



**UNITED STATES DEPARTMENT OF COMMERCE**

National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
263 13th Avenue South  
St. Petersburg, Florida 33701-5505  
<http://sero.nmfs.noaa.gov>

F/SER31:SBC  
SER-2018-19113

Philip S. Harris III, P.E., CPM, Unit Head  
North Carolina Department of Transportation  
Environment Analysis Unit  
1598 Mail Service Center  
Raleigh, North Carolina 27699-1598

**MAY 21 2018**

Dear Mr. Harris:

This letter responds to your request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act (ESA) for the following action.

Permit Number(s)	Applicant(s)	SER Number	Project Type(s)
STIP Nos. R-2721, R-2828, R-2829	North Carolina Department of Transportation	SER-2018-19113	Expressway Extension

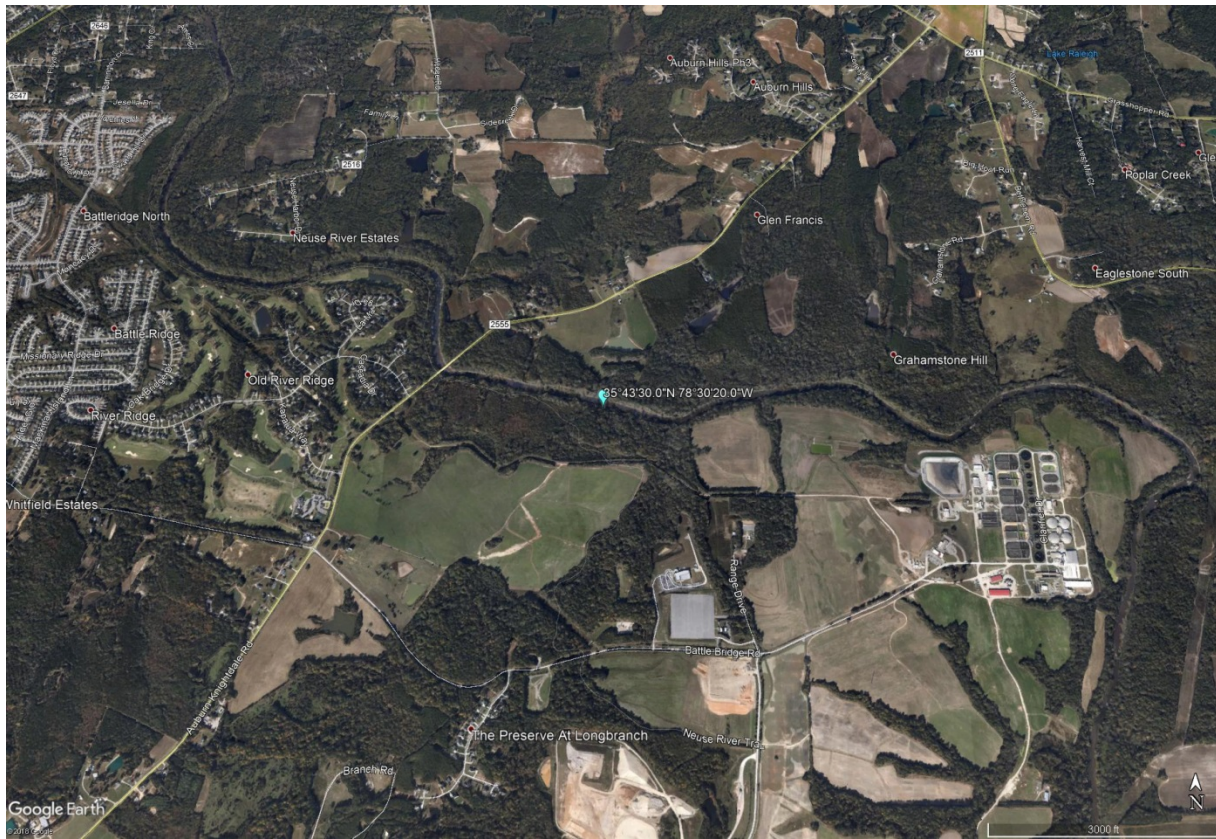
**Consultation History**

We received your letter requesting consultation on January 30, 2018, and we requested additional information (RAI) from NCDOT on March 1, 2018. We received NCDOT's response to our RAI on March 14, 2018 and initiated consultation that same day. We also received a completed ESA Section 7 checklist on May 4, 2018.

