggs (up to 30) will be returned to the laboratory for species verification (possibly using genetic analysis). All other eggs will be counted then replaced to the river bed.

DIDSON and Acoustic Transmitters

In the Penobscot and Kennebec complex DIDSON acoustic lens camera system would be mounted to a pan and tilt unit to assess sturgeon populations and characterize habitat. The DIDSON unit will be lowered to the river bottom in the area of tagged sturgeon. The DIDSON would be rotated 360 degrees to cover a standard area of the river bottom. The river bottom would be randomly "sampled" with the acoustic beam to quantify the number of fish visualized in a known area on the bottom that encompasses the sturgeon in the region. Sturgeon density in the sampled area covered will be interpolated using standard kriging (Li *et al.* 2007) protocols.

Signals from the acoustic transmitters would be detected by an array of VEMCO VR2 units (submersible, single-channel hydrophone/receiver/ID detector/data logger/power source) owned

by MDMR. While many VR2 units have already been deployed, new VR2 units will be placed between the Kennebec and the Saco (3 units) and south of the Saco (3 units). New VR2 units would be attached to stationary structures or anchoring systems, and deployed so that the entire width of the river would be covered at several freshwater, estuarine, and marine sites. The units would be deployed after ice-out (early April), and inspected and downloaded bi-weekly until the array is removed in late fall. Detection efficiencies would be tested using drones prior to the release of tagged fish. In addition to the anchored array, researchers would search for tagged fish at least once a week with a directional hydrophone and receiver (Vemco VR100) deployed from a boat in order to delineate habitat use on a fine scale. Development of spatial models using remote sensing data and management of the database would take place within a laboratory or office setting and do not involve the taking or handling of fish or samples.

Data from the VR2 units would be a date/time stamped sequence of detections of individually identified shortnose and Atlantic sturgeon. These data can be used to determine or infer path choice, transit time, and the general location of spawning, feeding and staging habitat.

1.3 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action, as well as who is responsible for obtaining them. Even when it is the recipient's responsibility to obtain such permissions, NMFS is obligated under NEPA to ascertain whether the applicant is seeking other federal, state, or local approvals for their action.

National Environmental Policy Act
The National Environmental Policy Act (NEPA) was enacted in 1969 and its Environmental Impact Assessment requirement is applicable to all "major" federal actions significantly affecting the quality of the human environment. A major federal action is an activity that is fully or partially funded, regulated, conducted, or approved by a federal agency. The procedural provisions outlining federal agency responsibilities under NEPA are provided in the Council on Environmental Quality's implementing regulations (40 CFR Parts 1500-1508).

NMFS has, through NOAA Administrative Order (NAO) 216-6, established agency procedures for complying with NEPA and the implementing regulations issued by the Council on Environmental Quality. When a proposed action that would otherwise be categorically excluded is the subject of public controversy based on potential environmental consequences, has uncertain environmental impacts or unknown risks, establishes a precedent or decision in principle about future proposals, may result in cumulatively significant impacts, or may have an adverse effect upon endangered or threatened species or their habitats, preparation of an EA or EIS is required.

NMFS is preparing an EA for this action primarily to provide a more detailed analysis of effects to ESA-listed species. This draft Environmental Assessment is prepared in accordance with NEPA, its implementing regulations, and NOAA 216-6.

Endangered Species Act
Section 7 of the ESA requires consultation with the appropriate federal agency (either NMFS or the U.S. Fish and Wildlife Service) for federal actions that "may affect" a listed species or adversely modify critical habitat. NMFS issuance of an award affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these Section 7 consultation requirements. Section 7 requires federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. NMFS is further required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of habitat for such species. Regulations specify the procedural requirements for these consultations (50 Part CFR 402).

Section 6 of the ESA provides that states and territories maintaining an adequate and active program for the conservation of endangered and threatened species may receive federal funds for the purpose of conserving those species or monitoring the status of candidate species. To remain eligible for this funding, States must enter into a section 6 agreement with NMFS and undergo annual reviews of their program to reconfirm the finding that the state's program is adequate and active in accordance with section 6(c) of the ESA. Activities supported through this financial assistance are authorized by regulation (50 CFR 17.21) and have been determined to comply with the requirements therein.

Marine Mammal Protection Act: The MMPA prohibits takes of all marine mammals in the U.S. (including territorial seas) with a few exceptions. The act defines "take" to mean "to hunt, harass, capture, or kill" any marine mammal or attempt to do so.

National Marine Sanctuaries Act
The NMSA (32 U.S.C. 1431 *et seq*.) authorizes the Secretary of Commerce to designate and manage areas of the marine environment with special national significance. The National Marine Sanctuary Program, operating under the NMSA and administered by NOAA's National Ocean Service (NOS) has the authority to issue special use permits for research activities that would occur within a National Marine Sanctuary. Obtaining special use permits is the responsibility of individual researchers. However, as a courtesy, the Office of Protected Resources consults with NOS when proposed research would occur in or near a National Marine Sanctuary. The actions supported by Award File 4720023 would not occur in a National Marine Sanctuary nor impact any National Marine Sanctuaries, so no consultation with the National Ocean Service (NOS) is required.

Magnuson-Stevens Fishery Conservation and Management Act: Under the MSFCMA Congress defined Essential Fish Habitat (EFH) as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). The EFH provisions

of the MSFCMA offer resource managers means to accomplish the goal of giving heightened consideration to fish habitat in resource management. NMFS Office of Protected Resources is required to consult with NMFS Office of Habitat Conservation for any action it authorizes, funds, or undertakes, or proposes to authorize, fund, or undertake that may adversely affect EFH. This includes renewals, reviews or substantial revisions of actions.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1

Under the No Action alternative, Award File No NA10NMF4720023 would not be approved. This alternative would not fund research that helps determine the degree of demographic correspondence and connectivity among Maine sturgeon populations to address the extent to which local and regional scale processes dictate population characteristics and status.

2.2

Under the Proposed Action alternative, Award File No. NA10NMF4720023 would be approved. This approval would allow financial assistance to be used to support the conservation of Atlantic and shortnose sturgeon and described in pages 2-6. Best practice sturgeon sampling and handling protocols, limited net soak times, avoidance of listed species and marine mammals, and live release of bycatch would help minimize any adverse impacts on the environment.

CHAPTER 3 AFFECTED ENVIRONMENT

3.1 SOCIAL AND ECONOMIC ENVIRONMENT

Although economic and social factors are listed in the definition of effects in the CEQ regulations and NAO 216-6, the definition of human environment states that "economic and social effects are not intended by themselves to require preparation of an EIS." However, an EIS or EA must include a discussion of a proposed action's economic and social effects when these effects are interrelated with effects on the natural or physical environment. The social and economic environment is not described in detail because there is no potential for social and economic effects. There are no significant social or economic impacts of the proposed action interrelated with significant natural or physical environmental effects.

3.2 BIOLOGICAL AND PHYSICAL ENVIRONMENT

Atlantic Sturgeon-Background

While intensely studied since the 1970s, many important aspects of Atlantic sturgeon life history are still unknown (Murawski and Pacheco 1977, Van den Avyle 1983, Smith and Dingley 1984, Smith and Clugston 1997, Bain 1997, Bemis and Kynard 1997, Kynard and Horgan 2002). Although specifics vary latitudinally, the general life history pattern of Atlantic sturgeon is that

of a long lived, late maturing, estuarine dependent, anadromous species. The species' historic range included major estuarine and riverine systems that spanned from Hamilton Inlet on the coast of Labrador to the Saint Johns River in Florida (Reviewed in Murawski and Pacheco 1977, Smith and Clugston 1997). Atlantic sturgeon spawn in freshwater, but spend most of their adult life in the marine environment. Spawning adults generally migrate upriver in the summer.

