

Environmental Assessment
on
The Effects of Issuing an Incidental Take Permit (No. 18102) to the North Carolina
Division of Marine Fisheries for Incidental Take of Atlantic Sturgeon Distinct
Population Segments in the North Carolina Inshore Gillnet Fishery

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Location: North Carolina Inshore waters

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue an incidental take permit to the North Carolina Division of Marine Fisheries (NCDMF), under Section 10(a)(1)(B) of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq.), and the regulations governing the incidental taking of endangered and threatened species (50 CFR 222.307). The permit would authorize the incidental capture, with some mortality, of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic Distinct Population Segments, associated with the otherwise lawful commercial and recreational fisheries operating in inshore waters and deploying anchored gillnets (i.e., passive gillnet sets deployed with an anchor or stake at one or both ends of the nets). The permit would be valid for ten years. NCDMF will continue to regulate the inshore gillnet fishery through the fisheries rules adopted by the North Carolina Marine Fisheries Commission and proclamations issued by the NCDMF director. Regulations include mandatory attendance, yardage limits, soak-time restrictions, net shot limits, net height tie down requirements, closed areas, mesh size restrictions, minimum distance between fishing operations, marking requirements, permit mandates, and observer requirements. On June 28, 2013, NCDMF submitted a complete application for a ESA Section 10(a)(1)(B) permit, including a conservation plan with an adaptive management program for the operation of their inshore anchored gillnet fishery to further monitor, minimize, and mitigate the impacts of incidental take of Atlantic sturgeon in the fishery to the maximum extent practicable. We requested NCDMF to add

additional language about potential impacts to Atlantic sturgeon and this was submitted in a revised application submitted on January 2, 2014. This was not a significant change to warrant publication of the most recent application for additional public comment. A draft of this Environmental Assessment was published in the Federal Register on August 21, 2013 (78 FR 51709) and no public comments were received.

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1.0 BACKGROUND

Five DPSs (Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic) of the Atlantic sturgeon were listed under the ESA on February 6, 2012 (77FR 5714; 77FR 5880). As a result on April 5, 2012, North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries (NCDMF) submitted to NMFS a draft permit application to exempt the take of Atlantic sturgeon incidentally captured in inshore gillnet fisheries. Based on a review of the draft application, NMFS requested further information and clarification. On December 19, 2012, and June 28, 2013, NCDMF submitted updated draft applications based upon public comments and conference calls with NMFS. Based on review of the updated draft, NMFS and NCDMF held further discussions on a monitoring program to gather improved estimates of Atlantic sturgeon population abundance and trends and developing an adaptive management plan based on the monitoring program. On January 2, 2014, NCDMF submitted a complete application for the incidental take of ESA-listed Atlantic sturgeon Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic DPSs that may be caught in gillnet fisheries operating in inshore waters and deploying anchored gillnets (i.e., passive gillnet sets deployed with an anchor or stake at one or both ends of the nets). The complete application package included a permit application and Conservation Plan.

In addition to the permit and Conservation Plan, NMFS and NCDMF have drafted an Implementing Agreement (IA) to better delineate responsibilities with regard to implementation of the Conservation Plan. This IA will be signed by both parties at the time the permit is signed by both parties. Because information on Atlantic sturgeon populations and trends in the inshore waters of North Carolina is limited this agreement was necessary. The IA outlines a year 1-3 information gathering and monitoring phase (first phase) of the Conservation Plan and a year 4-10 implementation phase (second phase) of the Conservation Plan. It is anticipated by both parties that the results of the first phase will adjust and better predict take numbers for years 4-10 during the second phase, during which information gathering and monitoring will still continue to take place.

Gillnet fishing in North Carolina is managed by NCDMF through rules and proclamations that regulate fishing times, areas, fishing gear, seasons, size limits, and quantities of fish harvested and possessed. The rules are adopted by the NCMFC (General Statutes 113-182; 143B-289.51; 143B-289.52) and proclamations issued by the Director (General Statute 113-221.1).

This EA will analyze the effects to the human and natural environment caused by the issuance of the permit (# 18102) to NCDMF for the incidental take of Atlantic sturgeon Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic DPSs, associated with the otherwise lawful commercial and recreational fisheries operating in inshore waters of North Carolina and deploying anchored gillnets (i.e., passive gillnet sets deployed with an anchor or stake at one or both ends of the nets). A draft of this Environmental Assessment was published in the Federal Register on August 21, 2013 (78 FR 51709) and no public comments were received.

2.0 PURPOSE OF AND NEED FOR ACTION

The purpose and need for this action is to allow the gillnet fishery in the inshore waters of North Carolina to continue to operate in compliance with the Endangered Species Act relating to the incidental take of Atlantic sturgeon during its operation. The Endangered Species Act section 10(a)(1)(B) allows the Secretary to permit any takings of listed species that are incidental to, and no the purpose of, the carrying out of an otherwise lawful activity. The State of North Carolina permits fishermen to fish with gillnets in their inshore waters. During this otherwise lawful fishing, Atlantic sturgeon are incidentally captured in these gillnets. North Carolina has applied for a 10(a)(1)(B) permit to cover the incidental take of these Atlantic sturgeon. Under Endangered Species Act section 10(a)(2)(B), if the Secretary finds, after opportunity for public comment, with respect to a permit application and related conservation plan that the taking will be incidental; the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; the applicant will ensure that adequate funding for the plan will be provided; the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and that other measures as required by the Secretary will be met. After review of North Carolina's application and conservation plan, NMFS believes these have been met.

The National Marine Fisheries Service (NMFS), Office of Protected Resources (NMFS PR) proposes to issue an incidental take permit for Atlantic Sturgeon Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic Distinct Population Segments (DPSs) to the North Carolina Division of Marine Fisheries (NCDMF), under Section 10(a)(1)(B) of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq.), and the regulations governing the incidental taking of endangered and threatened species (50 CFR 222.307). Permit Number 18102 would be valid for ten years and would include take levels and requirements requested in the NCDMF permit application.

Section 9(a)(1)(B) of the ESA prohibits "take"¹ of endangered species with only a few specific exceptions. As stated above, incidental take permits authorize the take of endangered species if: the taking is incidental to, not the purpose of, an otherwise lawful activity; those takes will not jeopardize the endangered species, and the applicant will to the maximum extent practicable minimize and mitigate the impacts of the taking, and the applicant will implement additional measures deemed necessary or appropriate by NMFS; and the applicant ensures adequate funding to implement its commitments under the conservation plan and permit.

This permit (18102) will provide the applicant with an exemption from the take prohibitions under the ESA for Atlantic sturgeon, including those listed as endangered, associated with gillnet fisheries in North Carolina's inshore estuarine system consistent with the ESA issuance criteria. A permit (16230) has already been issued for the take of listed sea turtles during the operation of this fishery and we incorporate that permit, its conservation plan, environmental assessment, and biological opinion here by reference.

¹ The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

The need for issuance of the permit is related to the purposes and policies of the ESA. NMFS has a responsibility to implement the ESA to protect, conserve, and recover threatened and endangered species under its jurisdiction. Incidental Take Permits and associated conservation plans are in place to ensure the conservation and management of endangered and threatened species and minimize the impact of otherwise lawful activities, such as the operation of the North Carolina inshore gillnet fishery. Working with state agencies to develop conservation plans for state managed actions, such as the operation of state fisheries, is a critical effort to reduce impacts from state managed actions and promote the conservation and recovery of species.

Commercial and recreational fishermen deploy gillnets in North Carolina's estuarine and ocean waters. Gillnet fishing in North Carolina is regulated by NCDMF through fisheries rules adopted by the North Carolina Marine Fisheries Commission (NCMFC) and proclamations issued by the Director. Existing regulations include mandatory attendance for some areas and gear, yardage limits, soak-time restrictions, net shot limits, tie down requirements, closed areas, mesh size restrictions, minimum distance between fishing operations, marking requirements, reporting requirements, and monitoring requirements. Gillnet fisheries and related restrictions differ throughout the state depending on season, target species, location, and physical characteristics of water body being fished. In general, there are three primary set techniques: anchored set nets, floating drift nets, and strike or runaround nets. NCDMF applied for incidental take of Atlantic sturgeon in recreational and commercial gillnet fisheries operating in inshore waters and deploying anchored gillnets (i.e., passive gillnet sets deployed with an anchor or stake at one or both ends of the nets), which have been identified as incidentally capturing, with some mortality, Atlantic sturgeon. The permit will provide an exemption to the ESA take prohibitions, and NCDMF will monitor, minimize and mitigate the impacts of the taking, to the maximum extent practicable, for the capture of Atlantic sturgeon incidental to these fisheries.

3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Large mesh gillnet fisheries consist primarily of five target species including southern flounder (*Paralichthys lethostigma*), striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), hickory shad (*A. mediocris*), and catfishes (*Ictalurus spp.*). Large mesh gillnet fisheries for southern flounder traditionally operated throughout the majority of the sounds and lower estuarine river systems with a peak in effort in the fall months. However, NCDMF issued Proclamation M-8-2010 effective May 15, 2010 implementing the provisions in a settlement agreement with the Duke Environmental Law and Policy Clinic filed suit against NCDMF and the NCMFC on behalf of the Karen Beasley Sea Turtle Rescue and Rehabilitation Center for the illegal taking of sea turtles in state regulated inshore gillnet fisheries. This proclamation was amended in 2011, and the current proclamations are attached at Appendix I.

Gillnet restrictions implemented by the proclamation include:

- restricted stretch mesh size range of 4 inch stretched mesh (ISM) to, and including, 6 ½ ISM for large mesh gillnets;
- soak times limited to overnight soaks an hour before sunset to an hour after sunrise, Monday evenings through Friday mornings, except for the southern portion of the state which is allowed to set Sunday evenings due to environmental conditions such as extreme tides;

- height restricted to no more than 15 meshes, constructed with a lead core or leaded bottom line and without corks or floats other than needed for identification;
- tie-downs are prohibited;
- gillnets restricted to a maximum of 2,000 yards per vessel or 1,000 yards per vessel depending on area fished; and
- individual net (shot) length restricted to 100 yards with a 25-yard break between shots.

Fisheries for striped bass, which are managed in most areas as bycatch fisheries by the NCDMF, are more limited in time and space due to the anadromous migration of this species. Striped bass gillnet fisheries are prosecuted from October to late April. The majority of estuarine striped bass harvest occurs in the Albemarle Sound with additional early spring effort occurring in the Pamlico Sound and the Pamlico and Neuse river systems.

American and hickory shad fishing operations occur exclusively from January 1 through April 14 due to their anadromous migration and distribution (season established by Fisheries Rule -- 15A NCAC O3M .0519). However, during 2012, the NCDMF developed a Shad Sustainability Plan that has been approved by the Atlantic States Marine Fisheries Commission (ASMFC) and reduced the seasons for American shad.

Catfish are harvested with large mesh gillnets in the major rivers and western Albemarle Sound and the majority of catches occur during the winter to spring months. The most common mesh size for all large mesh gillnet fisheries is 5 ½ ISM.

In addition to state regulations, gillnets greater than 4 ¼ ISM are prohibited in Pamlico Sound from September 1 through December 15 each year by Federal regulation (67 FR 56931, September 6, 2002) to protect ESA-listed sea turtles.

Small mesh gillnet operations target a more diverse array of species relative to large mesh gillnet fisheries. Small mesh gillnet fisheries primarily target spot (*Leiostomus xanthurus*), striped mullet (*Mugil cephalus*), bluefish (*Pomatomus saltatrix*), spotted seatrout (*Cynoscion nebulosus*), weakfish (*Cynoscion regalis*), Atlantic menhaden (*Brevoortia tyrannus*), Spanish mackerel (*Scomberomorus maculatus*), white perch (*Morone americana*), and kingfishes (*Menticirrhus spp.*). Spot are landed throughout the estuarine waters and river systems with peak landings in the spring/summer (April to June) and fall (October to November) months. Striped mullet are landed year round, but peaks occur in the fall/winter months (October to January). Bluefish are also landed year round throughout the estuarine and river systems, and most landings occur in the spring during April and May. Spotted seatrout and weakfish are targeted by small mesh gillnet operations primarily in the fall/winter (September to January) months. Weakfish landings may also peak in the spring during April and May. Atlantic menhaden are mostly targeted during the spring (February to May) and another peak in landings occurs in October. Spanish mackerel are targeted during the spring, summer, and fall months. White perch are almost exclusively targeted during the winter/spring months (December to April). Kingfishes are targeted primarily in the spring and the fall mainly in the more northern estuarine system. Mesh sizes used in small mesh gillnet operations vary more than those used in large mesh fisheries. However, the most commonly used small mesh sizes generally fall between 3.0 and 3 ¾ ISM.

Small mesh gillnet yardage use from 2001 to 2006, ranged from approximately 700 yards per trip in the white perch fishery to over 1,300 yards per trip for the weakfish fishery. Small mesh gillnet yardage fished per trips ranged from 100 yards per trip to 4,000 yards per trip. From 2009 to 2011, there has been a reduction (12%) of small mesh gillnet yardage used and trips in estuarine waters averaged 9,648 per year. Although the estuarine gillnet fishery is extensively managed, there is no maximum yardage limit for gillnets < 4.0 ISM for most of the estuarine waters.

The 1994 North Carolina Estuarine Striped Bass Fishery Management Plan (FMP) limited unattended small mesh gillnets in the Albemarle Sound Management Area (ASMA—Albemarle, Currituck, Croatan, Roanoke sounds and its tributaries) to 800 yards per operation to reduce the bycatch of striped bass, and the allowable mesh sizes < 4.0 ISM are limited.

Attendance (meaning fisherman presence at the net) of small mesh gillnets in inshore waters is required to minimize bycatch of undersized finfish. Small mesh gillnet attendance is required:

- ASMA—mid-May through mid-November;
- Upper reaches of Pamlico, Pungo, Neuse, and Trent Rivers—year round;
- Primary and secondary nursery areas, areas within 200 yards of any shoreline, and the extensive shallow grass flats located on the inshore side of the Outer Banks—May 1 through October 31 [note: An exemption to this rule lifts the attendance requirement for the region from Core Sound to the South Carolina state line in October to allow for the fall spot fishery];
- Lower Neuse River out to the mouth of the river within 200 yards of shore—May 1 through November 30;
- Primary and permanent secondary nursery areas and all modified no-trawl areas (shallow grass beds in eastern Pamlico and Core Sounds)—May 1 through November 30;
- Pamlico, Pungo, Neuse, and Bay Rivers within 200 yards of shore—May 1 through November 30;
- Pamlico and Core Sounds within 50 yards of shore—May 1 through November 30; and
- Coastal waters north of Core Sound within 50 yards of shore—May 1 through November 30;
- Coastal waters from Core Sound to South Carolina state line within 50 yards of shore—May 1 through September 30.

This regulatory structure for the recreational and commercial gillnet fishery in North Carolina would be the same under all three alternatives described here.

