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

SEP - 5 2013

To All Interested Government Agencies and Public Groups:

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

TITLE: Supplemental Environmental Assessment (SEA) On the Issuance of Two Modifications to Scientific Research Permits (File Nos. 14759 and 16375) to the North Carolina Cooperative Fish and Wildlife Research Unit to Conduct Research on Shortnose sturgeon and Atlantic sturgeon.

LOCATION: The action area is being expanded to include areas of suspected spawning habitat in both the Roanoke and Cape Fear River systems up to the first impassible dams on the Roanoke River (river kilometer (rkm) 221) and the Cape Fear River (rkm 300).

SUMMARY: The National Marine Fisheries Service (NMFS) proposes to issue modifications to two research permits held by the North Carolina Cooperative Fish and Wildlife Research Unit [hereinafter "Permit Holder" and Joseph Hightower, Ph.D., Responsible Party/Principal Investigator: North Carolina State University, Raleigh, NC 27695] for takes of shortnose sturgeon (*Acipenser brevirostrum*) (File No. 14759-01) and for takes of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) (File No. 16375-01) in the wild, pursuant to the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*).

The research objectives for both permits would remain unchanged: to collect data on the biology, distribution and abundance of endangered Shortnose sturgeon and Atlantic sturgeon to facilitate recovery of the respective species. In Permit No. 14759, the Permit Holder is currently authorized to capture with gill net, measure, weigh, genetic tissue sample, PIT tag and Floy tag up to 15 Shortnose sturgeon annually from the Chowan and Cape Fear River Basins and Albemarle Sound. Additionally, the Permit Holder is authorized to capture and sample up to 25 Shortnose sturgeon per year from the Roanoke River Basin. Annually, a sub-set of up to five sub-adults or adults from each of the river basins and Albemarle Sound can also be anesthetized and surgically implanted with internal sonic transmitters annually.

In Permit No. 16375, the Permit Holder is authorized to capture with gill nets measure, weigh, genetic tissue sample, PIT and Floy tag up to 200 Atlantic sturgeon annually from the same locations authorized in Permit No. 14759. Further, a sub-set of up to ninety juvenile, sub-adult or adult Atlantic sturgeon may be annually implanted with acoustic transmitter tags within the Albemarle Sound, and Roanoke, Chowan and Cape Fear River Basins, with no more than 45

tagged in each the Cape Fear River system or the combined area for the Albemarle Sound, Roanoke River and Chowan River.

The applicant now requests authorization to verify spawning activity shortnose and Atlantic sturgeon by deploying artificial egg mats downstream of suspected spawning areas to take up to 50 early life stages (ELS) of each species annually from both the Roanoke River and Cape Fear River (total of 200 ELS). The expanded action area for each species up to the first impassible dam on the Roanoke River (rkm 221) and on the Cape Fear (rkm 300), will also be a part of the permit modification. All other currently authorized takes, methods and activities would remain the same for each permit. The modifications would be valid through the expiration dates of the original Permit No. 14759 (August 19, 2015) and Permit No. 16375 (April 5, 2017).

RESPONSIBLE OFFICIAL:

Donna S. Wieting
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,

Patricia A. Montanio
NOAA NEPA Coordinator

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

Finding of No Significant Impact
Issuance of Scientific Research Permit Nos. 14759-01 and 16375-01

Background

On February 4, 2013, the National Marine Fisheries Service (NMFS) received two applications to modify Permit No. 147591 and Permit No. 16375 from North Carolina Cooperative Fish and Wildlife Research Unit [hereinafter "Permit Holder" and Joseph Hightower, Ph.D., Responsible Party/Principal Investigator]: North Carolina State University, Raleigh, NC 27695] for takes of early life stages (ELS) of shortnose sturgeon (*Acipenser brevirostrum*) (File No. 14759-01) and Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) (File No. 16375-01) in the wild, pursuant to the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*).

In accordance with the National Environmental Policy Act, NMFS has prepared a Supplemental Environmental Assessment (SEA) analyzing the impacts on the human environment associated with permit issuance entitled: *Batched Supplemental Environmental Assessment (SEA) on the Issuance of Two Modifications to Scientific Research Permits to the North Carolina Cooperative Fish and Wildlife Research Unit to Conduct Research on Shortnose sturgeon (File Nos. 14759-01) and Atlantic sturgeon (File No. 16375-01)*. In addition, a Biological Opinion was issued under the Endangered Species Act summarizing the results of an intra-agency consultation. The analyses in the SEA, as informed by the Biological Opinion, support the below findings and determination.

Analysis

National Oceanic and Atmospheric Administration 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) 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 actions reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in Fishery Management Plans?

> Because the action areas of the Proposed Actions were not associated with essential fish habitat (EFH) or ocean and coastal habitats, no EFH conservation recommendations pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act, and consideration of ocean and coastal habitats were necessary.

(2) Can the proposed actions 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.)?

Minimal impact on biodiversity or ecosystem function within the affected areas is expected as a result of the permit modifications. Disturbance to the benthic habitat resulting from anchoring egg mats to river bottoms would be minimal. Takes of sturgeon ELS, would not affect biodiversity and/or the ecosystem function within the affected areas.

(3) Can the proposed actions reasonably be expected to have a substantial adverse impact on public health or safety?

Issuance of the permit modifications is not expected to have substantial adverse impacts on public health or safety not already considered in the prior EAs. The proposed modifications will not affect traffic and transportation patterns, risk of exposure to hazardous materials or wastes, risk of contracting disease, risk of damages from natural disasters, food safety, or other aspects of public health and safety.