The geomorphology of most small coastal rivers in Maine is not sufficient to support Atlantic sturgeon spawning populations, except for the Penobscot, the estuarial complex of the Kennebec, Androscoggin, and Sheepscot rivers, and possibly the Saco river. During the summer months, the salt wedge intrudes almost to the site of impassable falls in these systems: St. Croix River (rkm 16), Machias River (rkm 10), and the Saco River (rkm 10).

Penobscot

There have been two surveys conducted in the last 15 years to document the presence of shortnose and Atlantic sturgeon in the Penobscot River. ME DMR conducted a limited sampling effort in 1994 and 1995 to assess whether shortnose sturgeon were present in the Penobscot River. The ME DMR made 55 sets of 90 meter experimental gillnets for a total fishing effort of 409 net hrs (1 net hr = 100 yds fished for 1 hr). The majority of the fishing effort in the Penobscot River was in the upper estuary near head-of-tide. No shortnose or Atlantic sturgeon were captured. In 2006, a similar gillnet survey was implemented by the University of Maine (UME) in the lower river using both 15 cm and 30 cm stretched mesh sinking gillnets. In 2006, sixty-two shortnose and seven Atlantic sturgeon were captured in 1004.39 net hours, (506.18 net hours using the smaller mesh and 498.21 net hours using the larger mesh) (M. Kinnison, UME, pers. comm. 2006). One of these Atlantic sturgeon, captured in July, may have been an adult based on its size (145 cm TL) and time of capture. Thus, it is probable that a small population of Atlantic sturgeon persists in the Penobscot River. This speculation is supported by archeological evidence that sturgeon were present, occasional observations by fishers, and at least one capture of an adult Atlantic sturgeon by a recreational fisherman. An additional 99 shortnose sturgeon were captured in 2007 (S. Fernandes, UME, pers. comm. 2007).

Kennebec Complex

ME DMR has conducted studies in the past to determine the distribution and abundance of shortnose sturgeon in the estuarine complex of the Kennebec, Androscoggin and Sheepscot rivers (Squiers and Smith, 1979, Squiers et al, 1982). Additional studies were conducted to determine the timing of the spawning run and the location of spawning areas in the tidal section of the Androscoggin River (Squiers, 1982, Squiers, 1983, Squiers et al, 1993). The estimated size of the adult population (>50cm TL), based on a tagging and recapture study done from 1977 through 1981, was 7,200 with a 95% C.I. of 5,000 - 10,800 (Squiers et al, 1982). The average density of adult shortnose sturgeon/hectare of habitat in the estuarine complex of the Kennebec River was the second highest of any population studied through 1983 (Dadswell et al, 1984). Another population study was conducted from 1998 through 2000. The Schnabel estimate using the tagging and recapture data from 1998, 1999, and 2000 was 9,488 with a 95% confidence interval of 6,942 to 13,358 (Squiers 2003).

Atlantic sturgeon were historically abundant in the Kennebec River and its tributaries, including

the Androscoggin and Sheepscot rivers (Bigelow and Schroeder 1953, Vladykov and Greeley 1963, Kennebec River Resource Management Plan 1993). In 1849, a directed fishery for Atlantic sturgeon landed 160 mt. Population estimates based on the landings indicated that approximately 10,240 adult sturgeon were present prior to 1843 (Kennebec River Resource Management Plan 1993). Three hundred and thirty-six Atlantic sturgeon (nine adults and 327 subadults) have been captured in the Kennebec River in a multi-filament gill net survey conducted intermittently from 1977-2000 (Squiers 2004). During this period, the CPUE of Atlantic sturgeon has increased by a factor of 10-25 (1977 – 1981 CPUE = 0.30 versus 1998 – 2000 CPUE = 7.43). The mean length of the 327 subadults was 86.7 cm TL with a range from 48-114.5 cm TL (a subadult was classified as being 40-130 cm TL). The majority of the adult captures were in July between Merrymeeting Bay and Gardiner. Additional insight concerning the timing of Atlantic sturgeon spawning season emerged from a small commercial fishery on the Kennebec River in South Gardiner near Rolling Dam from June 15 – July 26, 1980. Thirty-one adult Atlantic sturgeon (27 males, 4 of which were ripe and 4 females, 1 of which was ripe) were captured. Two adults tagged in 1978 by the MEDMR in South Gardiner were recaptured in this fishery.

On July 13, 1994, while sampling for sturgeon, the MEDMR captured seven adult Atlantic sturgeon just below the spillway of the Edwards Dam in Augusta. Five of the seven Atlantic sturgeon (56-195 cm TL) were males expressing milt. In 1997, a biweekly trawl survey conducted from April – November by Normandeau Associates in the lower Kennebec River, captured thirty-one subadults and one adult Atlantic sturgeon. Subadults were also captured by the MEDMR in September of 1997 in the Eastern River (n = 18) and the Cathance River (n = 5), which are freshwater tributaries to the Kennebec, in overnight sets of gill nets (T. Squiers, MEDMR, Pers. Comm. 1998). Additional sampling from 2000-2003 of the MEDMR inshore groundfish trawl survey collected 13 subadults at the mouth of the Kennebec River, which had the greatest occurrences of Atlantic sturgeon among five regions sampled along the New Hampshire and Maine coasts (Squiers 2003).

The most recent capture of an adult Atlantic sturgeon occurred in June of 2005, where a 178 cm TL sturgeon was captured in an American shad gill net (12.7 cm stretched mesh) in Ticonic Bay, just upstream of the confluence between Sebasticook and the Kennebec rivers (Squiers 2005). The presence of adult male Atlantic sturgeon in ripe condition near the head-of-tide during June and July of 1994, 1997, and possibly in 2005 presents strong evidence that a spawning population still exists in the Kennebec River. While no eggs, larvae, or YOY have been captured in the last 15 years, the presence of subadults (48 cm to over 100 cm TL) in tidal freshwater tributaries and the mid-estuary and mouth of the Kennebec River from at least April – November provides additional evidence that a spawning population of Atlantic sturgeon persists in the Kennebec River estuary.

The only documented occurrence of Atlantic sturgeon in the Androscoggin River was an adult captured and released approximately one km downstream of the Brunswick Dam in 1975. No studies have been conducted to assess whether Atlantic sturgeon are presently utilizing the Androscoggin River for spawning. Subadults have been captured in the Sheepscot River, which may function as a nursery area for Kennebec River Atlantic sturgeon.

Saco River
Independent research in the Saco River conducted since 2007 has resulted in over 40 individual juvenile Atlantic sturgeon and one shortnose sturgeon being captured (Sulikowski et al., unpublished). Sizes of captured Atlantic sturgeon have ranged from 93cm TL (juveniles) to 168 cm TL (likely adult). Historic evidence suggests there was a small fishery for caviar but no landing data are available from recent times.

Shortnose Sturgeon- Background
Shortnose sturgeon occur in estuaries and rivers along the east coast of North America (Vladykov and Greeley 1963). Their northerly distribution extends to the Saint John River, New Brunswick, Canada, which has the only known population in Canada (Scott and Scott 1988). Their southerly distribution historically extended to the Indian River, Florida (Everman and Bean 1898). Shortnose sturgeon spend most of their life in their natal river systems, only occasionally entering the marine environment. The species appears to be estuarine anadromous in the southern part of its range, but in some northern rivers, it is "freshwater amphidromous" (i.e., adults spawn in freshwater but regularly enter saltwater habitats during their life (Kieffer and Kynard 1993). Adult sturgeon occurring in freshwater or freshwater/tidal reaches of rivers in summer and winter often occupy only a few short reaches of the total river length (Buckley and Kynard 1985).