Alternative 1 - No Action: Under the No Action alternative no permit would be issued for the take of the Atlantic sturgeon Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic DPSs incidental to the otherwise lawful recreational and commercial gillnet fishery operating in inshore waters and deploying anchored gillnets.

Without an incidental take permit, North Carolina would not implement mitigation and minimization measures that would be protective of Atlantic sturgeon and would continue to operate its gillnet fishery without take coverage for Atlantic sturgeon.

Alternative 2 - Issue Permit as Requested in Application (Proposed Action): Under Alternative 2, a permit would be issued to exempt NCDMF from the ESA prohibition on taking Atlantic sturgeon Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic DPSs during the otherwise lawful recreational and commercial gillnet fishery operating in inshore waters and deploying anchored gillnets. The permit would be valid for ten years and would require NCDMF to operate the inshore gillnet fishery as described below in the permit, the Conservation Plan, and in the Implementing Agreement. The permit, Conservation Plan, and Implementing Agreement are incorporated here by reference. This alternative would include issuing the take levels proposed in the January 2, 2014 application and Conservation Plan. However, the Implementing Agreement allows for analyzing the monitoring data collected prior to issuance of the permit and during the first three years of the permit to determine whether the take levels should be adjusted for the remaining period and to make changes, if necessary, to the adaptive management specified in the Conservation Plan.

Summary of Conservation Plan: The Conservation Plan prepared by NCDMF describes measures designed to monitor, minimize, and mitigate, to the maximum extent practicable, the incidental take of Atlantic sturgeon Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic DPSs.

Monitoring: Monitoring of the inshore gillnet fisheries will be done through onboard and alternative platform observers. NCDMF will observe 7–10% ≥ 5.0 ISM; 1–2% < 5.0 ISM) statewide while gillnet fishing occurs. Observer coverage will be concentrated mostly on the large mesh, since most takes occur with large mesh. Furthermore, NCDMF has proposed weighted coverage in areas with more Atlantic sturgeon interactions. Well over 90% of historic Atlantic sturgeon interactions have occurred in management unit A, which is Albemarle Sound. If NCDMF covers 7-10% of the entire large mesh gill net fishery effort each year with weighted coverage in Albemarle Sound (formerly at 1% coverage), NMFS and NCDMF should start seeing much better data with regard to Atlantic sturgeon. This is also the reason though for a three year monitoring period to help gather better data and make appropriate decisions using the best available information. If in annual reports, it becomes clear that the monitoring is ineffective or not being done to the level agreed, NMFS and NCDMF also have an Implementing Agreement to help our agencies work through those disagreements, if any. NMFS would need to reinitiate consultation if it becomes evident that the action is not being carried out in the manner described in this EA.

Observer coverage will be based on the types and levels of fishing, Atlantic sturgeon activity, and NCDMF's ability to monitor fishing effort in primary fisheries within five primary management units (Figure 1. *note:* Management unit A is subdivided into three subunits because quantifiable evidence of differences in Atlantic sturgeon distribution and fishing effort exist within the management unit). Each of the units will be monitored seasonally (defined as: (1) Winter December–February; (2) Spring March–May; (3)

Summer June–August; and (4) Fall September–November) and by fishery with weighted coverage derived from estimated Atlantic sturgeon takes. Data on sturgeon incidental take will include gear type, soak time, gear parameters (e.g., mesh size), location, condition of individual caught, length, weight, disposition, and whether a tag was applied or fin clip collected. Information on fishing effort, catch, and discards will also be collected. Observers will be debriefed daily and submit reports weekly. The reports will include the following information: the fisherman’s name, area fished, all protected species interactions, quantity and species of fish caught, fishing effort in the area, and other vessels in the area, as well as any other information which will assist in the determination of ongoing observer effort required at that location. In addition to enforcing state regulations, Marine Patrol officers will inspect fish houses, conduct aerial surveys, check fishing gear and licenses, interview fishermen, and monitor fishing activities. NCDMF will use data collected through the Trip Ticket Program, which requires fishermen to report on their catch and discards. The data collected through onboard and alternative platform observers, Marine Patrol officer reports, and the Trip Ticket Program will be used to estimate fishing effort, Atlantic sturgeon bycatch, and level of compliance. All data will be housed in a statewide biological database.

Measures to Minimize and Mitigate: The Conservation Plan specifies if estimated takes of Atlantic sturgeon approach allowable thresholds in a management unit, NCDMF will issue a proclamation closing the season for the responsible fishery within the applicable management unit. NCDMF will issue proclamations implementing additional restrictions if necessary to provide increased protection of Atlantic sturgeon and other ESA-listed species or lifting gillnet or area restrictions if supported by NCDMF or NMFS biological data. Restrictions may include additional measures to reduce fishing effort, reduced yardage, seasonal/area closures, attendance requirements, other gear limitations or modifications, extensive outreach, and an adaptive Observer Program. NCDMF will also identify and adaptively respond to areas of high potential for Atlantic sturgeon bycatch. These “hotspots” will be defined as any area, determined by geographically enforceable boundaries, where Atlantic sturgeon observations are unusually high within a management unit or subunit, such that the director determines that closure and evaluation is necessary to (1) avoid violation of a take limit, or (2) provide adequate protection or the Atlantic sturgeon, or (3) to allow Atlantic sturgeon to complete a seasonal migration and minimize interactions. Temporary hotspot closures may be implemented while data are gathered and analyzed. Hotspot areas will be identified and handled proactively and reactively. For any given management unit or subunit during a season that shows high Atlantic sturgeon abundance, NCDMF may close the management unit or subunit for the duration of the defined season. If an area is closed as a hotspot multiple times throughout the year or over a two-year period, NCDMF will take proactive measures to close the area for longer than a defined season. If a particular area within a management unit or subunit can be defined within the unit as the hotspot that area can be defined geographically and closed within the unit temporarily or permanently.

Outreach: Although NCDMF currently reaches out to the fishing community on fisheries and protected species management, outreach is an integral component of the Conservation Plan. Informing and educating the industry about the ESA, the protection

of species listed as either threatened or endangered, and how this applies to the commercial fishing industry has been a major focus of the NCDMF outreach. Outreach efforts include public meetings, workshops, presentations, mail outs of summary information, public involvement (through advisory committees), and direct communications. Observer Program information is provided on the NCDMF website: <http://portal.ncdenr.org/web/mf/observers-program-details>.

Table 1. Requested number of incidental takes of Atlantic sturgeon in the inshore gillnet fishery for large and small mesh gillnet per year for the duration of the permit.

Year	Annual Large Mesh (≥ 5.0 ISM)		Annual Small Mesh (< 5.0 ISM)		Annual Total Interactions (Mortality)
	Carolina DPS Total Interactions (Mortality)	Other DPS Total Interactions (Mortality)	Carolina DPS Total Interactions (Mortality)	Other DPS Total Interactions (Mortality)	
2013	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2014	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2015	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2016	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2017	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2018	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2019	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2020	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2021	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2022	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
Total	16,550 (800)	5,480 (210)	6,070 (580)	1,170 (100)	29,270 (1,690)

Alternative 3 - Issue Permit with Reductions in Large and Small Mesh (Alternatives 3 and 5 in the Conservation Plan) and Expansion of Weekly Closures (Alternative 4 in the Conservation Plan): Under Alternative 3, a permit would be issued to exempt NCDMF from the ESA prohibition on taking Atlantic sturgeon Gulf of Maine, New York Bight, Chesapeake, Carolina, and South Atlantic DPSs during the otherwise lawful recreational and commercial gillnet fishery operating in inshore waters and deploying anchored gillnets. The permit would be valid for ten years and would require NCDMF to operate the inshore gillnet fishery as described in Alternatives 3, 4, and 5 of the Conservation Plan, Implementing Agreement, and with other measures deemed necessary or appropriate by NMFS in the permit. The permit, Conservation Plan, and Implementing Agreement are incorporated here by reference. Requested take would be reduced based on the reduction in fishing effort.

Large and Small Mesh Reduction: Large mesh gillnet effort would be reduced further throughout the state by reducing yardage, limiting soak time, and requiring attendance. Fishing trips would be reduced below the 2010 level ($n = 17,756$). Yards of gillnet fished would be reduced below the 2010 level ($n = 22,000,666$). Soak times would be shorter than the existing

overnight soak times. Attendance would be required for all large mesh gillnets. Small mesh gillnet effort could be reduced throughout the state by reducing yardage, limiting soak time, and requiring attendance. Fishing trips would be reduced below the 2010 level (n = 9,365). Yards of gillnet fished would be reduced below the 2010 level (n = 8,130,141). Soak time limits would be implemented and attendance would be required for all small mesh gillnets.

Expand Weekly Closures: The 3-day weekly gillnet (4 to 6 ½ ISM) closure (i.e., soak times prohibited from 1 hour after sunrise Friday a.m. through 1 hour before sunset on Monday p.m.) would be expanded to all inshore waters.

4.0 AFFECTED ENVIRONMENT

This section presents baseline information necessary for consideration of the alternatives, and describes the resources that would be affected by the alternatives. The effects of the alternatives on the environment are discussed in Section 4.

Physical Environment: The affected environment is described as all portions of the North Carolina internal coastal waters (inshore waters) that are open to recreation and commercial gillnet fishing deploying anchored sets. It includes a broad range of geomorphological estuarine types (riverine, lagoon, and sounds). These waters are described as the internal coastal waters of North Carolina. Inlets within these barrier islands allow saline ocean water to mix with fresh water, which is provided by a network of river systems to the west. This estuary provides prime habitat for numerous finfish species that are harvested by residents and visitors to North Carolina in both the commercial and recreational fisheries. The North Carolina inshore waters encompass approximately 3,000 square miles of surface water area; in the U.S., only the Chesapeake Bay, Virginia, is larger. The North Carolina inshore waters are separated from offshore waters by a chain of barrier islands that run along nearly the entire coast.

The North Carolina inshore waters include the following 5 management areas (Figure 1):

Management Unit A is divided into three subunits: A-1, A-2, and A-3 to allow NCDMF to effectively address subunits where proactive management actions may be taken at a finer scale.

- **Management Subunit A-1** will encompass Albemarle Sound as well as contributing river systems in the unit not crossing a line 36° 4.30'N -75° 47.64'W east to a point 36° 2.50'N -75° 44.27'W in Currituck Sound or 35° 57.22'N -75° 48.26'W east to a point 35° 56.11'N -75° 43.60'W in Croatan Sound and 36° 58.36'N -75° 40.07'W west to a point 35° 56.11'N -75° 43.60'W in Roanoke Sound.
- **Management Subunit A-2** will encompass Currituck Sound north of a line beginning at 36° 4.30'N -75° 47.64' east to a point at 36° 2.50'N -75° 44.27'W as well as the contributing river systems in this unit.
- **Management Subunit A-3** will encompass Croatan Sound waters south from a point at 35° 57.22'N -75° 48.26'W east to a point 35° 56.11'N -75° 43.60'W and Roanoke Sound waters south from a point 36° 58.36'N -75° 40.07'W west to a point 35° 56.11'N -75° 43.60'W south to 35° 46.30'N.

Management Unit B includes all inshore waters south of 35°46.30'N, east of 76°30.00'W and north of 34°48.2'N. This management unit will include all of Pamlico Sound and the northern portion of Core Sound.

Management Unit C includes the Pamlico, Pungo, Bay, and Neuse river drainages west of 76° 30.00'W.

Management Unit D includes all inshore waters south of 34°48.27'N and west of a line running from 34°40.70'N - 76°22.50'W to 34°42.48'N - 76°36.70'W to the Highway 58 bridge. Management in unit D includes the southern Core Sound, Back Sound, Bogue Sound, North River, and Newport River.

Management Unit E includes all inshore waters south and west of the Highway 58 bridge to the North Carolina/South Carolina state line. This includes the Atlantic Intracoastal Waterway and adjacent sounds and the New, Cape Fear, Lockwood Folly, White Oak, and Shallotte rivers.

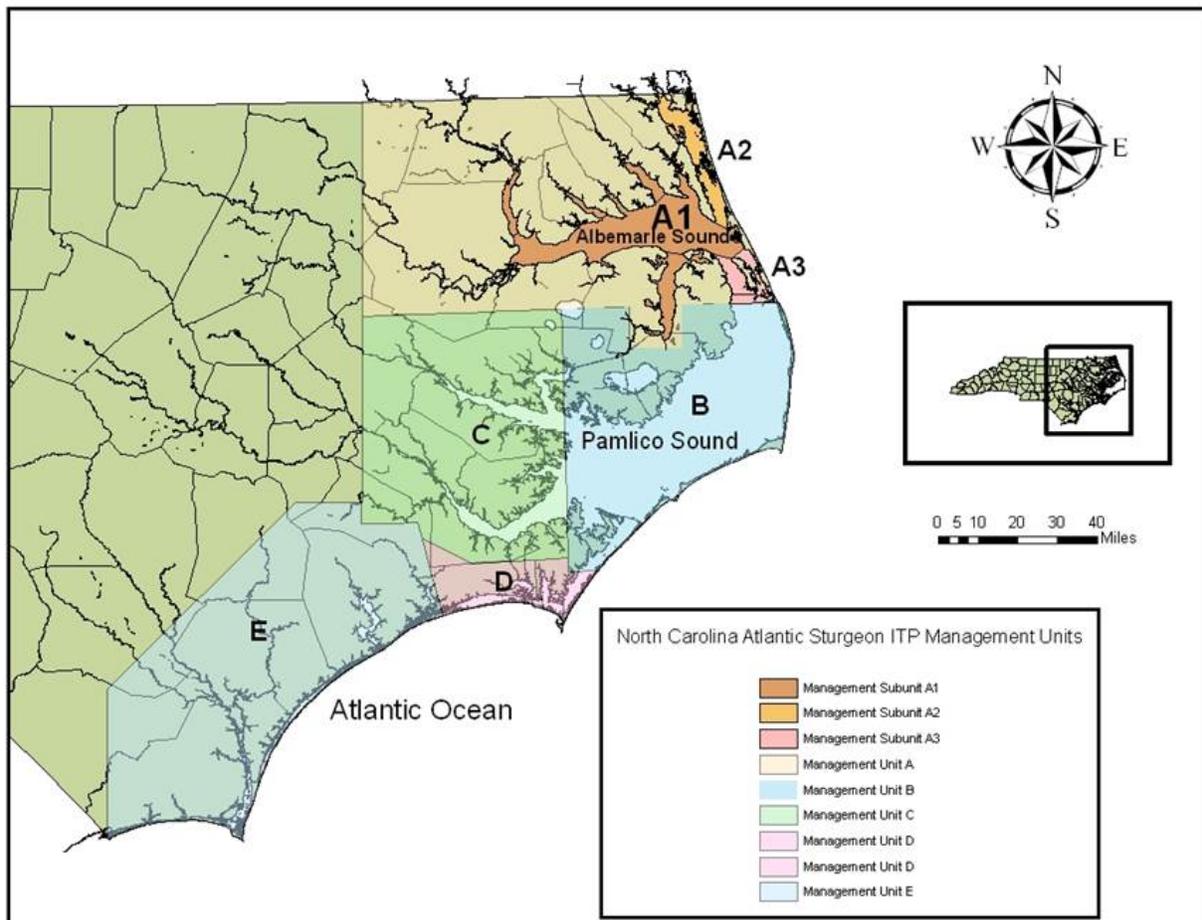


Figure 1. Management units for the North Carolina Atlantic sturgeon ESA section 10(a)(1)(B) incidental take permit (*source*: NCDMF Figure 4 in the application and Conservation Plan).