**Project Location**

Address	Latitude/Longitude	Water body
Neuse River, Wake and Johnston Counties, North Carolina	35.725632°N, 78.506774°W (North American Datum 1983), bridge point at Neuse River crossing	Neuse River





**Image of project location at Neuse River crossing (©2018 Google)**

### *Existing Site Conditions*

The proposed project crosses at the Neuse River (approximately RKM 338) and is approximately 185 miles (mi) from Pamlico Sound. The width at the deeper thalweg areas are narrow (approximately 25 feet (ft)), and the width at the proposed crossing is approximately 80 ft. Water depth in most of the crossing location is six inches (in) or less, and ranges in the action area from 0 to 3 ft. The action area is located in freshwater (above the saltwater wedge). The substrate in the Johnston County and eastern Wake County section of the Neuse River is dominated by shifting sand and soft clay banks, with sporadic pockets of gravel, cobble, and boulder and bedrock. Other than a minor small gravel component in limited areas, there was no concentration of any hard substrate found at the proposed crossing location. The substrate at which the bridge will cross is mainly muddy clay and coarse/fine sand. The project location is located in Atlantic sturgeon critical habitat Carolina Unit 3.

### **Project Description**

The North Carolina Department of Transportation (NCDOT) and the Federal Highway Administration (FHWA) propose to build the Complete 540 project, which will be a controlled access toll road extending the existing Triangle Expressway from NC 55 Bypass in Apex to the US 64/264 (I-495/Future I-87) in Knightdale, a distance of approximately 27 miles.

The project includes the construction of two bridges (one northbound and one southbound) over the Neuse River in conjunction with a six-lane expressway. Installation will include individual

temporary cofferdams in the stream for drilled shaft/column construction. Temporary work causeways and temporary work bridges will be placed between the two highway bridges for construction. The highway bridges will be concrete decks supported by concrete beams. The concrete decks are anticipated to be approximately 40,640 square feet (ft<sup>2</sup>) (635 ft long and 64 ft wide) for the southbound bridge and 36,830 ft<sup>2</sup> (635 ft long and 58 ft wide) for the northbound bridge. The bottom of the bridge beams would be approximately 35 ft above mean daily flow of the non-tidally influenced Neuse River.

Sixty-in concrete drilled shafts/concrete columns will be used to support the two bridge piers for both of the new highway bridges. Four drilled shafts/columns will be constructed for each pier (for a total of 16 concrete piers (4 per 4 bents)) and will be aligned parallel to stream flow. Holes will be augured and lined with steel liners. The steel liners will be removed as the concrete is placed in the holes. Material removed from the holes will be deposited in an approved off-site upland location. Each shaft will have an approximate permanent impact of 20 ft<sup>2</sup>, and the 4 piers will permanently impact approximately 320 ft<sup>2</sup>. It is estimated that permanent impacts will not exceed 500 ft<sup>2</sup>.

Each pier and the erection of girders will take place from one or two temporary causeways and river banks via cranes. The causeways will be made from cleaned large grade rip rap. There will be a causeway on each side of the river and each will temporarily impact 8,000 ft<sup>2</sup> for a total of 16,000 ft<sup>2</sup>. Temporary causeways will only be installed on one side of the river at a time, thereby leaving more than 50% of the river free flowing with no obstructions. It is estimated that approximately 10 prefabricated concrete cross pipes will also be installed under the causeway to maintain river flow. The exact size and number of cross pipes will be determined closer to the time of construction.

Geotechnical drilling may be performed at the project site and may require boring through the substrate. There would be 6 borings of 3-in diameter per bent, for a total of 24 borings. Borings will be performed by auguring a casing to the rock. Split spoon samples will pull material, after which the rock will be cored. Work will be performed from the river bank, a floating barge, or a temporary causeway.

Each pier is expected to take 1 week to install and an additional 4 weeks to erect the girders. Total in-water work time is expected to take 25 weeks to complete. In-water work will be done during daylight hours, however if daytime temperatures are too high, pouring of concrete may be done at night. While not anticipated, some shaft auguring may be done at night.