The Kennebec River supports sturgeon spawning and was thought to be the only watershed in Maine with suitable habitat for shortnose sturgeon spawning. A capture in 1978 (Squiers and Smith 1979) and archeological data (Knight 1985, Petersen and Sanger 1986) provide support for the conclusion that shortnose sturgeon occurred in this system. Shortnose sturgeon were also recently documented in the Saco River for the first time.

Atlantic Salmon
Atlantic salmon inhabit both fresh and marine waters. They migrate to the Maine rivers in spring or early summer, spawning in mid-October or November. Historically, salmon inhabited every coastal river north of the Hudson River. The population was split into three DPS's (Long Island Sound, Central New England, and Gulf of Maine) (NMFS and USFWS 2005). Currently only the Gulf of Maine DPS survives at critically low population levels. On November 17, 2000 the Gulf of Maine DPS was listed as endangered under the Endangered Species Act (65 FR 69459) and on June 19, 2009 the Gulf of Maine DPS was expanded (74 FR 29344).

Other ESA Listed Species Potentially Affected by the Proposed Action
There are no other known USFWS ESA listed species located within the action area; therefore, consultation with the United States Fish and Wildlife Service was not initiated.

Bycatch Species Susceptible to Incidental Capture in Gillnet
Researchers could incidentally capture striped bass (*Morone saxatilis*), or menhaden (*Brevoortia tyrannus*), or lamprey *(Petromyzon marinus*) during sampling. The applicant expects the catch of these species would be minimal.

Marine Mammal Interactions
Marine mammals are protected under the MMPA and may rarely be found within the action area. Habor seals, Harp seals, Hooded seals, and Gray seals may interact with nets in areas close to the river mouths.

Essential Fish Habitat (EFH)
Congress defined essential fish habitat for federally managed fish species as "those waters and substrate necessary for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). As such, EFH varies by species, geographic location, life stage, etc.
A description of specific designated EFH for species within the action area can be found at: http://www.nmfs.noaa.gov/habitat/habitatprotection/profile/newenglandcouncil.htm.

Critical Habitat
On June 19, 2009 critical habitat was designed for the Gulf of Maine DPS of Atlantic salmon under the ESA (74 FR 29300). Much of this proposed action will take place in Atlantic salmon critical habitat. A description of the specific designated critical habitat can be found at http://www.nmfs.noaa.gov/pr/pdfs/fr/fr74-29300.pdf.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

4.1 EFFECTS OF ALTERNATIVE 1: No action

An alternative to the proposed action is no action, i.e., denial of the grant. This alternative would eliminate any potential risk to the environment from the proposed research activities. However, the no action alternative would not allow research to be conducted and would deny the opportunity to conduct the proposed research that would provide information needed to manage and recover these species.

4.2 EFFECTS OF ALTERNATIVE 2: Issue grant with standard conditions

Any impacts of the proposed action would be limited to the biological environment since all activities would be directed at sturgeon. The impacts of affixing acoustic telemetry receivers (primarily to buoys) or netting activities would have a negligible impact on the physical environment. Sample collections and fish handling would be conducted by trained personnel according to standard scientific protocols. There are no significant social or economic impacts of the proposed action interrelated with significant natural or physical environmental effects.

Environmental Consequences to the Biological Environment- Sturgeon

Capture
The applicants propose to use gillnets to capture sturgeon. Based on analysis of six comparable shortnose sturgeon research projects with similar sampling techniques and protocol involving gillnetting, handling, measuring, PIT-tagging, tissue sampling, and releasing in Connecticut

River (CT), Delaware River (DE), Hudson River (NY), Chesapeake Bay (MD), and Ogeechee River (GA) from 1988 till 2004, the mortality rates range from 0 – 1.22%. Of the 5,911 sturgeon captured, only 23 died, making the average incidental mortality rate 0.39%. All mortalities that occurred during gillnetting were due to high water temperature and low dissolved oxygen. This analysis indicates that, if done in accordance with the NMFS's sturgeon protocols, gill netting for shortnose, and likely also for Atlantic sturgeon, can be done very safely and with little risk of direct mortality. The applicant would check the nets periodically while sampling. It is more difficult to directly assess the extent of any delayed mortality of sturgeon that may occur after individuals are released from gill nets.

However, many research studies have shown a high probability of recapturing sturgeon that were previously captured in gill nets, handled and tagged. Kieffer and Kynard (1993) tagged 25 shortnose sturgeon and proceeded to recapture two fish six times each. Twelve other fish were recaptured once with only one observed shortnose sturgeon mortality during recapture. It is important to note that each of the above studies involved not only the capture, but also the tagging of sturgeon, which subjects sturgeon captured in gill nets to an additional degree of stress.

To limit stress and mortality of sturgeon due to capturing with gill nets, the grant applicants would adhere to the following: that at lower water temperatures (< 15^{O}C) soak times must not exceed 6 hours; at water temperatures between 15^{O}C and 20^{O}C, net sets would not exceed 4 hours; and at water temperatures between 20^{O}C and 28^{O}C, soak times of would not exceed 2 hours. Netting activities must cease at 28^{O}C or higher until consulting with NMFS-PR. Further, dissolved oxygen would also be measured prior to each net set to ensure that at least 4.5 mg/L concentration is maintained. Also, to minimize injury, heavy multifilament mesh would be used instead of monofilament or light twine, which is more apt to cut into the fish causing injury.

Fish Sampling and Handling

The handling, measuring, and weighing procedures are simple and not invasive and NMFS expects that individual sturgeon would normally experience no more than short-term stresses as a result of these activities. No injury is expected from these activities, and sturgeon would be worked up as quickly as possible to minimize stresses resulting from capture and handling. The applicant would also be required to follow procedures designed to minimize the risk of either introducing a new pathogen into a population or amplifying the rate of transmission from animal to animal of an endemic pathogen when handling animals. These activities would not injure or compromise the animal and would not add appreciably to the stress the animal would experience during capture and other activities discussed here.

The applicant proposes to take a small (1 cm^2 or less) non-deleterious tissue sample, clipped with surgical scissors from a section of pectoral fin ray from captured sturgeon. The procedure is common and accepted practice in sturgeon permits and does not impair the sturgeon's ability to swim and is not thought to have any long-term impact (Moser *et al*. 2000). MDMR would initially retain the sample but the samples would be available to NOAA-NOS on request. This procedure is not expected to have any significant effect on the fish. Similarly, samples of hard bony tissue will be collected from the apical spines of sturgeon scutes. These spines wear down as a normal part of sturgeon development, are avascular and are not thought to contain nerve endings. As such, this material can be removed without any notable impact to health or

subsequent performance of live individuals. The total sample would amount to a few grams (at most) of bony tissue, derived from one or more of the more prominent apical spines on the lateral or dorsal scutes.

The applicant proposes to use PIT tags. These activities would cause stress during restraint and minor wounds from attachment. Either a 14-mm AVID or an 11.5-mm Destron Fearing PIT tag would be injected posterior to the dorsal fin using a sterilized hypodermic needle. The attachment and retention of PIT tags is not known to have any other direct or indirect effects on shortnose sturgeon. As such, the tagging of shortnose sturgeon PIT tags is unlikely to have any significant impact on the reproduction, numbers, or distribution of shortnose sturgeon in the proposed action areas.