Biological Environment: The inshore waters of North Carolina support a rich and diverse biota. More than 150 species of fish and invertebrates live in these waters, including shell fish, submerged aquatic vegetation, coastal colonial birds, and sea turtles.

Status of Affected Species: For the purposes of this EA, we focus on the affected species in the permit application, which is most likely to be affected by the alternatives.

Atlantic sturgeon: Atlantic sturgeon are an anadromous and iteroparous fish that range from Newfoundland in Canada south to Florida. They are listed as five DPSs: (1) the “Gulf of Maine (GOM) DPS” (*Threatened* in freshwater ranges), including Atlantic sturgeon originating from the Kennebec River and occurring in other GOM rivers; (2) the “New York Bight (NYB) DPS” (*Endangered*), including Atlantic sturgeon originating from the Hudson and Delaware Rivers; (3) the “Chesapeake Bay (CB) DPS” (*Endangered*), including Atlantic sturgeon originating from the James and York Rivers; (4) the “Carolina DPS” (*Endangered*), including all Atlantic sturgeon spawning in the watersheds from the Roanoke River, Virginia, southward along the southern Virginia, North Carolina, and South Carolina coastal areas to the Cooper River; and the (5) the “South Atlantic DPS” (*Endangered*), including all Atlantic sturgeon spawning in the watersheds of the Ashepoo, Combahee, and Edisto rivers basin in South Carolina to the St. Johns River, Florida. Further, the marine range of Atlantic sturgeon was found to contain individuals mixed from each of the defined population segments extending from the Bay of Fundy, Canada, to the Saint Johns River, Florida. All of the five DPSs may be affected by the recreational and commercial inshore gillnet fishery in North Carolina.

Detailed information on the status of Atlantic sturgeon, including information on population structuring, taxonomy and life history, distribution and abundance, and threats throughout each range, can be found in the ASSRT 2007; www.nmfs.noaa.gov/pr/pdfs/statusreviews/atlanticsturgeon2007.pdf) and the regional proposed listings (75 FR 61904; www.nmfs.noaa.gov/pr/pdfs/fr/fr75-61904.pdf and 75 FR 61872; www.nmfs.noaa.gov/pr/pdfs/fr/fr75-61872.pdf).

A more detailed description of the status of all five DPSs of Atlantic sturgeon is available in the Biological Opinion prepared for the proposed action, and is available to the public and incorporated here by reference.

Anticipated Incidental Take of Atlantic Sturgeon DPSs

NCDMF estimated incidental take of Atlantic sturgeon based on large and small mesh fisheries effort observed in 2010 (Tables 1 and 2). NCDMF amended their fisheries regulations in 2010, which restricted fishing practices and effort. The 2010 regulations were in response to a lawsuit by the Duke Environmental Law and Policy Clinic filed against NCDMF and the NCMFC on behalf of the Karen Beasley Sea Turtle Rescue and Rehabilitation Center for the illegal taking of sea turtles in state regulated inshore gillnet fisheries. Thus, fisheries effort is not anticipated to increase above the 2010 level and is most representative of what is likely to occur for the duration of the permit.

The majority of Atlantic sturgeon caught in inshore gillnet fisheries in North Carolina are less than migratory size (≥ 760 mm TL: Atlantic Sturgeon Status Review Team (ASSRT) 2007).

Smaller fish represent juveniles that have originated from rivers within the geographic area and have not migrated. Therefore, we assume juvenile Atlantic sturgeon that are caught in the North Carolina inshore gillnet fishery are from the Carolina DPS. A breakdown of fish collected through NCDMF gillnet surveys and the Observer Program identifies what proportion could have originated from outside the Carolina DPS based on the 700 mm TL cutoff described in ASSRT 2007. The majority of the take is expected to come from the Carolina DPS, with a smaller fraction from the other DPSs. At this time, data are insufficient to apportion the non-Carolina DPS take across the Gulf of Maine, New York Bight, Chesapeake, and South Atlantic DPSs (Tables 1 and 2). The Conservation Plan includes tagging of bycaught Atlantic sturgeon and collecting fin clips for genetic testing to identify which DPS the fish came from.

Table 2. Estimated annual incidental take of Atlantic sturgeon in North Carolina’s large mesh (≥ 5.0 ISM) inshore gillnet fishery.

Management Unit	Season	Carolina DPS Total Interactions (Mortality)	Other DPS Total Interactions (Mortality)
A	Winter	149 (6)	50 (2)
	Spring	460 (19)	154 (6)
	Summer	157 (6)	52 (2)
	Fall	838 (34)	279 (11)
B	Winter	*2 (1)	--
	Spring	*1 (1)	1 (0)
	Summer	*4 (2)	2 (0)
	Fall	*17 (2)	6 (0)
C	Winter	*2 (1)	--
	Spring	*3 (1)	1 (0)
	Summer	*2 (1)	1 (0)
	Fall	*4 (2)	2 (0)
D	Annual	*8 (2)	--
E	Annual	*8 (2)	--
Total		1,655 (80)	548 (21)

*Total interaction number represents actual observed and not estimated based on observer coverage. Mortality estimates could not be completed for Management Units B-E due to low take; thus, if observed interactions were ≤ 5 mortality was one; if observed interactions were >5 mortality was two.

Table 3. Estimated annual incidental take of Atlantic sturgeon in North Carolina’s small mesh (<5.0 ISM) inshore gillnet fishery.

Management Unit	Season	Carolina DPS Total Interactions (Mortality)	Other DPS Total Interactions (Mortality)
A	Winter	175 (14)	35 (3)
	Spring	219 (17)	44 (4)
	Summer	72 (6)	14 (1)
	Fall	103 (8)	21 (2)
B	Winter	*2 (1)	--
	Spring	*6 (2)	1 (0)
	Summer	*3 (1)	1 (0)
	Fall	*3 (1)	1 (0)
C	Winter	*2 (1)	--
	Spring	*2 (1)	--
	Summer	*2 (1)	--
	Fall	*2 (1)	--
D	Annual	*8 (2)	--
E	Annual	*8 (2)	--
Total		607 (58)	117 (10)

*Total interaction number represents actual observed and not estimated based on observer coverage. Mortality estimates could not be completed for Management Units B-E due to low take; thus, if observed interactions were ≤ 5 mortality was one; if observed interactions were >5 mortality was two.

The requested take in the application is based on Atlantic sturgeon interactions and applied across fishing effort. Thus, the estimate likely is biased high. More information is needed on Atlantic sturgeon population distribution, abundance and trends to predict a percent reduction in bycatch over the duration of the permit (Table 3). Also, NCDMF plans to manage adaptively the impacts to Atlantic sturgeon in their Conservation Plan (below), which makes it difficult to specify take levels in out years. As a result, NCDMF and NMFS agreed to enter an Implementing Agreement that allows setting reduction targets and changing management, if necessary, based on an analysis of the monitoring data collected prior to issuance of the permit and over the first three years of the permit.

Table 4. Requested number of incidental takes of Atlantic sturgeon in the inshore gillnet fishery for large and small mesh gillnet per year for the duration of the permit.

Year	Annual Large Mesh (≥ 5.0 ISM)		Annual Small Mesh (< 5.0 ISM)		Annual Total Interactions (Mortality)
	Carolina DPS Total Interactions (Mortality)	Other DPS Total Interactions (Mortality)	Carolina DPS Total Interactions (Mortality)	Other DPS Total Interactions (Mortality)	
2013	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2014	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2015	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2016	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2017	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2018	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2019	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2020	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2021	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
2022	1,655 (80)	548 (21)	607 (58)	117 (10)	2,927 (169)
Total	16,550 (800)	5,480 (210)	6,070 (580)	1,170 (100)	29,270 (1,690)

Configuration of Takes Per DPS: NCDMF will use the total number of live and also the total number of dead per unit and season to determine if NCDMF is approaching or has reached allowable Atlantic sturgeon takes as depicted above. However, there is no “real time” method to determine the actual DPS taken. The required genetic sampling will provide the actual take numbers per DPS, but this will not be determined until after genetic samples are processed and if funding allows for processing every fish. The best available information for estimating takes per DPS is from mixed stock assessments done by Ike Wirgin and Tim King. The method for estimation of takes per DPS before capture is outlined in Section 6.3.3 and 9 of the Biological Opinion for this permit.

While NMFS will know more about the exact probability of each DPS being affected by these fisheries after genetic processing is completed, NCDMF has provided information on the sizes of Atlantic sturgeon captured in previous monitoring. The sizes indicate the majority of Atlantic sturgeon captured as bycatch range from juveniles to small sub-adults. Because of this, NMFS believes that as many as 75% of the sturgeon and half of the sub-adult sturgeon will likely be from the Carolina DPS. That percentage during any given year, however, could be lower due to a small juvenile population and a higher percentage of sub-adult fish present from other areas. There will be years when as many as 40% of the Atlantic sturgeon captured could be from the South Atlantic or Chesapeake Bay DPSs. The Hudson River population, based on mixed stock assessments from the Chesapeake Bay (Bartron et al. 2007), New York (Wirgin and King 2011), and Canada (Wirgin et al. 2012) is more concentrated around the northeast coast of North America, with fewer proportional individuals in Canada and fewer individuals south of Chesapeake Bay. The highest composition of New York Bight DPS fish likely to be present in North Carolina during any year could be as high as 10%. The Gulf of Maine, which makes up

less than 3% of the Atlantic sturgeon identified as far south as the Chesapeake Bay (Bartron et al. 2007) is not likely to account for any more than 3% of the sturgeon captured in North Carolina. These percentage estimates are reflected in Tables 5 and 6. However, it is important to note that, because of uncertainty about the exact proportion of each DPS in inshore waters of North Carolina, the fact that a sample of the entire population will be representative of the actual proportion of each DPS but will vary around the mean, and the fact that the proportions of each DPS in inshore waters of North Carolina will naturally fluctuate seasonally and annually, the take estimates provide a maximum proportion of each DPS to be affected and do not attempt to estimate the exact proportion of each DPS to be taken.

Table 5. Total annual harassment caused by small mesh and large mesh gill nets in North Carolina.

Atlantic sturgeon DPS	Annual small mesh	Annual large mesh	Total
Total	724	2,203	2,927
Carolina DPS	Up to 543 of 724*	Up to 1,653 of 2,203*	Up to 2,196 of 2,927*
Chesapeake Bay DPS	Up to 290 of 724*	Up to 882 of 2,203*	Up to 1,171 of 2,927*
South Atlantic DPS	Up to 290 of 724*	Up to 882 of 2,203*	Up to 1,171 of 2,927*
New York Bight DPS	Up to 73 of 724*	Up to 221 of 2,203*	Up to 293 of 2,927*
Gulf of Maine DPS	Up to 22 of 724*	Up to 67 of 2,203*	Up to 88 of 2,927*

* Total annual take will not exceed the identified totals, however the DPS make-up of that total take may fluctuate annually.

Table 6. Total annual mortalities caused by small mesh and large mesh gill nets in North Carolina.

Atlantic sturgeon DPS	Annual small mesh	Annual large mesh	Total
Total	68	101	169
Carolina DPS	Up to 51 of 68*	Up to 76 of 101*	Up to 127 of 169*
Chesapeake Bay DPS	Up to 28 of 68*	Up to 41 of 101*	Up to 68 of 169*
South Atlantic DPS	Up to 28 of 68*	Up to 41 of 101*	Up to 68 of 169*
New York Bight DPS	Up to 7 of 68*	Up to 11 of 101*	Up to 17 of 169*
Gulf of Maine DPS	Up to 3 of 68*	Up to 4 of 101*	Up to 6 of 169*

* Total annual take will not exceed the identified totals, however the DPS make-up of that total take may fluctuate annually.

Listed Sea Turtles: Concurrent with the application process for Permit #18102, NMFS has issued a separate permit (# 16230) for the incidental take of five sea turtle species (green turtle (*Chelonia mydas*), Kemp's ridley turtle (*Lepidochelys kempii*), hawksbill turtle (*Eretmochelys imbricata*), leatherback turtle (*Dermochelys coriacea*) and the loggerhead turtle (*Caretta caretta*)) in the same inshore gillnet fisheries. As such, this Atlantic sturgeon EA and associated Atlantic sturgeon permit documents do not specifically consider the impacts to sea turtles, as listed sea turtles have been considered fully in the separate permit process and corresponding ESA consultation and we incorporate these documents (permit 16230 and its Conservation Plan, EA, biological opinion, implementing agreement) here by reference. A summary of these documents is as follows.

The NCDMF implemented a wide range of commercial gillnet regulations through proclamation

in 2010 in response to the lawsuit filed against NCDMF and the NCMFC for the illegal taking of sea turtles in state regulated inshore gill net fisheries, and the resulting Settlement Agreement. Gillnet restrictions implemented by the proclamation include: restricted stretch mesh size range of 4 ISM to, and including, 6 ½ ISM for large mesh gill nets; soak times limited to overnight soaks an hour before sunset to an hour after sunrise, Monday evenings through Friday mornings; height restricted to no more than 15 meshes, constructed with a lead core or leaded bottom line and without corks or floats other than needed for identification; tie-downs are prohibited; gill nets restricted to a maximum of 2,000 yards per vessel or 1,000 yards per vessel depending on area fished; and individual net (shot) length restricted to 100 yards with a 25-yard break between shots. These requirements were considered a baseline for the action and the resulting beneficial effects to sea turtles by reducing the number that are incidentally captured in the recreational and commercial gill net fisheries. The mortalities resulting from the North Carolina inshore gillnet fishery may result in impacts to the recovery of sea turtle species in the wild. However, it is difficult to identify the impact of this individual fishery on sea turtle populations as there are a number of other stressors on the population that must be considered as cumulative effects. Additionally, due to the uncertainty of population estimates for each sea turtle species found in North Carolina's waters, it is not possible to know the specific impact of the North Carolina gillnet fishery on these sea turtle species.

NMFS also prepared a biological opinion for issuance of the sea turtle permit, pursuant to section 7(b) of the ESA, evaluating the effects of the issuance of the ITP on listed species under NMFS' jurisdiction. NMFS analyzed the best available scientific and commercial data, the current status of the species, environmental baseline, effects of the proposed action, and cumulative effects to determine whether the proposed action is likely to jeopardize the continued existence of any sea turtle species. In doing so, the analysis focused on the impacts and population response of sea turtles in the Atlantic Ocean. However, except for the NW Atlantic loggerhead turtles that have been listed as a DPS, the impact of the effects of the proposed action on the Atlantic populations is directly linked to the global populations of the species, and the final jeopardy analysis is for the global populations as listed in the ESA.