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

The proposed modifications for directed mortality in sampling of shortnose and Atlantic sturgeon ELS will have adverse effects on individual animals.

Although the total number of ELS lethally sampled, and the suite of activities performed in deploying, anchoring and removing egg mats, would increase as a result of the Proposed Actions, these activities would not be expected to result in reduced reproductive success of either target species because of the prolific nature of spawning of each sturgeon species. Therefore, as supported in the Biological Opinion prepared for this action to modify both permits, authorizing the lethal takes of ELS would not be expected to significantly impact Atlantic or shortnose sturgeon populations or the two species' ability to survive.

The actions also would not likely destroy or adversely modify designated critical habitat because no critical habitat has been designated in the action areas for Atlantic or shortnose sturgeon.

Furthermore, because protected marine mammal species or ESA listed sea turtles would not occur in the proposed action areas, potential impacts on marine mammals or sea turtles would not be considered a risk in the modifications. Also, other non-target non-listed species would not be affected by the methods adopted and thus would not be affected by issuing the permits.

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

The analyses in the 2010 and 2012 EAs found no known social or economic impacts associated with the proposed actions. Since the proposed actions do not add to the existing impacts analyzed, there would be no significant social or economic impacts interrelated with natural or physical environmental effects within the current actions.

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

A *Federal Register* notice (78 FR 23225) was published on April 15, 2013, allowing other agencies and the public to comment on the actions. All agency comments were addressed and responses were included in the decision memos for the permit modifications. None of the agency comments addressed either proposal's potential impacts on the quality of the human environment. No public comments were received in response. Given that the proposed research methodologies are well known and are expected to have minimal effects, NMFS believes the modifications are not likely to be controversial.

(7) Can the proposed actions 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?

There would be no substantial changes in the former assessments to unique areas as a result of the permit modifications as they do not occur in the proposed action areas and would not be impacted.

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

The effects of the proposed modifications on the human environment are predictable based on evaluation of the effects of previously permitted research on the same species. The risks of the proposed actions are known in that they are expected to have minimal effects.

(9) Are the proposed actions related to other actions with individually insignificant, but cumulatively significant impacts?

Issuance of the permit modification is not interrelated with or interdependent on any other federal, state or local actions that could have environmental impacts. These permit modifications are independent of other permits. While the results of the research may inform future management actions affecting the environment, the nature and timing of those actions is too speculative to consider and those actions would be subject to separate NEPA analysis. Furthermore, there are no

other shortnose or Atlantic sturgeon permits authorized in either river system where ELS would be taken. Thus, there would be no overlapping parts of the action areas that would be cumulative to the proposed actions.

(10) Are the proposed actions 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?

The actions would not take place in any district, site, highway, structure, or object listed in or eligible for listing in the National Register of Historic Places, thus none would be impacted. The proposed actions would also not occur in areas of significant scientific, cultural or historical resources and would not cause their loss or destruction.

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

The actions' potential effects on the introduction or spread of non-indigenous species would remain the same as previously analyzed in the original 2010 and 2012 EAs. All of the conditions in the original permits minimizing these effects would remain in place. Thus, the modifications are not reasonably expected to result in the introduction or spread of non-indigenous species.

(12) Are the proposed actions likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

The decision to issue these permit modifications would not be precedent setting and would not affect any future decisions. NMFS has issued numerous scientific research permits to study Atlantic sturgeon and shortnose sturgeon pursuant to section 10 of the Endangered Species Act; thus, the permit modifications are not the first permits NMFS has issued for this type of research activity. Issuance of a permit or permit modification, to a specific individual or organization for a given research activity, also, 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 ESA and NMFS' implementing regulations.

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

Issuance of the proposed permit modifications is not expected to violate any Federal, State, or local laws for environmental protection. NMFS has sole jurisdiction for issuance of such permits for shortnose or Atlantic sturgeon and has determined the research consistent with applicable provisions of the ESA. The modifications contain language stating that these permits do not relieve the

Permit Holder of the responsibility to obtain other permits, or comply with other Federal, State, local, or international laws or regulations.

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

NMFS concluded that the proposed taking in both modifications may have adverse effects on individual Atlantic or shortnose sturgeon. However, while the actions would impact individuals of the targeted ELS, NMFS concluded that the research would not have any cumulative effects on each of the populations or species and is not likely to result in long-term or significant impacts.

The mitigation measures imposed by permit conditions are intended to reduce, to the maximum extent practical, the potential for adverse effects of the research. Since the proposed actions would be related to the capture and directed mortality of Atlantic and shortnose sturgeon ELS, no other portion of the human environment would be affected in a manner not already considered in the discussed 2010 or 2012 EAs.

NMFS did not consider impacts on marine mammals or sea turtles in this SEA to be different than already considered in Permit Nos. 14759 or 16375 because these animals do not occur in the part of the amended action area considered in this modification; thus, the original permit conditions in the new permit would continue to be protective of marine mammals and sea turtles in marine environments where they are more common.

DETERMINATION

In view of the information presented in this document, and the analyses contained in the SEA and Biological Opinion prepared for issuance of Permit Modification Nos.14759-01 and 16375-01, it is hereby determined that the modifications issuance will not significantly impact the quality of the human environment. 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 Environmental Impact Statement for this action is not necessary.