The applicant also requests the use of internally implanted transmitters. The surgical procedures could cause pain and discomfort to the fish, as well as a risk of infection. To address these concerns, the researchers propose to use the best management practices as endorsed by NMFS in the sturgeon Protocol (Moser *et al*. 2000). Only fish in optimal conditions would be internally tagged. Fish would be anesthetized and held for a short period of time for recovery. Protocols proposed for anesthetizing Atlantic sturgeon will follow those outlined in the researchers' permits for shortnose sturgeon (permit nos. 1595 and 1614). The researcher proposes to use tricaine methane sulphonate (MS-222) to anesthetize sturgeon at concentrations up to 100 mg/L to prevent captured sturgeon from stress during surgery. Because MS-222 is acidic (resulting in a prolonged induction time), sodium bicarbonate (NaHCO3) would be used to buffer the water.

The anesthesia, MS-222, is rapidly absorbed through the gills and its mode of action is to prevent the generation and conduction of nerve impulses and has direct actions on the central nervous system, cardiovascular system, neuromuscular junctions, and ganglion synapses. Like all fish anesthetic agents, the effects of MS-222 depend on the dose. The lower doses tranquilize and sedate fish while higher doses fully anaesthetize them (used for example with surgical interventions) (Taylor and Roberts, 1999). The sedative dissipates rapidly so the effects of the anesthesia would be short-term and only affect the target species.

An existing FDA 21 day withdrawal period for MS-222 applied to food fish would not be applicable to Atlantic sturgeon because of the existing moratorium on fishing. Thus there would not be a legitimate health risk by accidental consumption by humans. Moreover, MS-222 has been documented to be excreted from fish urine within 24 hours and tissue levels decline to near zero in the same amount of time (Coyle *et al.* 2004).

Invasive tools used would be sterilized with Nolvasan® between uses on each fish as well as the incision area swabbed with Nolvasan® prior to making the incision. After surgery a Vaseline betadyne mixture would be spread over the area to deter bacteria from entering the wound. Moreover, implanting transmitters would only be attempted when fish are in excellent condition and would not be attempted on pre-spawning fish in spring or fish on the spawning ground, nor if the water temperature exceeds 27° C to reduce handling stress, or is less than 7° C as incisions do not heal rapidly in lower water temperatures. To ensure normal mobility and swimming

behavior of the juvenile sturgeon receiving internal transmitters, the total weight of all transmitters and tags would not exceed 2% of the weight of the fish.

Although more invasive surgical procedures are required for internal implantation, this tagging procedure provides greater retention rates than external attachment. In general, adverse effects of the proposed tagging procedure could include pain, handling discomfort, hemorrhage at the site of incision, risk of infection from surgery, affected swimming ability, and/or abandonment of spawning runs. However, using proper anesthesia, sterilized conditions, and the surgical techniques described above, would minimize or eliminate potential short-term adverse effects from tagging and greatly lower the risk of injury and mortality. NMFS expects the tagging would result in no more than short-term stress to the animal.

These practices would minimize or eliminate potential short-term adverse effects from tagging and greatly lower the risk of injury and mortality.

Many fish have sensitivity to sound energy from 200 Hz up to 800 Hz, some species are able to detect lower frequency sounds (Popper 2005). The frequency of the acoustic tags used in the research (69 kHz) is well above the hearing threshold and would be inaudible to most fish.

It is possible that interaction with the capture methods described above could result in fewer adults reaching spawning grounds, and that this would exacerbate any reduced survival of eggs, larvae, and juveniles leading to a greater overall reduction in recruitment potential. However, the best available information indicates that, if handled correctly, these activities do not result in the mortality or significant injury of sturgeon, and that spawning runs are likely not interrupted.

Egg Surveys
The applicant proposes to sample sturgeon eggs using substrates and D-shaped icthyoplankton nets. The substrates and drift nets are small and do not in any way disrupt the flow of the water or the habitat around it. Shortnose and Atlantic sturgeon are broadcast spawners and lay tens of thousands of eggs at a time. Therefore, it is believed that the small number of eggs that may be sampled would not have an adverse effect on the population's viability.

Environmental Consequences to the Biological Environment-Other

Atlantic Salmon
The proposed research could incidentally capture Atlantic salmon. The applicant believes that the number of salmon caught would be small. Gillnets would be set on the bottom of the river channel and studies have shown that salmon use the top portion of the water column (Sturlaugsson 1995, Gowans *et al*. 1999). Salmon would be immediately released upon capture and nets would be checked periodically to ensure that salmon are released as quickly as possible.

Based on the permit and award conditions placed on the researchers to minimize impacts to Atlantic salmon, NMFS believes that Atlantic salmon captured in a gillnet during sturgeon research would result in short-term stresses and pose a potential risk to the salmon but is not likely to result in serious injury or mortality. In the event that a salmon is caught the researchers would suspend sampling and consult with the NMFS Northeast Region Protected Resources Division.

Non-Listed Non-Target Species Susceptible to Incidental Capture in Gillnet

The nets shall be checked every two hours or more frequently for any indication that an animal has been captured in the net. Captured animals would be immediately removed from the net. Researchers must plan for unexpected circumstances or demands of the research activities and have the ability and resources to meet this net checking condition at all times (e.g., if one animal is very entangled and requires extra time and effort to remove from the net, researchers must have sufficient staff and resources to continue checking the rest of the net at the same time). The applicant could not estimate the exact potential mortality of bycatch organisms, but it is believed that virtually all bycatch would be released alive. The applicant believes that the fact that she would frequently observe the net would essentially restrict the number of bycatch organisms taken. She also believes that her quick response to any capture would considerably reduce potential mortality.

Marine Mammal Interactions

While interactions with marine mammals and boats or set nets in the action area is rare, the possibility exists that these animals could be struck by the boat, entangled in nets, or stressed by the presence of the boat. As advised by the NMFS Regional Office of Protected Resources and as noted in the mitigation measures below, measures to minimize marine mammal interactions would be required (see below). Namely, nets would not be deployed when marine mammals are observed within the vicinity of the research; nets would be monitored in areas where marine mammals are known to occur; and marine mammals would be allowed to either leave or pass through the area safely before net setting is initiated. Additionally, in all boating activities (including travel to acoustic receiver arrays outside of the netting area) a close watch would be made for marine mammals to avoid harassment or interaction. Researchers would be advised to also review the NMFS Northeast Region Marine Mammal Approach and Viewing Guidelines located online at http://www.nero.noaa.gov/prot_res/mmv/. No take of marine mammals is expected.

Environmental Consequences to the Physical Environment

While the researcher's boats would pass through and over the water column of the area, NMFS determined that this portion of the research activities would not adversely impact the physical environment (including any portion that is considered critical habitat and EFH). The Office of Protected Resources (PR) also considered the potential impact of the researcher's proposed netting activities. PR contacted the applicant who is very familiar with the research area and she explained that the bottom habitat found in the Kennebec is mostly rocky bottom substrate. The bottom habitat in the Penobscot River is generally rocky with other varied bottom types, including large woody debris and cobble. The Saco River bottom habitat is sandy near the mouth and rockier upriver. There would be very little bottom drag by nets on the bottom habitat. Therefore the effect of the net and anchor on the bottom habitat is expected to be minimal.