Based upon the analyses described in the biological opinion, it is NMFS' opinion that issuance of the ITP and the operation of the North Carolina inshore gillnet fisheries under NCDMF management as described in the conservation plan:

- is not likely to jeopardize the continued existence of loggerhead, green, hawksbill, Kemp's ridley, or leatherback sea turtles.

Critical habitat has not been designated for these species in the action area; therefore, the destruction or adverse modification of critical habitat will not occur.

Florida manatee: The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over the Florida manatee and has provided permit conditions to limit interactions and avoid injury to endangered Florida manatee. These conditions are part of the permit and are included in Appendix II.

Essential Fish Habitat: North Carolina estuarine waters are characterized as inshore waters, and are considered Essential Fish Habitat (EFH) for various life stages of shrimp species,

snapper grouper, bluefish, summer flounder, gag grouper, gray snapper, cobia, king mackerel, Spanish mackerel, black sea bass, and spiny dogfish. EFH means that those waters and substrate are necessary for fish to spawn, breed, feed or grow to maturity (Magnuson-Stevens Fishery Conservation and Management Act, as amended in 2007, 16 U.S.C. 1801 et seq). EFH types found within inshore waters of North Carolina include state designated nursery and overwintering areas, tidal freshwater and estuarine emergent wetlands, submerged aquatic vegetation, unconsolidated bottom, hardbottom, inter- and subtidal non-vegetated flats, and oyster reefs.

No other species are likely to be affected by issuance of the proposed permit to take Atlantic sturgeon incidental to the legal inshore gillnet fishery in North Carolina.

Social and Economic Environment: A variety of human activities may occur in the action area such as commercial fishing, recreational fishing, recreational boating, ecotourism, and other commercial uses, such as shipping. For the purposes of this EA, the inshore gillnet fishery likely is the most affected resource. The socioeconomic characteristic of commercial fishing varies by county and region along the coast of North Carolina. The commercial fishing industry was a significant economic factor for some of the more prominent coastal fishing counties including Dare, Carteret, Pamlico, Hyde, and Tyrrell counties (Bianchi 2003). In these counties, 4% (greater than 8% in Hyde County) of the workforce participated in commercial fishing. Also in these counties, the average income of commercial fishermen was greater than the average annual wage per employee. In Albemarle and Pamlico Sounds, 40% of commercial fishermen made more than \$15,000 per year and 59% had annual household incomes greater than \$30,000 (Crosson 2007a). In the Core Sound region, commercial fishing accounted for 70% of the income on average of surveyed fishermen; however, only 53% made more than \$5,000 from commercial fishing (Crosson 2007b). The median household income for those surveyed was approximately \$40,000 (Crosson 2007b). In the southern part of the state, 5% of the commercial fishermen made \$30,000 or more from commercial fishing; however, less than 20% of these fishermen reported annual household incomes of more than \$50,000 (Crosson 2010).

Ex-vessel value is a measure of payment a fishermen receives from a fish dealer for landed product and provides an indicator of the value of a fishery. Total landings (all finfish and shellfish) throughout North Carolina were valued (ex-vessel) at approximately \$70 million in 2011. Inshore landings accounted for 64% of the total and were valued at \$44 million in 2011. From 1994 to 2011, the mean value of commercial fishing operations in North Carolina inshore waters was \$58 million per year. Inshore gillnets were responsible for landings valued at \$5.1 million in 2011 and averaged \$6.1 million per year from 1994 to 2011.

As fishermen spend their earnings in community stores, shipyards, offices, and other businesses, additional economic impacts are generated. NCDMF estimates that each \$1 spent generates approximately \$1.50 in economic impact within North Carolina. Inshore gillnet landed species contribute to the businesses of primary dealers and processors and are estimated to have an economic impact of \$255 million per year to the state economy (Hadley and Crosson 2010). These estimates do not include impacts of locally caught seafood that support ancillary businesses (e.g., restaurants, shipping and refrigeration companies).

Historic Places, Scientific, Cultural, and Historical Resources: Numerous historic, scientific, cultural, and historical resources are found throughout the action area [<http://gis.ncdcr.gov/hpweb/>]. Four sites established under the National Estuarine Reserve System occur in the area: Currituck Banks, Beaufort (Rachel Carson), and Masonboro and Zeke's Islands [<http://nerrs.noaa.gov/Reserve.aspx?ResID=NOC>]. Six sites established under the North Carolina Coastal Reserve occur in the area: Buxton Woods, Kitty Hawk Woods, Permuda Island, Bald Head Island, Bird Island, and Emily and Richardson Preyer Buckridge [<http://www.nccoastalreserve.net/>]. These ten sites were established for long-term research, education, and stewardship of inshore resources.

5.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

This section presents the scientific and analytic basis for comparison of the direct, indirect, and cumulative effects of the alternatives. Regulations for implementing the provisions of NEPA require considerations of both the context and intensity of a proposed action (40 CFR §1508.27).

Effects Under All Alternatives: The NCDMF implemented new commercial gillnet regulations through proclamation in 2010 in response to the suit filed against NCDMF and the NCMFC for the illegal taking of sea turtles in state regulated inshore gillnet fisheries. Gillnet restrictions implemented by the proclamation include: restricted stretch mesh size range of 4 ISM to, and including, 6 ½ ISM for large mesh gillnets; soak times limited to overnight soaks an hour before sunset to an hour after sunrise, Monday evenings through Friday mornings (except for the southern portion of the state); height restricted to no more than 15 meshes, constructed with a lead core or leaded bottom line and without corks or floats other than needed for identification; tie-downs are prohibited; gillnets restricted to a maximum of 2,000 yards per vessel or 1,000 yards per vessel depending on area fished; and individual net (shot) length restricted to 100 yards with a 25-yard break between shots. Although the regulations were designed to minimize incidental capture of sea turtles, bycatch estimates of Atlantic sturgeon dropped significantly from 2009 to 2010 (70% reduction in large mesh and 45% reduction in small mesh). Because the new regulations have already taken effect, the resulting beneficial effects to Atlantic sturgeon by reducing the number of sturgeon that are incidentally captured in the recreational and commercial gillnet fisheries deploying anchored sets and operating in inland fisheries would be the same under all Alternatives.

Negative effects would occur when the North Carolina inshore gillnet fishery results in incidental takes of Atlantic sturgeon, including live releases and mortalities. Incidental capture of Atlantic sturgeon in the gillnet fishery might have negative impacts on the individuals captured. It is important to recognize that an adverse effect on a single 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) that causes 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 take of individual animals by the fishery would first have to result in:

- direct mortality,
- serious injury that would lead to mortality, or

- disruption of essential behaviors such as feeding or spawning, to a degree that the individual's likelihood of successful reproduction or survival was substantially reduced.

That mortality or reduction in the individual's likelihood of successful reproduction or survival would then have to result in a net reduction in the number of individuals of the species. In other words, the loss of the individual or its future offspring would not be offset by the addition, through birth or emigration, of other individuals into the population. In order for the proposed action to have an adverse effect on the species, the adverse impacts to individuals would need to be linked to a net loss to the species that would have to be reasonably expected, directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of the listed species in the wild.

The magnitude of this impact on loss of Atlantic sturgeon due to mortality at the level addressed under the permit would likely reduce a portion of the population as specified, although the population size is unknown so we cannot produce an exact estimate. Therefore, we can only reason a magnitude based on percent mortality commented on by researchers such as Bahn *et al.* (2012) and keep overall mortality under the stated percentage values. Impacts below the mortality level, such as impacts to reproduction or survival would be anywhere from none at all to injury and mortality, reduced fecundity, and delayed or aborted spawning migrations (Moser and Ross 1995, Collins *et al.* 2000, Moser *et al.* 2000).

Mortality is expected to result for 2.3% of sturgeon incidentally captured in set nets (Bahn *et al.* 2012). This 2.3% mortality rate takes into account the potential for occasional years with higher sturgeon mortality, such as the 8% mortality rate observed in 2007 in the Altamaha River, Georgia, by Bahn *et al.* (2012). NCDMF requested an overall mortality rate of 5.8%, which breaks down to: Carolina DPS 4.8% mortality in large mesh (≥ 5.0 ISM) and 9.5% in small mesh (< 5.0 ISM); all other DPSs combined 3.8% in large mesh (≥ 5.0 ISM) and 8.5% in small mesh (< 5.0 ISM). In addition to the captures that are expected to result in known mortalities, an unknown proportion of the Atlantic sturgeon that are released alive will succumb to post-release mortality or sub-lethal effects resulting in aborted spawning runs or failed reproductive efforts.

The effects of incidental capture of sturgeon in the gillnet fishery are expected to be similar to the effects of capture of sturgeon for research purposes using anchored gillnets. Entanglement in nets could result in injury and mortality, reduced fecundity, and delayed or aborted spawning migrations of sturgeon (Moser and Ross 1995, Collins *et al.* 2000, Moser *et al.* 2000). Also, during periods of warm water or low dissolved oxygen, fish have been lethally stressed (Hastings *et al.* 1987, Secor and Gunderson 1998).

Handling and restraining sturgeon may cause short-term stress responses, but those responses are not expected to result in pathologies because commercial fishermen release sturgeon immediately after they are removed from their nets. Sturgeon may inflate their swim bladder when held out of water (Moser *et al.* 2000), and if they are not returned to neutral buoyancy prior to release, they will float and be susceptible to sunburn and predation. Collins *et al.* (1996) note that as much as 20% of the shortnose sturgeon bycatch in the shad fishery are injured during capture. Bahn *et al.* (2012) discussed post-release mortality without mentioning any injuries; therefore, we assume there were likely no injuries observed because they would have been

important in the post-release mortality discussion. We anticipate the number of sturgeon injured as bycatch to be between the number observed in South Carolina (20%) and the number reported during monitoring of the Altamaha River (0%), resulting in no more than 10% of the sturgeon bycatch being injured.

Under some conditions, pre-spawning adults will interrupt or abandon their spawning migrations after being handled (Moser and Ross 1995). However, spawning Atlantic sturgeon are not likely to be intercepted by the fishery because of the size gillnets used, the timing, and the location of the nets. The majority of fish caught in gillnets operating in inland water of North Carolina are less than 760 mm TL (ASSRT 2007) indicating they have not migrated and are pre-spawn.

Essential Fish Habitat: The recreational and commercial gillnet fishery is an ongoing activity and the alternatives considered in this EA, including the proposed action, would not reduce the quality and/or quantity of EFH. The issuance of the permit will require NCDMF to adaptively manage their inshore gillnet fishery deploying anchored sets for Atlantic sturgeon bycatch. Adaptive management includes a suite of alternatives, including season and area closures, which will reduce overall fishing effort. If any shift in effort occurs, the NCDMF Observer Program will also shift effort to continue required levels of coverage for the fishery.

Further, gillnets using anchored sets have minimal effects on EFH as compared to trawls (Barnette 2001). Barnette (2001) summarizes many other studies that examined the effects of gillnets and found them not to be a major contributor to bottom disturbance (Carr 1988; ICES 1991; West *et al.* 1994; ICES 1995; Kaiser *et al.* 1996). As such, NMFS does not anticipate any impacts of issuing this ITP on EFH since the nets would not come in contact with EFH at all. NMFS submitted the proposed ITP application to NMFS Office of Habitat Conservation and received a response on August 1, 2013 which stated that “NMFS concurs with the Office of Protected Resources that the actual taking of ESA-listed species, proposed monitoring plan, and mitigation measures such as mandatory attendance, yardage and mesh size limits, soak-time restrictions, net shot limits, etc., does not adversely affect Essential Fish Habitat.”

Historic Places, Scientific, Cultural, and Historical Resources: Numerous scientific, cultural and historical resources are found throughout the action area. The commercial gillnet fishery deploying anchored sets and operating in inshore waters does not preclude availability for other scientific, cultural, or historic uses. All of the alternatives considered, the action would not occur in or indirectly affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause loss or destruction of significant scientific, cultural or historical resources or preclude their availability for other scientific, cultural, or historic uses. Thus, effects on such resources are not anticipated under any alternative.

Effects of the No Action Alternative (Alternative 1): In this EA, NMFS will assume for the No Action Alternative that the status quo would largely be maintained for the fishery. Because no incidental take permit would be issued, NCDMF would not receive an exemption from the ESA prohibitions against take, therefore, any incidental takes of Atlantic sturgeon resulting from the recreational and commercial gillnet fishery deploying anchored sets and operating in inshore waters would not be exempted.

While NMFS cannot know for certain what measures the State would implement absent the permit, we will assume for purposes of analysis in the EA that the full suite of measures to monitor, minimize, and mitigate the impact of incidental take under the proposed conservation plan and permit would not be implemented. Thus, the overall beneficial effects expected for the species from implementing that full suite of measures would not be achieved. In addition, it is possible that NCDMF would amend their fishing regulations to be less restrictive than they are under the existing regulatory structure. The recreational and commercial gillnet fishery would thus continue to result in adverse effects to Atlantic sturgeon at levels commensurate with the fishery as operated under its past or current regulatory structure.

To the extent that this alternative would limit additional burdens on recreational and commercial gillnet fishermen (e.g. allowing more yardage, net shots, avoiding additional reporting requirements, education etc.), the No Action Alternative would have less of an adverse socio-economic impact than the two action alternatives.

Effects of Issuing the Permit as Requested in the Application (Alternative 2 Proposed Action): The issue most relevant to this analysis is the potential for impacts on the incidentally captured Atlantic sturgeon. In addition to the effects described in the “Effects Common to All Alternatives” section, multiple positive effects (described below; 1) avoiding areas where high numbers of Atlantic sturgeon bycatch occurs or may occur in gillnet fisheries operating in inshore waters would result in fewer individual sturgeon being injured or killed, which potentially has a positive effect on the populations those individuals represent; 2) providing better education as to handling of sturgeon, more frequent net checks, reporting, and release; 3) better tracking of sturgeon) to Atlantic sturgeon would occur upon implementation of the Conservation Plan and compliance with the terms and conditions of the permit.

Implementation of adaptive management to close or restrict fishing effort in areas of high Atlantic sturgeon abundance or encounter rates with gillnets will result in beneficial effects on Atlantic sturgeon over the No Action alternative (Alternative 1). Avoiding areas where high numbers of Atlantic sturgeon bycatch occurs or may occur in gillnet fisheries operating in inshore waters would result in fewer individual sturgeon being injured or killed, which potentially has a positive effect on the populations those individuals represent.

Implementation of the proposed mitigation and monitoring measures would provide education to recreational and commercial gillnet fishermen on identification of sturgeon species; proper handling techniques to minimize impacts to incidentally captured sturgeon, including the importance of frequently checking nets and immediately releasing sturgeon that were incidentally captured; the biological and legal importance of reporting incidental capture of sturgeon; and the importance of accurately recording sturgeon encounters and returning the trip tickets in a timely manner.