AUG 15 2013

Donna S. Wieting,
Director, Office of Protected Resources

Date

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

Supplemental Environmental Assessment (SEA)
On the Issuance of Two Modifications to Scientific Research Permits (File Nos. 14759 and 16375) to the North Carolina Cooperative Fish and Wildlife Research Unit to Conduct Research on Shortnose sturgeon and Atlantic sturgeon.

[September 2013]

A supplement to the 2010 EA entitled "*Environmental Assessment on the Effects of the Issuance of a Scientific Research Permit (File No. 14759) to Conduct Scientific Research on Shortnose Sturgeon in North Carolina Rivers;*" and a supplement to the 2012 EA entitled "*Environmental Assessment for the Issuance of 12 Scientific Research Permits for Research on Atlantic Sturgeon (File No. 16375)*"

Lead Agency:	USDC National Oceanic and Atmospheric Administration National Marine Fisheries Service, Office of Protected Resources
Responsible Official	Donna Wieting, 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) 427-8401

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue modifications to two research permits held by the North Carolina Cooperative Fish and Wildlife Research Unit [hereinafter "Permit Holder" and Joseph Hightower, Ph.D., Responsible Party/Principal Investigator: North Carolina State University, Raleigh, NC 27695] for takes of shortnose sturgeon (*Acipenser brevirostrum*) (File No. 14759-01) and for takes of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) (File No. 16375-01) in the wild, pursuant to the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*).

The research objectives for both permits would remain unchanged: to collect data on the biology, distribution and abundance of endangered shortnose sturgeon and Atlantic sturgeon to facilitate recovery of the respective species. In Permit No. 14759, the Permit Holder is currently authorized to capture with gill net, measure, weigh, genetic tissue sample, PIT tag and Floy tag up to 15 shortnose sturgeon annually from the Chowan and Cape Fear River Basins and Albemarle Sound. Additionally, the Permit Holder is authorized to capture and sample up to 25 shortnose sturgeon per year from the Roanoke River Basin. Annually, a sub-set of up to five sub-adults or adults from each of the river basins and Albemarle Sound can also be anesthetized and surgically implanted with internal sonic transmitters annually.

In Permit No. 16375, the Permit Holder is authorized to capture with gill nets measure, weigh, genetic tissue sample, PIT and Floy tag up to 200 Atlantic sturgeon annually from the same locations authorized in Permit No. 14759. Further, a sub-set of up to ninety juvenile, sub-adult or adult Atlantic sturgeon may be annually implanted with acoustic transmitter tags within the Albemarle Sound, and Roanoke, Chowan and Cape Fear River Basins, with no more than 45 tagged in each the Cape Fear River system or the combined area for the Albemarle Sound, Roanoke River and Chowan River.

The applicant now requests authorization to verify spawning activity shortnose and Atlantic sturgeon by deploying artificial egg mats downstream of suspected spawning areas to take up to 50 early life stages (ELS) of each species annually from both the Roanoke River and Cape Fear River (total of 200 ELS). The expanded action area for each species up to the first impassible dam on the Roanoke River (rkm 221) and on the Cape Fear (rkm 300), will also be a part of the permit modification. All other currently authorized takes, methods and activities would remain the same for each permit. The modifications would be valid through the expiration dates of the original Permit No. 14759 (August 19, 2015) and Permit No. 16375 (April 5, 2017).

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CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

The National Marine Fisheries Service (NMFS) proposes to issue identical modifications to two research permits held by the North Carolina Cooperative Fish and Wildlife Research Unit [hereinafter "Permit Holder" and Joseph Hightower, Ph.D., Responsible Party/Principal Investigator: North Carolina State University, Raleigh, NC 27695] for takes of shortnose sturgeon (*Acipenser brevirostrum*) (File No. 14759-01) and Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) (File No. 16375-01) in the wild, pursuant to the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*).

1.1.1 *BACKGROUND:*

In response to the receipt of applications to modify two existing scientific research permits from the North Carolina Cooperative Fish and Wildlife Research Unit [Permit No. 14759 and Permit No.16375], NMFS PR proposes to issue the proposed permit modifications. This analysis will facilitate a cumulative assessment of potential impacts added from the proposed modifications on the human environment including the targeted endangered species. This SEA supplements both the 2010 EA (NMFS 2010a) entitled "*Environmental Assessment on the Effects of the Issuance of a Scientific Research Permit (File No. 14759) to Conduct Scientific Research on Shortnose Sturgeon in North Carolina Rivers"* and the 2012 EA (NMFS 2012a) entitled "*Environmental Assessment for the Issuance of 12 Scientific Research Permits for Research on Atlantic Sturgeon.*"

1.1.2 *PURPOSE AND NEED:*

The primary purpose of the permit modifications would be to provide an exemption from the ESA prohibitions allowing "takes" of endangered species for bona fide scientific research. The need for issuance of the permit is related to NMFS's mandates under the ESA, specifically, the responsibility to protect, conserve, and recover threatened and endangered species under its jurisdiction. The ESA prohibits takes of threatened and endangered species with only a few very specific exceptions, including for scientific research and enhancement purposes. Permit issuance criteria require research activities are consistent with the purposes and policies of this federal law and will not have a significant adverse impact on the species. NMFS reviewed the proposed action to ensure all the proposed activities fulfill these permit issuance criteria.