**File Installation**

<b>Pile type(s)</b>	<b>Number of Piles</b>	<b>Installation Method</b>	<b>Confined Space or Open Water</b>
Concrete	16	Auguring	Confined

*Construction Conditions*

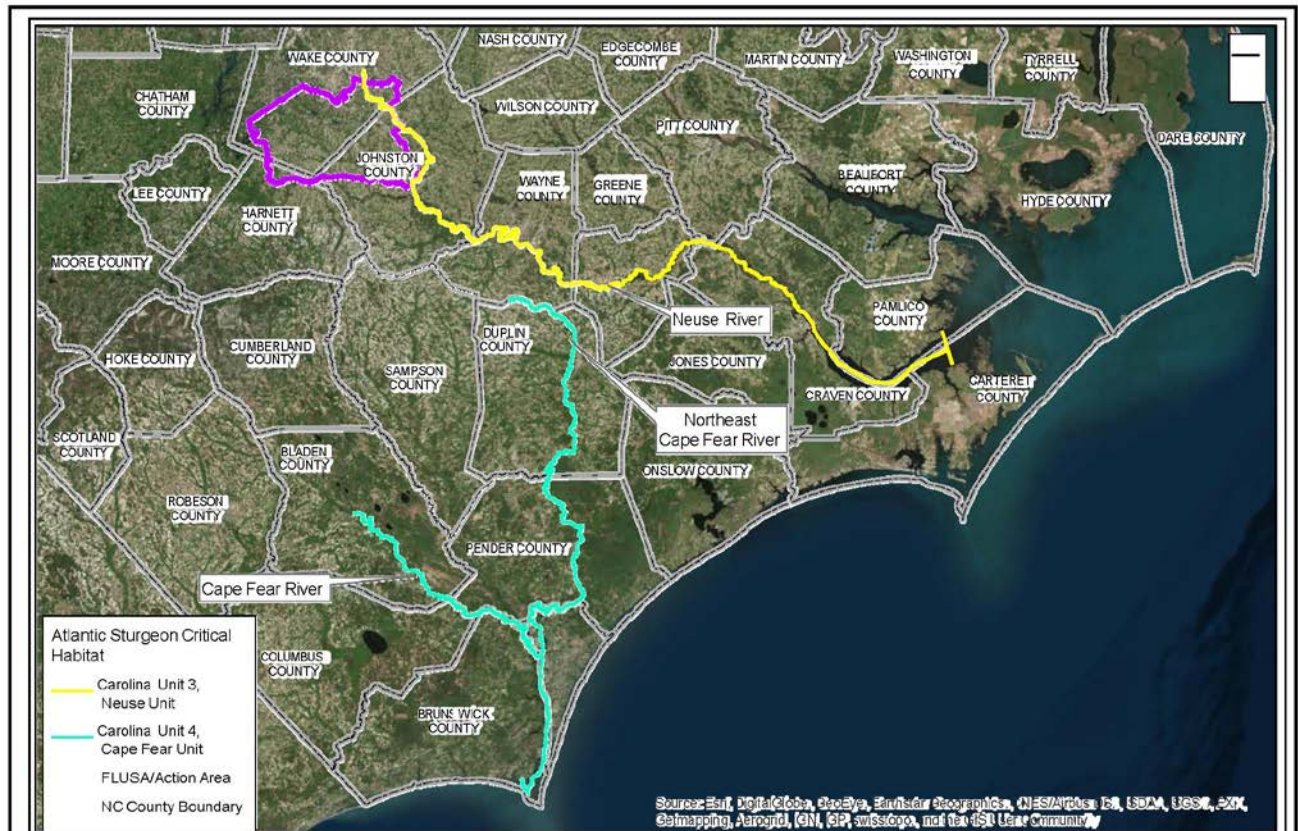
The contractor will comply with NCDOT’s Best Management Practices. The NCDOT has agreed to provide an additional measure of protection by requiring in-water construction activities to stop if a sturgeon is spotted within 50 ft of operations. No in-water work will occur from February 15 – October 31. Causeways and temporary work bridges will be

installed/removed outside the moratorium and construction will not block more than 50% of the stream. Any blasting, if necessary, associated with the project will not occur within 50 ft of the river. In addition, NCDOT has agreed to abide by the PDCs for temporary structures (Attachment 1) for the proposed actions associated with this project. Project specific PDCs that will be part of this project at the Neuse River crossing are listed below:

- 1) New Bridges
  - Shoreline stabilization for new bridges (approaches/causeway/embankment) will adhere to Shoreline Stabilization PDCs stated below.
- 2) New Piers
  - New piers will not be installed where swimming sturgeon are known to occur.
  - New piers within 0.5 mile of areas where sturgeon are known to occur, or where Atlantic sturgeon critical habitat is present, will adhere to the following:
    - Take-off/causeway fill for piers will not be placed below the OHWM or MHWL of the waterbody or impede or restrict normal flows.
    - Shoreline stabilization activities for new or replacement piers (approaches/causeway/embankment) will adhere to Shoreline Stabilization PDCs stated below.
- 3) Installation, Maintenance, and Removal of Shoreline Stabilization
  - Installation of new shoreline stabilization
    - Bank stabilization will not exceed 500 feet in length (for any type: e.g., seawalls, riprap, revetments)
  - Riprap/Revetments
    - Shoreline stabilization materials will be free of debris and are limited to sand cement, concrete, and quarry stone. No slope paving, poured concrete, or reinforced concrete will be utilized.

**Effects Determination(s) for Species the Action Agency or NMFS Believes May Be Affected by the Proposed Action**

Species	ESA Listing Status	Action Agency Effect Determination	NMFS Effect Determination
<b>Fish</b>			
Atlantic sturgeon (Carolina DPS)	E	NLAA	NLAA
E = endangered; NLAA = may affect, not likely to adversely affect			



**Image of the project location and Atlantic Sturgeon Critical Habitat in the Neuse River (Provided by NCDOT)**

**Critical Habitat**

The project is located in Atlantic sturgeon critical habitat Carolina Unit 3 (Neuse Unit). The physical and biological features (PBFs) of the critical habitat are described in the table below. We believe the proposed action may affect the unobstructed water of appropriate depth and water quality PBFs.

<b>Atlantic Sturgeon Critical Habitat PBFs and their Purpose/Function</b>		
	<b>PBF</b>	<b>Purpose/Function of PBF</b>
<i>Hard Substrate (PBF 1)</i>	Hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 ppt range)	Necessary for settlement of fertilized eggs, refuge, growth, and development of early life stages
<i>Salinity Gradient and Soft Substrate (PBF 2)</i>	Aquatic habitat with a gradual downstream salinity gradient of 0.5 ppt up to as high as 30 ppt and soft substrate (e.g., sand, mud) between the river mouth and spawning sites	Necessary for juvenile foraging and physiological development
<i>Unobstructed Water of</i>	Water of appropriate depth and absent physical barriers to	Necessary to support: <ul style="list-style-type: none"> <li>• Unimpeded movement of adults to and</li> </ul>

<p><i>Appropriate Depth (PBF 3)</i></p>	<p>passage (e.g., locks, dams, thermal plumes, turbidity, sound, reservoirs, gear, etc.) between the river mouth and spawning sites</p>	<p>from spawning sites</p> <ul style="list-style-type: none"> <li>• Seasonal and physiologically dependent movement of juvenile Atlantic sturgeon to appropriate salinity zones within the river estuary</li> <li>• Staging, resting, or holding of subadults or spawning condition adults. Water depths in main river channels must also be deep enough (at least 1.2 m) to ensure continuous flow in the main channel at all times when any sturgeon life stage would be in the river</li> </ul>
<p><i>Water Quality (PBF 4)</i></p>	<p>Water quality conditions, especially in the bottom meter of the water column, with the appropriate combination of temperature and oxygen values</p>	<p>Necessary to support:</p> <ul style="list-style-type: none"> <li>• Spawning</li> <li>• Annual and inter-annual adult, subadult, larval, and juvenile survival</li> <li>• Larval, juvenile, and subadult growth, development, and recruitment. Appropriate temperature and oxygen values will vary interdependently, and depending on salinity in a particular habitat.</li> </ul> <p>For example, 6.0 mg/L DO or greater likely supports juvenile rearing habitat, whereas DO less than 5.0 mg/L for longer than 30 days is less likely to support rearing when water temperature is greater than 25 °C. In temperatures greater than 26 °C, DO greater than 4.3 mg/L is needed to protect survival and growth. Temperatures of 13 to 26 °C likely support spawning habitat.</p>