The combination of onboard observers, alternative platform observers, Marine Patrol officer reports and the Trip Ticket Program would result in NCDMF better tracking incidental captures of Atlantic sturgeon in the recreational and commercial gillnet fishery, compared to the No Action alternative.

Training and requiring observers to collect fin samples and tagging sturgeon caught incidentally in gillnet fisheries operating in inshore waters would result in a better understanding of the number and composition of Atlantic sturgeon DPSs being taken. Captured individuals would be PIT tagged and a 1cm² portion of their pelvic fin removed for genetic analysis using the methods described in Kahn and Mohead (2010). Total handling time is expected to be approximately 5-10 min. The sturgeon would then be released alive. PIT tags ensure unique identification upon capture or recapture for population and growth estimates. To avoid duplicate tagging, all sturgeon would be scanned with a PIT tag reader prior to the insertion of a PIT tag. Tagging procedures could result in stress during restraint and minor wounds from insertion. PIT tag use is not known to have any other direct or indirect effects on sturgeon when tags are appropriately sized and inserted correctly. There has been reported shortnose sturgeon mortality as a result of PIT tags being too large for the fish or inserted too deeply. Henne et al. (2008) found that 14mm tags inserted into smaller shortnose sturgeon (150 to 220 mm total length TL) caused 40% mortality after 48 hours; however, no mortality occurred in a larger group of juvenile sturgeon measuring 250 to 330 mm TL using smaller 11.5mm PIT tags. Therefore, to address these concerns, permit conditions would restrict NCDMF from PIT tagging sturgeon <250mm TL, the same size animals that have been authorized to be tagged for over 10 years in prior permits resulting in no mortality. As such, the tagging of Atlantic sturgeon with PIT tags is unlikely to have significant adverse impacts on sturgeon. Collection of a small (1 cm²) genetic tissue sample, clipped with surgical scissors from a section of soft fin rays of incidentally captured sturgeon, does not appear to impair the sturgeon's ability to swim and is not thought to have any long-term adverse impact (Kahn and Mohead 2010). Many researchers have removed tissue samples according to this same protocol reporting no adverse effects; therefore NMFS does not anticipate any long-term adverse effects to the sturgeon from this activity.

NCDMF will analyze the first three years of the monitoring program to better understand Atlantic sturgeon bycatch estimates, distribution, abundance, and population trends, where possible. NCDMF, in consultation with NMFS, will adjust their management program, if necessary, based on the analysis of the monitoring data.

NMFS has undergone Endangered Species Act section 7 consultation with NMFS' Endangered Species Act Interagency Cooperation Division to ensure the issuance of Permit 18102 is not likely to jeopardize the continued existence of NMFS ESA-listed species or to result in the destruction or adverse modification of designated critical habitat. That consultation produced a Biological Opinion which concluded the following:

After reviewing the current status of endangered South Atlantic, Carolina, Chesapeake Bay, and New York Bight DPSs of Atlantic sturgeon and threatened Gulf of Maine Atlantic sturgeon, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is NMFS' Opinion that the issuance of this incidental take permit to the state of North Carolina is not likely to jeopardize the continued existence of South Atlantic, Carolina, Chesapeake Bay, New York Bight, or Gulf of Maine DPS Atlantic sturgeon. Critical habitat has not been designated or proposed for these DPSs. Critical habitat will therefore not be affected by this action.

Issuance of the proposed Permit 18102 would not involve alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat. Thus, effects on habitat are not anticipated.

To the extent that this alternative would result in additional requirements (in terms of fishing time) to recreational and commercial gillnet fishermen deploying anchored sets and operating in inshore waters, NCDMF could potentially close areas or further restrict fisheries practices and effort in areas and times identified as a high potential for Atlantic sturgeon bycatch. This would result in adverse socio-economic impacts to the fishing community and ancillary businesses that are greater than the no action alternative (Alternative 1). Under this alternative, other management areas would still remain open to large and small mesh gillnets. While we cannot know for sure how fishing practices may shift due to a hotspot or other closure, or if most of the fishing effort would shift to other management areas, it is unlikely that overall fishing effort would be significantly impacted. Furthermore, the permit and conservation plan are based in large part on the existing regulations, and NMFS does not anticipate any additional incremental impact resulting from issuance of the permit.

Effects of Issuing the Permit with Reductions in Large and Small Mesh and Expansion of Weekly Closures (Alternative 3): The issue most relevant to this analysis is the potential for impacts on incidentally captured Atlantic sturgeon. In addition to the effects described in the “Effects Common to All Alternatives” section, and the positive effects described in Alternative 2 (Proposed Action), this alternative would further benefit Atlantic sturgeon by reducing fishing effort and thereby reducing the number of sturgeon captured incidentally in the fishery.

This alternative would result in a lower number of takes authorized by the proposed permit for Atlantic sturgeon than in Alternative 2, but a quantitative reduction target cannot be identified. Reducing fishing effort through restrictions on yardage fished, soak times, attendance requirements in certain areas and times, and extending the 3-day weekly closure to all inshore waters, may result in varying levels of benefit through bycatch reduction, depending on Atlantic sturgeon distribution and abundance. Understanding the amount of bycatch reduction is further confounded by the fact that this alternative incorporates the NCDMF’s Conservation Plan in Alternative 2, which relies on an adaptive management program to respond proactively and reactively to the potential for high encounter rates for Atlantic sturgeon in the gillnet fishery operating in inshore waters. Thus, NMFS concludes this alternative would result in a lower, but unspecified, number of Atlantic sturgeon takes.

To the extent that this alternative would result in additional burdens to recreational and commercial gillnet fishermen deploying anchored sets and operating in inshore waters, NCDMF would further limit gillnet fishing in all inshore waters to a 3-day closure and limit yardage and soak times and require attendance in certain areas and times. This would result in adverse socio-economic impacts to the fishing community and ancillary businesses that are greater than the No Action (Alternative 1) and Proposed Action (Alternative 2) alternatives.

Cumulative Impacts: Cumulative effects are defined those that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such actions.

Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

Historically, one of the major contributors to declines in Atlantic sturgeon populations was direct commercial harvest of this fish. A coast-wide moratorium on harvesting Atlantic sturgeon was implemented in 1998 pursuant to Amendment 1 of the Atlantic States Marine Fisheries Commission's (ASMFC) Interstate Fishery Management Plan for Atlantic sturgeon (ASMFC, 1998). Retention of Atlantic sturgeon from the U.S. Exclusive Economic Zone (EEZ) was prohibited by NMFS in 1999 (64 FR 9449; February 26, 1999). However, despite these prohibitions on directed fishing for and retention of incidentally caught Atlantic sturgeon, other anthropogenic activities continue to take Atlantic sturgeon. These include incidental bycatch in commercial fisheries, vessel strikes, activities affecting water quality, and habitat disturbances such as dredging.

Dissolved Oxygen (DO), Temperature, and Salinity: Operation of the fishery under different DO, temperature, and salinity regimes will vary the effects of net capture on Atlantic sturgeon resulting in a cumulative effect. Research has revealed that sturgeon survival is affected by a relationship between temperature, dissolved oxygen, and salinity. Jenkins *et al.* (1993), Secor and Gunderson (1998), Niklitschek (2001), Secor and Niklitschek (2002), and Niklitschek and Secor (2009) demonstrated shortnose and Atlantic sturgeon survival in a laboratory setting was affected by reduced dissolved oxygen, increased temperature, or increased salinity. Other researchers have demonstrated similar relationships between temperature, dissolved oxygen, and salinity in green sturgeon (Van Eenennaam *et al.* 2005, Allen *et al.* 2006, Allen and Cech 2007). Likewise, Altinok *et al.* (1998), Sulak and Clugston (1998), Sulak and Clugston (1999), and Waldman *et al.* (2002) reported high temperatures, low dissolved oxygen, and high salinities result in lower survival of Gulf sturgeon.

Considerable work has been conducted on temperature tolerances of sturgeon (Wang *et al.* 1985, Wehrly 1995, Kynard 1997, Campbell and Goodman 2004, Cech and Doroshov 2004, Van Eenennaam *et al.* 2005, Ziegeweid *et al.* 2007, Sardella *et al.* 2008). In recent work on critical thermal maximum, Ziegeweid *et al.* (2007) demonstrated hatchery-raised young of year shortnose sturgeon can tolerate between 28° and 30°C, while the maximum safe temperature limits for adults ranges between 28° and 31°C. Kynard (1997) also notes empirical temperatures of 28° to 30°C in summer months creates unsuitable shortnose sturgeon habitat. Atlantic sturgeon experience lower survival when water temperatures exceed 28°C (Niklitschek and Secor 2005). Mayfield and Cech (2004) estimated the lethal water temperature for green sturgeon in the wild at 27°C. Given the inshore gillnet fishery operates year-round, sturgeon caught during warmer months are anticipated to be more affected than those caught during the colder winter months.

There is no clear evidence to suggest minimum water temperatures negatively affect sturgeon when captured beyond the early life stages. However, when air temperatures are below freezing, sturgeon handling protocols for researchers recommend that handling be limited to less than two minutes to prevent exposure of a sturgeon's skin to freezing temperatures (Kahn and Mohead 2010).

Because warm water can hold less dissolved oxygen, percent oxygen saturation is a measurement that accounts for water temperatures and dissolved oxygen concentrations, providing a general index of how much dissolved oxygen is available to sturgeon under various environmental conditions. The 24-hour dissolved oxygen concentration lethal to 50% of the test fish (LC50) for shortnose sturgeon is documented between 2.2 and 3.1 mg/L at temperatures ranging from 22°C to 29°C (Campbell and Goodman 2004) and between 4.3 and 4.7 mg/L for shortnose and Atlantic sturgeon at temperatures ranging from 22° and 27°C, respectively (Secor and Niklitschek 2002). Further, acute lethal effects to shortnose and Atlantic sturgeon were observed when DO was 3.3 mg/L at temperatures between 22° and 27°C (Secor and Niklitschek 2002). Survival of Atlantic sturgeon was observed to be 100% in water temperatures of 26°C with 7 mg/L dissolved oxygen; however, 12% survival was observed in waters with 3 mg/L dissolved oxygen at the same temperature (Secor and Gunderson 1998). Even when water temperatures were only 19°C and dissolved oxygen was 3 mg/L, 25% of the Atlantic sturgeon died. Jenkins *et al.* (1993) confirmed 12% mortality for 339 mm juvenile sturgeon when held at 2.5 mg/L dissolved oxygen and 22.5°C, while no sturgeon died when dissolved oxygen was above 4 mg/L at any temperature. Likewise, Secor and Gunderson (1998) found the dissolved oxygen level required avoiding mortality was 5 mg/L. Hypoxia for many *Acipenser* species has been documented to begin at 4 mg/L (Cech *et al.* 1984, Jenkins *et al.* 1993, Secor and Gunderson 1998). Similarly, Cech and Crocker (2002) identified hypoxia for sturgeon as 58% oxygen saturation.

NMFS recognizes that there are synergistic effects of water temperature and dissolved oxygen, but it is clear from reported empirical catch data and scientific literature that higher temperatures and lower dissolved oxygen levels stress sturgeon; even if the percent oxygen saturation remains constant or increases, water temperature and dissolved oxygen can be responsible for mortality events. Each individual sturgeon will react differently to changes in environmental conditions such as water quality, salinity, and stress associated with incidental capture. Because the gillnet fishery takes place year round, water temperatures could be warmer than the temperatures described above and higher mortality may be expected during certain months based on high temperatures and low dissolved oxygen concentration.

Given the implications of water temperature, dissolved oxygen, and percent oxygen saturation, both soak times and mesh size of gillnets are important factors in the survival of incidentally captured sturgeon. Mesh size that is too small for the targeted life stage is more likely to constrict gills resulting in mortality via suffocation. Therefore, NMFS recommendations for researchers intentionally capturing sturgeon indicate mesh size for gillnetting sturgeon should be carefully considered and appropriate for the species and life stage targeted (Kahn and Mohead 2010). For example, due to disproportionately high reports of Atlantic sturgeon mortality using 10.0 ISM (Balazik *et al.* 2009), NMFS recommends this size mesh not be used to sample adult Atlantic or Gulf sturgeon (Kahn and Mohead 2010).

Safe net soak times are influenced by water temperature, dissolved oxygen, and, to a lesser extent, salinity. While there are no publications documenting the effects of soak times on mortality rates of sturgeon, there is consensus among sturgeon researchers that shorter soak times are safer than longer soak times (Mark Collins, South Carolina Department of Natural Resources; Matt Fisher, Delaware Division of Fish and Wildlife; Dewayne Fox, Delaware State University; Chris Hager, Virginia Institute of Marine Science; Doug Peterson, University of

Georgia; William Post, South Carolina Department of Natural Resources; Mike Randall, United States Geological Survey (USGS); and Ken Sulak, USGS, pers. comm.).

NMFS recommends maximum net set durations at certain water temperatures for intentional capture of sturgeon during research (Table 7; Kahn and Mohead 2010). Mortalities have been documented in the empirical records of researchers while fishing above 20°C at net set durations ranging from 45 minutes to 24 hours. NCDMF requires soak times to be limited to overnight soaks an hour before sunset to an hour after sunrise Monday evenings through Friday mornings and requires attendance of small mesh gillnets in certain areas and seasons. Therefore, NMFS expects sturgeon that are incidentally caught in anchored gillnets would be released within 24 hours.

Table 7. NMFS-recommended maximum net set durations at certain water temperatures for intentional capture of sturgeon during research for Gulf, Atlantic, and shortnose sturgeon.

Net set duration (hours)	Temperature at sampling depth	Minimum Dissolved Oxygen at sampling depth	% oxygen saturation at sampling depth
14 [†]	Up to 15°C	4.5 mg/L	55%
4	15° to 20°C	4.5 mg/L	55%
2	20° to 25°C	4.5 mg/L	55%
1	25° to 28°C	4.5 mg/L	55%
No sampling	Over 28°C	4.5 mg/L	55%

[†] Net set duration for Gulf sturgeon should not exceed four hours for all temperatures up to 20°C.

When following the protocols in Table 7 between 2005 and 2009, East Coast sturgeon researchers recorded over 3,800 captures of shortnose sturgeon resulting in no mortality. However, while fishing outside of these recommended criteria, the same researchers experienced a 0.6% mortality rate of captured shortnose sturgeon. The primary causes of mortality identified during a review of all scientific research permits issued prior to 2005 were due to high water temperature, low dissolved oxygen concentration, and extended net set duration. Because the NCDMF inshore gillnet fishery operates year round, mortality may be high depending on water temperature, dissolved oxygen concentration, and net set duration.

The new commercial gillnet fishery regulations went into effect in 2010, and burdens to the recreational and commercial inshore gillnet fishermen resulting from the regulations exist under all alternatives.

Today, sturgeon may be adversely affected by human activities or the result of human activities including incidental capture and poaching, ship strikes, artificial propagation, dams, dredging and blasting, poor water quality, and contaminants. For all of these activities or their results, lethal takes of sturgeon and the disturbance resulting in displacement of animals or abandonment of behaviors such as feeding or breeding by groups of animals are possible and may have cumulative effects on the species.