1.1.3 *OBJECTIVES OF THE RESEARCH:*

The main objectives of the proposed modifications are identical to those of the original permits: collecting data on the biology, distribution and abundance of the endangered shortnose and Atlantic sturgeon in North Carolina waters to facilitate recovery of the species. The applicant is now requesting authorization to take up to 50 early life stages (ELS) of each species annually from both the Roanoke River and Cape Fear River (or a total of 200 ELS) by deploying artificial egg mats downstream of suspected spawning areas. To accomplish this objective, the applicant requests sampling for each species up to the first impassible dam on the Roanoke River (rkm 221) and on the Cape Fear (rkm 300). The current activities, proposed methods, and authorized take in Permit Nos. 14759-01 and 16375-01 are highlighted in Table 1 and 2 of Appendix 1.

1.2 OTHER EAs/EISs INFLUENCING THE SCOPE OF THIS SEA

A 2010 EA (NMFS 2010a) and a 2012 EA (NMFS 2012a) were prepared for the respective issuance of the original Permit Nos. 14759 and 16375, each resulting in a FONSI determining that the issuance of the permits and the associated research would not result in significant impacts to any portion of the human environment. These documents are hereby incorporated by reference.

The proposed action would change the nature of the research activities by adding authorization for sampling ELS in the up-river locations for which sampling of ELS would take place; however, the effects on the social and economic environment would not change and are not re-examined in this SEA. Thus, because the modifications would newly authorize annual takes of ELS on suspected spawning grounds for both shortnose and Atlantic sturgeon, the scope of this SEA is relevant to the biological impacts to both species and to the physical environment of the substrate affected by the proposed sampling methods in spawning areas.

1.3 SCOPING SUMMARY

The purpose of scoping is to identify the issues to be addressed and the significant issues related to the proposed permit modification, as well as identify and eliminate from detailed study the issues not significant or those having been covered by prior environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes. CEQ regulations implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) do not require that a draft SEA be made available for public comment as part of the scoping process.

A Notice of Receipt of the applications was published in the *Federal Register*, announcing the availability of the permit modification applications and related documents for public comment (File Nos. 14759 and 16375; April 18, 2013; 78 FR 23225). No comments were received from the public regarding this application. Comments from NMFS Southeast Regional Office were also solicited and addressed.

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

This section has not changed from that described in the 2010 EA (NMFS 2010a) and in the 2012 EA (NMFS 2012a). Applicable laws in this SEA include the NEPA and ESA.

CHAPTER 2: ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action alternative, modifications to scientific research Permit Nos. 14759 and 16375, adding authorization to take shortnose and Atlantic sturgeon ELS at new locations on the Roanoke River and Cape Fear River, would not be issued at this time. The existing permits would remain in effect through expiration, allowing research to continue as originally authorized.

2.2.1 ALTERNATIVE 2 – PROPOSED ACTION

Under the Proposed Action alternative, the two permit modifications would be issued for research activities, each having similar terms and conditions standard to such permits as issued by NMFS.

Permit No. 14759 currently authorizes the Permit Holder to capture with gill net, measure, weigh, genetic tissue sample, PIT tag and Floy tag up to 15 shortnose sturgeon annually from the Chowan and Cape Fear River Basins and Albemarle Sound. Additionally, the Permit Holder can capture up to 25 shortnose sturgeon per year from the Roanoke River Basin. A sub-set of up to five sub-adults or adults from each of the river basins and Albemarle Sound can be anesthetized and surgically implanted with internal sonic transmitters annually.

Permit No. 16375 currently authorizes the Permit Holder to capture with gill nets measure, weigh, genetic tissue sample, PIT and Floy tag up to 200 Atlantic sturgeon annually from the same locations authorized in Permit No. 14759. Further, a sub-set of up to 90 juvenile, sub-adult or adult Atlantic sturgeon may be annually implanted with acoustic transmitter tags within the Albemarle Sound, and Roanoke, Chowan and Cape Fear River Basins, with no more than 45 tagged in each tagged in the Cape Fear River system or the combined area for the Albemarle Sound, Roanoke River and Chowan River.

Identical modifications of these permits are now requested to allow for use of artificial substrates (Fox et al. 2000) characterizing spawning activity of both shortnose and Atlantic sturgeon in the Roanoke and Cape Fear rivers. Specifically the applicant proposes to use artificial substrates to collect up to 50 shortnose and Atlantic sturgeon ELS per river annually, 30 of which could be brought back to the lab for genetic sampling or identification purposes. The remainder of eggs would be enumerated and returned alive to the river substrate or allowed to mature on the collection substrate. The location for sampling for eggs could be conducted up to the first impassible dam: rkm 221 in the Roanoke River and rkm 300 in the Cape Fear River. All other currently authorized takes, methods and activities would remain in place for each permit.

2.3 DESCRIPTION OF THE PROPOSED ACTION

2.3.1 *BOUNDARIES OF ACTION AREA*:

The action area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The description of the action area therefore includes the areas affected by sampling activities as well as the area transited by project vessels.

The action area is being expanded to include areas of suspected spawning habitat in both the Roanoke and Cape Fear River systems up to the first impassible dams on the Roanoke River (river kilometer (rkm) 221) and the Cape Fear River (rkm 300).

2.3.2 *MAP OF ACTION AREA:*

The action area map of research is illustrated at the link below, highlighting upper boundaries of research proposed for sampling ELS of both shortnose and Atlantic sturgeon. [1]

2.3.3 *AUTHORIZED AND PROPOSED TAKE OF SHORTNOSE AND ATLANTIC STURGEON ELS*

Shortnose and Atlantic sturgeon ELS would be collected using artificial substrates (i.e., floor buffing pads) approximately 2 feet in diameter (Fox et al. 2000). These pads would be anchored to the river bottom and marked with a buoy. The timing of deployment of mats would be at the discretion of the applicant, depending on documented movements of tagged animals during either the spring or fall spawning runs of the respective species. The pads would be monitored at least twice per week once deployed downstream of suspected spawning activity (Kahn and Mohead 2010). Once a total of 50 ELS of each species has been collected, all egg collecting gear would be removed from the river until sampling is resumed the following year.