4.3 SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

*Compliance with Endangered Species Act***:** To comply with Section 7 of the ESA Regulations (50 CFR 402.14(c)), a Section 7 informal consultation was initiated by the NMFS PR, under the ESA. In accordance with Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.), a not likely to adverse affect memo was prepared for this proposed action. It is NMFS' finding that issuance of Award No. NA10NMF4720023, as proposed, is not likely to jeopardize the continued existence of the shortnose sturgeon or any other NMFS ESA-listed species and is not likely to destroy or adversely modify designated critical habitat. NMFS requested concurrence with USFWS.

Compliance with Marine Mammal Protection Act: NMFS has determined that while the award creates the possibility of interactions with marine mammals, the possibility of incidental take through such interactions is considered remote. The awarding of the grant, therefore, should not require the recipient to obtain authorization for incidental take under the MMPA in order to conduct the research activities.

*Compliance with the Magnuson-Stevens Act***:** Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) requires NMFS to complete an EFH consultation for any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by the agency that may adversely affect EFH. The issuance of the proposed award would not impact designated EFH. The Office of Habitat Conservation was contacted and concurred via email that the proposed action as it would be conditioned would have minimal impacts on EFH. Therefore, no further consultation was necessary.
*Coordination with the National Ocean Service***:** The actions in the applications for Award No. 4720023 would not occur in a National Marine Sanctuary. The research activities would not impact any National Marine Sanctuaries, so no consultation was conducted.

4.4 MITIGATION MEASURES

The activities authorized under proposed Award NA10NMF4720023, if approved, would follow certain procedures in order to minimize and mitigate effects of the proposed action. If the grant is awarded, the following Special Award Conditions (SACs) would be placed on the award to ensure compliance with appropriate research protocols. The researchers state in their application that only trained personnel would be allowed to handle the fish.

To minimize the potential adverse effects of the award activities, mitigating measures are included in the conditions of the grant award. All permit conditions apply. Award conditions include:

> 1. Handling Time: Fish will be handled with care and kept in water to the maximum extent possible during sampling and processing procedures. To reduce stress, all fish handled out-of-water will be transferred using a sanctuary net that

holds water during transfer. If fish are anesthetized, they will be allowed to recover before release.

a. Total handling time of any individual sturgeon will not exceed 15 minutes.

b. Fish will be treated with an electrolyte bath prior to release to help reduce stress and restore slime coat.

c. For weight measurements, sturgeon will be supported using a sling or net and handling should be minimized throughout the procedure. Researchers will wear smooth rubber gloves to reduce abrasion of skin and removal of mucus.

2. Net conditions:

a. The awardees will take all necessary precautions to ensure that sturgeon are not harmed during captures, including the use of appropriate gill net mesh size and twine type that prevents shutting gill opercula, restricting gill netting activities and decreasing the time of net sets or ceasing netting according to the following water temperature and DO levels.

Fishing protocols for Atlantic and shortnose sturgeon		
Net set	Temperature at sampling depth	DO at sampling depth
6 hours	Up to 15°C	4.5 mg/l
4	15° to 20°C	4.5 mg/l
2	20° to 25°C	4.5 mg/l
1	25° to 28°C	4.5 mg/l
No netting	Over 28°C	4.5 mg/l

b. To minimize injury, heavy multifilament mesh will be used instead of monofilament or light twine, which is more apt to cut into the fish causing injury.

3. Holding Conditions:

a. Total holding time of any sturgeon, after removal from the net, will not exceed two hours.

b. Sturgeon will be held in floating net pens or live cars during processing.

c. If water temperature exceeds 27^{o} C, sturgeon will never be held on board for longer than 30 minutes.

d. When fish are onboard the research vessel, they will be placed in flow-through tanks that allow for total replacement of water volume every 15-20 minutes. Oxygenation of holding tanks is necessary during periods of high temperature and/or low dissolved oxygen to ensure that dissolved oxygen levels are at least 4.5 mg/l.

e. Sturgeon are extremely sensitive to chlorine; therefore, holding tanks that have been sterilized with bleach will be thoroughly flushed with fresh water between sampling periods to ensure that sturgeon are not exposed to chlorine in the bleach.

4. Tagging Conditions:

a. Researchers will not insert PIT tags into juvenile sturgeon less than 330 mm in length; if investigators choose to insert PIT tags into juvenile shortnose sturgeon in this size class, PIT tags will not be larger than 11.5 mm x 2.1 mm.

b. Prior to placement of tags - the entire dorsal surface of each fish will be scanned with a waterproof PIT tag reader and visually inspected to ensure detection of fish tagged in other studies. Previously PIT-tagged fish will not be retagged.

c. Total weight of tags (external and internal) on any fish will not exceed 2% of the fish's total body weight.

d. Surgical implantation of internal tags will not occur when water temperatures exceed 27^{o} C or are less than 7^{o} C, or be implanted in pre-spawning fish or fish on the spawning grounds. All sturgeon will be anesthetized with tricaine methane sulfonate (MS-222) for internal implantation of transmitters. Anesthetized fish will be observed for recovery before release.

5. Sampling Conditions: Extreme care will be used when collecting tissue samples (tissue/fin ray/scute spine). Instruments will be cleaned between each fish sampled to avoid possible disease transmission.

6. Atlantic Salmon: Should an Atlantic salmon be taken incidentally during the course of netting, researchers will suspend operations and notify and consult with NOAA Fisheries Northeast Region Protected Resources Division within 24 hours of any capture of an Atlantic salmon.

a. When possible, a scale sample will be collected from all captured salmon for subsequent age and origin analysis.

b. Salmon will be released alive back to the river. They will be cut free from the net mesh and held in the water to the extent practical

7. Marine Mammals: Should a marine mammal be taken incidentally during the course of netting, researchers will suspend operations and notify and consult with NOAA Fisheries Northeast Region Protected Resources Division within 24 hours.

a. In areas of rivers where pinnipeds may be present, nets will not be deployed when animals are observed within the vicinity of the research; nets will be monitored in areas where marine mammals are known to occur; and animals will be allowed to either leave or pass through the area safely before net setting is initiated.

b. In all boating activities (including travel to acoustic receiver arrays outside of the netting area) a close watch will be made for marine mammals to avoid harassment or interaction.

c. Researchers are advised to review the marine mammal approach and viewing guidelines online at http://www.nero.noaa.gov/prot_res/mmv/ and the bottlenose dolphin at guidelines at http://www.nmfs.noaa.gov/pr/education/regional.htm#se.

d. All sampling and boating activities will also comply, as applicable, with the relevant portions of the Atlantic Large Whale, the Bottlenose Dolphin, and Harbor Porpoise Take Reduction Plans.

8. Aquatic Nuisance Species

a. To prevent potential spread of aquatic nuisance species identified in the watershed, all equipment assigned to the research will not be reassigned to other watersheds until the research is completed or is suspended.

b. If the research has been completed or is suspended, all gear and equipment used will be bleached, washed and air dried before being redeployed to another location.

4.5 CUMULATIVE EFFECTS

Effects of past and ongoing human and natural factors (fisheries, maintenance dredging, existing NMFS research permits and other activities) occurring in or near the action area that have contributed to the current status of the species. Activities and threats are expected to continue into the future. NMFS expects the proposed research activities will not appreciably reduce Atlantic sturgeon or salmon likelihood of survival and recovery in the wild by adversely affecting their birth rates, death rates, or recruitment rates. In particular, NMFS expects that the

proposed research activities will not affect adult sturgeon or Atlantic salmon in a way that appreciably reduces the reproductive success of adults, the survival of young, or the number of young that annually recruit into the breeding populations of any of the species.