Atlantic sturgeon have been the focus of field studies for decades. Over time, NMFS has issued dozens of scientific research permits for takes of sturgeon within its range for a variety of activities including capture, handling, lavage, laparoscopy, bloodwork, habitat, spawning verification, genetics, aging, and tracking. As such, all scientific research permits have been conditioned with mitigation measures to ensure that the research minimizes adverse impacts to target and non-target species as much as possible. The purpose of issuing ESA scientific research permits is to gain knowledge needed to help conserve and recover it.

Range wide, there are currently 12 permits for Atlantic sturgeon research occurring in similar or overlapping action areas. A biological opinion was issued for each of these actions, including the requirement for consideration of cumulative effects to the species (as defined for ESA). For each of the actions, the biological opinion concluded that issuance, as conditioned, would not likely jeopardize the continued existence of the species studied, either individually or cumulatively.

Conclusion and Summary of Cumulative Effects: Overall, the preferred alternative would not be expected to have more than short-term adverse effects on Atlantic sturgeon that are captured and released alive. The impacts of incidental capture and release are not expected to have more than short-term adverse effects on individual animals and any increase in stress levels from the capture and handling would dissipate rapidly. Even if an animal was exposed to additional capture (e.g., a week later), no significant cumulative effects would be expected because the increase in stress levels from the previous capture should have already dissipated.

NCDMF requested an overall mortality rate of 5.8%, which breaks down to: Carolina DPS 4.8% mortality in large mesh (≥ 5.0 ISM) and 9.5% in small mesh (< 5.0 ISM); all other DPSs combined 3.8% in large mesh (≥ 5.0 ISM) and 8.5% in small mesh (< 5.0 ISM). In addition to the captures that are expected to result in known mortalities, an unknown proportion of the Atlantic sturgeon that are released alive will succumb to post-release mortality or sub-lethal effects resulting in aborted spawning runs or failed reproductive efforts.

The removal of these numbers of individuals is not likely to have a significant impact on the future spawning population size of Atlantic sturgeon.

Based on the analysis in this EA and supported by the Biological Opinion, NMFS expects that issuance of the proposed incidental take permit would not appreciably reduce the species likelihood of survival and recovery in the wild, nor would it adversely affect spawning, mortality rates, or recruitment rates. In particular, NMFS expects that issuance of the proposed permit would not affect reproductive sturgeon adults in a way appreciably reducing their reproductive success, survival of its young, or the number of young annually recruiting into the breeding populations.

The incremental impact of the proposed authorization of takes of limited numbers of Atlantic sturgeon incidental to the otherwise legal North Carolina gillnet fishery deploying anchored sets and operating in inshore waters, when added to other past, present, and reasonably foreseeable future actions, is not expected to result in population-level effects.

6.0 MITIGATION MEASURES

There are no additional mitigation measures beyond those described by NCDMF or included as permit conditions, as discussed in the description of the Proposed Action (Alternative 2). The applicant's protocols are incorporated into the permit by reference.

In summary, the permit conditions limit the level of take and require monitoring and reporting.

7.0 ESA SECTION 7 CONSULTATION

The Endangered Species Conservation Division determined that issuance of the proposed permit is not likely to adversely affect NMFS ESA-listed DPSs of Atlantic sturgeon that are the subject of the permit. The Endangered Species Conservation Division requested consultation, on July 11, 2013, with NMFS Endangered Species Act Interagency Cooperation Division, to determine whether the issuance of the permit is likely to jeopardize the continued existence of NMFS ESA-listed species or to result in the destruction or adverse modification of designated critical habitat. The conclusion of the Biological Opinion is that the issuance of the incidental take permit to the state of North Carolina is not likely to jeopardize the continued existence of South Atlantic, Carolina, Chesapeake Bay, New York Bight, or Gulf of Maine DPS Atlantic sturgeon. Critical habitat has not been designated or proposed for these DPSs. Critical habitat will therefore not be affected by this action.

8.0 PUBLIC REVIEW AND COMMENT

Federal Register notices were published to inform the public and allow for comments. On July 9, 2013 (78 FR 41034), NMFS published the Notice of Receipt of the June 28, 2013, application from NCDMF for the incidental take of Atlantic Sturgeon Distinct Population Segments. The public comment period ended on August 8, 2013. Additionally, NMFS requested internal and expert review of the application on July 15, 2013. On August 21, 2013, NMFS published a notice requesting comments on this Environmental Assessment (78 FR 51709). There were no comments received for the Environmental Assessment.

9.0 LIST OF PREPARERS AND AGENCIES CONSULTED

This document was prepared by the Endangered Species Conservation Division of NMFS' Office of Protected Resources (F/PR3) in Silver Spring, Maryland.

F/PR3 consulted with NCDMF in preparing this document.

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11.0 APPENDIX 1 – NORTH CAROLINA INSHORE GILLNET RESTRICTIONS

A. PROCLAMATIONS

PROCLAMATION M-14-2009 RE: COMMERCIAL LARGE MESH GILLNETS

Dr. Louis B. Daniel III, Director, Division of Marine Fisheries, hereby announces that effective 12:01 A.M., Monday, July 13, 2009, the following management measures will be implemented for commercial large mesh gillnet operations in the following areas:

I. AREA DESCRIPTIONS

Core Sound to the Atlantic Beach Bridge: In the internal waters of the state from Core Sound south and west of a line beginning at a point on Core Banks at 34° 58.7963'N- 76° 10.0013'W; running northwesterly near Marker # 2CS at the mouth of Wainwright Channel at 35° 00.2780'N- 76° 12.1682'W; running westerly to a point on Camp Point 34° 59.7942'N - 76° 14.6514'W to the Atlantic Beach Bridge (SR 1182). North River, Newport River are included in this description. The COLREG Demarcation lines at Drum, Barden and Beaufort inlets delineate the division between the ocean and internal waters.

Emerald Isle Bridge to Hammocks Beach State Park: In the internal waters of the state south and west of the Highway 58 Emerald Isle Bridge excluding tributaries as described below to a line on the west side of the Hammocks Beach State Park Ferry Channel beginning at a point at the Wildlife Resources Commission Shell Rock Landing boat ramp at 34° 39.1967'N – 77° 09.9383'W; running southeasterly to a point on Bear Island at 34° 37.9608'N - 77° 09.3698'W. White Oak River and Queens Creek are not included in this area. The Highway 24 Bridge at Swansboro is the boundary in the White Oak River. A line across the mouth of Queens Creek beginning at a point on the west shore 34° 39.8455'N - 77° 09.1203'W; running easterly to a point on the east shore 34° 40.1860'N - 77° 08.8383'W is the boundary for Queens Creek. The COLREGS Demarcation Line at Bogue Inlet delineates the division between the ocean and internal waters.

II GILLNET RESTRICTIONS

It is unlawful to use large mesh gillnets (greater than or equal to 5 ½ inch stretched mesh) from 12:01 A.M. Monday, July 13 through midnight, August 31, 2009 in the internal waters described above, unless they meet the following parameters:

- A. It is unlawful to use more than 1000 yards of large mesh gillnet per commercial fishing operation.
- B. It is unlawful to set more than 200 yards of large mesh gillnet in a continuous line.
- C. It is unlawful to use large mesh gillnets without leaving a space of at least 25 yards between separate lengths of net.
- D. It is unlawful to possess large mesh gillnets with a depth from floatline to leadline of more than 15 meshes.
- E. It is unlawful to use tie-downs in large mesh gillnets.

III. GENERAL INFORMATION:

A. This proclamation is issued under the authority of N.C.G. S. 113-134; 113-170.4; 113-170.5; 113-182; 113-221.1; 143B-289.52 and N.C. Fisheries Rules 15A NCAC 3H .0103, 3I .0107, 3I .0113, and 3J .0103.

B. It is unlawful to violate the provisions of any proclamation issued by the Fisheries Director under his delegated authority pursuant to N.C. Fisheries Rule 15A NCAC 3H .0103.

C. The intent of this proclamation is to implement management measures in the large mesh gillnet fisheries in Core Sound, Back Sound and the vicinity of Hammocks Beach State Park that are expected to address the unlawful takes of Endangered Species Act-listed sea turtles.

D. Fishermen using large mesh gillnets shall take an observer if requested and shall supply catch and turtle interaction information requested by state or federal employees on the water or at landing sites. E. This proclamation supplements, but does not supersede, the small mesh gillnet attendance requirement for areas described in Marine Fisheries Rule 3J .0103 from May 1 through October 31 each year.

PROCLAMATION M-27-2011 RE: LARGE MESH GILLNETS: INTERNAL COASTAL WATERS

Dr. Louis B. Daniel III Director, Division of Marine Fisheries, hereby announces that effective at **one hour before sunset on Monday, September 12, 2011**, the following provisions shall apply to the use of large mesh gillnets:

I. SUSPENSION OF PORTION OF MARINE FISHERIES RULE 15A NCAC 03J .0103

The following portion of Marine Fisheries Rules for Coastal Waters 15A NCAC 03J .0103 is suspended:

Section (i) (1), which reads: (i) For gillnets with a mesh length five inches or greater, it is unlawful: (1) To use more than 3,000 yards of gillnet per vessel in internal waters regardless of the number of individuals involved.

The provisions below in this proclamation shall be complied with at all times.

II. AREAS AND EXEMPTIONS

A. This proclamation applies to all internal coastal waters except for portions of Croatan and Roanoke sounds, Albemarle and Currituck sounds and their tributaries and the Neuse, Bay and Pamlico rivers described as follows:

1. In Croatan and Roanoke sounds, the restrictions do not apply north and west of the Virginia Dare Memorial Bridge and the Washington Baum Bridge described below:

a. Croatan Sound - beginning at a point 35° 53.1720'N - 75° 45.6160' W on the mainland shore; running easterly along the south side of the Virginia Dare Memorial Bridge to a point at 35° 53.1630'N - 75° 40.1640' W on Roanoke Island.

b. Roanoke Sound - beginning at a point 35° 53.6240'N - 75° 38.4170' W on shore at Roanoke Island; running easterly along the south side of the Washington Baum Bridge to a point at 35° 54.3820'N - 75° 35.9240' W on the Outer Banks shore.

2. In Pamlico, Bay and Neuse rivers, the restrictions do not apply west of a line in the vicinity of the mouths of those waterbodies described below:

- a. Pamlico River – a line beginning at a point at 35° 24.5920'N - 76° 32.3810'W near Currituck Point; running southwesterly to a point at 35° 19.6960'N - 76° 36.5360'W near Fulford Point.
- b. Bay River – a line beginning at a point 35° 11.0760'N - 76° 31.6200'W near Bay Point; running southerly to a point at 35° 08.9290'N - 76° 32.2680'W near Maw Point.
- c. Neuse River – a line beginning at a point 35° 08.9290'N - 76° 32.2680'W near Maw Point; running southerly to a point at 34° 59.29400'N – 76° 59.2940'N – 76° 34.8230'W on the east shore of the mouth of South River.

III. EXEMPTION FOR RUN-AROUND, STRIKE OR DROP NETS

A run-around, strike or drop net that is used to surround a school of fish and then is immediately retrieved is exempted from the restrictions in this proclamation.

IV. GILLNET CONSTRUCTION AND USE REQUIREMENTS

It is unlawful to use large mesh gillnets (defined as 4 inches to 6½ inches stretched mesh, inclusive) unless they comply with the following provisions:

- A. It is unlawful to use large mesh gillnets of more than 15 meshes in height and without a lead core or leaded bottomline. It is unlawful to use cork, floats, or other buoys except those required for identification except that floats are allowed south of the Highway 58 (B. Cameron Langston) Bridge, beginning at a point on the north shore at 34° 40.7848'N - 77° 04.0273'W; running southerly to a point on the south shore at 34° 39.8620'N – 77° 03.7438'W.
- B. It is unlawful to use or possess more than 2,000 yards of large mesh gillnet per vessel north of the Highway 58 Bridge (coordinates above) and it is unlawful to use or possess more than 1,000 yards of large mesh gillnet per vessel south of the Highway 58 Bridge.
- C. It is unlawful to set more than 100 yards of large mesh gillnet without leaving a space of at least 25 yards between separate lengths of net.

V. GILLNET SETTING TIME REQUIREMENTS

It is unlawful to use large mesh gillnets (defined as 4 inches to 6½ inches stretched mesh inclusive) for daytime sets other than during the setting and retrieval periods specified below. Only single night overnight soaks are permitted, and are only lawful if set and retrieved as follows:

- A. Nets set for Tuesday retrieval may be set no sooner than one hour before sunset on Monday and must be retrieved no later than one hour after sunrise on Tuesday.
- B. Nets set for Wednesday retrieval may be set no sooner than one hour before sunset on Tuesday and must be retrieved no later than one hour after sunrise on Wednesday.
- C. Nets set for Thursday retrieval may be set no sooner than one hour before sunset on Wednesday and must be retrieved no later than one hour after sunrise on Thursday.
- D. Nets set for Friday retrieval may be set no sooner than one hour before sunset on Thursday and must be retrieved no later than one hour after sunrise on Friday.

No other overnight sets are permitted, and in no case shall daytime sets occur other than during setting and retrieval periods as specified above.

VI. GENERAL INFORMATION

This proclamation is issued under the authority of N.C.G. S. 113-134; 113-170.4; 113-170.5; 113-182; 113-221.1; 143B-289.52 and N.C. Fisheries Rules 15A NCAC 03H .0103 and 03J .0101 and .0103.

- A. It is unlawful to violate the provisions of any proclamation issued by the Fisheries Director under his delegated authority pursuant to N.C. Fisheries Rule 15A NCAC 03H .0103.
 - B. The intent of this proclamation is to implement gillnet restrictions while the Division applies for a statewide incidental take permit from NMFS under Section 10 of the Endangered Species Act. It returns gillnet restrictions for use of large mesh gillnets (defined as 4 inches to 6½ inches stretched mesh, inclusive) to those in existence prior to May of 2010 for the areas listed in II. A. 2.
 - C. The restrictions in this proclamation apply to gillnets used by Recreational Commercial Gear License holders as well as Standard and Retired Commercial Fishing Licenses holders.
 - D. The small mesh gillnet attendance requirements in N.C. Marine Fisheries Rule 15A NCAC 03J .0103 (h), size restrictions in 03J .0103(a)(2), the navigational passage requirements in 03J .0101, as well as all other existing gillnet rules and proclamations remain in effect.
 - E. Proclamation M-7-2011, dated February 25, 2011 prohibits the use of gillnets with a stretched mesh length more than 6 ½ inches. G. This proclamation supersedes Proclamation M-18-2011 (Revised) dated July 12, 2011, M-22-2011 and M-23-2011, dated July 12, 2011. It does not supersede Proclamation M-24-2011, dated July 14, 2011, which closed southern Core Sound, Back Sound, the Straits and North River to large mesh gillnets.
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PROCLAMATION M-37-2012 RE: LARGE MESH GILLNETS: INTERNAL COASTAL WATERS

Dr. Louis B. Daniel III Director, Division of Marine Fisheries, hereby announces that effective at **5:31 P.M. Monday, September 3, 2012**, the following provisions shall apply to the use of large mesh gillnets:

I. SUSPENSION OF PORTION OF N.C. MARINE FISHERIES COMMISSION RULE 15A NCAC 03J .0103 The following portion of N.C. Marine Fisheries Commission Rule 15A NCAC 03J .0103 is suspended: Section (i) (1), which reads:

(i) For gillnets with a mesh length five inches or greater, it is unlawful: (1) To use more than 3,000 yards of gillnet per vessel in internal waters regardless of the number of individuals involved.