As highlighted in Table 1 and 2 of Appendix 1, 50 ELS of each species are requested to be sampled from the spawning grounds of each river, or a total of 100 eggs annually of each species. The research objectives sought would: (1) document the occurrence and periodicity of spawning by Atlantic and shortnose sturgeon in respective river systems; (2) determine the upstream spawning locations and habitat characteristics of shortnose and Atlantic sturgeon respective river systems; and (3) document the genetic diversity component of the populations derived in-part from analyses of early life stage nDNA and/or mtDNA.

2.3.4 *LETHAL TAKE OF ELS:*

Eggs and larval samples would be lethally taken, preserved in ethyl alcohol, and identified in the laboratory. Collection of the early life stages is essential for documenting the timing and location of spawning; however, although eggs not removed for genetic analysis or identification would be counted and returned alive to the river with potential to survive, all takes would be considered lethal.

2.3.5 *MITIGATION MEASURES:*

In addition to the applicant's stated methods, the permit would contain formal conditions for minimizing impacts to the target animals. These mitigations are highlighted in Section 4.5.1 of this SEA.

CHAPTER 3: AFFECTED ENVIRONMENT

This SEA evaluates the potential impacts to the human environment from issuance of the proposed permit modifications.

1.http://maps.google.com/maps/ms?ie=UTF8&hl=en&oe=UTF8&msa=0&msid=110136104058063386946.00048164b43be6240e008.

3.1 SOCIAL AND ECONOMIC RESOURCES

The proposed action does not affect distribution of environmental burdens, access to natural or depletable resources or other social or economic concerns in ways not previously considered in the other EAs (NMFS 2010a and NMFS 2012a). Thus, effects on such resources will not be considered further in this SEA.

3.2 PHYSICAL ENVIRONMENT

The action area for the research under the proposed permit modification is changed from that evaluated in Permit No. 14759 (NMFS 2010a) and Permit No. 16375 (NMFS 2012a). Because both proposed modifications intend to capture ELS with artificial substrates (egg mats) in new locations up to the first up-river dam located at river kilometer 300 on the Cape Fear River and at river kilometer 221 on the Roanoke River, the proposed modifications are expected to impact the physical environment in ways not previously analyzed.

Specifically, the effects of sampling ELS with the egg mats essential for documenting the presence and location of spawning areas in the target rivers may potentially disturb the benthic environment by actions related to the deployment, anchor, and removal of egg mats on the bottom. Section 4.2.1.1 of this SEA discusses this potential. Other impacts to the physical environment related to the current modifications are briefly summarized below.

3.2.1 *OCEAN AND COASTAL HABITATS*

The proposed actions are directed at ELS of the target shortnose and Atlantic sturgeon ELS collected on egg mats deployed in up-stream locations of the Roanoke River and Cape Fear River, and would not affect ocean and coastal habitats. Thus, effects on ocean and coastal habitats will not be considered further in this SEA.

3.2.2 *UNIQUE AREAS*

If authorized, the research would not take place in any sanctuaries, reserves or conservation areas or have any components of essential fish habitat (EFH) present in the modified action area. Further, because there is no critical habitat designated for Atlantic sturgeon or shortnose sturgeon, none would be considered. Thus, the proposed modifications would also not affect habitat or unique areas differently than discussed in the 2010 (NMFS 2010a) and the 2012 EA (NMFS 2012a) and such effects on such unique areas will not be considered further in this SEA.

3.2.3 *HISTORIC PLACES, SCIENTIFIC, CULTURAL, AND HISTORICAL RESOURCES*

There are no districts, sites, highways or structures listed in or eligible for listing in the National Register of Historic Places in the new action area. The proposed actions represent the use of shortnose and Atlantic sturgeon ELS for scientific research purposes and does not preclude their availability for other scientific, cultural, or historic uses. Thus, effects on such resources will not be considered further in this SEA.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 *ESA TARGET SPECIES*:

ESA Endangered: Shortnose sturgeon (*Acipenser brevirostrum*) [File 14759-01]
ESA Endangered Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) [File No. 16375-01]
The 2010 and 2012 EAs for issuing Permit 14759 (NMFS 2010a) for shortnose sturgeon and Permit No. 16375 (NMFS 2012a) for Atlantic sturgeon, summarize the current status and occurrence information of targeted shortnose and Atlantic sturgeon range-wide and in the action areas of the Roanoke and Cape Fear River Basins. Impacts on non-target listed turtles and marine mammals were also discussed in these documents. Further descriptions of the status of target and non-target species can be found in the Biological Opinion accompanying this document as well as NMFS Recovery Plans and other documents at http://www.nmfs.noaa.gov/pr/publications/.

3.3.2 *BIODIVERSITY AND ECOSYSTEM FUNCTION*

The proposed action is directed at the target shortnose and Atlantic sturgeon and does not interfere with the benthic productivity, predator-prey interactions or other biodiversity or ecosystem functions. With the exception of the proposed lethal take of the ELS of both species, the effects on the biodiversity and ecosystem function have already been considered in the 2010 EA (NMFS 2010a) and the 2012 EA (NMFS 2012a) and are not considered further in this SEA. The topics in these NEPA documents included: *ESA Non-target Species Under USFWS Jurisdiction*; *ESA Non-target Species Under NMFS Jurisdiction*; *Non-ESA species Impacted as Bycatch, Marine Mammals and Sea Turtles Potentially Affected by Proposed Research*; and *Aquatic Nuisance Species*. NMFS does not expect any impacts to non-target species. (Please see Chapter 4 for a more detailed discussion on the effects of ELS removal from the system).