**Analysis of Potential Routes of Effects to Species**

Atlantic sturgeon may be affected by (1) the potential risk of injury from direct impact by construction machinery and associated in-water activities (e.g., crane and temporary work bridge/causeway operations), (2) the risk of exposure to turbidity from in-water construction activities, and (3) the effects of temporarily avoiding the project site due to construction activities. We believe these effects are discountable due to the complete moratorium on in-water work from February 15 – October 31. Because of the moratoria, Atlantic sturgeon (adult, larval, and small juvenile sturgeon) will not be exposed to the risk of injury because they are extremely unlikely to be in the action area.

The permanent installation of 16 concrete shafts (60-in) will result in the loss of approximately 320 ft<sup>2</sup> of unvegetated river bottom (i.e., fine/course sand and clay) where sturgeon might forage for invertebrate prey. In addition, up to 16,000 ft<sup>2</sup> of river bottom will be temporarily displaced

by the rip rap installed for the temporary work causeways. We believe the effects on sturgeon caused by the loss of river bottom due to this project will be insignificant. Because sturgeon are opportunistic feeders and forage over large areas, they would be able to locate prey beyond the immediate area of the piles and temporary causeways. The temporary causeways and work bridges will be removed once the new bridge is built. Invertebrates, which are prey for Atlantic sturgeon, will quickly recolonize this river bottom upon removal of these substructures.

### **Analysis of Potential Routes of Effect to Critical Habitat**

Since the project is located in freshwater and no hard substrate was found at the proposed bridge crossing, we believe PBF 1 and PBF 2 will not occur in the action area.

Unobstructed water of appropriate depth (PBF 3) that supports staging, resting, holding, or movement of various life stages of Atlantic sturgeon may be affected by the installation of piles and temporary work structures. We believe the obstructions created by the installation of piles will have an insignificant effect on PBF 3 because the temporary causeways/work bridges and permanent bridge piles will only affect small portions of the main channel. The temporary causeways and work bridges will not block more than 50% of the stream and will be removed at the end of the project's construction. While the placement of the causeways and work bridges will have a temporary effect on water depth (deeper upstream, shallower downstream), these effects will be minimized by placing pipes within the causeways, are localized, and will not affect the overall depth of the river in this area since sufficient passage will be maintained within a portion of the river at all times during construction. In addition, sedimentation effects are not anticipated to reach a level that would create a depth barrier, and the implementation of the construction moratorium will ensure there is no noise barrier to migrating individuals in the event they are present in the river.

Water quality (PBF 4) supporting important life functions, such as growth and reproduction, of various life stages of Atlantic sturgeon may be affected by temporary and highly localized turbidity and associated effects on suitable water temperature and oxygen values caused during installation of piles and temporary causeways/work bridges. However, we believe the effects to PBF 4 will be discountable. NCDOT has committed to Design Standards for Sensitive Watersheds along with specific Project Design Criteria (PDC's). All work will be completed outside of February 15 - October 31 to prevent adult, larval, and small juvenile sturgeon from being exposed to elevated turbidity levels during times of the year when they might be present in the project area.

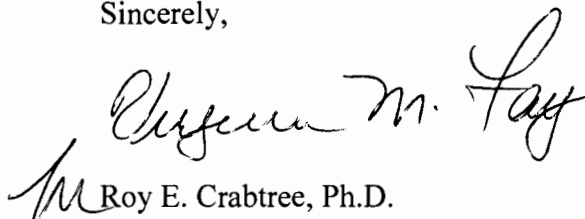
### **Conclusion**

Because all potential project effects to listed species and critical habitat were found to be discountable, insignificant, or beneficial, we conclude that the proposed action is not likely to adversely affect listed species and critical habitat under NMFS's purview. This concludes your consultation responsibilities under the ESA for species under NMFS's purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. NMFS's findings on the project's potential effects are based on the project description in this

response. Any changes to the proposed action may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Shelby Creager, Consultation Biologist, at (727) 209-5951, or by email at [shelby.creager@noaa.gov](mailto:shelby.creager@noaa.gov).