Effects of the research activities include stress and localized pain from the capture, tagging, and sampling methods. However, effects are short-term in nature and have been shown to have no long-lasting effects on the individual's ability to survive.

A review of the data from annual permit reports indicates that, if done in accordance with the NMFS's sturgeon protocols, gill netting for shortnose sturgeon can be done very safely with little risk of direct mortality. Of the approximately 5,000 captures documented between 1999 and 2002, only 12 shortnose sturgeon, or 0.2%, suffered direct mortality. In addition, studies have also shown that tagged fish appear to recover quickly and show no long-term effects from handling (Moser et al. 2000). It is likely that Atlantic sturgeon would have a similar response.

The short-term stresses (separately and cumulatively) resulting from the activities discussed above are expected to be minimal. NMFS expects the additional short-term stress of the activities would not significantly affect the sturgeon. The award and permit would contain conditions (outlined above) to mitigate adverse impacts to animals from these activities.

Overall, the proposed action would not be expected to have more than short-term effects on endangered shortnose sturgeon, ESA candidate Atlantic sturgeon, or endangered Atlantic salmon. The incremental impact of the action when added to other past, present, and reasonably foreseeable future actions discussed here would be minimal and not significant. The data generated by the tagging, measuring, and sampling activities associated with the proposed action would help determine the movement and habitat use of sturgeon found in the waters of the action area. The research would provide information that would help manage and recover threatened and endangered species and would outweigh any adverse impacts that may occur.

The proposed action would not be expected to have any more than short-term effects any marine life species or other portions of the environment and would not result in any cumulatively significant effects.

CHAPTER 5 LIST OF PREPARERS AND AGENCIES CONSULTED

Preparers:
Office of Protected Resources
National Marine Fisheries Service
Permits, Conservation and Education Division
Office of Protected Resources
Silver Spring, MD 20910

Agencies Consulted:

Office of Protected Resources
National Marine Fisheries Service
Permits, Conservation and Education Division (shortnose sturgeon analyst)
Silver Spring, MD 20910

Office of Protected Resources
National Marine Fisheries Service
Endangered Species Division (section 7 team)
Silver Spring, MD 20910

Northeast Regional Office
National Marine Fisheries Service
Habitat Conservation Division
Gloucester, MA 01930

CHAPTER 6 LITERATURE CITED

Bain, M. B. 1997. Atlantic and shortnose sturgeons of the Hudson River: Common and Divergent Life History Attributes. Environmental Biology of Fishes 48: 347-358.

Bemis, W. E. and B. Kynard. 1997. Sturgeon rivers: an introduction to *Acipenseriform* biogeography and life history. Environmental Biology of Fishes 48: 167-183.

Bigelow, H. B. and W. C. Schroeder. 1953. Fishes of the Gulf of Maine. Fisheries Bulletin, U.S. Fish and Wildlife Service 53: 577 pp.

Buckley, J. and B. Kynard. 1985. Yearly movements of shortnose sturgeons in the Connecticut River. Transactions of the American Fisheries Society 114:813-820.

Coyle, S.D., Durborow, R.M., and Tidwell, J.H. 2004. Anesthetics in aquaculture. SRAC, Nov 2004., Publication No. 3900; 6 pp.

Dadswell, M.J., B.D. Taubert, T.S. Squires, D. Marchette, and J. Buckley. 1984. Synopsis of biological data on shortnose sturgeon, *Acipenser brevirostrum* LeSueur 1818. NOAA Technical Report. NMFS 14. 45p.

Evermann, B.W. and B.A. Bean. 1897 (1898). Indian River and its fishes. U.S. Comm. Fish Fisher., Rep. Comm. 22:227-248.

Fox, D. A.; Hightower, J. E.; Paruka, F. M., 2000: Gulf sturgeon spawning migration and habitat in the Choctawatchee River system, Alabama-Florida. Trans. Am. Fish: Soc. 129, 811-826.

Gowans, AR, J.D. Armstrong, and I.G. Priede. 1999. Movements of adult Atlantic salmon through a reservoir above a hydroelectric dam: Loch Faskally. Journal of Fish Biology 54: 727-740.

Kennebec River Resource Management Plan. 1993. Kennebec River resource management plan: balancing hydropower generation and other uses. Final Report to the Maine State Planning Office, Augusta, ME. 196 pp.

Kieffer, M. and B. Kynard. 1993. Annual movements of shortnose and Atlantic sturgeons in the Merrimack River, Massachusetts. Transaction of the American Fisheries Society. 122:1088-1103.

Knight, J.A. 1985. Differential preservation of calcined bone at the Hirundo site, Alton, Maine. Master's Thesis, Institute for Quaternary Studies, University of Maine, Orono, Maine.

Kynard, B. and M. Horgan. 2002. Ontogenetic behavior and migration of Atlantic sturgeon, *Acipenser oxyrinchus oxyrinchus*, and shortnose sturgeon, *A. brevirostrum*, with notes on social behavior. Environmental Behavior of Fishes 63: 137-150

Li, Xinhai, Litvak, Mathew, & Clarke, John. 2007. Overwintering habitat use of shortnose sturgeon (*Acipenser brevirostrum*): defining critical habitat using a novel underwater video survey and modeling approach. Canadian Journal of Fisheries and Aquatic Sciences. 64, 1248-1257.

Marchant, R.S., and M.K. Sutters. 1996. Artificial substrates collect gulf sturgeon eggs. North American Journal of Fisheries Management 16:445-447.

Mohler, J. W. 2004. Culture manual for the Atlantic sturgeon, Acipenser oxyrinchus oxyrinchus. U.S. fish and Wildlife Service, Hadley, Massachusetts. 70 pp.

Moser, M.L., M. Bain, M.R. Collins, N. Haley, B. Kynard, J.C. O'Herron, G. Rogers, and T.S. Squiers. 2000. A Protocol for Use of Shortnose and Atlantic Sturgeons. Prepared by Moser M.L. et. al. NOAA Technical Memorandum NMFS-OPR-18.

Murawski, S. A. and A. L. Pacheco. 1977. Biological and fisheries data on Atlantic Sturgeon, *Acipenser oxyrhynchus* (Mitchill). National Marine Fisheries Service Technical Series Report 10: 1-69.

NMFS ESA section 10(a)(1)(A) permit number 1595.

NMFS ESA section 10(a)(1)(A) permit number 1578. Request for Major Modification pending.

NMFS ESA section 10(a)(1)(A) permit number 1614.

NMFS and USFWS. 2005. Recovery Plan for the Gulf of Maine DPS of Atlantic Salmon. National Marine Fisheries Service, Silver Spring, MD.

Petersen, J.B., and D. Sanger. 1986. Archeological Phase II Testing at the Eddington Bend site (74-8), Penobscot County, Maine. Final Report to Bangor Hydro-Electric Company, University of Maine, Orono, Maine.

Popper, A.N. 2005. A Review of Hearing by Sturgeon and Lamprey. Environmental BioAcoustics, LLC. Rockville, Maryland. Submitted to the U.S. Army Corps of Engineers, Portland District. August 12, 2005.

Shuman, D.A., and E.J. Peters. 2007. Evaluation of pulsed gastric lavage on the survival of captive shovelnose sturgeon. J. Appl. Ichthyol. 23:521-524.

Smith, T. I. J. and J. P. Clungston. 1997. Status and management of Atlantic sturgeon, *Acipenser oxyrinchus*, in North America. Environmental Biology of Fishes 48: 335-346.