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter represents the scientific and analytical basis for comparison of the direct, indirect, and cumulative effects of the alternatives of permit issuance. Regulations for implementing the provisions of NEPA require consideration of both the context and intensity of a proposed action (40 CFR Parts 1500-1508).

4.1 *EFFECTS OF THE NO ACTION ALTERNATIVE*

Under the No Action alternative, the take activities would continue as currently authorized under the existing permits. Based on the analyses in then 2010 and 2012 EAs, NMFS determined that issuance of the permits and conduct of the associated research would not likely jeopardize the continued existence of either Atlantic sturgeon or shortnose sturgeon. Additionally, the activities conducted under the permit were not expected to significantly affect any other portions of the environment.

4.2 EFFECTS OF THE PROPOSED PERMIT ALTERNATIVE

Any impacts of the Proposed Action alternative of sampling ELS with egg mats would be primarily limited to the to the target species and the localized physical environment where the

egg mats would be deployed for collecting ELS. There are unlikely impacts to the socioeconomic environment or risks to public health and safety in any way not already analyzed in the original 2010 EA and 2012 EA. The following discussion therefore assesses the anticipated impacts of directed lethal take of ELS on both shortnose sturgeon (File No. 14759-01) and Atlantic sturgeon (File No. 16375-01), and upon the benthic environment.

4.2.1 *EFFECTS OF PROPOSED SAMPLING OF STURGEON ELS*

4.2.1.1 Impacts of Lethal Takes on ELS of Each Target Species

The issue most relevant to this analysis of both actions is the potential for negative impacts of lethal takes of the ELS target species. It is important to recognize that an adverse effect on an individual or a small group of animals does not translate into an adverse effect on the population or species unless it results in reduced reproduction or survival of the individual(s) causing an appreciable reduction in the likelihood of survival or recovery for the species. In order for the Proposed Action to have an adverse effect on a species, the exposure of individual animals to the research activities would first have to result in:

- direct mortality,
- serious injury that would lead to mortality, or
- disruption of essential behaviors such as feeding, mating, or nursing, to a degree that the individual's likelihood of successful reproduction or survival was substantially reduced.

Collection of shortnose and Atlantic sturgeon eggs and larvae would be essential for developing life history information on the species by documenting the timing and location of spawning. The biological impacts on the species from lethal takes of the ELS would be measured in terms of the actions' likelihood that the reduction in the likelihood of the species survival due to a net reduction in the number of individual ELS of the species would not be offset by the addition, through birth, or emigration, of other individuals into the population. However, to be significant, the net loss to the species would have to be reasonably expected, directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of the Atlantic or shortnose sturgeon in the wild.

Atlantic Sturgeon: The fecundity of Atlantic sturgeon has been correlated with age and body size (ranging from 400,000 to 8 million eggs (Smith et al. 1982, Van Eenennaam and Doroshov 1998, Dadswell 2006). However, Atlantic sturgeon likely do not spawn every year, as evidenced by multiple studies showing spawning intervals ranges from 1-5 years for males (Smith 1985, Collins et al. 2000, and Caron et al. 2002) and 2-5 years for females (Vladykov and Greeley 1963, Van Eenennaam et al. 1996, Stevenson and Secor 1999). The populations (if any) and sex ratio of Atlantic sturgeon in the rivers within the Proposed Action are largely unknown; therefore, it is important to be conservative when analyzing the impacts of removing eggs and larvae from the river systems. For that reason, if only 1 female Atlantic sturgeon reproduces each year in a either river, producing a minimal number of eggs (400,000), the proposed sampling cumulatively would collect approximately 0.025% of the ELS produced in a year. As such, the request by the researchers to annually collect 100 Atlantic sturgeon ELS for documenting spawning activity is not expected to impact the biological environment and the ability of Atlantic sturgeon to survive.

Shortnose Sturgeon: Similarly, the fecundity of female shortnose sturgeon in a southern river (Altamaha) has been estimated to be between 79,000 and 90,000 eggs by Gilbert (1989), and between 94,000 and 200,000 by COSEWIC (2005). Therefore, if only one female sturgeon reproduces successfully each year in the Cape Fear or the Roanoke River, the proposed lethal take would result in the loss of no more than 0.11% of the eggs produced in that year. In this conservative scenario, therefore, the annual take of 100 shortnose sturgeon ELS from both river systems would have a negligible effect on the species survival.

4.2.1.2 Impacts of Artificial Substrates to the Benthic Environment

The artificial substrates deployed would be low pads, designed for passively collecting adhesive eggs and/or larvae adrift in the water. Due to their small size, these pads would not disrupt the flow of the water or the habitat around it. The act of installing and removing the egg mats would also not be disruptive of the bottom environment; and thus, any impacts to the bottom environment would be minimal and short-lived.

Although the total number of ELS lethally sampled, and the suite of activities performed in deploying, anchoring and removing egg mats, would increase as a result of the Proposed Action, these activities would not be expected to result in reduced reproductive success of the two target species, as supported in the Biological Opinion prepared for this action (NMFS 2013) and incorporated by reference. Therefore the Proposed Actions to modify both permits to add the authorizing of takes of ELS would not be expected to significantly impact individual Atlantic or shortnose sturgeon, their populations, or either of the species abilities to survive.