The provisions below in this proclamation shall be complied with at all times.

II. AREAS AND EXEMPTIONS

A. This proclamation applies to all internal coastal waters including portions of Croatan and Roanoke sounds, Albemarle and Currituck sounds and their tributaries and the Neuse, Bay and Pamlico rivers described as follows:

1. In Croatan and Roanoke sounds, the net construction and use requirements in Section IV. and the net setting times in Section V. below do not apply north and west of the Virginia Dare Memorial Bridge and the Washington Baum Bridge described below:

a. Croatan Sound - beginning at a point $35^{\circ} 53.1720' N - 75^{\circ} 45.6160' W$ on the mainland shore; running easterly along the south side of the Virginia Dare Memorial Bridge to a point at $35^{\circ} 53.1630' N - 75^{\circ} 40.1640' W$ on Roanoke Island.

b. Roanoke Sound - beginning at a point $35^{\circ} 53.6240' N - 75^{\circ} 38.4170' W$ on shore at Roanoke Island; running easterly along the south side of the Washington Baum Bridge to a point at $35^{\circ} 54.3820' N - 75^{\circ} 35.9240' W$ on the Outer Banks shore.

2. In Pamlico, Bay and Neuse rivers, the net construction and use requirements in Section IV. and the net setting times in Section V. below do not apply west of a line in the vicinity of the mouths of those waterbodies described below:

a. Pamlico River – a line beginning at a point at $35^{\circ} 24.5920' N - 76^{\circ} 32.3810' W$ near Currituck Point; running southwesterly to a point at $35^{\circ} 19.6960' N - 76^{\circ} 36.5360' W$ near Fulford Point.

b. Bay River – a line beginning at a point $35^{\circ} 11.0760' N - 76^{\circ} 31.6200' W$ near Bay Point; running southerly to a point at $35^{\circ} 08.9290' N - 76^{\circ} 32.2680' W$ near Maw Point.

c. Neuse River – a line beginning at a point $35^{\circ} 08.9290' N - 76^{\circ} 32.2680' W$ near Maw Point; running southerly to a point at $34^{\circ} 59.29400' N - 76^{\circ} 34.8230' W$ on the east shore of the mouth of South River.

3. In the areas described in II.A. 1. and 2. above, the maximum large mesh gillnet yardage allowed is 2,000 yards.

4. It is unlawful to fail to be present at the nets at least once during a 24 hour period no later than noon each day.

B. CLOSED AREA DESCRIPTION

It is unlawful to use large mesh gillnets (defined as 4 inches to 6½ inches stretched mesh, inclusive) in the area described in II. B. below from April 1 through November 30: SOUTHERN CORE SOUND, BACK SOUND, THE STRAITS, NORTH RIVER AND TRIBUTARIES –The area bound in the north by a line at latitude $34^{\circ} 48.2660' N$ which runs approximately from the Club House on Core Banks westerly to a point on the shore at Davis near Marker “1”, bound in the west by a line at longitude $76^{\circ} 36.9972' W$, which runs northerly from a point on Shackleford Banks to Lennoxville Point, then to the head of Turner Creek, and northerly up the western side of North River, and bound in the east by the COLREGS demarcation line at Barden Inlet including southern Core Sound, Back Sound, The Straits, North River and all tributaries.

III. EXEMPTION FOR RUN-AROUND, STRIKE OR DROP NETS

A run-around, strike or drop net that is used to surround a school of fish and then is immediately retrieved is exempt from the restrictions in this proclamation.

IV. GILLNET CONSTRUCTION AND USE REQUIREMENTS

It is unlawful to use large mesh gillnets (defined as 4 inches to 6½ inches stretched mesh, inclusive) unless they comply with the following provisions:

- A. It is unlawful to use large mesh gillnets of more than 15 meshes in height and without a lead core or leaded bottomline. It is unlawful to use cork, floats, or other buoys except those required for identification except that floats are allowed south of the Highway 58 (B. Cameron Langston) Bridge, beginning at a point on the north shore at 34° 40.7848'N - 77° 04.0273'W; running southerly to a point on the south shore at 34° 39.8620'N – 77° 03.7438'W.
- B. It is unlawful to use or possess more than 2,000 yards of large mesh gillnet per fishing operation regardless of the number of vessels involved in coastal fishing waters north of a line at latitude 34° 48.2660' N which runs approximately from the Club House on Core Banks westerly to a point on the shore at Davis near Marker "1".
- C. It is unlawful to use or possess more than 1,000 yards of large mesh gillnet per fishing operation regardless of the number of vessels involved in coastal fishing waters bound in the north by a line at longitude 76° 36.9972' W, which runs northerly from a point on Shackleford Banks to Lennoxville Point, then to the head of Turner Creek, and northerly up the western side of North River and bound in the south by the North Carolina-South Carolina border.
- D. It is unlawful to set more than 100 yards of large mesh gillnet without leaving a space of at least 25 yards between separate lengths of net.

V. GILLNET SETTING TIME REQUIREMENTS

It is unlawful to use large mesh gillnets (defined as 4 inches to 6 1/2 inches stretched mesh inclusive) for daytime sets other than during the setting and retrieval periods specified below. Only single night overnight soaks are permitted, and are only lawful if set and retrieved as follows: In all areas subject to the restrictions in this proclamation:

- A. Nets set for Tuesday retrieval may be set no sooner than one hour before sunset on Monday and must be retrieved no later than one hour after sunrise on Tuesday.
- B. Nets set for Wednesday retrieval may be set no sooner than one hour before sunset on Tuesday and must be retrieved no later than one hour after sunrise on Wednesday.
- C. Nets set for Thursday retrieval may be set no sooner than one hour before sunset on Wednesday and must be retrieved no later than one hour after sunrise on Thursday.
- D. Nets set for Friday retrieval may be set no sooner than one hour before sunset on Thursday and must be retrieved no later than one hour after sunrise on Friday. In the area bound in the north by a line at longitude 76° 36.9972'W which runs from a point on Shackleford Banks northerly to Lennoxville Point, then to the head of Turner Creek, and northerly up the western side of North River, and bound in the south by the North Carolina-South Carolina border, an additional overnight soak period is permitted in addition to V. A. through D above:
- E. Nets set for Monday retrieval may be set no sooner than one hour before sunset on Sunday and must be retrieved no later than one hour after sunrise on Monday.

No other overnight sets are permitted, and in no case shall daytime sets occur other than during setting and retrieval periods as specified above.

VI. GENERAL INFORMATION

- A. This proclamation is issued under the authority of N.C.G.S. 113-134; 113-170.4; 113-170.5; 113-182; 113-221.1; 143B-289.52 and N.C. Marine Fisheries Commission Rules 15A NCAC 03H .0103 and 03J .0101 and .0103. B. It is unlawful to violate the provisions of any proclamation issued by the Fisheries Director under his delegated authority pursuant to N.C. Marine Fisheries Commission Rule 15A NCAC 03H .0103. C. The intent of this proclamation is to implement gillnet restrictions while the Division applies for a statewide incidental take permit from NMFS under Section 10 of the Endangered Species Act. It closes southern Core Sound, Back Sound, the Straits and North River to large mesh gillnets from April through November. It also reduces the maximum yardage of large mesh gillnets allowed between Lennoxville Point (near Beaufort) and the North Carolina-South Carolina border from 2,000 yards to 1,000 yards. In addition, it reduces the maximum yardage of large mesh gillnets in the formerly exempted rivers and Albemarle Sound Management Area and adds a requirement to be present at the nets in those areas at least once a day by noon.
- B. The restrictions in this proclamation apply to gillnets used by Recreational Commercial Gear License holders as well as Standard and Retired Standard Commercial Fishing Licenses holders.
- C. N.C. Marine Fisheries Commission Rule 15A NCAC 03I .0113 specifies that it is unlawful for any licensee under Chapter 113, Subchapter IV of the General Statutes to refuse to allow the Fisheries Director or his agents to obtain biological data, harvest information, or other statistical data necessary or useful to the conservation and management of marine and estuarine resources from fish in the licensee's possession. The Division of Marine Fisheries has implemented an observer program as an inspection procedure to obtain such data.
- D. The small mesh gillnet attendance requirements in N.C. Marine Fisheries Commission Rule 15A NCAC 03J .0103 (h), size restrictions in 03J .0103(a)(2), the navigational passage requirements in 03J .0101, as well as all other existing gillnet rules and proclamations remain in effect. G. Proclamation M-7-2012, dated February 23, 2012 prohibits the use of gillnets with a stretched mesh length more than 6 ½ inches. H. This proclamation supersedes Proclamation M-33-2012, dated August 24, 2012.
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PROCLAMATION M-38-2012 RE: GILLNETS – ALBEMARLE SOUND AREA

Dr. Louis B. Daniel III, Director, Division of Marine Fisheries, hereby announces that effective at 5:31 P.M. on Monday, September 3, 2012, the following provisions shall apply to the use of gillnets in the following areas:

I. AREA DESCRIPTION

A. In Croatan and Roanoke, Albemarle and Currituck sounds, north and west of the Virginia Dare Memorial Bridge and the Washington Baum Bridge described below:

1. Croatan Sound – beginning at a point 35° 53.1720' N – 75° 45.6160' W on the mainland shore; running easterly along the south side of the Virginia Dare Memorial Bridge to a point at 35° 53.1630' N – 75° 40.1640' W on Roanoke Island.
2. Roanoke Sound – beginning at a point 35° 53.6240' N – 75° 38.4170' W on shore at Roanoke Island; running easterly along the south side of the Washington Baum Bridge to a point at 35° 54.3820' N – 75° 35.9240' W on the Outer Banks shore.

B. The area between the lines referenced in I.A.1. and 2. and the southern boundary of the Albemarle Sound Management Area described as a line beginning at a point 35° 48.3693'N – 75°43.7232'W on Roanoke Marshes Point, running southeasterly to a point 35° 44.1710'N – 75° 31.0520'W on the north point of Eagle Nest Bay.

II. NET RESTRICTIONS

Only gillnets meeting the specified mesh lengths may be used in the described areas. A fishing operation, regardless of the number of vessels or persons involved, shall adhere to the gillnet restrictions specified for the following areas:

A. Albemarle, Currituck, Roanoke and Croatan sounds (areas described in I.A.1. and 2):

1. Gillnets with a mesh length less than 3 inches shall not be used.
2. Gillnets with a mesh length of 3 inches through 4 inches shall not exceed 800 yards, and must be attended at all times.
3. Gillnets with a mesh length greater than 4 inches and less than 5 ½ inches shall not be used.
4. Gillnets with a mesh length of 5 ½ inches and larger are required to be equipped with tie downs spaced no farther apart than 10 yards, restricting the vertical distance between the top and bottom lines to 48 inches or less unless they are equipped with floats that do not exceed 2 inches in diameter and 6 inches in length placed a minimum of 10 yards apart, not to exceed 11 floats per 100 yards of net. Gillnets must be set so as to fish the bottom not to exceed a vertical height of 48 inches.
5. Gillnets with a mesh length of 5 ½ inches and larger can only be used as described in II.A.4 and may not exceed 2,000 yards combined.
6. It is unlawful to fail to be present at the nets at least once during a 24 hour period no later than noon each day.
7. No gillnets may be used in the area southwest of a line from Black Walnut Point 35° 59.3833'N - 76° 41.0060'W; running southeasterly to a point 35° 56.3333'N - 76° 36.0333'W at the mouth of Mackey's Creek, including Roanoke, Cashie, Middle and Eastmost rivers.

B. Area of southern Albemarle Sound Management Area described in I.B. above

1. Gillnets with a mesh length less than 3 inches shall not be used.
2. Gillnets with a mesh length of 3 inches but less than 4 inches shall not exceed 800 yards and must be attended at all times.
3. Gillnets with a mesh length of 4 inches to 6 ½ inches stretched mesh (inclusive) must adhere to the requirements in Proclamation M-37-2012, dated August 29, 2012.
4. Gillnets with a mesh length larger than 6 ½ inches shall not be used.

III. DRIFT GILLNETS

Drift gillnets may not be used in the Joint Fishing Waters portion of the Roanoke, Middle, Eastmost, Cashie, Chowan and Meherrin rivers and all other joint water tributaries of the Albemarle Sound Management Area.

IV. GENERAL INFORMATION

A. This proclamation is issued under the authority of N.C.G.S. 113-170.4; 113-170.5; 113-182; 113-221.1; 143B-289.52 and N.C. Marine Fisheries Commission Rules 15A NCAC 03H .0103 and 03J .0103, 03Q .0107(c); 03M .0202 and 03M .0513.

B. It is unlawful to violate provisions of any proclamation issued by the Fisheries Director under his delegated authority pursuant to N.C. Marine Fisheries Commission Rule 15A NCAC 03H .0103.

C. "Attended" is defined in N.C. Marine Fisheries Commission Rule 15A NCAC 3I .0101.

D. Attended gillnet areas are defined in N.C. Marine Fisheries Commission Rule 15A NCAC 3R.0112.

E. N.C. Marine Fisheries Commission Rule 15A NCAC 03I .0113 specifies that it is unlawful for any licensee under Chapter 113, Subchapter IV of the General Statutes to refuse to allow the Fisheries Director or his agents to obtain biological data, harvest information, or other statistical data necessary or useful to the conservation and management of marine and estuarine resources from fish in the licensee's possession. The Division of Marine Fisheries has implemented an observer program as an inspection procedure to obtain such data.

F. This proclamation supersedes Proclamation M-32-2012 (Revised) dated August 27, 2012. It reduces the maximum yardage of large mesh gillnets in the formerly exempted portion of the Albemarle Sound Management Area and adds a requirement to be present at the nets in those areas at least once a day by noon.

B. Other Gear Restrictions in the North Carolina Inshore Gillnet Fishery

I. Closed area in Western Albemarle Sound

The NCDMF enacted a rule during 1987 closing an area in western Albemarle Sound to all gillnet fishing operations. No gillnets may be used in the area southwest of a line from Black Walnut Point 35° 59.3833'N - 76° 41.0060'W; running 138° (M) to a point 35° 56.3333'N - 76° 36.0333'W at the mouth of Mackey's Creek, including Roanoke, Cashie, Middle and Eastmost rivers. The purpose of this rule is to protect striped bass during their migrations into the Roanoke River. However, Albemarle Sound independent gillnet data have shown this area also has large collections of Atlantic sturgeon and this closure has benefitted the juvenile sturgeon that inhabit this area of the estuary before they migrate to the oceans, as well as, adults on their way into the Roanoke River for spawning. Recent data analysis has shown that Atlantic sturgeon tend to move throughout the western portion of Albemarle Sound between the Highway 32 bridge and the Highway 17 bridge.