Smith, T. I.J. and E. K. Dingley. 1984. Review of biology and culture of Atlantic (*Acipenser oxyrhynchus*) and shortnose sturgeon (*A. brevirostrum*). Journal of World Mariculture Society 15: 210-218.

Squiers, T.S. and M. Smith. 1979. Distribution and abundance of shortnose and Atlantic sturgeon in the Kennebec River estuary. 1979. Completion Report AFC-19, 1976-1978. 51 pp.

Squiers, T.S., Smith, M. and Flagg, L. 1982. American shad enhancement and status of sturgeon stocks in selected Maine waters. Final report to NMFS, Gloucester, MA.

Squiers, T.S. 1983. Evaluation of the spawning run of shortnose sturgeon (Acipenser brevirostrum) in the Androscoggin River, Maine. Final report to Central Maine Power Company to fulfill requirement of Article 43 of FERC license #2284. 14 pp.

Squiers, T.S., M. Robillard, and N. Gray. 1993. Assessment of potential shortnose sturgeon spawning sites in the upper tidal reach of the Androscoggin River. Final report of the Maine Department of Marine Resources to the Maine Department of Transportation, Augusta, ME. 15 pp.

Squiers, T.S. 2003. Completion report Kennebec River shortnose sturgeon population study (1997-2001). Report to National Marine Fisheries Service for NMFS Contract 40-EANF-8-00053 and NMFS Contract 43-EANF-0-00147.

Squiers, T. 2004. State of Maine 2004 Atlantic sturgeon compliance report to the Atlantic States Marine Fisheries Commission. Report submitted to the Atlantic States Marine Fisheries Commission, December 22, 2004, Washington, DC.

Squiers, T. 2005. State of Maine 2005 Atlantic sturgeon compliance report to the Atlantic States

Marine Fisheries Commission. Report submitted to Atlantic States Marine Fisheries Commission, September 30, 2005, Washington, D.C.

Sturlaugsson, J. 1995. Migration study on homing of Atlantic salmon (Salmo salar L.) in coastal waters W-Iceland -- depth movements and sea temperatures recorded at migration routes by data storage tags. ICES-CM-1995/M:17.

Sulikowski, J.A., W.B. Driggers, W. Ingram, J. Kneebone, D.E. Ferguson, and P.C.W. Tsang. 2007. Profiling plasma steroid hormones: a non-lethal approach for the study of skate reproductive biology and its potential use in conservation management. Environ. Bio. Fish. 80: 285-292.

Taylor, P.W. and S.D. Roberts. 1999. Clove oil: An alternative anesthetic for aquaculture. North American Journal of Aquaculture 61(2):150-1555.

Van den Avyle, M. J. 1983. Species profiles: life histories and environmental requirements (South Atlantic) - Atlantic sturgeon. U.S. Fish and Wildlife Service, Division of Biological Services FWS/OBS-82/11. U.S. Army Corps Eng. TREL-82-4. 38 pp.

Vladykov, V.D., and J.R. Greeley. 1963. Order Acipenseroidei. Pages 24-60 *in* Fishes of the western North Atlantic. Part III. Memoirs of the Sears Foundation for Marine Research 1.

Wilk, S.J., and M.J. Silverman. 1976. Summer benthic fish fauna of Sandy Hook Bay, New Jersey. NOAA Technical Report SSRF-698. National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, Massachusetts.

Finding of No Significant Impact
for Issuance of a Protected Species Conservation and Recovery Grant to the Maine Department of Marine Resources (Award File 4720023) to Conduct Research on Sturgeon in Maine

National Marine Fisheries Service

The National Marine Fisheries Service, Office of Protected Resources (NMFS PR) proposes to provide financial assistance in the form of a grant to the Maine Department of Marine Resources (MDMR) (Gail Wippelhauser, P.I.) to support research that helps determine the degree of demographic correspondence and connectivity among Maine Atlantic and shortnose sturgeon populations to address the extent to which local and regional scale processes dictate population characteristics and status. This award would be issued through the Protected Species Conservation and Recovery Grant Program (CFDA no. 11.472, Unallied Science Programs) authorized under section 6 of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1535). The federal government would provide 75 percent of the cost of the project, and the state would provide the remaining 25 percent. This financial assistance award would extend for three years and is subject to semi-annual review by NMFS. The grant would support monitoring activities for Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), a candidate for listing under the ESA, and conservation activities for the endangered shortnose sturgeon (*Acipenser brevirostrum*) in Maine. Many of the specific activities that would be funded through the proposed action addressing endangered shortnose sturgeon have been authorized under ESA section 10(a)(1)(A) permits (permit nos. 1595, 1578 and 1614); thus, these activities have also been previously analyzed under NEPA and are incorporated by reference in the Environmental Assessment supporting this action.

In accordance with the National Environmental Policy Act (NEPA), as implemented by the regulations published by the Council on Environmental Quality and NAO 216-6, NMFS prepared an Environmental Assessment (EA) analyzing the impacts on the human environment associated with award issuance (*Issuance of a Protected Species Conservation and Recovery Grant to the Maine Department of Marine Resources (Award No. NA10NMF4720023) to Conduct Research on Sturgeon in Maine, March 2010).* The EA is hereby incorporated by reference in its entirety. The analyses in the EA support the following findings and determination.

The applicant is requesting funds to 1) collect information using regionally standardized methods to estimate population size of sturgeon in major river systems; 2) characterize intersystem movements- including determining which coastal river systems are being used, what paths fish take to traverse between them, and the timing and duration of such movements; 3) determine feeding habitat and trophic position of sturgeon in each river; 4) determine the sex and stage of

maturity using circulating levels of reproductive hormones; 5) determine whether elemental analysis of scutes can be used to accurately reconstruct the river of juvenile origin for subadult and adult fish captured in a given system; 6) expand regional collaboration among Gulf of Maine (GoM) researchers to place demographic connectivity and correspondence into its broader research and management context.

The National Oceanic and Atmospheric Administration's Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) NEPA implementing regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1. Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat (EFH) as defined under the Magnuson - Stevens Act and identified in Fishery Management Plans?

   Response: The project's proposed research activity, including boating and netting activities, would not take place in national marine sanctuaries. Also, no coral reef ecosystems occur in the action area and thus none would be affected. However, designated EFH would overlap with a section of the proposed action area. Although researcher's boats would pass through and over the water column in the action area where EFH does exist, NMFS determined this portion of the researcher's activities would not adversely impact the physical environment, including any portion considered EFH. Additionally, with respect to anticipated effects on EFH by gill nets, NMFS concluded netting would result in minimal disturbance to the physical environment, including the bottom substrate and any portion having EFH.

   NMFS PR requested concurrence on whether the proposed action as conditioned would have adverse impacts or not on designated EFH in the action area. The NMFS, Northeast Office of Habitat Conservation was contacted and agreed by email that the proposed boating and netting activities would have no more than minimal impact to EFH.

2. Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

   Response: No substantial impact on biodiversity or ecosystem function within the affected area is expected. The bottom habitat found in the Kennebec, Penobscot and Saco rivers is generally rocky with varied bottom types including large woody debris, cobble, and sand. The impacts to the river bottoms would be during capture (gillnet); however, with minimal contact in localized areas of the river in addition to the mitigation measures set forth in the award conditions, we expect minimal disturbance of benthic organisms and substrate. The impact from the use of boat anchors is expected to be minimal.