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

As summarized below, NMFS has determined the proposed research is consistent with the purposes, policies, and applicable requirements of the ESA and NMFS regulations. NMFS' issuance of each of the modifications would be consistent with the ESA. However, issuance of the modified permits would not relieve the Permit Holder of the responsibility to obtain any other necessary permits, or comply with any other Federal, State, local, or international laws or regulations.

4.3.1 *COMPLIANCE WITH THE ENDANGERED SPECIES ACT*

The consultation process under section 7 of the ESA was concluded after close of the comment period on the applications for File Nos. 14759-01 and 16375-01 to ensure that no relevant issues or information were overlooked during the initial scoping process summarized in Chapter 1. For the purpose of the consultation, the draft SEA represented NMFS' assessment of the potential biological impacts.

After reviewing the current status of endangered shortnose and Atlantic sturgeon, the environmental baselines for the action area, the effects of the proposed research, and the cumulative effects, NMFS's biological opinion (NMFS 2013) concluded that issuance of this permit modification would not likely jeopardize the continued existence of the shortnose or Atlantic sturgeon, nor would it impact any designated critical habitat, as none has been designated for either species currently.

4.4 COMPARISON OF ALTERNATIVES

The No Action alternative would not allow any aspects of the requested modification to be authorized. The research would continue as currently authorized. Thus, this alternative would not result in any significant adverse impacts to the social, economic, biological, or physical environment; however, the opportunity to gather additional information that would aid in the conservation and management of endangered shortnose sturgeon would be lost.

The Proposed Action alternative would authorize takes of shortnose and Atlantic sturgeon ELS. Although this alternative would result in impacts to both of the target species, no other aspects of the environment are expected to be significantly adversely affected. The mitigation measures proposed in the original permit would be used to guard against any adverse effects to the species and population. The information gained would outweigh any potential for negative impacts to the target species.

4.5 MITIGATION MEASURES

The mitigation measures contained in Permit Modifications Nos. 14759-01 and 16375-01 are intended to minimize the potential for adverse effects on shortnose and Atlantic sturgeon (Kahn and Mohead 2010). All of the prior mitigation measures in the current permits would remain in effect.

4.5.1 *MITIGATION OF IMPACTS*

The following conditions would be added to each of the permits to lessen the impacts to the two species and to the physical environment caused by sampling ELS with the artificial substrates.

Artificial Substrates

(1) The total number of ELS collected by artificial substrates for each species in the Cape Fear and Roanoke River systems must not exceed 50, or a total of 100 for each species.

(2) Up to 30 (out of the 50) ELS for each species per river may be transported back to the lab for genetic sampling; the remainder must be returned back to the river at the site of collection.

(3) Once a total of 50 ELS for each species have been preserved, artificial substrates must be removed from the river and sampling may be resumed the following year.

(4) All artificial substrates must be removed from the river upon completion of this project or by the expiration date of this permit (whichever comes first).

(5) Pads should be checked at least twice a week or more frequently if circumstances allow.

(6) If it is not necessary to remove the ELS from the mat, the mat may be returned to the river bottom allowing them to mature before being removed.

(7) For every artificial substrate collecting an ELS, environmental conditions such as latitude, longitude, water velocity, substrate type, depth, dissolved oxygen, etc. should be collected.

4.6 UNAVOIDABLE ADVERSE EFFECTS

The research is not expected to have more than a minimal effect on older life stages and no effect on populations due to the procedures. While early life stages of eggs and larvae would experience lethal takes in response to the collection activities of researchers, the impact to populations of Atlantic and shortnose sturgeon is not expected to be significant. The minimization measures imposed by permit conditions are intended to reduce, to the maximum extent practical, the potential for adverse effects of the research on these species. Since the Proposed Actions would only occur on Atlantic and shortnose sturgeon ELS already captured, no other portion of the human environment would be affected in a manner not already considered in the discussed 2010 EA (NMFS 2010a) or in the 2012 EA (NMFS 2012a).

4.7 CUMULATIVE EFFECTS

The baseline of cumulative effects for this document, which was discussed in the original 2010 and 2012 EAs, in the Biological Opinion prepared for the respective permits (NMFS 2010a and 2012a), include the past and present impacts of state, Federal or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone consultations under Section 7 of the ESA, and the impact of contemporaneous state or private actions.

There are no other shortnose or Atlantic sturgeon permits authorized in either river system where ELS would be taken. Thus, there would be no overlapping parts of the action areas that would be cumulative to the proposed actions. Further, any future permit authorized in the same action areas would be expected to have no more than short-term effects on individual endangered shortnose or Atlantic sturgeon and no effects on other aspects of the environment.

NMFS believes that the proposed modifications as discussed above, and in the original EAs, would not have a significant cumulative effect on either the human or marine environment. The proposed actions are directed at shortnose and Atlantic sturgeon ELS, and, as modified would also not have a significant cumulative impact on non-target species encountered or on the physical environment in the proposed action area. Further, as informed by the Biological Opinion prepared for this action (NMFS 2013), issuance of these two modifications would not likely be to jeopardize the continued existence of endangered shortnose or Atlantic sturgeon. There are no critical habitats designated for either species; should critical habitat be designated prior to the expiration of either permitted action, permitted activity affecting the habitat would be halted until Section 7 interagency consultation is re-initiated to determine potential impacts.