Sincerely,



Roy E. Crabtree, Ph.D.  
Regional Administrator

File: 1514-22.L.1



# ATTACHMENT 1

## SER-2018-19113

### **Activity-specific PDCs for temporary platforms, access fills, and cofferdam activities:**

A6.1 All [water dependent] activities will be limited to a total of 120 days or less (“temporary” is defined as 120 days or less), except temporary work platforms/work trestles. Temporary work platforms/work trestles are limited to 24 months or less.

A6.2 Temporary platforms/work trestles will be installed/constructed following the PDCs outlined in Section 5.2 (“Noise”) below and Appendix A. (similar to the Pile driving stuff you said you would be able to follow)

A6.3 The combined temporary impacts from temporary platforms/access fills/cofferdams are limited to a total of 0.5 acres or less in waters of the U.S. (e.g., below OHWM or MHWL) for a single, complete project. Of the total 0.5 acres of temporary impacts, individual activity breakdowns are as follows:

A6.3.1 Temporary platforms are limited to those with substrate impacts (e.g., footprint of pilings equaling less than 500 ft<sup>2</sup> (0.011 acres).

A6.3.2 Temporary access fills are limited to 0.5 ac of clean fill (e.g., riprap free of debris) in waters of the U.S. (e.g., below OHWM or MHWL) at any given time.

A6.3.3 Individual temporary cofferdams are limited to:

A. 500 ft<sup>2</sup> (0.011 ac) or less in size and a maximum of 2 cofferdams (regardless of size) may be installed/in place at any given time; a maximum of 8 cofferdams (regardless of size) may be installed for a single, complete project.

or

B. 1000 ft<sup>2</sup> (0.023 ac) or less in size and a maximum of 1 cofferdam (regardless of size) may be installed/in place at any given time; a maximum of 4 cofferdams (regardless of size) may be installed for a single, complete project.

A6.4 Placement of geotextile barriers is required prior to placement of the platform/access fills to ensure that the fill will be removed completely at the end of construction.

A6.5 Temporary fill materials will be placed in a manner that will not be eroded by high water flows. Temporary fills will be removed in their entirety and the affected areas returned to pre-construction conditions/elevations.

A6.6 The navigability of the waterway will remain uninterrupted and freely open for species movement in/out of the area.

A6.6.1 Cofferdams and fills will be limited to no more than 50% of the width of a waterbody. In tidal areas (e.g., tidal creeks), the width of the water body should be considered/measured at mean low water (MLW).

A6.7 Projects will not appreciably impact surface water flow into or out of any waters of the U.S.

A6.8 Appropriate measures will be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of the construction sites.

A6.9 Temporary steel sheet pile cofferdams will be installed/removed by vibratory hammers only.

A6.10 For temporary inflatable cofferdams, the footprints of the walls will be included into the overall impacts area.

A6.11 All activities will avoid impacts to submerged aquatic vegetation (i.e., seagrasses), to the maximum extent practicable; activities will not impact more than 100 ft<sup>2</sup> of submerged aquatic vegetation.

A6.12 Activities are not authorized at the mouths of rivers where sturgeon are known to migrate for spawning purposes.

#### **Critical Habitat-specific PDCs:**

A6.13 Temporary platforms/work trestles in Atlantic sturgeon critical habitat, where the following PBF is present, are limited to 24 months or less and those with total substrate impacts (e.g., footprint of pilings) of 250 ft<sup>2</sup> (0.005 acres) or less, do not impede or obstruct sturgeon movement, and will be installed outside of the spawning/migration season.

Suitable hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand range [ppt]) for settlement of fertilized eggs and refuge, growth, and development of early life stages.

A6.14 Temporary access fills in Atlantic sturgeon critical habitat, where the following PBF is present, are limited to 0.25 acre of total temporary impacts or less, and will be installed and removed outside of the spawning/migration (moratoria) season(s):

Suitable hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand range [ppt]) for settlement of fertilized eggs and refuge, growth, and development of early life stages.

A6.15 Temporary cofferdams in Atlantic sturgeon critical habitat, where the following PBF is present, are limited to 2000 ft<sup>2</sup> (0.04 acres) of total temporary impacts or less (must adhere to

the same individual size restrictions as A6.3.3), and will be installed and removed outside of the spawning/migration (moratoria) season(s):

Suitable hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand range [ppt]) for settlement of fertilized eggs and refuge, growth, and development of early life stages.