Due to the nature of netting, the researchers would expect that other non-target species would become enmeshed. Other non-target species collected in the past during gill netting by the applicant include: striped bass (*Morone saxatilis*), menhaden (*Brevoortia tyrannus*), and lamprey *(Petromyzon marinus*). It is also possible that the applicant may capture Atlantic salmon (*Salmo salar*). However, the nets would be checked at short intervals, and non-target fish would be removed from the net and immediately released at the site of capture. It is believed that virtually all by-catch would be released alive without long-term effects on predator-prey relationships.

3. Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?

   Response: Issuance of this award is not expected to have substantial adverse impacts on public health or safety that could reasonably be expected by the proposed research activities. This action would involve the use of 95% ethanol pre-measured in vials for preservation, storage, and transportation of tissue samples. MS-222 powder, used for anesthetizing shortnose and Atlantic sturgeon during surgery, would also be transported in premeasured amounts and mixed onboard. The researchers would wear gloves and masks during mixing of the chemical; therefore, direct contact with the alcohol or MS-222 would be eliminated. Additionally, researchers would be advised in the permit to dispose of the anesthetic safely following state approved measures.

4. Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?

   Response: The proposed research activities could potentially have adverse effects on individual endangered shortnose sturgeon or ESA candidate Atlantic sturgeon including mortality, but the effects are not expected to have adverse population-level impacts.

   The award activities require standard NMFS research and mitigation protocols to minimize stress and harmful effects on shortnose and Atlantic sturgeon. Critical habitat has yet to be designated for shortnose sturgeon; thus, none would be affected.

   It is possible that this action may have adverse impacts on Atlantic salmon although gill nets would be set to minimize Atlantic salmon interactions. Nets would be checked at short intervals to ensure the quick release of any Atlantic salmon. NMFS believes that Atlantic salmon captured in a gillnet during sturgeon research would result in short-term stresses and pose a potential risk to the salmon but is not likely to result in serious injury or mortality. In the event that a salmon is captured, the researchers would suspend sampling and consult with the NMFS Northeast Region Protected Resources Division. Habitat impacts from netting and boating would be minimal so it is highly unlikely that this action would adversely modify Atlantic salmon critical habitat.

It is also possible that researchers could also incidentally capture striped bass (*Morone saxatilis*), or menhaden (*Brevoortia tyrannus*), or lamprey *(Petromyzon marinus*) during sampling. The applicant expects the catch of these species would be minimal and NMFS believes that this catch is not likely to result in serious injury or mortality.

In the unlikely event that marine mammals or sea turtles are encountered while netting, researchers would be directed by permit conditions to avoid contact with these animals. If researchers do come into contact with any marine mammals, either through boating or netting activities, the Northeast Regional Office suggested appropriate precautionary measures that would be required. Namely, netting would not be deployed when animals are observed within the vicinity of the research; and animals would be allowed to either leave or pass through the area safely before net setting is initiated. Also, in all boating activities (including travel to acoustic arrays outside of the netting area), researchers would be advised to watch for marine mammals to avoid harassment or interaction.

5. Are significant social or economic impacts interrelated with natural or physical environmental effects?

   Response: There would be no significant social or economic impacts interrelated with natural or physical environmental effects. Only researchers would be affected by this action.

6. Are the effects on the quality of the human environment likely to be highly controversial?

   Response: The effects on the quality of the human environmental are not likely to be controversial. This project is similar to other existing projects that have negligible effects on the human environment and are not controversial.

7. Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?

   Response: The activities in this proposed award would not be expected to result significant impacts to any unique areas mentioned above. Similar research has been conducted in the proposed area that has not impacted unique areas.

8. Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

   Response: Potential risks by proposed research methods are not unique or unknown, nor is there significant uncertainty about impacts. Monitoring reports from other projects of a similar nature, and published scientific information of impacts on shortnose and Atlantic sturgeon, indicate the proposed activities would not result in significant adverse impacts to the human environment or the species. There is considerable scientific information available on the likely impacts for the proposed action.

9. Is the proposed action related to other actions with individually insignificant, but cumulatively

significant impacts?

Response: Overall, the proposed action would be expected to have no more than short-term effects on Atlantic sturgeon and no effects on other aspects of the environment. The incremental impact of the action when added to other past, present, and reasonably foreseeable future actions discussed in the environmental assessment would be minimal and not significant.

10. Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

    Response: The action would not adversely affect any district, site, highway, structure, or object listed in or eligible for listing in the National Register of Historic Places. The proposed action would also not cause loss or destruction of significant scientific, cultural or historical resources. The proposed action will not occur in the aforementioned areas.

11. Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

    Response: The U.S. Geological Survey has documented several aquatic nuisance species occurring in the action area having potential to be spread by the actions of the proposed research. However, the applicant has agreed to follow certain conditions proposed by NMFS to minimize the potential spread of these aquatic nuisance species. Therefore, the proposed research activities would not be expected to result in introduction or spread of non-indigenous species to other watersheds.

12. Is the proposed action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

    Response: The decision to issue this award would not be precedent setting and would not affect any future decisions. NMFS has issued numerous awards to study both shortnose and Atlantic sturgeon. Issuance of an award to a specific individual or organization for a given research activity does not in any way guarantee or imply NMFS would authorize other individuals or organizations to conduct the same research activity. Any future request received, including those by the applicant, would be evaluated upon its own merits relative to the criteria established in the MMPA, ESA, and NMFS' implementing regulations.

13. Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

    Response: Issuance of the proposed award is not expected to violate any Federal, State, or local laws for environmental protection. This award would not relieve the applicant of the responsibility to comply with other Federal, State, local, or international laws or regulations.

14. Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Response: The proposed procedures would have potential adverse impacts on individual sturgeon. However, because sturgeon are a robust species and respond well to the types of handling proposed, the cumulative effects on the population are not likely long-term or significant on the species. NMFS expects that the proposed research activities would not appreciably reduce Atlantic or shortnose sturgeon likelihood of survival and recovery in the wild by adversely affecting their birth rates, death rates, or recruitment rates. In particular, NMFS expects that the proposed research activities would not affect adult sturgeon in a way that appreciably reduces the reproductive success of adults, the survival of young, or the number of young that annually recruit into the breeding populations of any of these species.

Likewise, it is possible that this action may have adverse impacts on Atlantic salmon although gill nets would be set and tended to minimize Atlantic salmon interactions. Nets would be checked at short intervals to ensure the quick release of any bycatch. Based on the permits and award conditions placed on the researchers to minimize impacts to Atlantic salmon, NMFS believes that Atlantic salmon captured in a gillnet during sturgeon research would result in short-term stresses and pose a potential risk but is not likely to result in serious injury or mortality. In the event that a salmon is caught researchers would suspend sampling and consult with the NMFS Northeast Region Protected Resources Division.

NMFS also considered impacts of potential marine mammal and sea turtle interactions during sturgeon research. Although interactions with marine mammals and sea turtles would be considered rare based on historical records in the river, the award conditions state that nets would not be set if marine mammals are seen in the vicinity of the research, and also mandate the animals must be allowed to leave the area before the nets are set, minimizing potential adverse impacts to these species.

DETERMINATION

In view of the information presented in this document and the analysis contained in the Environmental Assessment (EA) prepared for Issuance of Award No. NA10NMF4720023 it is hereby determined that the issuance of Award No. NA10NMF4720023 will not significantly impact the quality of the human environment as described above. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environment Impact Statement for this action is not necessary.

APR 14 2010

James H. Lecky
Director, Office of Protected Resources

Date