CHAPTER 5 LIST OF PREPARERS AND AGENCIES CONSULTED

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Agencies and Personnel Consulted:

NMFS, Office of Protected Resources Section 7 Endangered Species Division, Silver Spring, MD 20910	Formal Consultations on the Effects on ESA Target Species (shortnose sturgeon and Atlantic sturgeon)

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APPENDIX 1

Table 1. Requested Annual Take of Shortnose Sturgeon: File No. 14759-01*****

Species	Life Stage	Sex	Expected Annual Take	Take Action	Location
Shortnose sturgeon (*Acipenser brevirostrum*)	Juvenile & adult	Male & female	Up to 10 annually, or a total of 20 over 5yrs	Capture, hold, measure, weigh, photograph/video, Floy T-bar tag, PIT tag, & genetic tissue sample	Chowan River and all tributaries; NC/VA
Shortnose sturgeon (*Acipenser brevirostrum*)	Juvenile & Adult	Male & female	Up to 5 annually, or a total of 10 over 5 yrs	Capture, hold, measure, weigh, photograph/video, Floy T-bar tag, PIT tag, & genetic tissue sample; anesthetize w/ MS-222; & implant acoustic tag	Chowan River and all tributaries; NC/VA
Shortnose sturgeon (*Acipenser brevirostrum*)	Juvenile & Adult	Male & female	Up to 20 annually; or a total of 40 over 5 yrs	Capture, hold, measure, weigh, photograph/video, Floy T-bar tag, PIT tag, & genetic tissue sample	Roanoke River and all tributaries; NC
Shortnose sturgeon (*Acipenser brevirostrum*)	Juvenile & Adult	Male & female	Up to 5 annually; or a total of 10 over 5 yrs	Capture, hold, measure, weigh, photograph/video, Floy T-bar tag, PIT tag, & genetic tissue sample; anesthetize w/ MS-222; & implant acoustic tag	Roanoke River and all tributaries; NC
Shortnose sturgeon (Acipenser brevirostrum)	**Early Life Stages**	**NA**	**Up to 50 annually**	**Capture with egg mat (directed mortality)**	**Roanoke River and all tributaries; NC (up to RKM 221)**
Shortnose sturgeon (*Acipenser brevirostrum*)	Juvenile & Adult	Male & female	Up to 10 annually, or a total of 20 over 5yrs	Capture, hold, measure, weigh, photograph/video, Floy T-bar tag, PIT tag, & genetic tissue sample	Cape Fear River and all tributaries; NC
Shortnose sturgeon (*Acipenser brevirostrum*)	Juvenile & Adult	Male & female	Up to 5 annually; or a total of 10 over 5 yrs	Capture, hold, measure, weigh, photograph/video, Floy T-bar tag, PIT tag, & genetic tissue sample; anesthetize w/ MS-222; & implant acoustic tag	Cape Fear River and all tributaries;
Shortnose sturgeon (Acipenser brevirostrum)	**Early Life Stages**	**NA**	**Up to 50 annually**	**Capture with egg matt (directed mortality)**	**Cape Fear River and all tributaries; (up to RKM 300)**
Shortnose sturgeon (*Acipenser brevirostrum*)	Juvenile & Adult	Male & female	Up to 10 annually, or a total of 20 over 5yrs	Capture, hold, measure, weigh, photograph/video, Floy T-bar tag, PIT tag, & genetic tissue sample	Albermarle Sound and all tributaries; NC
Shortnose sturgeon (*Acipenser brevirostrum*)	Juvenile & Adult	Male & female	Up to 5 annually; or a total of 10 over 5 yrs	Capture, hold, measure, weigh, photograph/video, Floy T-bar tag, PIT tag, & genetic tissue sample; anesthetize w/ MS-222; & implant acoustic tag	Albermarle Sound and all tributaries;

*The modifications are highlighted in bold

Table 2. Requested Annual Take of Atlantic Sturgeon: File No. 16375-01*

Species	Life Stage	Sex	Expected Annual Take	Take Action	Location
Atlantic **s**turgeon (Acipenser oxyrinchus oxyrinchus)	Adult/Sub-adult	Male & female	45	Measure; Weigh; Photograph; PIT tag; Floy/T-bar tag; Genetic tissue sample; Internal sonic tag & Anesthetize;	Albemarle Sound, Roanoke & Chowan Rivers; Carolina Bight DPS
Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus)	Adult/Sub-adult	Male & female	55	Measure; Weigh; Photograph; PIT tag; Floy/T-bar tag; Genetic tissue sample	Albemarle Sound, Roanoke & Chowan Rivers; Carolina Bight DPS
Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus)	**Early Life Stages**	**NA**	**Up to 50 annually**	**Capture with egg mat (directed mortality)**	**Roanoke River and all tributaries; NC (Up to RKM 221)**
Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus)	Adult/Sub-adult	Male & female	45	Measure; Weigh; Photograph; PIT tag; Floy/T-bar tag; Genetic tissue sample; Anesthetize; Internal acoustic tag;	Cape Fear River Basin; Carolina Bight DPS
Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus)	Adult/Sub-adult	Male & female	55	Measure; Weigh; Photograph; PIT tag; Floy/T-bar tag; Genetic tissue sample	Cape Fear River Basin; Carolina Bight DPS
Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus)	**Early Life Stages**	**NA**	**Up to 50 annually**	**Capture with egg mat (directed mortality)**	**Cape Fear River (Up to RKM 300)**

*****The modifications are highlighted in bold