II. Small Mesh Gillnet Attendance Albemarle Sound Management Area

All small mesh gillnet fisherman operating in the Albemarle Sound Management Area are required to attend their nets at all times from May 15th through November 18th. Attend small mesh gillnets (less than 5 inch stretched mesh) from May 1 through November 30 in primary and secondary nursery areas and in the Attended Gillnet Areas along the Outer Banks specified in 3R .0112 (b) (2).

Along the Outer Banks, the Attended Gillnet Area is a modification of the NO TRAWL line that has two changes between Rodanthe and Gull Island and at Olivers Reef that straightened out the lines so gillnet attendance is not required in those deeper waters.

Attend small mesh gillnets May through November in an area within 200 yards of shore upstream (west) of a line from Roos Point at the mouth of the Pungo River south to Point of Marsh in Neuse River (Pamlico, Pungo Bay and Neuse rivers). 3R .0112 (b) (4).

Attend small mesh gillnets from May through November within 50 yards of shore in Pamlico Sound and Core Sound and in waters south to South Carolina. EXCEPTION Core Sound south in October and November attendance not required. 3R .0112 (b) (5).

Year-round attendance of small mesh gillnets within 200 yards of shore in the Neuse River from New Bern to mouth, and in the Pamlico and Pungo rivers. Small mesh gillnets in the entire upper reaches of Pamlico, Pungo, Neuse, and Trent rivers require year-round attendance. Areas described in 3R .0112 (a).

III. Large Mesh Gillnets

June through October - all unattended large mesh (≥ 5.0 ISM) must be set a minimum of 10 feet off the shoreline. Shoreline is defined as mean high water or marsh line, whichever is most seaward. 3J .0103 (i).

Large mesh gillnets (≥ 5.0 ISM) after Central Southern striped bass season is over in April through December each year.

Tie-downs (3-feet) are required west of a line from Roos Point at the mouth of the Pungo River south to Point of Marsh. In upstream areas of Neuse, Pamlico, and Pungo rivers, nets must be a minimum of 50 yards offshore. Proclamation M-9-2009.

Large Mesh Gillnet Attendance – Cape Fear River, NC. In 2005, in response to high abundance of sea turtles in the lower Cape Fear River and associated takes in gillnet gear, the NCDMF required attendance of large mesh gillnets from June 20 to August 31. The time period for required attendance has increased since 2005. In 2009, attendance of all gillnets in this region was required from May 23 to November 11. Since 2005, seasonal attendance has proven to be an effective method of reducing interactions with turtles and managing the gillnet fishery in the lower portions of the Cape Fear River. Effort has been reduced by 66% when comparing landings data from 2007 to 2010. Discussions with NCDMF staff indicate that the attendance requirement allowed for timely detection and release of sea turtles and likely Atlantic and shortnose sturgeon from gillnet gear and also resulted in reduced effort and participation due to the seasonal attendance requirement in the lower Cape Fear River flounder fishery.

IV. Gillnet Restrictions Enacted Due to the Settlement Agreement

In June 2009, the NMFS began an AP Observer Program in Core Sound, NC. The NMFS observers documented sea turtle interactions in gillnets >5.0 ISM in this area beginning in late June and notified the NCDMF of their concern for these unauthorized takes. The NCDMF consulted with the NMFS-SERO via conference calls and correspondence to discuss short- and long-term actions to address sea turtle takes in gillnets in Core Sound and throughout the state. In the short term, the agencies agreed for the NCDMF to implement gear restrictions (yardage limits, mesh depth reduction, and net shot reductions) and increased observer coverage in Core Sound and adjacent water bodies (NCDMF Proclamation M-14-2009). For the long term, the

NCDMF continued consultations with the NMFS-SERO (July 2009 to present) concerning the preparation of an ITP application for internal coastal waters while compiling sea turtle interaction data from gillnet surveys, research projects, and direct observations.

As a result of continued sea turtle interactions in the Core Sound large mesh gillnet fishery throughout the summer months and anecdotal reports from fishermen of increased sea turtle sightings along the Outer Banks in Pamlico Sound, the NCDMF delayed the opening of the 2009 PSGNRA until September 5. Monitoring efforts in the PSGNRA continued through October 22 when authorized thresholds of live green sea turtles were exceeded and the NCDMF closed the PSGNRA for the remainder of the season. On October 20, 2009, the day that authorized sea turtle takes were exceeded in the 2009 PSGNRA, a 60-day Notice of Intent (NOI) to sue the NCDMF and the NCMFC was received from the Duke Environmental Law and Policy Clinic on behalf of the Beasley Center. The NOI stated that the NCDMF and the NCMFC violated Section 9 of the ESA by allowing gear that had unauthorized takes of threatened or endangered sea turtles.

The NCDMF consulted with the NMFS-SERO concerning this NOI while continuing to work toward the preparation of an application for a statewide ITP for gillnet fisheries in internal coastal waters. In November 2009, the NCDMF received further correspondence from the NMFS-SERO reiterating the need to “satisfy the requirements of the ESA” relative to Core Sound sea turtle interactions. The NCDMF continued to compile sea turtle interaction data while developing an interim plan to address sea turtle interactions in gillnet gear. As a result of discussions and correspondence with the NMFS-SERO, the NCDMF submitted an interim plan in January 2010 to address sea turtle interactions in gillnet fisheries prosecuted in internal coastal waters. The plan proposed to close large mesh gillnet fisheries throughout the majority of the estuarine waters of North Carolina from May to December 2010.

On February 18, 2010 the NCDMF presented the interim proposal to the NCMFC and the public at an emergency NCMFC meeting in New Bern, NC. During the meeting, numerous commercial fishery representatives expressed concern with the proposed closure on the basis of the economic devastation that would result from such a closure. Representatives from the Coastal Conservation Association (CCA-NC) did not support the interim closure stating the plan was too limited in scope. After thoroughly debating the issue, the NCMFC voted to direct the NCDMF to implement alternative measures that included reductions in the number of days per week that large mesh gillnets were allowed to be fished, restricted soak times, reductions in the length of individual nets (shots), and reductions in total yardage.

On February 23, 2010, the Duke Environmental Law and Policy Clinic filed suit against the NCDMF and the NCMFC on behalf of the Beasley Center (Appendix G). Negotiations between the parties occurred between late February and March 23, 2010, when the NCMFC met again. During the meeting, the NCMFC directed the Fisheries director to issue a gillnet proclamation effective May 15, 2010 restricting the number of days during the week that large mesh gillnets would be allowed, limiting soak time, establishing a maximum yardage limit, mandating maximum mesh depth, requiring net shot lengths, establishing spacing between net shots, and eliminating the use of tie-downs and floats or corks along float lines. The NCDMF director did not issue the proclamation because of ongoing negotiations with the Beasley Center and the Duke Environmental Law and Policy Clinic.

The NCMFC met May 12 through 14, 2010 and discussed the parameters of the final Settlement Agreement between the Beasley Center (plaintiff) and the NCDMF and the NCMFC (Appendix G). At that meeting, the NCMFC reached an agreement concerning restrictions that would be implemented in the 4.0 ISM to 6.5 ISM gillnet fishery in NC estuarine waters. As a result of the NCMFC action, the NCDMF issued Proclamation M-8-2010 effective May 15, 2010 implementing the provisions of the Settlement Agreement (Appendix G; Table 1). Gillnet restrictions implemented by the proclamation included: a stretch mesh size range of 4.0 inch to, and including, 6.5 inch for large mesh gillnets; soak times limited to an hour before sunset to an hour after sunrise, Monday evenings through Friday mornings; large mesh gillnets were restricted to a height of no more than 15 meshes, constructed with a lead core or leaded bottom line and without corks or floats other than needed for identification; a maximum of 2,000 yards of large mesh gillnets allowed to be used per vessel; maximum individual net (shot) length of 100 yards with a 25-yard break between shots. Fishermen in the southern portion of the state were allowed to use floats on nets but were restricted to the use of a maximum of 1,000 yards of large mesh gillnet per fishing operation.

Although gillnets are identified as small (<5 ISM) and large (>5 ISM) in the NCDMF Trip Ticket Program (Trip Ticket) and many of its rules, the Settlement Agreement includes gillnets from 4.0 ISM to 5.0 ISM in the large mesh category because of observed sea turtle takes in 4.0 ISM and 4.5 ISM gillnets in the NCDMF Independent Gillnet Survey. The measures were modified slightly several times during 2010, with the concurrence of the Beasley Center, to improve gear efficiency or adjust fishing area boundaries without compromising the sea turtle conservation provisions of the Settlement Agreement.

Section 5(a) of the Settlement Agreement specifies: “The restrictions as listed in Paragraph 1, 2(e) and 2(i) are minimum requirements for the 2010 statewide ITP application.” Paragraph 1 specifies the restrictions on large mesh gillnets, Section 2(e) pertains to different restrictions in the southern portion of the state as described above, and Section 2(i) specifies that the restrictions apply to standard commercial fishing license holders and recreational commercial gear license holders. However, Section 5(d) of the Settlement Agreement states “The restrictions as listed in Paragraphs 1, 2(e), and 2(i) are deemed solely interim measures and will be in effect within internal coastal waters, not otherwise exempt, until the NMFS issues the NCDMF an ITP for the affected areas. Furthermore, this Agreement shall not foreclose more lenient or more restrictive provisions in future ITP applications if warranted by biological data collected through reliable sources including but not limited to the NMFS and the NCDMF.”

Section 2(b) of the Settlement Agreement makes note of the fact that the PSGNRA expired December 31, 2010 and specifies that that area will be subject to the Agreement. It is the intent of the NCDMF that management measures formerly implemented in the PSGNRA that proved to be effective for sea turtle conservation be carried forward in the sea turtle ITP application for the shallow water portions of management unit B, season 4, which were formerly designated as the PSGNRA.

12.0 APPENDIX II – FLORIDA MANATEE PERMIT CONDITIONS

Methods provided to avoid capture of Florida manatee

Personnel must be informed that it is illegal to harm, harass, or otherwise “take” manatees, and to obey posted manatee protection speed zone, Federal manatee sanctuary and refuge restrictions, and other similar state and local regulations while conducting in-water activities. Such information shall be provided in writing to all vessel personnel prior to beginning permitted research.

Crew involved in research activities must wear polarized sunglasses to reduce glare while on the water and keep a look out for manatee. The crew shall include at least one member dedicated to watching for manatee during all in-water activities.

All vessels engaged in netting and trapping shall operate at the slowest speed consistent with those activities.

Rope attaching floats to nets should not have kinks or contain slack to entangle manatee.

All nets must be continuously monitored. Netting activities must cease if a manatee is sighted within a 100-foot radius of the research vessel or net, and may resume only when the animal is no longer within this safety zone, or 30 minutes has elapsed since the manatee was observed.

Methods provided to avoid injury if manatee are accidentally captured

Devote all research staff efforts to freeing the animal. Remember that a manatee must breathe and surface approximately every 4 minutes. The PI must brief all research participants to ensure that they understand that freeing a manatee can be dangerous. This briefing will caution people to keep fingers out of the nets, that no jewelry should be worn, that they be careful to stay away from the manatee’s paddle, and that they give the animal adequate time and room to breathe as they are freeing it.

As appropriate, turn off vessel or put engine in neutral to avoid injury.

Release tension on the net allowing the animal to free itself. Exercise caution when attempting to assist the animal. Manatees are docile animals but can thrash violently if captured or become entangled. A 1,200 to 3,500 pound manatee can cause extensive damage to nets while trying to escape or breathe, so quick action is essential to protect both the manatee and the net. Ensure the animal does not escape with a net still attached.

As stated in the permit:

Requirements for interactions with Endangered Florida Manatee: (The following conditions are provided by the USFWS to limit interactions and avoid injury to endangered Florida manatee) U.S. Fish and Wildlife Service Guidelines to Reduce the Impact to Manatees if Encountered by

Fisherman. NCDMF must issue a proclamation specifying the guidelines fishermen must follow in the event that a manatee is encountered.

a. The Permit Holder will inform all fishermen associated with the fisheries that manatees may be present in the area, and the need to avoid any harm to these endangered mammals. The applicant will ensure that all fishermen know the general appearance of the species and their habit of moving about completely or partially submerged in shallow water. All fishermen will be informed that they are responsible for observing water-related activities for the presence of manatees.

b. The Permit Holder will advise all fishermen that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the ESA and the Marine Mammal Protection Act.

c. If a manatee is seen within 300 ft of the active vessel movement, all appropriate precautions shall be implemented to ensure protection of the manatee. The precautions shall include the operation of all moving vessels no closer than 50 ft of a manatee. Operation of any vessels closer than 50 ft to a manatee shall necessitate immediately placing any motors in neutral or shutting them off. Activities will not resume until the manatee has departed the fishing area on its own volition. Manatees should not be herded away or harassed into leaving.

d. Fishermen will monitor and tend nets for manatees at the same time they do so for sturgeon (and sea turtles). For help with an entangled, injured, or stranded manatee, fishermen should contact:

Rachel Lo Piccolo
NOAA, Beaufort Lab
101 Pivers Island Road
Beaufort, NC 28516
252-728-8762 (office)
252-444-8064 (pager)

In the event an entangled manatee is encountered, fishermen should take immediate actions in a manner which best minimizes stress or injury to the animal but is sufficient to free it entirely. The above person should then be contacted as soon as possible.

e. Any boat collision or fishing gear interaction with and/or injury to a manatee will be reported immediately. The report must be made to the U.S. Fish and Wildlife Service (USFWS) and NCWRC, and fishing should be postponed until cause of injury or mortality can be determined and a revised fishing and or monitoring plan is produced and approved. The addresses for USFWS and NCWRC are:

U.S. Fish and Wildlife Service
P.O. Box 33726

Raleigh, NC 27636-3726
919-856-4520 extension 16

North Carolina Wildlife Resources
183 Paul Drive
Trenton, NC 28585
252-448-1546

f. A sign should be posted in all fish houses associated with the fisheries where it is clearly visible and will be distributed, as appropriate, to vessel operators to post in vessels. The sign should state:

CAUTION: The endangered manatee may occur in these waters during the warmer months, primarily from June through October. Idle speed is required if operating this vessel in shallow water during these months. All motors must be shut down or placed in neutral if a manatee comes within 50 ft of the fishing vessel. A collision with and/or injury to a manatee will be reported immediately to the U.S. Fish and Wildlife Service and the North Carolina Wildlife Resources Commission.

g. All vessels associated with the fishing activities will operate at “no wake/idle” speeds at all times while in water where the draft of the vessel provides less than four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.